A76XX Series_
AT Command Manual

LTE Module

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Version History

Version	Date	Chapter	Description
V1.00	2019.5.15		New version
V1.01	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
	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	Modify these commands

	17.2.17 AT+FTPSTYPE	
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	Modify these commands

	9.2.14 AT+CMSS	
	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	Modify these commands
	8.2.2 AT+CPBR	
	8.2.4 AT+CPBW	
.2020.5.19	6.2.11 AT+UIMHOTSWAPON	Add these commands
	6.2.11 AT+UIMHOTSWAPLEVEL	
2020.5.20	18 AT Commands for MQTT(S)	Modify this chapter
2020.5.20	3.2.11 AT+CMEE	Modify these commands
	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	
2020.5.22	15.2.1 AT+NETOPEN	Modify these commands
	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	
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	Modify these commands
	5.2.2 AT+CEREG	
2020.5.29	6.2.2 AT+CPIN	Modify these commands
	6.2.3 AT+CLCK	
	6.2.4 AT+CPWD	
2020.5.29	12.2.9 AT+FSCOPY	Modify these commands
	13.2.1 AT+CFTRANRX	
	13.2.2 AT+CFTRANTX	
2020.5.29	18.2.9 AT+CMQTTDISC	Modify this command
2020.6.1	3.2.1 AT+CFUN	Modify these commands
	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	

	2020.6.1	4.2.11 AT+CTZU 4.2.12 AT+CTZR 9.2.1 AT+CSMS 9.2.5 AT+CSCB 9.2.7 AT+CSDH 9.2.8 AT+CNMA 9.2.10 AT+CGSMS 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		Modify these commands

		10.2.3 AT+IPR	
		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	Modify these sections

		24.2.8 AT+CGPSNMEARATE	
	2020.8.21	5.2.7 AT+CGTFT 5.2.5 AT+CGDCONT	Modify these commands
	2020.8.24	4.2.9 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 18.2.17 AT+CMQTTCFG	Modify these command
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	Modify these commands

	24.2.1 AT+CGNSSPWR 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

	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
V1.03	