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 14.2.3 AT+CNTP	Modify these commands
	2019.6.5	2.2.15 AT&W 2.2.16 ATZ	Modify these commands
	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 5.2.14 AT+CGCLASS 14.2.1 AT+CHTPSERV 14.2.3 AT+CNTP	Modify these commands
	2019.7.8	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 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	Modify these commands
	2019.12.11	4.2.2 AT+COPS	Modify this command
	2019.12.25	8.2.5 AT+CNUM	Modify this command
	2020.1.7	4.2.7 AT+CNMP	Modify this command
	2020.3.6	5.2.11 AT+CGEQMIN	Modify this command

	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+CMQTTACCQ 18.2.8 AT+CMQTTCONNECT 18.2.9 AT+CMQTTDISC 18.2.10 AT+CMQTTTOPIC 18.2.11 AT+CMQTTPAYLOAD 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+CSQDELTA	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
	2020.5.11	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 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+CMQTTSTART	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

	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+CIPOPEN 15.2.5 AT+CIPRXGET 15.2.8 AT+CIPHEAD 15.2.9 AT+CIPSRIP 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+CLCK 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

		4.2.12 AT+CTZR	
	2020.6.1	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 9.2.11 AT+CMGL 9.2.13 AT+CMGS 9.2.16 AT+CMGD 9.2.18 AT+CMVP	Modify these commands
	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 11.2.7 AT+CPMVT 11.2.8 AT+CRIIC 11.2.10 AT+CBC	Modify these commands
	2020.6.3	4.2.11 AT+CTZU 5.2.5 AT+CGDCONT 5.2.17 AT+CPING 8.2.2 AT+CPBR	Modify these commands
	2020.6.3	16.2.8 AT+HTTPPOSTFILE 16.2.9 AT+HTTPREADFILE	Modify these commands
	2020.6.4	12.2.3 AT+FSRMDIR 12.2.4 AT+FSLS 12.2.8 AT+FSMEM 12.2.9 AT+FSCOPY 13.2.1 AT+CFTRANRX	Modify these commands
	2020.6.10	5.2.13 AT+CGPADDR 15.2.3 AT+CIPOPEN 15.2.6 AT+CIPCLOSE 15.2.9 AT+CIPSRI	Modify these commands
	2020.6.19	All	
V1.02	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	9.1Overview 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

	2020.7.10	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+CSCS	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
	2020.8.11	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 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

		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

	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

		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	Modify this section
	2020.11.2	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 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 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

		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+CIPOPEN 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+CLCK 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+CSQDELTA 3.2.10 AT+CCLK	Modify these commands
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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+CLCK	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+CLCK	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

	2021.2.3	All	Add support on A7678 Series
		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	12.2Detailed 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

	2021.4.22	26.2.19 +BLESRREQ 26.2.20 +BLESWREQ 26.2.21 +BLESCON	Add this command
	2021.4.22	26.2.9 AT+BLESLSTART 26.2.11 AT+BLEADV	Modify this command
	2021.4.27	20.2.3 AT+CDTAM	Modify this command
	2021.4.27	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
	2021.4.28	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+BLESSCAD	Modify this command

		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+BLESDREG 10.2.10AT+CFGRI 24.2.6AT+CGNSSIPR 24.2.9AT+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	12.1Overview 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	22.2.1AT+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

	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
V1.04	2021.7.13	15.2.18 AT+CSOCKSETPN 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+CSOCKSETPN 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

	2021.7.30	24.2.2 AT+CGNSSTST 10.2.11 AT+CURCD	Modify these commands
V1.05	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	Add read command
	2021.8.23	25.2.1AT+CWSTASCAN 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+CSOCKSETPN 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+CSOCKSETPN	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+CFTPSDELE 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

	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
V1.06	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

	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+CIPOPEN	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+LWOPEN 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	Add command

	2021.12.31	15.2.3 AT+CIPOPEN	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+CMQTTPUB	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

		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

		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+CWMOCH 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+CWCLICNT	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

		26.3.7 AT+BTUNPAIR 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 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+BTSPPCONN	Modify this command
V1.08	2022.8.3	19.1 Modify directory 19.2.1 AT+CSSLCFG	Modify directory Modify this command
	2022.8.4	36.2.1 AT+SJDR 36.2.2 AT+SJDCFG	Add jd commands
	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

	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+BTSPPCONN	Modify this command
	2022.10.20	26.3.11 AT+BTSPPCONN	Modify this command

	2022.11.11	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+CIPOPEN 15.2.5 AT+CIPRXGET 15.2.13 AT+CIPCCFG 15.2.22 AT+CIPCFG	Modify these commands Modify these commands Modify these commands 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

		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
	2023.4.17	4.2.11 AT+CNSMOD Show network system mode	Modify this command
	2023.4.18	17.2.13 AT+CFTPSGET	Modify this command
	2023.4.19	2.2.20 AT+CSCS Select TE character set	Modify this command
	2023.4.21	28.4 Modify 340 error meaning	Modify 340 error meaning
	2023.4.23	4.2.8 AT+CNBP 6.2.15 AT+DUALSIMURC	Modify this command
	2023.4.24	7.2.6 AT+CLCC	Add NOTE
V1.10	2023.4.28	15.2.22AT+CIPCFG	Modify this command
	2023.05.11	9.2.10 AT+CGSMS	Modify this command
	2023.05.19	4.2.3AT+CUSDUnstructuredsupplementary service data	Add dcs refer value
	2023.05.23	2.2.14AT&W Save the user setting to ME	Add SAVE type to command
	2023.05.29	2.2.14AT&W Save the user setting to ME	Update AT&W save comamnd
	2023.05.29	3.2.10AT+CCLK Real time clock management	Update CCLK <time> yy range
	2023.05.29	5.2.7AT+CGTFT Traffic Flow Template	Modify this command
	2023.6.05	2.2.20 AT+CSCS	Modify this command
	2023.6.12	32.2.1 AT+CSMTPSCFG 32.2.2 AT+CSMTPSSRV 32.2.5 AT+CSMTPSRCPT 32.2.6 AT+CSMTPSSUB	Modify this command
	2023.6.12	26.2.46 AT+BLESSETSCANRESP	Add this command
	2023.6.13	34.2.4 AT+CEDRXS DRX Setting	Add this command
	2023.6.13	34.2.5AT+CEDRXRDP Edrx Read Dynamic Parameters	Add this command

	2023.6.27	4.2.10 AT+CPSITD	Delete this command
	2023.7.3	16.2.3 AT+HTTPPARA	Modify this command
	2023.7.4	35 AT Commands for USB	Modify this command
	2023.7.14	19.2.1 AT+CSSLCFG	Add ignorecertCN parameters
	2023.7.14	7.2.10 AT+CLIP 7.2.8 AT+CCWA	Modify parameter description Add new parameter description
	2023.7.17	25.2.1 AT+CWSTASCAN 25.2.2 AT+ CWSTASCANEX	Modify this commands
	2023.7.18	7.2.14 AT+VTS 7.2.15 AT+VTD	Modify command Note
	2023.7.20	26.2.47 +BLESCANRESPDATA	Add this URC
V1.11	2023.7.25	9.2.9 AT+CNMI	Modify this command
	2023.7.25	18.2 Detailed Description of AT Commands for MQTT(S)	Modify chapter number
	2023.7.25	2.2.20 AT+CSCS	Modify command parameter
	2023.7.25	16.2.3 AT+HTTPPARA 16.2.4 AT+HTTPACTION	Modiffy this command Modify parameter description
	2023.7.26	36.2.1 AT+SJDR 36.2.2 AT+SJDCFG	Modify command parameter
	2023.7.26	29.2.1 AT+WSSTART 29.2.2 AT+WSSTOP 29.2.3 AT+WSCONNECT 29.2.5 AT+WSSEND	Modify this command
	2023.7.28	35.2.2 AT$MYCONFIG	Modify command parameter
	2023.8.14	32.2.2 AT+CSMTPSSRV 16.2.6 AT+HTTPREAD	Modify example description Modify description
	2023.8.21	6.2.2 AT+CPIN	Add parameter description
	2023.8.22	9.2.11 AT+CMGL	Modify this command
	2023.8.22	31.2.8 AT+COAPSENDTX	Modify this command
	2023.8.28	32.2.9 AT+CSMTPSFILE	Modify this command
	2023.9.1	5.2.6 AT+CGDSCONT	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

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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 inusersetting_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.

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- 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.

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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	
Execution Command **ATD<n>[<mgsm>][;]**	Response Originate a voice call successfully: **OK** **VOICE CALL: BEGIN** Originate a data call successfully: **CONNECT [<text>]** Originate a call unsuccessfully during command execution: **ERROR** Originate a call unsuccessfully for failed connection recovery: **NO CARRIER** Originate a call unsuccessfully for error related to the MT: **+CME ERROR: <err>**
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)
<mgsm>	String of GSM modifiers: I 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

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	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**	Response 1)For voice call: **OK** **VOICE CALL: BEGIN** 2)For data call, and TA switches to data mode: **CONNECT** 3)No connection or no incoming call: **NO CARRIER**
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	
Execution Command **ATH**	Response If AT+CVHU=0: **OK** **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>	000 Automatic answering mode is disable.
	001–255 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

Execution Command **ATO**	Response 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	
Execution Command **AT&V**	Response 1) **<TEXT>** **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
```

2.2.10 ATV 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 **ATV[<value>]**	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 **AT&F[<value>]**	Response **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>	0 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 ATS0.After restarted, the value saved by AT&W must be restored by ATZ.

AT&W Save the user setting to ME	
Write Command **AT&W<value>**	Response 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 **ATZ<value>**	Response 1) **OK** 2) **ERROR**
Execution Command **ATZ**	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
```

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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 **AT+CGMM=?**	Response **OK**
Execution Command **AT+CGMM**	Response **<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 **AT+CGMR=?**	Response **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 **AT+CGSN=?**	Response **OK**
Execution Command **AT+CGSN**	Response **<sn>** **OK** If there is any error, response **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 <chest> 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
```

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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**
Execution Command **AT+CSQ**	Response 1) **+CSQ: <rssi>,<ber>** **OK** 2) **ERROR**
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 **AT+CPOF=?**	Response **OK**
Execution Command **AT+CPOF**	Response **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 **AT+CRESET**	Response **OK**
Test Command **AT+CRESET=?**	Response **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	
Test Command **AT+CACM=?**	Response 1) **OK** 2) **ERROR**
Read Command **AT+CACM?**	Response 1) **+CACM: <acm>** **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	
Test Command **AT+CAMM=?**	Response 1) **OK** 2) **ERROR**
Read Command **AT+CAMM?**	1) **+CAMM: <acmmax>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CAMM=<acmmax>[,<passwd>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**

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

Defined Values

<acmmax>	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	
Test Command **AT+CPUC=?**	Response 1) **OK** 2) **ERROR**

Read Command **AT+CPUC?**	Response 1) **+CPUC: [<currency>,<ppu>]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CPUC=<currency>,<ppu>[,<passwd>]**	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

<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
```

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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 **AT+CPAS=?**	Response **+CPAS: (**list of supported **<pas>s)** **OK**
Execution Command **AT+CPAS**	Response **+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**
Read Command **AT+SIMEI?**	Response 1) **+SIMEI: <imei>** **OK** **2)** **ERROR**
Write Command **AT+SIMEI=<imei>**	Response 1) **OK** 2) **ERROR**
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 **AT+SIGNS=?**	Response **+SIGNS:** **OK**
Read Command **AT+SIGNS?**	Response **+RSRP0: < RP0>** **+RSRP1: < RP1>** **+RSRQ0: < RQ0>** **+RSRQ1: < RQ1>** **+RSSI0: < SI0>** **+RSSI1: < SI1>** **OK**
Execution Command **AT+SIGNS**	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

Test Command **AT+CREG=?**	Response **+CREG: (**range of supported **<n>s)** **OK**
Read Command **AT+CREG?**	Response 1) **+CREG: <n>,<stat>[,<lac>,<ci>]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CREG=<n>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
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)

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	7 registered for "SMS only", roaming (applicable only when <AcT> indicates 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 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>**
Read Command **AT+COPS?**	Response 1) **+COPS: <mode>[,<format>,<oper>[,<AcT>]]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
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.Nomally, 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	
Test Command **AT+CUSD=?**	Response **+CUSD: (**range of supported **<n>s)** **OK**
Read Command **AT+CUSD?**	Response **+CUSD: <n>** **OK**
Write Command **AT+CUSD=<n>[,<str>[,<dcs>]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CUSD**	Response Set default value（<n>=0): **OK** **NOTE:** After execute，you must test module whether to support IMS: **at*imsrcfg="switch"** 1) if spported, 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.
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)** **OK** 2) **ERROR**
Read Command **AT+CSSN?**	Response **+CSSN: <n>,<m>** **OK**
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	
Test Command **AT+CPOL=?**	Response 1) **+CPOL: (**range of supported **<index>s),(**range of supported **<format>s)** **OK** 2) **ERROR**
Read Command **AT+CPOL?**	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_AcT**

	1>,<UTRAN_AcT1>,<LTE_AcT1>] **[..]]]** **OK** 2) **ERROR**
Write Command **AT+CPOL=<index>[,<format>[,<oper>][,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>]]** **NOTE:** If using USIM card, the last four parameters must set.	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

<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=?

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```
+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	
Test Command **AT+COPN=?**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+COPN**	Response 1) **+COPN: <numeric1>,<alpha1>[<CR><LF><CR><LF>** **+COPN: <numeric2>,<alpha2>** **[..]]** **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 **AT+CNMP=?**	Response **+CNMP: (**list of supported **<mode>s)** **OK**
Read Command **AT+CNMP?**	Response **+CNMP: <mode>** **OK**
Write Command **AT+CNMP=<mode>**	Response 1) **OK** 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 efficient 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 **AT+CNBP=<mode>[,<lte_mode>][,<lte_modeExt>][,<saveMode>]**	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

<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)

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	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 vaule) 1 Don't save in NVM

Examples

```
AT+CNBP?
+CNBP: 0X0000000000000180,0X0000000040080085,0X0080

OK
AT+CNBP=0X0000000000000180,0X0000000040080085,0X0080
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**
Read Command **AT+CPSI?**	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>** **OK** 3)If camping on a lte cell: **+CPSI: <System Mode>,<Operation Mode>[,<MCC>-<MNC>,<TAC>,<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/Io 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)

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	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**
Read Command **AT+CNSMOD?**	Response 1) **+CNSMOD: <n>,<stat>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CNSMOD=<n>**	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>	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 AT+CTZU=?	Response **+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
```

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```
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**
Write Command **AT+CTZR=<on/off>**	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+CGERG	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	
Test Command **AT+CGREG=?**	Response **+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> 2 there is a change in the ME network registration status or a change of the network cell: +CGREG: <stat>[,<lac>,<ci>]
<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.

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	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	
Test Command **AT+CEREG=?**	Response 1) **+CEREG: (**range of supported **<n>s)** **OK** 2) **ERROR**
Read Command **AT+CEREG?**	Response 1) **+CEREG: <n>,<stat>[,<tac>,<ci>]** **OK**

	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 numberic parameter that indicates the access technology of serving cell 0 GSM (not applicable) 1 GSM Compact (not applicable)

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	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 **AT+CGATT=?**	Response 1) **+CGATT: (**list of supported **<state>s)** **OK**

	2) **ERROR**
Read Command **AT+CGATT?**	Response 1) **+CGATT: <state>** **OK** 2) **ERROR**
Write Command **AT+CGATT=<state>**	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
```

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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	
Test Command **AT+CGACT=?**	Response **+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 deactive default bearer(cid 1) and dedicated beaeer(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**
Read Command **AT+CGDCONT?**	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>** **+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**
Execution Command **AT+CGDCONT**	Response 1) **OK** 2) **ERROR**
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

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	1 on
<request_type>	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. 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. 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>	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. 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>	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+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
```

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```
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**
Read Command **AT+CGDSCONT?**	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**
Write Command **AT+CGDSCONT=<cid>[,<p_cid>[,<d_comp>[,<h_comp>[,<imCnSignallingFlagInd>]]]]**	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. 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)
```

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```
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 from 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	
Test Command **AT+CGTFT=?**	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)** **[..]]** **OK** 2) **ERROR**
Read Command **AT+CGTFT?**	Response 1) **+CGTFT: [<cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4)/ next header (ipv6)>,<source port range>,<destination port range>,<ipsec security parameter index (spi)>,<type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>,<direction>** **[<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4)/ next header (ipv6)>,<source port range>,<destination port range>,<ipsec security parameter index (spi)>,<type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>,<direction>** **[..]]]** **OK** 2) **ERROR**
Write Command **AT+CGTFT=<cid>[,[<packet filter identifier>,<evaluation precedence index>[,<source address and subnet mask>[,<protocol number (ipv4)/ next header (ipv6)>[,<destination port range>[,<source port range>[,<ipsec security parameter index (spi)>[,<type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>[,<flow label (ipv6)>[,<direction>]]]]]]]]]**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CGTFT**	Response **OK**
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 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

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```
AT+CGTFT=?
+CGTFT:
"IP",(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFF
FF)
+CGTFT:
"IPV6",(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-F
FFFF)
+CGTFT:
"IPV4V6",(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0
-FFFFF)

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)	
Test Command **AT+CGQREQ=?**	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**

	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

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	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 data loss 5 Real-time traffic error non-sensitive application that can cope with data loss
<peak>	A numeric parameter which specifies the peak throughput class: 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>	A numeric parameter which specifies the mean throughput class: 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)

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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 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 **<Deliv ery 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**

	priority>s),(list of supported **<Source statistics descriptor>s),(**list of supported **<Signaling indication flag>s)** **OK** 2) **ERROR**
Read Command **AT+CGEQREQ?**	Response 1) **+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>** **+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>[…]]** **OK** 2) **ERROR**
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>]]]]]]]]]]]]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CGEQREQ**	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 parameter is also used in other PDP context-related commands. The range is from 1 to 15
<Traffic class>	0 conversational 1 streaming 2 interactive 3 background 4 subscribed value
<Maximum bitrate UL>	This parameter indicates the maximum number of kbits/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 kbits/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

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	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.
<Guaranteed bitrate DL>	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,…). 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.
<Delivery order>	This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not. 0 no 1 yes 2 subscribed value
<Maximum SDU size>	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.
<SDU error ratio>	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",…). "0E0" subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"
<Residual bit error ratio>	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",.).

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	"0E0" subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "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 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.
<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 from 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+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)	
Test Command **AT+CGQMIN=?**	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**
Read Command **AT+CGQMIN?**	Response 1) **+CGQMIN:** **[<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR>** **<LF><LF>** **+CGQMIN:** **<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[…]]]** **OK**

	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>	(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>	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

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	data loss 5 Real-time traffic error non-sensitive application that can cope with data loss
<peak>	A numeric parameter which specifies the peak throughput class: 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>	A numeric parameter which specifies the mean throughput class: 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
```

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```
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 Quallity 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)** **OK** 2) **ERROR**
Read Command AT+CGEQMIN?	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

	parameter is also used in other PDP context-related commands. The range is from 1 to 15.
<Traffic class>	0 conversational 1 streaming 2 interactive 3 background 4 subscribed value
<Maximum bitrate UL>	This parameter indicates the maximum number of kbits/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,…). 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 kbits/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,…). 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.
<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+CGEQMIN=…,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 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.
<Guaranteed bitrate DL>	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,…).

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	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.
<Delivery order>	This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not. 0 no 1 yes 2 subscribed value
<Maximum SDU size>	This parameter indicates the maximum allowed SDU size inoctets. 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.
<SDU error ratio>	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",…). "0E0" subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"
<Residual bit error ratio>	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",.). "0E0" subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6"

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	"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","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+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
```

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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	
Test Command **AT+CGDATA=?**	Response 1) **+CGDATA:** (list of supported **<L2P>s)** **OK** 2) **ERROR**
Write Command **AT+CGDATA=[<L2P>,[<cid>]]**	Response 1) **CONNECT [<text>]** 2) **NO CARRIER** 3) **OK** 4) **ERROR** 5) **+CME ERROR: <err>**
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	
Test Command **AT+CGPADDR=?**	Response 1) **[+CGPADDR: (**list of **defined <cid>s)]** **OK** 2) **ERROR**
Write Command **AT+CGPADDR=<cid>[,<cid>[,…]]**	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**
Execution Command **AT+CGPADDR**	Response 1) **[+CGPADDR: <cid>,<PDP_addr>]** **+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** 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
```

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```
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**
Read Command **AT+CGCLASS?**	Response 1) **+CGCLASS: <class>** **OK** 2) **ERROR**
Write Command **AT+CGCLASS=<class>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CGCLASS**	Response 1) **OK** 2) **ERROR**
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 AT+CGEREP=?	Response 1) **+CGEREP: (**list of supported **<mode>s),(**list of supported **<bfr>s)** **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>]	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. <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. 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.

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+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]][,<WLAN_Offload>]	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. <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. 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 <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>.

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.

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

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	defined above. <event_type>: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it. 0 Informational event 1 Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.
+CGEV: ME ACT <p_cid>,<cid>,<event_type>[,<WLAN_Offload>]	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.

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

+CGEV: NW DEACT <PDP_type>,<PDP_addr>[,<cid>]	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.
+CGEV: ME DEACT <PDP_type>,<PDP_addr>[,<cid>]	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.
+CGEV: NW PDN DEACT <cid>[,<WLAN_Offload>]	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.

NOTE

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

+CGEV: ME PDN DEACT <cid>	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.

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	
Test Command **AT+CGAUTH=?**	Response 1) **+CGAUTH: (**range of supported **<cid>s),(**list of supported **<auth_type> s),50,50** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Read Command **AT+CGAUTH?**	Response 1) **+CGAUTH: [<cid>,<auth_type>[,<user>,<passwd>]]** **…** **OK**

	2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CGAUTH=<cid>[,<auth_type>[,<passwd>[,<user>]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CGAUTH**	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

<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 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	
Test Command **AT+CPING=?**	Response 1) **+CPING: IP address,(**list of supported **<dest_addr_type>s),(1-5),(4-188),(1000-10000),(10000-100000),(16-255)** **OK** 2) **ERROR**
Write Command **AT+CPING=<dest_addr>,<dest_addr_type>[,<num_pings>[,<data_packet_size>[,<interval_time>[,<wait_time>[,<TTL>]]]]]**	Response 1) **OK** If ping's result_type=1 **+CPING: <result_type>,<resolved_ip_addr>,<data_packet_size>,<rtt>,<TTL>** If ping's result_type=2 **+CPING: <result_type>** If ping's result_type=3> **+CPING:**

	<result_type>,<num_pkts_sent>,<num_pkts_recvd>,<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_recvd>	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

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```
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
```

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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+CLCK	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**
Execution Command **AT+CICCID**	Response 1) **+ICCID: <ICCID>** **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
+ICCID: 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 **AT+CPIN=?**	Response **OK**
Read Command **AT+CPIN?**	Response 1) **+CPIN: <code>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CPIN=<pin>[,<newpin>]**	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

<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**
Write Command **AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]**	Response 1) **OK** 2) When <mode>=2 and command successful: **+CLCK: <status>[,<class1>[** **+CLCK: <status>,<class2>** **[..]]** **OK** 3) **ERROR** 4) **+CME ERROR: <err>**
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
```

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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

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	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 **AT+CIMI=?**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CIMI**	Response 1) **<IMSI>** **OK** 2) **ERROR**
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 **AT+CSIM=?**	Response **OK**
Write Command **AT+CSIM=<length>,<command>**	Response 1) **+CSIM: <length>,<response>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE

Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<length>	Interger 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 **AT+CRSM=?**	Response **OK**

Write Command **AT+CRSM=<command>[,<fileID>[,<p1>,<p2>,<p3>[,<data>]]]**	Response 1) **+CRSM: <sw1>,<sw2>[,<response>]** **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 convet 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

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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

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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

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	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**
Execution Command **AT+SPIC**	Response 1) **+SPIC: <pin1>,<puk1>,<pin2>,<puk2>** **OK** 2) **+CME ERROR: <err>**
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	
Test Command **AT+CSPN=?**	Response 1) **OK** 2) **ERROR**
Read Command **AT+CSPN?**	Response 1) **+CSPN: <spn>,<display mode>** **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
```

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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=<onoff>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	Vendor

Defined Values

<onoff>	0 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
```

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```
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	
Test Command **AT+SWITCHSIM=?**	Response **+SWITCHSIM: (0: SIM1, 1: SIM2)** **OK**
Read Command **AT+SWITCHSIM?**	Response **+SWITCHSIM: <simID>** **OK**
Write Command **AT+SWITCHSIM=<simID>**	Response 1)If the parameter is correct,and the corresponding card has been inserted, response: **OK** 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	
Test Command **AT+DUALSIM=?**	Response **+DUALSIM: (0: DUAL SIM DUAL STANDBY, 1: DUAL SIM SINGLE STANDBY, 3: DUAL SIM DUAL STANDBY FP)** **OK**
Read Command **AT+DUALSIM?**	Response **+DUALSIM: <dsmode>** **OK**
Write Command **AT+DUALSIM=<dsmode>**	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	
Test Command **AT+BINDSIM=?**	Response **+BINDSIM: (0: SIM1, 1: SIM2)** **OK**
Read Command **AT+BINDSIM?**	Response **+BINDSIM: <simID>** **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	
Test Command **AT+DUALSIMURC=?**	Response **+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 contro
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	
Test Command **AT+CVHU=?**	Response **+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
```

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```
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**
Execution Command **AT+CBST**	Set default value Response **OK**
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)

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	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>	0 Asynchronous modem 1 Synchronous modem– PAD Access (asynchronous)(UDI) 2 Packet Access (synchronous)(UDI) 3 data circuit asynchronous (RDI) 4 data circuit synchronous (RDI) 5 PAD Access (asynchronous)(RDI) 6 Packet Access (synchronous)(RDI) 7 Packet Access (synchronous)(RDI)
<ce>	0 transparent 1 non-transparent

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	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	
Test Command AT+CRLP=?	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>]]** **OK**
Write Command **AT+CRLP=<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]]**	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
```

NOTE

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<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	
Test Command **AT+CLCC=?**	Response **+CLCC:** (range of supported **<n>s)** **OK**
Read Command **AT+CLCC?**	Response **+CLCC: <n>** **OK**
Write Command **AT+CLCC=<n>**	Response 1)

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

URC	Description
+CLCC: **<id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>][,<priority>][,<CLI validity>]][** **+CLCC:** **<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>][,<priority>][,<CLI validity>]]**	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>	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 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>	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. 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 (refer3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Unavailable") 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). 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.

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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)** **OK**
Read Command **AT+CCWA?**	Response **+CCWA: <n>**

	OK
Write Command **AT+CCWA=<n>[,<mode>[,<class>]]**	Response 1)When <mode>=2 and command successful: **+CCWA: <status>,<class>[** **+CCWA: <status>,<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

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	<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 **AT+CCFC=?**	Response **+CCFC: (**list of supported **<reason>s)** **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)

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

AT+CLIP?	1) **+CLIP: <n>,<m>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CLIP=<n>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CLIP**	Set default value 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

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	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	
Test Command **AT+CLIR=?**	Response **+CLIR: (**range of supported **<n>s)** **OK**
Read Command **AT+CLIR?**	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
```

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7.2.12 AT+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

	1	enable
<m>	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)** **OK**
Write Command	Response

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. 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	
Test Command **AT+CSTA=?**	Response **+CSTA: (**list of supported **<type>s)** **OK**
Read Command **AT+CSTA?**	Response **+CSTA: <type>** **OK**
Write Command **AT+CSTA=<type>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CSTA**	Set default value 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	
Test Command **AT+CMUT=?**	Response **+CMUT: (**list of supported **<mode>s)** **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 **AT+CSDVC=?**	Response **+CSDVC: (**list of supported **<dev>s)** **OK**
Read Command **AT+CSDVC?**	Response **+CSDVC: <dev>** **OK**
Write Command **AT+CSDVC=<dev>**	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<dev>	1 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**
Write Command **AT+COUTGAIN=<value>**	Response 1) **OK** 2) **ERROR**
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
```

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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 AT+CPBS=?	Response **+CPBS: (**list of supported **<storage>s)** **OK**
Read Command AT+CPBS?	Response 1) **+CPBS: <storage>[,<used>,<total>]** **OK** 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 EFFDN under ADFUSIM 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	
Test Command **AT+CPBR=?**	Response 1) **+CPBR: (<minIndex>-<maxIndex>), [<nlength>], [<tlength>]** **OK** 2) **+CME ERROR: <err>**
Write Command **AT+CPBR=<index1>[,<index2>]**	Response 1) **[+CPBR: <index>,<number>,<type>,<text>[** **+CPBR: <index>,<number>,<type>,<text>[…]]]** **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 <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+CPBR=?
+CPBR: (1-500),40,14

OK
AT+CPBR=3
+CPBR: 3,"12345678901234567890123456789012345678901234567890",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 **AT+CPBF=?**	Response 1) **+CPBF: [<nlength>],[<tlength>]**

	OK 2) **+CME ERROR: <err>**
Write Command **AT+CPBF=[<findtext>]**	Response 1) **[+CPBF: <index1>,<number>,<type>,<text>[** **+CPBF: <indexN>,<number>,<type>,<text>[…]]]** **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
```

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```
AT+CPBF="lly"
+CPBF: 500,"12345678901234567890123456789012345678901234567890",129,"lly"

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

<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,"lly1"
OK
```

8.2.5 AT+CNUM 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+CNUM Subscriber number	
Test Command **AT+CNUM=?**	Response 1) **OK**
Write Command **AT+CNUM=<index>[,<number>[**	Response 1)

,<type>[,<text>]]]	**OK** 2) **+CME ERROR: <err>**
Execution Command **AT+CNUM**	Response 1) **[+CNUM: <text>,<number>,<type>** **+CNUM: <text>,<number>,<type>]** **OK** 2) **+CME ERROR: <err>**
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.

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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>,<mids>,<dcss>	Parameters are not allowed to be omitted	Only CAT1 Modules
AT+CMGS AT+CMGW	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**
Write Command **AT+CSMS=<service>**	Response 1) **+CSMS: <mt>,<mo>,<bm>** **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**
Read Command **AT+CPMS?**	Response **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>, <used3>,<total3>** **OK**
Write Command **AT+CPMS=<mem1>[,<mem2>[, <mem3>]]**	Response 1) **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK**

	2) **ERROR** 3) **+CMS ERROR: <err>**
Execution Command **AT+CPMS**	Response 1)Set default value (<mem1>="SM",<mem2>="SM",<mem3>="SM"): **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **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). "ME" FLASH message storage "SM" 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). "ME" FLASH message storage "SM" 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). "ME" FLASH message storage "SM" 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**
Read Command **AT+CMGF?**	Response 1) **+CMGF: <mode>** **OK** 2) **ERROR**
Write Command **AT+CMGF=<mode>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CMGF**	Response 1) **Set default value (<mode>=0):** **OK**

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

Defined Values

<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 **AT+CSCA=?**	Response **OK**
Read Command **AT+CSCA?**	Response 1) **+CSCA: <sca>,<tosca>** **OK** 2) **ERROR**

Write Command **AT+CSCA=<sca>[,<tosca>]**	Response 1) **OK** 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 **AT+CSCB=?**	Response 1) **+CSCB: (**range of **supported <mode>s)**

	OK 2) **ERROR**
Read Command **AT+CSCB?**	Response 1) **+CSCB: <mode>,<mids>,<dcss>** **OK** 2) **ERROR**
Write Command **AT+CSCB=<mode>[,<mids>[,<dcss>]]**	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

<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)** **OK**
Write Command **AT+CNMA=<n>**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Execution Command **AT+CNMA**	1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
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"
Testing                                          // receive new short message

AT+CNMA
OK                                               //send ACK to the network
AT+CNMA                                          //the second time return error, it needs ACK only once
+CMS ERROR:340
```

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>	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. 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. 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.
<mt>	The rules for storing received SMS depend on its data coding scheme, preferred memory storage (AT+CPMS)setting and this value: 0 No SMS-DELIVER indications are routed to the TE. 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>. 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). 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.
<bm>	The rules for storing received CBMs depend on its data coding scheme, the setting of Select CBM Types (AT+CSCB)and this value: 0 No CBM indications are routed to the TE. 2 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)
<ds>	0 No SMS-STATUS-REPORTs are routed to the TE. 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:

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	+CDS: <length><CR><LF><pdu> (PDU mode enabled); or +CDS: <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: +CDSI: <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
```

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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**
Write Command **AT+CMGL=<stat>[,<mode>]**	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>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[** **+CMGL:** **<index>,<stat>,<oa>/<da>,[<alpha>],[<scts>][,<tooa>/<toda>,<fo>,<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>[..]]**

	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

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	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>).
<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>	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.
<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

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	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
```

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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**
Write Command **AT+CMGR=<index>**	Response 1)If text mode (AT+CMGF=1), command successful and SMS-DELIVER: **+CMGR:** **<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: **+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>**

	OK 4)If text mode (AT+CMGF=1), command successful and CBM storage: **+CMGR:** **<stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** **OK** 5)If PDU mode (AT+CMGF=0)and Command successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK** 6) **+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.
<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 2. PDU Mode: 0 received unread message (i.e. new message) 1 received read message 2 stored unsent message 3 stored sent message
<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>).

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<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

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	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)).

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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>]** Text is entered. <CTRL-Z/ESC> If PDU mode(AT+CMGF=0) **AT+CMGS=<length>** PDU is entered <CTRL-Z/ESC>	Response 1)If sending successfully: **+CMGS: <mr>** **OK** 2)If cancel sending: **OK** 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 **AT+CMSS=?**	Response **OK**
Write Command **AT+CMSS=<index>[,<da>[,<toda>]]**	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 **AT+CMGW=?**	Response **OK**
Write Command If text mode(AT+CMGF=1) **AT+CMGW=<oa>/<da>[,<tooa>/<toda>[,<stat>]]** Text is entered. <CTRL-Z/ESC> If PDU mode(AT+CMGF=0): **AT+CMGW=<length>[,<stat>]** PDU is entered. <CTRL-Z/ESC>	Response 1)If write successfully: **+CMGW: <index>** **OK** 2)If write fails: **ERROR** 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

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	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**
Write Command **AT+CMGD=<index>[,<delflag>]**	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.
<delflag>	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.

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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 **AT+CMGMT=?**	Response **OK**
Write Command **AT+CMGMT=<index>**	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**
Write Command **AT+CMVP=<vp>**	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

<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
```

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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**
Write Command **AT+CMGRD=<index>**	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-SU-BMIT: **+CMGRD:** **<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]** **<data>** **OK** 3)If text mode(AT+CMGF=1),command successful and SMS-STA-TUS- 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 sto-rage: **+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

Write Command If text mode(AT+CMGF=1): **AT+CMGSEX=<da>[,<toda>][,<mr>,<msg_seg>,<msg_total>]** Text is entered. <CTRL-Z/ESC>	Response 1) **+CMGSEX: <mr>** **OK** 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 **AT+CMSSEX=?**	Response **OK**
Write Command **AT+CMSSEX=<index>[,<index>[,…]]**	Response 1) **[+CMSSEX: <mr>[,<mr>[,…]]]** **OK** 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.

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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**
Execution Command **AT+CCONCINDEX**	Response 1) **+CCONCINDEX: N,i,j,k,...** **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 AT&D[<value>]	Response 1) **OK** 2)

	ERROR
Parameter Saving Mode	AT&W_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<value>	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	
Execution Command **AT&C[<value>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AT&W_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<value>	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)** **OK**
Read Command **AT+IPR?**	Response **+IPR: <speed>** **OK**
Write Command **AT+IPR=<speed>**	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, 115200, 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, 115200, 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**) **OK**
Read Command **AT+ICF?**	Response **+ICF: <format>,<parity>** **OK**
Write Command **AT+ICF=<format>,<parity>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+ICF**	Response Set default value: **OK**
Parameter Saving Mode	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 **AT+IFC=?**	Response **+IFC: (**list of supported**<DCE>s**),(list of supported**<DTE>s**) **OK**
Read Command **AT+IFC?**	Response **+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.

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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 **AT+CMUX=?**	Response **+CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000)** **OK**
Read Command **AT+CMUX?**	Response **+CMUX: <value>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>** **OK**
Write Command **AT+CMUX=<value>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>]]]]]]**	Response 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+CATR 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+CATR Configure URC destination interface	
Test Command **AT+CATR=?**	Response **+CATR: (**list of supported **<port>s)** **OK**
Read Command **AT+CATR?**	Response **+CATR: <port>** **OK**
Write Command	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	Response
AT+CFGRI=?	**+CFGRI:** (list of supported**<status>**),(list of

	supported**<URC_time>**ms), (list of supported**<SMS_time>**ms) **OK**
Read Command **AT+CFGRI?**	Response **+CFGRI: <status>,<URC_time>,<SMS_time>** **OK**
Write Command **AT+CFGRI=<status>[,<URC_time >[,< SMS_time >]]**	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
```

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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
```

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```
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.

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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)** **OK**
Read Command **AT+CVALARM?**	Response **+CVALARM: <enable>,<low voltage>,<high voltage>** **OK**
Write Command **AT+CVALARM=<enable>[,<low voltage>],[<high voltage>]**	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 WARNNING" every 10s. If voltage greater than <high voltage>, it will report "OVER-VOLTAGE WARNNING" 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
```

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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	
Test Command **AT+CVAUXS=?**	Response 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?
```

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```
+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**
Write Command **AT+CADC=<adc>**	Response 1) **+CADC: <value>** **OK** 2) **ERROR**
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 **AT+CADC2=?**	Response **+CADC2: (**range of supported **<adc>s)** **OK**
Write Command **AT+CADC2=<adc>**	Response 1) **+CADC2: <value>** **OK** 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**
Write Command **AT+CMTE=<on/off>**	Response 1) **OK** 2) **ERROR**
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**
Write Command **AT+CPMVT=<enable>[,<low voltage>],[<high voltage>]**	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 WARNNING POWER DOWN" and power off the module. If voltage greater than <high voltage>, it will report

	"OVER-VOLTAGE WARNNING 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 **AT+CRIICNAU8X=?**	Response **OK**
Write Command **AT+CRIICNAU8X=<addr>,<reg>,<len>**	Response 1) **+CRIICNAU8X: <data>** **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 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 **AT+CWIICNAU8X=?**	Response **OK**
Write Command **AT+CWIICNAU8X=<addr>,<reg>,<data>,<len>**	1) **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 **AT+CWIIC=?**	Response **OK**
Write Command **AT+CWIIC=<addr>,<reg>,<data>,<len>**	1) **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 **AT+CRIIC=?**	Response **OK**
Write Command **AT+CRIIC=<addr>,<reg>,<len>**	Response 1) **+CRIIC: <data>** **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 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

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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 **AT+CBC**	Response 1) **+CBC: <vol>** **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 **AT+CPMUTEMP**	Response **+CPMUTEMP: <temp>** **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**
Write Command **AT+CGDRT=<GPIO>**	Response 1) **+CGDRT: <GPIO>,<gpio_io>** **OK** 2) **ERROR**
Write Command **AT+CGDRT=<GPIO>,<gpio_io>**	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_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 **AT+CGSETV=?**	Response **+CGSETV: (**list of supported **<GPIO>s),(**list of supported **<gpio_hl>s)** **OK**
Write Command **AT+CGSETV=<GPIO>,<gpio_hl>**	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_hl>	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 **AT+CGGETV=?**	Response **+CGGETV: (**list of supported **<GPIO>s)** **OK**

Write Command **AT+CGGETV=<GPIO>**	Response 1) **+CGGETV: <GPIO>,<gpio_hl>** **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_hl>	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.

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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	Response
AT+FSRMDIR=?	**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>** **OK**
Write Command **AT+FSLS=<type>**	Response **[+FSLS: SUBDIRECTORIES:** <list of **subdirectories**>**]** **[+FSLS: FILES:** <list of **files**>**]** **OK**
Execution Command **AT+FSLS**	Response **[+FSLS: SUBDIRECTORIES:** <list of **subdirectories**>**]** **[+FSLS: FILES:** <list of **files**>**]** **OK**
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
```

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```
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 **AT+FSRENAME=?**	Response **OK**
Write Command **AT+FSRENAME=<old_name>,<new_name>**	Response 1)If successfully: **OK** 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.

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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**
Execution Command **AT+FSMEM**	Response: 1)If successfully, currently C:/: **+FSMEM: C:(<total>,<used>)** **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**
Write Command **AT+FSCOPY=<file1>,<file2>[,<sync_mode>]**	Response 1)If successfully, synchronous mode: **+FSCOPY: <percent>** **[+FSCOPY: <percent>]** **OK** 2)If successfully, asynchronous mode: **OK** **+FSCOPY: <percent>** **[+FSCOPY: <percent>]** **+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>	The open mode of the file. 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. 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. 2 if the file exist, open it and it can be read only. When the file does not exist, it will respond an error.

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 **AT+FSREAD =<filehandle>[,<length>]**	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 **AT+FSWRITE=?**	Response **+FSWRITE: <filehandle>[,<length>[,<timeout>]]** **OK**
Write Command **AT+FSWRITE=<filehandle>[,**	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>]** **OK**
Write Command **AT+FSSEEK=<filehandle>,<offset>,[<position>]**	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>** **OK**
Write Command **AT+FSPOSITION=<filehandle>**	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 release and should not be used again, unless the file is opened again by **AT+FSOPEN**.

AT+FSCLOSE Close a file	
Test Command **AT+FSCLOSE=?**	Response **+FSCLOSE: <filehandle>** **OK**
Write Command **AT+FSCLOSE=<filehandle>**	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.

Examples

```
AT+FSCLOSE=1                                    //move file from root directory to the user directory
OK
```

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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>,<len>[,<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>	The length of the file data to send. 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.
<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**
Write Command **AT+CFTRANTX=<filepath>[,<location>][,<size>][,<transMode>]**	Response 1)If successfully: **[+CFTRANTX: DATA,<len>** **…** **+CFTRANTX: DATA,<len>]** **+CFTRANTX: 0** **OK** 2)If <transMode> is 1 : **>…** **OK** 3)If failed: **ERROR**
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)lager 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>** **OK**
Write Command **AT+CFTRXBUF=<buffsize_level>**	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=?	Response **+CHTPCFG: "CID",(1-n)** **OK**
Write Command /*Configure the cid values of all clients when a connection is created*/ AT+CHTPCFG="CID"[,<cid>]	Response 1) When <cid> is omitted: **+CHTPCFG: "CID",<cid>** **OK** 2) If the <cid> set successfully: **OK** 3)If failed: **ERROR**

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**
Read Command **AT+CHTPSERV?**	Response 1) **OK** 2) **+CHTPSERV: <index><host>,<port>,<http_version>[,<proxy>,<proxy_port>]** **…** **+CHTPSERV: <index><host>,<port>[,<proxy>,<proxy_port>]** **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 **AT+CHTPUPDATE=?**	Response **OK**
Read Command **AT+CHTPUPDATE?**	Response **+CHTPUPDATE: <status>** **OK**
Execute Command **AT+CHTPUPDATE**	Response 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+CHTPCFG Configure the HTP Context	
Test Command **AT+CNTPCFG=?**	Response **+CNTPCFG: "CID",(1-n)** **OK**
Write Command /*Configure the cid values of all clients when a connection is created*/ **AT+CNTPCFG="CID"[,<cid>]**	Response 1) When <cid> is omitted: **+CNTPCFG: "CID",<cid>** **OK** 2) If the <cid> set successfully: **OK** 3)If failed: **ERROR**

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>[,<timezone>]**	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+CIPSRIP	Show Remote IP Address and Port
AT+CIPMODE	Set TCP/IP Application Mode
AT+CIPSENDMODE	Set Sending Mode
AT+CIPTIMEOUT	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**
Write Command **AT+NETOPEN=<cid>** /*activate the specified PDP context by <cid>*/	Response 1) If the PDP context has not been activated or the network closed abnormally, response: **OK** **+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**
Execute Command **AT+NETOPEN**	Response 1)If the PDP context has not been activated or the network closed abnormally, response: **OK** **+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**
Execute Command **AT+NETCLOSE**	Response 1)If the PDP context has been activated, response: **OK**

	+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+CIPOPEN Establish Connection in Multi-Socket Mode

You can use AT+CIPOPEN 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+CIPOPEN Establish Connection in Multi-Socket Mode	
Test Command **AT+CIPOPEN=?**	Response **+CIPOPEN: (0-9),("TCP","UDP","UDP SERVER")** **OK**
Read Command **AT+CIPOPEN?**	Response **+CIPOPEN: <link_num>[,<type>,<serverIP>,<serverPort>,<index>]** **+CIPOPEN: <link_num>[,<type>,<serverIP>,<serverPort>,<index>]** **[…]** **OK**

	If a connection identified by <link_num>has not been established successfully, only +CIPOPEN: <link_num> will be returned.
Write Command TCP connection **AT+CIPOPEN=<link_num>,"TCP",<serverIP>,<serverPort>[,<localPort>]**	Response 1)if PDP context has been activated successfully, response: **OK** **+CIPOPEN: <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: **+CIPOPEN: <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**
Write Command UDP Connection **AT+CIPOPEN=<link_num>,"UDP",,,<localPort>**	1)If PDP context has been activated successfully, response: **+CIPOPEN: <link_num>,0** **OK** 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 other errors, response: **+CIPOPEN: <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

	AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. <serverIP> and <serverPort> should be set if AT+CIPMODE=1. If success **CONNECT [<text>]** if failure **CONNECT FAIL** 5)Others: **ERROR**
Write Command UDP server Connection **AT+CIPOPEN=<link_num>,"UDP SERVER",,,<localPort>**	1)If PDP context has been activated successfully, response: **+CIPOPEN: <link_num>,0** **OK** 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 other errors, response: **+CIPOPEN: <link_num>,<err>** **ERROR** 4)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

<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+CIPOPEN=?
+CIPOPEN: (0-9),("TCP","UDP","UDP SERVER")

OK
AT+CIPOPEN?
+CIPOPEN: 0
+CIPOPEN: 1,"TCP","183.230.174.137",6031,-1
+CIPOPEN: 2
+CIPOPEN: 3
+CIPOPEN: 4
+CIPOPEN: 5,"UDP","183.230.174.137",6031,-1
+CIPOPEN: 6
+CIPOPEN: 7
+CIPOPEN: 8
+CIPOPEN: 9

OK
AT+CIPOPEN=0,"TCP","183.230.174.137",6031
OK                                          //TCP connection

+CIPOPEN: 0,0
AT+CIPOPEN=5,"UDP",,,6031
+CIPOPEN: 5,0
                                            // UDP Connection
OK                                          //UDP server connection
AT+CIPOPEN=2,"UDP SERVER",,,8888
+CIPOPEN: 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)** **OK**
Read Command **AT+CIPSEND?**	Response **OK**
Write Command If service type is "TCP", send data with changeable length **AT+CIPSEND=<link_num>** Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation	Response 1)If the connection identified by <link_num> has been established successfully, response: **> <input data> CTRL+Z** **OK** **+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>** **ERROR** 3)Others: **ERROR**
Write Command If service type is "TCP", send data with fixed length **AT+CIPSEND=<link_num>,<len**	Response 1)If the connection identified by <link_num> has been established successfully, response: **>**

gth>	**<input data with specified length>** **OK** **+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>** **ERROR** 3)Others: **ERROR**
Write Command If service type is "UDP", send data with changeable length **AT+CIPSEND=<link_num>,,<serverIP>,<serverPort>** Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation	Response 1)If the connection identified by <link_num> has been established successfully, response: **>** **<input data>** **CTRL+Z** **OK** **+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>** 2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** 3)Others: **ERROR**
Write Command If service type is "UDP", send data with fixed length **AT+CIPSEND=<link_num>,<length>,<serverIP>,<serverPort>** Response ">", type data until the data length is equal to <length>	Response 1)If the connection identified by <link_num> has been established successfully, response: **>** **<input data with specified length>** **OK** **+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>** 2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** 3)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

<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
OK                                      fixed length

+CIPSEND: 1,5,5
AT+CIPSEND=8,5,"183.230.174.137",6031
>12345                                  // If service type is "UDP", send data with
OK                                      fixed length

+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 **AT+CIPRXGET=?**	Response **+CIPRXGET: (0-5),(0-9),(1-1500)** **OK**
Read Command **AT+CIPRXGET?**	Response **+CIPRXGET: <mode>** **OK**
Write Command **AT+CIPRXGET=<mode>** In this case,<mode> can only be 0 or 1	Response 1)If the parameter is correct, response: **OK** 2)If the parameter is incorrect or other error, response: **+IP ERROR: <err_info>** **ERROR**

	3)Others: **ERROR**
Write Command **AT+CIPRXGET=2,<link_num>[,<len>]** Retrieve data in ACSII form	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>ACSII form** **OK** 2)If the buffer is empty, response: **+IP ERROR: No data** **ERROR** 3)If the parameter is incorrect or other error, response: **+IP ERROR: <err_info>** **ERROR** 4)Others: **ERROR**
Write Command **AT+CIPRXGET=3,<link_num>[,<len>]** Retrieve data in hex form	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** **ERROR** 3)If the parameter is incorrect or other error, response: **+IP ERROR: <err_info>** **ERROR** 4)Others: **ERROR**
Write Command **AT+CIPRXGET=4,<link_num>**	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>**

	ERROR 3)Others **ERROR**
Write Command **AT+CIPRXGET=5**	Response 1)If the parameter is correct, response: **OK** 2)If the parameter is incorrect or other error, response: **+IP ERROR: <err_info>** **ERROR**
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	
Test Command **AT+CIPCLOSE=?**	Response **+CIPCLOSE: (0-9)** **OK**
Read Command **AT+CIPCLOSE?**	Response **+CIPCLOSE: <link0_state>,<link1_state>,<link2_state>,<link3_state>,<link4_state>,<link5_state>,<link6_state>,<link7_state>,<link8_state>,<link9_state>**

	OK
Write Command **AT+CIPCLOSE=<link_num>**	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**
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**
Execute Command **AT+IPADDR**	Response 1)If PDP context has been activated successfully, response **+IPADDR: <ip_address>** **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)** **OK**
Read Command **AT+CIPHEAD?**	Response **+CIPHEAD: <mode>** **OK**
Write Command **AT+CIPHEAD=<mode>**	Response 1)If the parameter is correct, response: **OK** 2) **ERROR**
Execute Command **AT+CIPHEAD**	Response Set default value:(<mode>=1) **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

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 **AT+CIPSRIP=?**	Response **+CIPSRIP: (0-1)** **OK**
Read Command **AT+CIPSRIP?**	Response **+CIPSRIP: <mode>** **OK**
Write Command **AT+CIPSRIP=<mode>**	Response 1)If the parameter is correct, response: **OK** 2) **ERROR**
Execute Command **AT+CIPSRIP**	Response Set default value:(<mode>=1)

	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+CIPSRIP=?
+CIPSRIP: (0-1)

OK
AT+CIPSRIP?
+CIPSRIP: 1

OK
AT+CIPSRIP=0
OK
AT+CIPSRIP
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 **AT+CIPMODE=?**	Response **+CIPMODE: (0-1)** **OK**
Read Command **AT+CIPMODE?**	Response **+CIPMODE: <mode>**

	OK
Write Command **AT+CIPMODE=<mode>**	Response 1)If the parameter is correct, response: **OK** 2) **ERROR**
Execute Command **AT+CIPMODE**	Response 1)Set default value:(<mode>=0) **OK** 2)If failed: **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+CIPOPEN/AT+CIPSEND.

AT+CIPTIMEOUT Set TCP/IP Timeout Value	
Read Command **AT+CIPTIMEOUT?**	Response **+CIPTIMEOUT: <netopen_timeout>,<cipopen_timeout>,<cipsend_timeout>** **OK**
Write Command **AT+CIPTIMEOUT=[<netopen_timeout>][,[<cipopen_timeout>][,[<cipsend_timeout>]]]**	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 is120000ms. Range is 3000ms-120000ms.
<cipopen_timeout>	Integer type, timeout value for AT+CIPOPEN. default is120000ms. Range is 3000ms-120000ms.
<cipsend_timeout>	Integer type, timeout value for AT+CIPSEND. default is120000ms. 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	
Test Command **AT+CIPCCFG=?**	Response **+CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000),(0-1)** **OK**
Read Command **AT+CIPCCFG?**	Response **+CIPCCFG: <NmRetry>,<DelayTm>,<Ack>,<errMode>,<Header-Type>,<AsyncMode>,<TimeoutVal>,<udpRecvmode>** **OK**
Write Command **AT+CIPCCFG=[<NmRetry>][,[<DelayTm>][,[<Ack>][,[<errMode>][,[<HeaderType>][,[[<AsyncMode>][,[<TimeoutVal>][,[<udpRecvmode>]]]]]]]]]**	Response 1)If the parameter is correct, response: **OK** 2) **ERROR**
Execute Command **AT+CIPCCFG**	Response Set default value: **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

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**
Read Command **AT+SERVERSTART?**	Response 1)If the PDP context has not been activated successfully, response: **+CIPERROR: <err>** **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	
Write Command **AT+SERVERSTOP=<server_index>**	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**
Write Command **AT+CIPACK=<link_num>**	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>** **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**
Write Command **AT+CDNSGIP=<domain name>**	Response 1)If the given domain name has related IP, response: **+CDNSGIP: 1,<domain name>,<IP address>** **+CDNSGIP: 2,<domain name>,<IP address>** **[…]** **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+CSOCKSETPN 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+CSOCKSETPN Set acitve PDP context's profile	
Test Command **AT+CSOCKSETPN=?**	Response **+CSOCKSETPN: 1,(1,6)** **OK**
Read Command **AT+CSOCKSETPN?**	Response **+CSOCKSETPN: <profile_num>,<ip_family>** **OK**
Write Command **AT+CSOCKSETPN=<profile_nu**	Response 1)If the parameter is correct, response:

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+CSOCKSETPN=?
+CSOCKSETPN: 1,(1,6)

OK
AT+CSOCKSETPN?
+CSOCKSETPN: 1,1

OK
AT+CSOCKSETPN=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
```

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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",<rtx>, <tcp_backoff>** **+CSOC: "Mss",<mtu>** **+CSOC: "RecvWin",<win>** **+CSOC: "DnsTmr",<dnsMaxWaitTime>,<dnsMaxRetry>,<dns_wait_tmr>** **+CSOC: "SendWin",<send_win>** **OK**
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}
<rtx>	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, 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",6,1,1,2,2,3,4,5,6,7,7,7,7,7
+CSOC: "Mss",1500
+CSOC: "RecvWin",64240
+CSOC: "DnsTmr",5,2,2,3,4,8,8,8,8,8

+CSOC: "SendWin",11680

OK
```

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```
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",(5-1000)** **+CIPCFG:"DATAECHO","ON/OFF"** **OK**
Read Command **AT+CIPCFG?**	Response **+CIPCFG: "transwaittm",<transwaittime>** **+CIPCFG: "DATAECHO",<dataecho>** **OK**
Write Command **AT+CIPCFG="transwaittm",<transwaittime>**	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>**	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.*/	Response 1)If optional parameter are omitted, query the current configuration: **+CIPCFG: "CID",<cid>** **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**
Write Command **AT+CIPCFG="SCID"[,<link_num>,<cid>]** /*cid for the specified link.*/	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
```

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```
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	
Test Command AT+CIPSENDSTR=?	Response **+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+CIPOPEN=0,"TCP","183.230.174.137",6044
OK

+CIPOPEN: 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 **AT+CIPSETAPN=?**	Response **OK**
Write Command **AT+CIPSETAPN=<link_num>,<cid>**	Response 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

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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+CIPOPEN
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,

	the URC carries the cid parameter, and each cid link reports an independent URC.
+IPCLOSE: <client_index>,<close_reason>	Socket is closed passively. <client_index> is the link number. <close_reason>: 0 Closed by local, active 1 Closed by remote, passive 2 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>.

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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**
Write Command **AT+HTTPINIT=<cid>**	Response 1) **OK** **+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**	Response 1)If stop HTTP service successfully: **OK** 2)If failed: **ERROR**
Write Command **AT+HTTPTERM=<cid>**	Response 1) **OK** **+HTTPTERM: <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 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",<sslcfg_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 repeatly. 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 mutipart/form-data to transfer data, you should set AT+HTTPPARA="CONTENT","mutipart/form-data" .And we will construct boundary header.

Examples

```
AT+HTTPPARA="URL","http://www.baidu.com"
OK
```

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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**
Write Command **AT+HTTPACTION=<method>**	Response 1)If parameter format is right: **OK** **+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**
Execute Command **AT+HTTPHEAD**	Response 1)If read the header information successfully: **+HTTPHEAD: <data_len>** **<data>** **OK** 2)If read failed: **ERROR**
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: f4b9e1793697d1ef2950f530aeec4519
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 **AT+HTTPREAD=?**	Response **OK**
Read Command **AT+HTTPREAD?**	Response 1)If check successfully: **+HTTPREAD: LEN,<len>** **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\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**
Write Command **AT+HTTPDATA=<size>,<time>**	Response 1)if parameter format is right: **DOWNLOAD** **<input data here>** 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**
Write Command **AT+HTTPPOSTFILE=<filename>[,<path>[,<method>[,<send_header>]]]**	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**
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+HTTPOSTFILE 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**
Write Command **AT+HTTPREADFILE=<filename>[,<path>]**	Response 1)if parameter format is right: **OK** **+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

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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**
Write Command **AT+CFTPSSTART=<cid>**	Response **OK** **+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 **AT+CFTPSSTOP=?**	Response **+CFTPSSTOP: (1-n)** **OK**
Execution Command **AT+CFTPSSTOP**	Response 1) **OK** **+CFTPSSTOP: <errcode>** 2) **ERROR**
Write Command **AT+CFTPSSTOP=<cid>**	Response 1) **OK** **+CFTPSSTOP: <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 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> to1 or 2. About <sever_type>, more details please refer to Defined Values <server_type>.

AT+CFTPSLOGIN Login to a FTP(S)server	
Test Command **AT+CFTPSLOGIN=?**	Response **+CFTPSLOGIN: "ADDRESS",(1-65535),"USERNAME","PASSWORD"[,(0-3)]** **OK**
Read Command **AT+CFTPSLOGIN?**	Response 1) i If the status is not logged in **+CFTPSLOGIN: 0** **OK** 2) If it is logged in **+CFTPSLOGIN: 1** **OK** 3) **ERROR**
Write Command **AT+CFTPSLOGIN=<host>,<port>,<username>,<password>[<server_type>]**	Response 1) **OK** **+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 **AT+CFTPSLOGOUT=?**	Response **OK**
Execute Command **AT+CFTPSLOGOUT**	Response 1) **OK** **+CFTPSLOGOUT: 0** 2) **OK** **+CFTPSLOGOUT: <errcode>** 3) **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.

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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 **AT+CFTPSLIST=?**	Response **OK**
Write Command **AT+CFTPSLIST=<dir>**	Response 1) **OK** **+CFTPSLIST: DATA,<len>** **…** **+CFTPSLIST: 0** 2) **OK** **+CFTPSLIST: <errcode>** 3) **ERROR** 4) **+CFTPSLIST: <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
<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 **AT+CFTPSMKD=?**	Response **+CFTPSMKD: "DIR"** **OK**
Write Command **AT+CFTPSMKD=<dir>**	Response 1) **OK** **+CFTPSMKD: 0** 2) **OK** **+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**
Write Command **AT+CFTPSRMD=<dir>**	Response 1) **OK** **+CFTPSRMD: 0** 2) **OK** **+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)sever. 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 **AT+CFTPSCWD=?**	Response **+CFTPSCWD: "DIR"** **OK**
Write Command **AT+CFTPSCWD=<dir>**	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**
Execute Command **AT+CFTPSPWD**	Response 1) **OK** **+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 **AT+CFTPSDELE=?**	Response **+CFTPSDELE: "FILENAME"** **OK**
Write Command **AT+CFTPSDELE=<filename>**	Response 1) **OK**

	+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**
Write Command **AT+CFTPSGETFILE=<filepath>[,<dir>[,<offset>]]**	Response 1) **OK** **+CFTPSGETFILE: 0** 2) **OK** **+CFTPSGETFILE: <errcode>** 3) **ERROR** 4) **+CFTPSGETFILE: <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 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	
Test Command **AT+CFTPSPUTFILE=?**	Response **+CFTPSPUTFILE: "FILEPATH"**[,(range of supported **<dir>s**),(range of supported **<rest_size>s**)] **OK**
Write Command **AT+CFTPSPUTFILE=<filepath>[,<dir>[,<rest_size>]]**	Response 1) **OK** **+CFTPSPUTFILE: 0** 2) **OK** **+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**
Write Command **AT+CFTPSGET=<filepath>[,<rest_size>]**	Response 1) **OK** **+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+CFTPSPUT 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**
Write Command **AT+CFTPSPUT=<filepath>[,<data_len>[,<rest_size>]]**	Response 1)if upload file through serial port successfully: **OK** **+CFTPSPUT: 0** 2)if failed before input data: **ERROR** **+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	
Test Command **AT+CFTPSSINGLEIP=?**	Response **+CFTPSSINGLEIP: (0,1)** **OK**
Read Command **AT+CFTPSSINGLEIP?**	**+CFTPSSINGLEIP: <singleip>** **OK**
Write Command **AT+CFTPSSINGLEIP=<singleip>**	Response 1) **OK** 2) **ERROR** 3) **+CFTPSSINGLEIP: <singleip>** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms

Reference	

Defined Values

<singleip>	The FTPS data socket IP address type: 0 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**
Write Command **AT+CFTPSSIZE=<filepath>**	Response 1) **OK** **+CFTPSSIZE: <filesize>** 2) **ERROR** **+CFTPSSIZE: <errcode>**

	3) **ERROR** 4) **+CFTPSSIZE: <errcode>** **ERROR**
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 **AT+CFTPSTYPE=?**	Response **+CFTPSTYPE: (A,I)** **OK**
Read Command **AT+CFTPSTYPE?**	**+CFTPSTYPE: <type>**

	OK
Write Command **AT+CFTPSTYPE=<type>**	Response 1) **OK** **+CFTPSTYPE: 0** 2) **OK** **+CFTPSTYPE: <errcode>** 3) **ERROR** 4) **+CFTPSTYPE: <errcode>** **ERROR**
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
```

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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 **AT+CFTPSSLCFG=?**	Response **+CFTPSSLCFG: (0,1),(0-9)** **OK**
Write Command **AT+CFTPSSLCFG=<session_id>,<ssl_id>**	Response 1) **OK** 2) **ERROR**
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.

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AT+CFTPSMODE Set Active or Passive FTP Mode

Test Command **AT+CFTPSMODE=?**	Response **+CFTPSMODE: (0,1)** **OK**
Read Command **AT+CFTPSMODE?**	**+CFTPSMODE: <mode>** **OK**
Write Command **AT+CFTPSMODE=<mode>**	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 excute 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+CMQTTACCQ	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+CMQTTPUB	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
```

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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**
Execute Command **AT+CMQTTSTOP**	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**
Write Command **AT+CMQTTSTOP=<cid>**	Response 1) **OK** **+CMQTTSTOP: <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+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>** **OK**
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)** **OK**
Read Command **AT+CMQTTREL?**	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
```

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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**
Write Command **AT+CMQTTWILLTOPIC=<client_index>,<req_length>**	Response 1)If successfully: **> <input data here>** **OK** 2)If failed: **+CMQTTWILLTOPIC: <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. 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**
Write Command **AT+CMQTTWILLMSG=<client_index>,<req_length>,<qos>**	Response 1)If successfully: **> <input data here>** **OK** 2)If failed: **+CMQTTWILLMSG: <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 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_name>[,<pass_word>]]]** **+CMQTTCONNECT: 1[,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]]** **OK**
Write Command **AT+CMQTTCONNECT=<client_index>,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]**	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**

	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>	The clean session flag. The value range is from 0 to 1, and default value is 0. 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. 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.
<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
```

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+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 **AT+CMQTTTOPIC=?**	Response **+CMQTTTOPIC: (0-1),(1-1024)** **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+CMQTTPUB.

18.2.11 AT+CMQTTPAYLOAD Input the publish message

AT+CMQTTPAYLOAD is used to input the message body of a publish message.

AT+CMQTTPAYLOAD Input the publish message	
Test Command **AT+CMQTTPAYLOAD=?**	Response **+CMQTTPAYLOAD: (0-1),(1-10240)** **OK**
Write Command **AT+CMQTTPAYLOAD=<client_index>,<req_length>**	Response 1)If successfully: **> <input data here>** **OK** 2)If failed: **+CMQTTPAYLOAD: <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 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+CMQTTPAYLOAD=0,6
>

OK
```

NOTE

The topic will be clean after execute AT+CMQTTPUB.

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18.2.12 AT+CMQTTPUB Publish a message to server

AT+CMQTTPUB is used to publish a message to MQTT server.

AT+CMQTTPUB Publish a message to server	
Test Command **AT+CMQTTPUB=?**	Response **+CMQTTPUB: (0-1),(0-2),(1-180),(0-1),(0-1)** **OK**
Write Command **AT+CMQTTPUB=<client_index>,<qos>,<pub_timeout>[,<ratained>[,<dup>]]**	Response 1)If successfully: **OK** **+CMQTTPUB: <client_index>,0** 2)If failed: **OK** **+CMQTTPUB: <client_index>,<err>** 3)If failed: **+CMQTTPUB: <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

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	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+CMQTTPUB=0,1,60
OK

+CMQTTPUB: 0,0
```

NOTE

The topic and payload will be clean after execute AT+CMQTTPUB.

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**
Write Command **AT+CMQTTSUBTOPIC=<client_index>,<req_length>,<qos>**	Response 1)If successfully: **>** **<input data here>** **OK** 2)If failed: **+CMQTTSUBTOPIC: <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.
<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 **AT+CMQTTSUB=?**	Response **+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 /* subcribe 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 AT+CMQTTUNSUBTOPIC=?	Response **+CMQTTUNSUBTOPIC: (0-1),(1-1024)** **OK**

Write Command **AT+CMQTTUNSUBTOPIC=<client_index>,<req_length>**	Response 1)If successfully: **> <input data here> OK** 2)If failed: **+CMQTTUNSUBTOPIC: <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+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	
Test Command **AT+CMQTTUNSUB=?**	Response **+CMQTTUNSUB: (0-1),(1-1024),(0-1)** **OK**
Write Command /*unsubscribe one or more topics which input by AT+CMQTTUNSUBTOPIC*/ **AT+CMQTTUNSUB=<client_index>,<dup>**	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**
Write Command /* unsubscribe one topic*/ **AT+CMQTTUNSUB=<client_index>,<reqLength>,<dup>**	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+CMQTTACCQ. 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)**

	OK
Read Command **AT+CMQTTCFG?**	Response **+CMQTTCFG: 0,<checkUTF8_flag>,<optimeout_val>** **+CMQTTCFG: 1,<checkUTF8_flag>,<optimeout_val>** **OK**
Write Command /*Configure the check UTF8 flag of the specified MQTT client context*/ **AT+CMQTTCFG="checkUTF8",<index>,<checkUTF8_flag>**	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>**	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>]**	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>]**	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. 0 Not check UTF8 coding. 1 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","devicesecret"	(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. 0: Not show length of received. 1: Show length of received. (0-1):A numeric parameter that identifies report payload length. 0: 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.
+CMQTTRXSTART: <client_index>,<topic_total_len>,<payload_total_len>	If a client subscribes to one or more topics, any message published to

+CMQTTRXTOPIC: <client_index>,<sub_topic_len> **<sub_topic>** /*for long topic, split to multiple packets to report*/ **[<CR><LF>+CMQTTRXTOPIC:** **<client_index>,<sub_topic_len>** **<sub_topic>]** **+CMQTTRXPAYLOAD: <client_index>,<sub_payload_len>** **<sub_payload>** /*for long payload, split to multiple packets to report*/ **[+CMQTTRXPAYLOAD: <client_index>,<sub_payload_len>** **<sub_payload>]** **+CMQTTRXEND: <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)+CMQTTRXSTART: <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)+CMQTTRXTOPIC: <client_index>,<sub_topic_len>\r\n <sub_topic> After the command "+CMQTTRXSTART" 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 "+CMQTTRXTOPIC" 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)+CMQTTRXPAYLOAD: <client_index>,<sub_payload_len>\r\n<sub_payload> After the command "+CMQTTRXTOPIC" 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 "+CMQTTRXTOPIC".

	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.

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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+CCERTDELE	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
Read Command AT+CSSLCFG?	Response +CSSLCFG: 0,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 1,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 2,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 3,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 4,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 5,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 6,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG: 7,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> +CSSLCFG:

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	8,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag> **+CSSLCFG:** **9,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag>** **OK**
Write Command /*Query the configuration of the specified SSL context*/ **AT+CSSLCFG=<ssl_ctx_index>**	Response **+CSSLCFG:** **<ssl_ctxindex>,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enableSNI_flag>,<ignorecertCN_flag>** **OK**
Write Command /*Configure the version of the specified SSL context*/ **AT+CSSLCFG="sslversion",<ssl_ctx_index>,<sslversion>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Write Command /*Configure the authentication mode of the specified SSL context*/ **AT+CSSLCFG="authmode",<ssl_ctx_index>,<authmode>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Write Command /*Configure the ignore local time flag of the specified SSL context*/ **AT+CSSLCFG="ignorelocaltime",<ssl_ctx_index>,<ignoreltime>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Write Command /*Configure the negotiate timeout value of the specified SSL context*/ **AT+CSSLCFG="negotiatetime",<ssl_ctx_index>,<negotiatetime>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Write Command /*Configure the server root CA of the specified SSL context*/ **AT+CSSLCFG="cacert",<ssl_**	Response 1)If successfully: **OK** 2)If failed:

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

	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.
<authmode>	The authentication mode, the default value is 0. 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.)
<ignoreltime>	The flag to indicate how to deal with expired certificate, the default value is 1. 0 care about time check for certification. 1 ignore time check for certification When set the value to 0, it need to set the right current date and time by AT+CCLK when need SSL certification.
<negotiatetime>	The timeout value used in SSL negotiate stage. The range is 10-300 seconds. The default value is 300.
<ca_file>	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). There are two ways to download certificate files to module: 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<clientcert_file>	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. 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). There are two ways to download certificate files to module: 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<clientkey_file>	The client key file name of SSL context. The file name must have

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	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). There are two ways to download certificate files to module: 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<password_file>	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. 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). There are two ways to download certificate files to module: 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<enableSNI_flag>	The flag to indicate that enable the SNI flag or not, the default value is 0. 0 not enable SNI. 1 enable SNI.
<ignorecertCN_flag>	The flag to indicate that enable the ignorecertCN flag or not, the default value is 0. 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)
```

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```
+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	
Test Command **AT+CCERTDOWN=?**	Response **+CCERTDOWN: (5-108),(1-10240)** **OK**

Write Command **AT+CCERTDOWN=<filename>,<len>**	Response 1)If it can be download: **> <input data here>** **OK** 2)If failed: **ERROR**
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
```

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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+CCERTDELE Delete certificates

AT+CCERTDELE Delete certificates	
Write Command AT+CCERTDELE=<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 (中华.pem), then input the hexadecimal (262378344532443B262378353334453B2E70656D)of UTF8 coding.

Examples

```
AT+CCERTDELE="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	
Test Command **AT+CCHSET=?**	Response **+CCHSET: (0,1),(0,1)** **OK**
Read Command **AT+CCHSET?**	Response **+CCHSET: <report_send_result>,<recv_mode>** **OK**
Write Command **AT+CCHSET=<report_send_result>[,<recv_mode>]**	Response 1)If successfully: **OK** 2)If failed:

	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)** **OK**
Read Command **AT+CCHMODE?**	Response **+CCHMODE: <mode>** **OK**
Write Command **AT+CCHMODE=<mode>**	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>**
Write Command **AT+CCHSTART=<cid>**	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	
Execute Command **AT+CCHSTOP**	Response 1)If stop SSL service successfully: **OK** **+CCHSTOP: 0** 2)If failed: **ERROR**
Write Command **AT+CCHSTOP=<cid>**	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)
```

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```
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	
Test Command **AT+CCHCFG=?**	Response **+CCHCFG: "sendtimeout",(0-1),(60-150)** **+CCHCFG: "sslctx",(0-1),(0-9)** **OK**
Read Command **AT+CCHCFG?**	Response **+CCHCFG: 0,<sendtimeout_val>,<sslctx_index>** **+CCHCFG: 1,<sendtimeout_val>,<sslctx_index>** **OK**
Write Command /*Configure the timeout value of the specified client when sending data*/ **AT+CCHCFG="sendtimeout",<session_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.

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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 **AT+CCHSEND=?**	Response **+CCHSEND: (0,1),(1-2048)** **OK**
Read Command **AT+CCHSEND?**	Response **+CCHSEND: 0,<unsent_len_0>,1,<unsent_len_1>**

	OK
Write Command **AT+CCHSEND=<session_id>,<len>**	Response 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
```

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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**
Write Command **AT+CCHRECV=<session_id>[,<max_recv_len>]**	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>** 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
```

```
: 158501683004041477221096231439704472797 8
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="鐧惧害鏄熸儚" /><link rel="icon" sizes="any" mask
href="//www.baidu.com/img/baidu_85beaf5496f291521eb75ba38eacbd87.svg"><link
rel="dns-prefetch" href="//dss0.bdstatic.com"/><link rel="dns-prefetch"
href="//dss1.bdstatic.com"/><link rel="dns-prefetch" href="//ss1.bdstatic.com"/><link
rel="dns-prefetch" href="//sp0.baidu.com"/><link rel="dns-prefetch" href="//sp1.baidu.com"/><link
rel="dns-prefetch" href="//sp2.baidu.com"/><title>鐧惧害涓€涓?
+CCHRECV: DATA,0,1024
紝浣犲氨鏁ヲ亾</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;p
adding:0}.clearfix:after{content:'\20';display:block;height:0;clear:both}.clearfix{zoom:1}#wrapper{p
osition: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-he
ight: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.co
m/static/superman/img/icons-5859e577e2.png);background-repeat:no-repeat;_background-image:u
rl(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**
Write Command **AT+CCERTMOVE=<filename>**	Response 1)if parameter is right and the file need to move is exist: **OK** 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:**

	OK **+CTTS: <err>** // transform end 4)If <mode>is 3 or 4: **+CTTS:** **OK** **+CTTS: <err>** // transform end 5) **ERROR**
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, Chinses 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 synthetized 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 TOUNGTONE 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=zhao1>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**
Read Command **AT+CTTSPARAM?**	Response **+CTTSPARAM: <volume>,<sysvolume>,<digitmode>,<pitch>,<speed>,<digitreading>** **OK**
Write Command **AT+CTTSPARAM=<volume>[,<sysvolume>[,<digitmode>[,<pitch>[,<speed>[,<digitreading>]]]]]**	Response 1) **OK** 2) **ERROR**
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

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```
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 **AT+CTTSPARAM=?**	Response **+CTTSPARAM: (0-7),(0-2),(0-2),(0-2),(0-2),(0-1)** **OK**
Read Command **AT+CTTSPARAM?**	Response **+CTTSPARAM: <volume>,<sysvolume>,<digitmode>,<pitch>,<speed>,<ttslib>** **OK**
Write Command **AT+CTTSPARAM=<volume>[,<sysvolume>[,<digitmode>[,<pitch>[,<speed>[,<ttslib>]]]]]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	Just <volume> is AUTO_SAVE
Max Response Time	9000ms
Reference	Ventor

Defined Values

<volume>	Settting system volume like AT+COUTGAIN,default value is 4.
<sysvolume>	0 The min system volume 1 The small system volume 2 The normal system volume
<digitmode>	0 Read digit based on default mode 1 Read digit based on digit 2 Read digit based on number
<pitch>	0 The min voice tone 1 The normal voice tone 2 The max voice tone
<speed>	0 The min voice speed 1 The normal voice speed 2 The max voice speed
<ttslib>	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> fucntion 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 **AT+CDTAM=?**	Response **+CDTAM: (0-1)** **OK**
Read Command **AT+CDTAM?**	Response **+CDTAM: <status>** **OK**
Write Command **AT+CDTAM=<mode>**	Response 1)If <mode>is 0 or 1: **OK** 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
```

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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

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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	swtich 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:
```

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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.

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21.2.2 AT+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**
Execution Command **AT+CCMXSTOP**	Response 1) **+CCMXSTOP:** **OK** **+AUDIOSTATE: audio play stop** 2) **OK**
Parameter Saving Mode	
Max Response Time	
Reference	

Examples

```
AT+CCMXSTOP
+CCMXSTOP:

OK

+AUDIOSTATE: audio play stop
```

21.2.3 AT+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**
Write Command **AT+CREC=<record_path>,<file_name>**	Response 1) **+CREC: 1** **OK** 2) **+CREC: 2** **OK** 3) **+CREC: 3** **OK** 4) **ERROR**
Write Command **AT+CREC=<mode>**	Response 1) **+CREC: 0** **OK** 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 recoding 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 **AT+CRTSWITCH=?**	Response **+CRTSWITCH: (0-1)** **OK**
Read Command **AT+CRTSWITCH?**	Response **+CRTSWITCH: (list current <status>s)** **OK**
Write Command **AT+CRTSWITCH =<status>**	Response 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 **AT+CRINGSET=?**	Response **+CRINGSET: <fileName>** **OK**
Read Command **AT+CRINGSET?**	Response **+CRINGSET: <fileName>** **OK**
Write Command **AT+CRINGSET** **=<fileName>[,<mode>]**	Response 1) **OK** 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
```

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```
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+CCODECSWTICH Set codec type	
Read Command **AT+CCODECSWITCH?**	Response **+CCODESWITCH: <type>** **OK**
Write Command **AT+CCODECSWITCH =<type>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	**AUTO_SAVE_REBOOT:**
Max Response Time	
Reference	

Defined Values

<type >	Codec type, 0 is externel 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**
Execution Command **AT+CLDTMF**	Response **OK** Abort any DTMF tone currently being generated and any DTMF tone sequence
Write Command **AT+CLDTMF=<n>,<DTMF string>[,<timeBase>][,<path>]**	Response 1) **OK** **+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 **AT+SIMTONE=?**	Response **+SIMTONE:** **(0-1),(20-4000),(50-25500),(0,40-25500),(50-500000)** **OK**
Write Command **AT+SIMTONE=<mode>[,<frequency>][,<periodOn>][,<periodOff>][,<duration>]**	Response 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** **+STTONE: 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.
<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 = 15300000ms (supported range = 50-15300000)

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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)** **OK**
Write Command **AT+CPCMCLKWB=<value>**	Response 1) **OK** 2) **ERROR**
Read Command **AT+CPCMCLKWB?**	Response **+CPCMCLKWB: <value>** **OK**
Parameter Saving Mode	
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**
Write Command **AT+CPCMRATION=<value>**	Response 1) **OK** 2) **ERROR**
Read Command **AT+CPCMRATION?**	Response **+CPCMRATION: <value>** **OK**
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*ration .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 **AT+CFOTA=<channel>,<mode>,<destination_ip/url>,<username>,<password>,<https_sni>**	Response 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 maxmum 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 maxmum of the length is 128 bytes.
<password>	The login password, it should be ASCII characters, and the maxmum 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
```

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+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**
Read Command **AT+LFOTA?**	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**
Write Command **AT+LFOTA=<ops>,<File Size>**	Response 1)If successfully: **>** **OK** 2)If failed: **>** **ERROR** 3)If failed: **ERROR**
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 /*Setting FOTA service status*/ **AT+CAPFOTA=<on/off>**	Response 1)If successfully: **OK** 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 **AT+CSCFOTA=<OEM>,<models>,<product ID>,<product Secret>,<target version>**	Response 1)If successfully: **OK** 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","A7600C_A39_190327_V1.00"
OK
+CSCFOTA: 2
+CSCFOTA: 3
+CSCFOTA: 0
```

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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+CGPSHOT	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	
Test Command **AT+CGNSSPWR=?**	Response **+CGNSSPWR: <GNSS_Power_status>,<AP_Flash_status>,<GNSS _dynamic_load>** **OK**
Read Command **AT+CGNSSPWR?**	Response **+CGNSSPWR: <GNSS_Power_status>,<AP_Flash_status>,<GNSS _dynamic_load>** **OK**
Write Command **AT+CGNSSPWR=<GNSS_Power_status>[,<AP_Flash_status>][,<GNSS _dynamic_load>]**	Response 1)If successfully: **OK** 2)if GNSS can work properly: **+CGNSSPWR: READY!** 2)If failed: **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<GNSS_Power_status>	0 Close GNSS 1 Active GNSS The function will take effect immediately.
<AP_Flash_status>	0 Close GNSS AP_Flash fast hot start mode 1 Active GNSS AP_Flash fast hot start mode The function will take effect immediately.
<GNSS _dynamic_load>	0 Close GNSS _dynamic_load 1 Active GNSS _dynamic_load The function will take effect immediately.

NOTE

1. In ASR1601, only the GNSS_Power_status field is supported.
2. In ASR1603, GNSS will take about 9 seconds to updata 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 AT+CGNSSTST=?	Response **+CGNSSTST: (0,1)** **OK**
Read Command AT+CGNSSTST?	Response **+CGNSSTST: <on/off>**

	OK
Write Command **AT+CGNSSTST=<on/off>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<on/off>	0 Stop sending data received from UART3 to NMEA port. 1 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 to excute 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 “+CGNSSPWR: READY!”.

AT+CGPSCOLD Cold start GPS	
Execution Command **AT+CGPSCOLD**	Response **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 “+CGNSSPWR: READY!”.

AT+CGPSCOLD Warm start GPS	
Execution Command AT+CGPSWARM	Response 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+CGPSHOT Hot start GPS

This command is valid after the URC reports “+CGNSSPWR: READY!”.

AT+CGPSHOT Hot start GPS	
Execution Command	Response

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 **AT+CGNSSIPR=?**	Response **+CGNSSIPR: (list of supported <baud-rate>s)** **OK**
Read Command **AT+CGNSSIPR?**	Response **+CGNSSIPR: <baud-rate>** **OK**
Write Command **AT+CGNSSIPR=<baud-rate>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Execution Command **AT+CGNSSIPR**	Response Set default value **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<baud-rate>	9600 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 “+CGNSSPWR: READY!”.

AT+CGNSSMODE Configure GNSS support mode	
Test Command AT+CGNSSMODE=?	Response **+CGNSSMODE: (1-7)** **OK**
Read Command AT+CGNSSMODE?	Response **+CGNSSMODE: <mode>** **OK**
Write Command AT+CGNSSMODE=<mode>	Response 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>	1 GPS L1 + BDS B1 + QZSS 2 BDS B1 3 GPS L1+QZSS The mode is supported in foreign module: 1 GPS L1+SBAS+QZSS 2 BDS B1 3 GPS+GLONASS+GALILEO+SBAS+QZSS 4 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+CGNSSNMEA Configure NMEA sentence type

This command is valid after the URC reports “+CGNSSPWR: READY!”.

AT+CGNSSNMEA Configure NMEA sentence type	
Test Command AT+CGNSSNMEA=?	Response **+CGNSSNMEA: (0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1)** **OK**
Read Command AT+CGNSSNMEA?	Response **+CGNSSNMEA: 1,0,1,1,1,0,0,0** **OK**
Write Command AT+CGNSSNMEA=[nGGA,[nGLL,[nGSA,[nGSV,[nRMC,[nVTG,[nZDA,[nGST]]]]]]]	Response 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),(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 **AT+CGPSNMEARATE=?**	Response **+CGPSNMEARATE: (1,2,4,5,10)** **OK**
Read Command **AT+CGPSNMEARATE?**	Response **+CGPSNMEARATE: <rate>** **OK**
Write Command **AT+CGPSNMEARATE=<rate>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Execution Command **AT+CGPSNMEARATE**	Response Set default value 1 **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	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 AT+CGPSFTM=?	Response **OK**
Read Command AT+CGPSFTM?	Response **+CGPSFTM: 0/1** **OK**
Write Command AT+CGPSFTM=<on/off>	Response 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 “+CGNSSPWR: READY!”.

AT+CGPSINFO Get GPS fixed position information	
Test Command **AT+CGPSINFO=?**	Response **+CGPSINFO: (0-255)** **OK**
Read Command **AT+CGPSINFO?**	Response **+CGPSINFO: <time>** **OK**
Write Command **AT+CGPSINFO=<time>**	Response 1)If successfully: **OK** **+CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]** 2)If <time>=0: **OK** 3)If failed: **ERROR**
Execution Command **AT+CGPSINFO**	Response **+CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<time>	The rang is 0-255, unit is second. after set <time> will report the GPS information every the 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.

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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 "+CGNSSPWR: READY!".

AT+CGNSSINFO Get GNSS fixed position information	
Test Command AT+CGNSSINFO=?	Response **+CGNSSINFO: (0-255)** **OK**
Read Command AT+CGNSSINFO?	Response **+CGNSSINFO: <time>** **OK**
Write Command AT+CGNSSINFO=<time>	Response 1)If successfully: **OK** **+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]** 2)If <time>=0: **OK** 3)If failed: **ERROR**

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 rang 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
```

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```
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+CGNSSCMD Send command to GNSS

This command is valid after the URC reports “+CGNSSPWR: READY!”.

AT+CGNSSCMD Send command to GNSS	
Test Command AT+CGNSSCMD=?	Response **+CGNSSCMD: "CmdString"** **OK**
Write Command AT+CGNSSCMD=<CmdString>	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 “+CGNSSPWR: 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)** **OK**
Read Command AT+CGNSSPORTSWITCH?	Response **+CGNSSPORTSWITCH:** **<parse_data_port>,<nmea_data_port>**

	OK
Write Command **AT+CGNSSPORTSWITCH=<parse_data_port>[,<nmea_data_port>]**	Response 1)If send OK: **OK** 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 “+CGNSSPWR: READY!”.

AT+CAGPS Get AGPS data from the AGNSS server for assisted positioning	
Execution Command **AT+CAGPS**	Response 1)If successfully: **OK** **+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 **AT+CGNSSPROD=?**	Response OK
Execution Command **AT+CGNSSPROD**	Response 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
```

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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+CWMOCH	80211 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	Response
AT+CWSTASCAN=?	**+CWSTASCAN: (0-1)**

	OK
Read Command **AT+CWSTASCAN?**	Response **+CWSTASCAN: <flag_show_signal>** **OK**
Write Command **AT+CWSTASCAN=<flag_show_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
```

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```
+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=?**	Response **+CWSTASCANEX: (0-1),(1-3),(4-10),(0-255),(0-1)** **OK**
Read Command **AT+CWSTASCANEX?**	Response **+CWSTASCANEX:** **<flag_show_signal>,<scan_round_num>,<scan_max_bssid_num>,<scan_timeout>,<scan_priority>** **OK**
Write Command **AT+CWSTASCANEX=<flag_show_signal>[,<scan_round_num>[,<scan_max_bssid_num>[,<scan_timeout>[,<scan_priority>]]]]**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CWSTASCANEX**	Response **+CWSTASCANEX:** **[** **<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.
<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**
Write Command **AT+CWSTASCANSYN=<op>[,<scan_para>]**	Response 1) If op==1 and parameter format is right, response 0 indicates the end of the scan response **OK** **[+CWSTASCANSYN: <mac_addr>,<channel_number>,<rssi>,[… …]]** **+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.
<rssi>	The signal level of external wireless network.

Examples

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

OK
AT+CWSTASCANSYN=1
OK
```

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```
+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 betwwen 8 to 64. The char in the password is only allow the ASCII's decimal code betwwen 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)

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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:TIKP-AES
```

25.2.7 AT+CWMOCH 80211 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 – 2.4Gmode 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 **AT+CWCLICNT?**	Response **+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
```

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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 adverting package
AT+BLESCLRADVDATA	Clear adverting package
AT+BLESSETADVPARAM	Set adverting parameters
AT+BLESLSTART	Start advertising
AT+BLESLSTOP	Stop advertising
AT+BLEADV	Set adverting 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+BTIOCAP	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 **AT+BLEPOWER=?**	Response **OK**
Read Command **AT+BLEPOWER?**	Response **+BLEPOWER: <status>** **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 **AT+BLESTATUS=?**	Response **OK**
Read Command **AT+BLESTATUS?**	Response If ble has no connection: **OK** else: **+BLESTATUS: <conn_id>,<gatts_type>,<user_id>,<addr>** **OK**
Parameter Saving Mode	NO_SAVE
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
```

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26.2.3 AT+BLEHOST Inquiry and Set Host Device Name

AT+BLEHOST Inquiry and Set Host Device Name	
Test Command **AT+BLEHOST=?**	Response **OK**
Read Command **AT+BLEHOST?**	Response **+BLEHOST: <name>,<address>** **OK**
Write Command **AT+BLEHOST=<name>**	Response **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 **AT+BLEADDR=?**	Response **OK**
Read Command **AT+BLEADDR?**	Response **+BLEADDR: <address>**

	OK
Write Command **AT+BLEADDR=<address>**	Response **+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 **AT+BLESREG=?**	Response **OK**
Read Command **AT+BLESREG?**	Response If the server has already been registered, response **+BLESREG: <server_index>,<user_id>** **…** **+BLESREG: <server_index>,<user_id>** **OK** else only response

	OK
Execution Command **AT+BLESREG**	Response **+BLESREG: <server_index>,<user_id>** **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+BLESDREG Deregister GATT Server

AT+BLESDREG Deregister GATT Server	
Test Command **AT+BLESDREG=?**	Response **OK**
Read Command **AT+BLESDREG?**	Response **OK**
Write Command **AT+BLESDREG=<server_index**	Response **+BLESDREG: <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 AT+BLESSAD=?	Response **OK**
Read Command AT+BLESSAD?	Response If the server has already been registered, response **+BLESSAD: <service_index>,<user_id>,<uuid>,<is_primary>,<inst>,<service_handle>** **…** **+BLESSAD: <service_index>,<user_id>,<uuid>,<is_primary>,<inst>,<service_handle>**

	OK else only response **OK**
Write Command **AT+BLESSAD=<server_index>,<uuid>,<num_handles>,<is_primary>,<inst>**	Response **+BLESSAD: <service_index>,<user_id>,<uuid>,<is_primary>,<inst>,<service_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.
<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
```

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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**
Write Command **AT+BLESSRM=<service_index>**	Response **+BLESSRM: <service_index>,<user_id>,<uuid>,<service_handle>** **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
```

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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**
Read Command **AT+BLESSCAD?**	Response If the server has already been registered, response **+BLESSCAD: <char_index>,<user_id>,<char_uuid>,<inst>,<prop>,<permission>,<char_handle>** **…** **+BLESSCAD: <char_index>,<user_id>,<char_uuid>,<inst>,<prop>,<permission>,<char_handle>** **OK** else only response **OK**
Write Command **AT+BLESSCAD=<service_index>,<char_uuid>,<inst>,<prop>,<permission>**	Response **+BLESSCAD: <char_index>,<user_id>,<char_uuid>,<inst>,<char_handle>** **OK** or **ERROR**
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

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	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 AT+BLESSCRM=?	Response **OK**
Write Command AT+BLESSCRM=<char_index>	Response **+BLESSCRM: <char_index>,<user_id>,<char_uuid>** **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 **AT+BLESSDAD=?**	Response **OK**
Read Command **AT+BLESSDAD?**	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**
Write Command **AT+BLESSDAD=<char_index>,<desc_uuid>,<inst>,<permission>**	Response **+BLESSDAD: <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
```

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```
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+BLESLSTART=0
+BLESLSTART: 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

Write Command AT+BLESSDRM=<desc_index>	Response **+BLESSDRM: <desc_index>,<desc_uuid>** **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**
Read Command AT+BLESSSTART?	Response If no started device: **OK** 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 **AT+BLESSSTOP=?**	Response **OK**
Read Command **AT+BLESSSTOP?**	Response **OK**
Write Command **AT+BLESSSTOP=<server_index>**	Response **+BLESSSTOP: <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.(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+BLESLSTART=0
+BLESLSTART: 0,ABCDEF00

OK

AT+BLESSSTOP=0
ERROR

AT+BLESLSTOP=0
+BLESLSTOP: 0,ABCDEF00

OK

AT+BLESSSTOP=0
+BLESSSTOP: 0,ABCDEF00,0

OK
```

26.2.15 AT+BLESSETADVDATA Set Adverting 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 Adverting Package	
Test Command AT+BLESSETADVDATA=?	Response +BLESSETADVDATA: <server_index>,<type>,<value> OK

Write Command AT+BLESSETADVDATA=<server_index>[,<type>,<value>]	Response 1)if <type> and <value> is ignored: **+BLESSETDAVDATA: [<adv_data>]** **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 adverting 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 adverting 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>	Adverting 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
```

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26.2.16 AT+BLESCLRADVDATA Clear Adverting package

This command is only used to clear the adverting package set by +BLESSETADVDATA command.

AT+BLESCLRADVDATA Clear Adverting package	
Test Command AT+BLESCLRADVDATA=?	Response **OK**
Write Command AT+BLESCLRADVDATA=<server_index>	Response **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	
Test Command AT+BLESSETADVPARAM=?	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**
Write Command AT+BLESSETADVPARAM=<server_index>[,<adv_interval_min	Response **+BLESSETDAVDPARAM: <adv_interval_min>,<adv_interval_max>,<adv_type>,<own_a**

>,<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>	Hexademical 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>	Hexademical 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_type>	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.
< 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: Public Device Address (default). 0x01: Random Device Address. Other values: Reserved for future use.
<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

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	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: Reverved for future use.
<adv_tx_power>	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 3: set advertising tx power to 0dBm 4: set advertising tx power to +6dBm
<adv_tx_power_dBm>	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 0: indicate that current advertising tx power is 0dBm 6: indicate that current advertising tx power is +6dBm

Examples

```
AT+BLESETADVPARAM=?
+BLESETADVPARAM:
<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+BLESETADVPARAM=0
+BLESETADVPARAM: 0x0800,0x0800,0,0,0,"00:00:00:00:00:00",7,0,0

OK
AT+BLESETADVPARAM=0,80,f0
+BLESETADVPARAM: 0x0080,0x00f0,0,0,0,"00:00:00:00:00:00",7,0,0

OK
AT+BLESETADVPARAM= 0,320,320,0,0,0,"00:00:00:00:00:00",7,0,2
+BLESETADVPARAM: 0x0320,0x0320,0,0,0,"00:00:00:00:00:00",7,0,254

OK
AT+BLESETADVPARAM= 0,320,320,0,0,0,"00:00:00:00:00:00",7,0,4
+BLESETADVPARAM: 0x0320,0x0320,0,0,0,"00:00:00:00:00:00",7,0,6

OK
```

26.2.18 AT+BLESLSTART Start Advertising

AT+BLESLSTART Start Advertising	
Test Command AT+BLESLSTART=?	Response **OK**
Read Command AT+BLESLSTART?	Response If no device in adversing. **OK** Else **+BLESLSTART: <server_index>,<user_id>** **OK**
Write Command AT+BLESLSTART=<server_index>	Response **+BLESLSTART: <server_index>,<user_id>** **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 in set { '0'~'9','a'~'f','A'~'F'}.Length is 8.

Examples

```
AT+BLEPOWER=1
OK

AT+BLESREG?
OK

AT+BLESREG
+BLESREG: 0,ABCDEF00
```

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```
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+BLESLSTART=0
ERROR

AT+BLESSSTART=0,0
+BLESSSTART: 0,ABCDEF00,0

OK

AT+BLESLSTART=0
+BLESLSTART: 0,ABCDEF00

OK
```

26.2.19 AT+BLESLSTOP Stop Advertising

AT+BLESLSTOP Stop Advertising	
Test Command AT+BLESLSTOP=?	Response **OK**
Read Command AT+BLESLSTOP?	Response **OK**
Write Command AT+BLESLSTOP=<server_index>	Response **+BLESLSTOP: <server_index>,<user_id>** **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
```

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```
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+BLESLSTART=0
+BLESLSTART: 0,ABCDEF00

OK

+BLESCON: 1,ABCDEF00,7e:c3:ed:71:e5:55,1

AT+BLESLSTOP=0
ERROR

+BLESCON: 0,ABCDEF00,7e:c3:ed:71:e5:55,1

AT+BLESLSTOP=0
+BLESLSTOP: 0,ABCDEF00

OK
```

26.2.20 AT+BLEADV Set Adverting Parameters

AT+BLEADV Set Adverting 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 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 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 in set { '0'~'9','a'~'f','A'~'F'}. The length of it should be 0 or 4~32.

Examples

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```
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 AT+BLEDISCONN=?	Response **OK**
Read Command AT+BLEDISCONN?	Response **OK**
Write Command AT+BLEDISCONN=<conn_id>	Response **OK** **+BLESCON: <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 **AT+BLESIND=?**	Response **OK**
Write Command **AT+BLESIND=<char_index>,<value>**	Response **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
```

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26.2.23 AT+BLESNTY Send an notice to a Client

AT+BLESNTY Send an Notice to a Client	
Test Command **AT+BLESNTY=?**	Response **OK**
Write Command **AT+BLESNTY=<char_index>,<value>**	Response **+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
```

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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	
Write Command AT+BLESRSP=<switch>,<value>	Response **+BLESRSP: <result>,<user_id>,<conn_id>,<attr_handle>** **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**
Read Command **AT+BLECREG?**	Response If the client has already been registered, response **+BLECREG: <client_index>,<user_id>** **…** **+BLECREG: <client_index>,<user_id>** **OK** else only response **OK**
Execution Command **AT+BLECREG**	Response **+BLECREG: <client_index>,<user_id>** **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 AT+BLECDREG=?	Response **OK**
Write Command AT+BLECDREG=<client_index>	Response **+BLECDREG: <client_index>,<user_id>** **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 **AT+BLESCAN=?**	Response **OK**
Read Command **AT+BLESCAN?**	Response If has the devices scaned, response **+BLESCAN: <client_index>,<server_index>,<remote_address>** **…** **+BLESCAN: <client_index>,<server_index>,<remote_address>** **OK** else only response **OK**
Write Command **AT+BLESCAN=<client_index>,<operation>**	Response **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>	This parameter has the following two values: 0 stop scan. If the device is not scanning, the command response error. 1 start scan. If the device is scanning currently, the command response error.

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	
	Response **+BLESCANRST: <client_index>,<server_index>,<remote_address>,<rssi>,<adv_data>**
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.
<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 AT+BLECGDT=?	Response **OK**
Write Command AT+BLECGDT=<server_index>	Response **+BLECGDT: <server_index>,<device_type>** **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.
<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+BLECCON=?	Response **OK**
Write Command AT+BLECCON=<server_index>	Response **OK** **+BLECCON: <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+BLECCON=0
OK

+BLECCON: 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**
Write Command AT+BLECDISC=<connect_id>	Response **OK** **+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 AT+BLECSS=?	Response **OK**
Read Command AT+BLECSS?	Response If has the services searched, response **+BLECSS: <server_index>,<service_index>,<uuid>** **…** **+BLECSS: <server_index>,<service_index>,<uuid>** **OK** else only response **OK**
Write Command AT+BLECSS=<service_index>	Response **+BLECSS: <server_index>,<service_index>,<uuid>** **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 uuid 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 AT+BLECGC=?	Response **OK**
Read Command AT+BLECGC?	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**
Write Command AT+BLECGC=<characteristic_index>	Response **+BLECGC:** **<service_index>,<characteristic_index>,<properties>,<uuid>** **OK** or **ERROR**
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 AT+BLECGD=?	Response **OK**
Read Command AT+BLECGD?	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 AT+BLECGD=<descriptor_index>	Response **+BLECGD: <characteristic_index>,<descriptor_index>,<uuid>** **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 uuid 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 AT+BLECRC=?	Response **OK**
Write Command AT+BLECRC=<characteristic_index>	Response 1) If the server response the read request quickly: **OK** **+BLECRC: <characteristic_index>,<value>** 2) If send read request succefully 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 **AT+BLECWC=?**	Response **OK**
Write Command **AT+BLECWC=<characteristic_index>,<write_type>,<value>**	Response 1) If write the characteristic succefully: **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 AT+BLECRD=?	Response **OK**
Write Command AT+BLECRD=<descriptor_index>	Response 3) If the server response the read request quickly: **OK** **+BLECRD: <descriptor_index>,<value>** 2) If send read request succefully 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

<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>,<value>	Response 1) If write the characteristic succefully: **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 Notication from Peer's Device

+BLECNTY Notify When Get a Notication from Peer's Device	
	Response **+BLECNTY: <connect_id>,<characteristic_index>,<value>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
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	
	Response **+BLECIND: <connect_id>,<characteristic_index>,<value>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
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

```
+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 **AT+BLESSETSCANRESP=?**	Response **+BLESSETSCANRESP: <server_index>,<type>,<value>** **OK**
Write Command **AT+BLESSETSCANRESP=<server_index>[,<type>,<value>]**	Response 1)if <type> and <value> is ignored: **+BLESSETSCANRESP: [<resp_data>]** **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 adverting 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 adverting 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+BTSPPSEND command.

AT+BTPOWER Open/Close BT Device	
Test Command **AT+BTPOWER=?**	Response **+BTPOWER: (0-1)** **OK**
Read Command **AT+BTPOWER?**	Response **+BTPOWER: <status>** **OK**
Write Command **AT+BTPOWER=<flag>[,<debug>]**	Response **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 inquiried by other bt device is the same as previous bt device name.

AT+BTHOST Get/Set BT Device Name	
Read Command AT+BTHOST?	Response **+BTHOST: <bt_name>,<bt_addr>** **OK**
Write Command AT+BTHOST=<new_bt_name>	Response **OK** 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 AT+BTADDR?	Response **+BTADDR: <bt_addr>** **OK**
Write Command AT+BTADDR=<new_bt_addr>	Response **OK** 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 AT+BTSCAN=?	Response **+BTSCAN: (0-1),(0-1),(6-48)** **OK**
Write Command AT+BTSCAN=<flag>[,<mode>[,<timeout>]]	Response **OK** **+BTSCAN: <scan_status>[,<index>,<bt_name>,<bt_addr>,<rssi_level>]** **…** **<scan_status>[,<index>,<bt_name>,<bt_addr>,<rssi_level>]** 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	
Test Command AT+BTIOCAP=?	Response **+BTIOCAP: (0-3)** **OK**

Test Command **AT+BTIOCAP?**	Response **+BTIOCAP: <mode>** **OK**
Write Command **AT+BTIOCAP=<mode>**	Response **+BTIOCAP: 1** **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+BTIOCAP=?
+BTIOCAP: (0-3)
OK

AT+BTIOCAP?
+BTIOCAP: 1
OK

AT+BTIOCAP=3
+BTIOCAP: 1
OK

AT+BTIOCAP?
+BTIOCAP: 3
OK
```

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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 **OK** **+BTPAIRING: <mode>,<bt_name>,<bt_addr>[,<key>]** Or **ERROR**
Write Command **AT+BTPAIR=<mode>,<accept>[,<key>]**	Response **OK** **+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.

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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 OK +BTPAIR: 1,KK,04:8C:9A:D7:90:4C	//"123456", remote bt device displayed

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 AT+BTUNPAIR=?	Response **+BTUNPAIR: (index)** **OK**
Write Command AT+BTUNPAIR=<index>	Response **OK** **+BTUNPAIR: <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 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+BTUNPAIR=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 AT+BTPAIRED?	Response **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
```

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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)** **OK**
Rest Command **AT+BTSPPSRV?**	Response **+BTSPPSRV: <status>** **OK**
Write Command **AT+BTSPPSRV=<flag>**	Response **+BTSPPSRV: <result>** **OK** Or **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<flag>	This parameter has the following two values: 0 deactive 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 deactived. 1 local spp service is active.

Examples

```
AT+BTPOWER=1
OK

AT+BTSPPSRV=?
+BTSPPSRV: (0-1)
OK
```

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```
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	
Write Command AT+BTSPPPROF=<index>	Response **OK** **+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?
```

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```
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 does'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 AT+BTSPPCONN=?	Response **+BTSPPCONN: (0-1)** **OK**
Rest Command AT+BTSPPCONN?	Response **+BTSPPCONN: <status>** **OK**
Write Command AT+BTSPPCONN=<action>[,<index>]	Response **OK** **+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 "+BTSPPCONN: 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+BTSPPCONN=1,1
```

```
OK

+BTSPPCONN: 1,990,04:8C:9A:D7:90:4C

AT+BTSPPCONN=0
OK

+BTSPPCONN: 0
```

26.3.12 AT+BTSPPSEND SPP Send Data

This command is used to send data by spp. SPP connection must be established before sending data.

AT+BTSPPSEND SPP Send Data	
Write Command AT+BTSPPSEND=<data>	Response **OK** **+BTSPPSEND: <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+BTSPPCONN=1,1
OK
+BTSPPCONN: 1,990,04:8C:9A:D7:90:4C

AT+BTSPPSEND=00310032003300610062006 3
OK
+BTSPPSEND: 1

AT+BTSPPSEND={non-ascii}"00310032003300610062006 3"
OK
+BTSPPSEND: 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 **+BTSPPRECV: 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 +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. The amount of data received from remote should less than or equal to SPP MTU, or return +BTSPPRECV: 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+BTSPPCONN=1,1
OK
+BTSPPCONN: 1,990,04:8C:9A:D7:90:4C
```

+BTSPPRECV: 24,00310032003300610062006 3

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?**	Response **+BTCFG: <config>,<data>** **...** **+BTCFG: <config>,<data>** **OK** **+BTSPPSEND: <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>,<band>,<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.

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	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 OK
Write Command **AT+CTBURST=<mode>[,<band>,<channel>,<power>[,<bandwith>]]**	Response 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

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	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

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	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)
<bandwith>	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
+CTBURST: RX: -60                           //Start RF RX Power of WCDMA2000 the arfcn is 9750

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 Aauthentication 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+CMEE 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

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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
```

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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	
Execution Command AT+WSSTART	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 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	
Execution Command **AT+WSSTOP**	Response 1)If stop websocket service successfully: **OK** **+WSSTOP: 0** 2)If failed: **+WSSTOP: <err>** **ERROR** 3)If websocket service have stopped successfully and you executed AT+WSSTOP again: **ERROR**
Write Command **AT+WSSTOP=<cid>**	Response 1)If stop websocket service successfully: **OK** **+WSSTOP: 0** 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
```

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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**
Read Command **AT+WSCONNECT?**	Response 1)if connected: **+WSCONNECT: <connect_status>[,<server_addr>,<server_port>,<server_path>]** **OK** 2)if not connected: **+ WSCONNECT: <connect_status>** **OK**
Write Command **AT+WSCONNECT=<server_addr>,[time_out]**	Response 1)If successfully: **OK** **+WSCONNECT: 0** 2)If failed: **OK** **+WSCONNECT: <err>** 3)If failed: **+WSCONNECT: <err>** **ERROR** 4)If failed: **ERROR**
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)** **OK**
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**
Write Command **AT+WSSEND=<dataLength>,<datatype>**	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**
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
```

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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 AT+LWSTART=?	Response OK
Execute Command AT+LWSTART	Response 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 **AT+LWSTOP=?**	Response **OK**
Execute Command **AT+LWSTOP**	Response 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
```

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```
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 **AT+LWOPEN=?**	Response **OK**
Execute Command **AT+LWOPEN**	Response 1) **OK** **+LMOPEN:<lwm2mId>** 2) **ERROR**
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 **AT+LWCLOSE=?**	Response **OK**
Write Command **AT+LWCLOSE=<lwm2mId>**	Response 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 **AT+LWADDOBJ=?**	Response **OK**
Write Command **AT+LWADDOBJ=<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<resouceId>….**	Response 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 add.the range is from 0 to 65535, But 0-7 has already used.
<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.

Examples

```
AT+LWADDOBJ=?
OK
AT+LWADDOBJ=0,3303,0,6,5518,5601,5602,5603,5604,5605
OK
```

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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 **AT+LWDELOBJ=?**	Response **OK**
Write Command **AT+LWDELOBJ=<lwm2mId>,<objectId>**	Response 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 **AT+LWREADRSP=?**	Response **OK**

Write Command **AT+LWREADRSP=<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valuetype>,<valuelen>,<value>,<resourceId >,<valuetype>…**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	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 reponse. ● I Integer ● F Float ● B Boolean ● D UINT8 array data ● S String
<valuelen>	The length of value.
<value>	The reponse 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 the this command after URC “+LWREAD” returned.“+LWREAD” see 30.2.11

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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 **AT+LWWRITERSP=?**	Response **+LWWRITERSP: <lwm2mId>,<result>** **OK**
Write Command **AT+LWWRITERSP=<lwm2mId>,<result>**	Response 1) **OK** 2) **ERROR**
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 **AT+LWEXECUTERSP=?**	Response **OK**
Write Command **AT+LWEXECUTERSP=<lwm2mId>,<result>**	Response 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.

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<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>	The type of value of reponse. ● I Integer ● F Float ● B Boolean ● D UINT8 array data S String
<valuelen>	The length of value.
<value>	The reponse 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.

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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

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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 AT+COAPSTART=?	Response **OK**
Execute Command AT+COAPSTART	Response 1) **OK** 2) **ERROR**

Write Command **AT+COAPSTART=<cid>**	Response 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+COAPSTART
OK
AT+COAPSTART=1
OK
```

31.2.2 AT+COAPSTOP Deactive PDP

AT+LWSTOP is used to deactive PDP context When you are no longer using the COAP service, use this command.

AT+COAPSTOP Deactive PDP	
Test Command **AT+COAPSTOP=?**	Response **OK**
Execute Command **AT+COAPSTOP**	Response 1) **OK** 2) **ERROR**
Write Command **AT+COAPSTOP=<cid>**	Response 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 **AT+COAPOPEN=?**	Response **OK**
Write Command **AT+COAPOPEN=<server>,<serverport>**	Response 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

This command is used to Deregister to a COAP server.

AT+COAPCLOSE Close a COAP server	
Test Command **AT+COAPCLOSE=?**	Response **OK**
Write Command **AT+COAPCLOSE=<coap_sessionId >**	Response 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 **AT+COAPHEAD=?**	Response **OK**
Write Command **AT+COAPHEAD=<coap_sessionId>,<msgId>,<tkl>,<token>**	Response 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 **AT+COAPOPTION=?**	Response **OK**
Write Command **AT+COAPOPTION=<coap_sessionId>,<opt_count>,<optNum>,<optValue>,<opt_count>…..**	Response 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.
<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
```

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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 **AT+COAPSEND=?**	Response **OK**
Write Command **AT+COAPSEND=<coap_sessionId>,<type>,<method>,<data_len>,<data>**	Response 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.
<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>** **OK**
Write Command **AT+COAPSENDTX=<coap_sessionId>,<type>,<method>,<data_len>**	Response 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.
<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.

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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+CSMTPSSTOP	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 **AT+CSMTPSCFG=?**	Response **OK**
Write Command /* select the ssl context */ **AT+CSMTPSCFG="sslCtxId"[,<sslCtxId>]**	Response 1)if the “sslCtxId” is default: **+CSMTPSCFG: "sslCtxId",<sslCtxId>** **OK** 2) the “sslCtxId” is not default: **OK** 3) error **ERROR**
Write Command /* select the pdp context */ **AT+CSMTPSCFG="pdpCtxId"[,<pdpCtxId>]**	Response 1)the “pdpCtxId” is default: **+CSMTPSCFG: "pdpCtxId",<pdpCtxId>** **OK** 2) the “pdpCtxId” is not default: **OK** 3) error **ERROR**
Write Command /* select the cid */ **AT+CSMTPSCFG="CID"[,<cid>]**	Response 1)the “pdpCtxId” is default: **+CSMTPSCFG: "CID",<cid>** **OK** 2) the “CID” is not default: **OK** 3) error **ERROR**
Execution Command **AT+CSMTPSCFG**	Response **OK** or **ERROR**

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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 **AT+CSMTPSSRV=?**	Response **OK**
Read Command **AT+CSMTPSSRV?**	Response **+CSMTPSSRV: <server>,<port>,<server_type>** **OK**
Write Command **AT+CSMTPSSRV=<server>,<port>[,<server_type>]**	Response **OK** or

	ERROR
Execution Command **AT+CSMTPSSRV**	Response **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>	The type of server: 1 – SMTP server. 2 – SMTPS server with SSL3.0/TLS1.0/TLS1.1/TLS1.2 supported 3 – SMTPS server with STARTTLS

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
```

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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 **AT+CSMTPSAUTH=?**	Response **+CSMTPSAUTH: (list of supported <flag>s)** **OK**
Read Command **AT+CSMTPSAUTH?**	Response **+CSMTPSAUTH: <flag>,<user>,<pwd>** **OK**
Write Command **AT+CSMTPSAUTH=** **<flag>[,<user>,<pwd>]**	Response **OK** or **ERROR**
Execution Command **AT+CSMTPSAUTH**	Response **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 **AT+CSMTPSFROM=?**	Response **OK**
Read Command **AT+CSMTPSFROM?**	Response **+CSMTPSFROM: <saddr>,<sname>** **OK**
Write Command **AT+CSMTPSFROM=** **<saddr>[,<sname>]**	Response **OK** or

	ERROR
Execution Command **AT+CSMTPSFROM**	Response **OK** 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)
Test Command **AT+CSMTPSRCPT=?**	Response **+CSMTPSRCPT: (list of supported <kind>s), (list of supported <index>s)** **OK**
Read Command **AT+CSMTPSRCPT?**	Response **[+CSMTPSRCPT: <kind>,<index>,<raddr>,<rname>** **[<CR><LF>…]]** **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?	**+SMTPSUB: <subject_len>,<subject_character><CR><LF>** **[<subject>]** **OK**
Write Command **AT+CSMTPSSUB=<subject_len>[,<subject_character>]**	Response **>** **OK** or **ERROR**
Execution Command **AT+CSMTPSSUB**	Response **OK** 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 SMTPS 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?
+SMTPSSUB: 19,"utf-8"
THIS IS A TEST MAIL
```

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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 **AT+CSMTPSBODY=?**	Response **OK**
Read Command **AT+CSMTPSBODY?**	Response **+CSMTPSBODY: <body_len><CR><LF>** **[<body>]** **OK**
Write Command **AT+CSMTPSBODY=<body_len>**	Response **>** **OK**
Execution Command **AT+CSMTPSBODY**	Response **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
```

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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 **AT+CSMTPSBCH=?**	Response **OK**
Read Command **AT+CSMTPSBCH?**	Response **+CSMTPSBCH: <charset>** **OK**
Write Command **AT+CSMTPSBCH=<charset>**	Response **OK** or **ERROR**
Execute Command **AT+CSMTPSBCH**	Response **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 **AT+CSMTPSFILE=?**	Response **+CSMTPSFILE: (list of supported <index>s)** **OK**
Read Command **AT+CSMTPSFILE?**	Response **[+CSMTPSFILE: <index>,<filename>,<filesize>** **[<CR><LF>…]]** **OK**
Write Command **AT+CSMTPSFILE=<index>[,<filename>]**	Response **OK** or **[+CSMTPS: <err>]** **ERROR**
Execution Command **AT+CSMTPSFILE**	Response **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+CSMTPSSEND 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+CSMTPSSEND	Initiate session and send e-mail
Test Command **AT+CSMTPSSEND=?**	Response **OK**
Execution Command **AT+CSMTPSSEND**	Response **OK** **+CSMTPSSEND: <err>** or **ERROR** or **+CSMTPSSEND: <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+CSMTPSSEND
OK

+CSMTPSSEND: 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

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

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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 AT+HWVER=?	Response **OK**
Execution Command AT+HWVER	Response 1) **+HWVER: <ver>** **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 **AT+AUTOREGCFG=?**	Response **+AUTOREGCFG: <info>** **OK**
Read Command **AT+AUTOREGCFG?**	Response 1) **+AUTOREGCFG: <info>** **OK** 2) **ERROR**
Write Command **AT+AUTOREGCFG=<domain>[,<state>]**	Response **+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=?	Response ***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>** **OK**
Execution Command AT*COMCFG	Response 1) **OK** 2) **ERROR**
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
```

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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 **AT+CPSMS?**	Response **+CPSMS: <mode>,[<Requested_Periodic-RAU>],[<Requested_GPRS-READY-timer>],[<Requested_Periodic-TAU>],[<Requested_Active-Time>]** **OK**
Execution Command **AT+CPSMS=<mode>[,<Requested_Periodic-RAU>[,<Requested_GPRSREADY-timer>[,<Requested_Periodic-TAU>[,<Requested_ActiveTime>]]]]**	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 Smanufacturer specific.
<Requested_GPRS-READY-	string type; one byte in an 8 bit format. Requested

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timer>	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.
<Requested_Periodic-TAU>	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.
<Requested_Active-Time>	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

Examples

AT+CPSMS=1,,,"01101111","00001111" **OK**	Set t3412-ext time 30s, t3324 time 30s

34.2.3 AT+MEDCR Set/Get MEDATA COMM RESERVER

AT+MEDCR Set/Get MEDATA COMM RESERVER

Test Command **AT+MEDCR=?**	Response **+MEDCR** **OK**
Read Command **AT+MEDCR?**	Response **+MEDCR: <flag>,<position>,<value>** **OK**
Write Command **AT+ +MEDCR=<flag>,<position>[,<configVal>]**	Response 1) **OK** 2) **ERROR**
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 **OK**	Set t3412 time 2min
AT+MEDCR=0,103,1 **OK**	Enable HW psm

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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(Iu 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
```

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```
AT+CEDRXS?
+CEDRXS: 4,""

OK
```

34.2.5 AT+CEDRXRDP eDRX Read Dynamic Parameters

AT+CEDRXRDP eDRX Read Dynamic Parameters	
Action Command AT+CEDRXRDP	Response +CEDRXRDP: <eDrxAct>,["<requestedEdrxValue>"][,"<nwProvidedEdrxvalue>"][,"<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
```

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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 **AT+DIALMODE=?**	Response **+DIALMODE: (0-1)** **OK**
Read Command **AT+DIALMODE?**	Response **+DIALMODE:<mode>** **OK**
Write Command **AT+DIALMODE=<mode>**	Response 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 **OK**	Disable USBNET network

35.2.2 AT$MYCONFIG Set RNDIS/ECM Mode

AT$MYCONFIG Set RNDIS/ECM Mode

AT$MYCONFIG Set RNDIS/ECM Mode	
Test Command **AT$MYCONFIG=?**	Response for 1803 **$MYCONFIG: "usbnetmode",(0-2),(0,1),<macName>** **OK** Response for 1603 and 1606 **$MYCONFIG: "usbnetmode",(0-1),(0,1)** **OK**
Read Command **AT$MYCONFIG?**	Response **$MYCONFIG: "usbnetmode",<netmode>,<netport>** **OK**
Write Command **AT$MYCONFIG="USBNETMODE"[,<netmode>[,<netport>][,<macName>]]**	Response 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 usbnet name under mac pc

Examples

AT$MYCONFIG="USBNETMODE",1,1 **OK**	Change to ECM

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,tpos,dhcps,dhcpe,leasetime** **OK** a)If successfully mode=1: **+USBNETIP:1,,,,leasetime** **OK** b)If failed: **ERROR**
Write Command **AT+USBNETIP=<mode>[,<tpos>[,<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 **OK**	Change usbnet ip

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
```

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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 **OK**	Enable Jamming Detect

36.2.2 AT+SJDCFG Config Jamming Detect

AT+SJDCFG Config Jamming Detect	
Test Command **AT+SJDCFG=?**	Response **+SJDCFG: "period",(0-120)** **+SJDCFG: "mnl",(0-31)** **+SJDCFG: "minch",(0-254)** **+SJDCFG: "detecstat",(0-1)** **OK**
Read Command **AT+SJDCFG?**	Response **+SJDCFG: "period",<value>** **+SJDCFG: "mnl",<value>** **+SJDCFG: "minch",<value>** **+SJDCFG: "detecstat",<value>** **OK**
Write Command **AT+SJDCFG= <type>,<value>**	Response 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

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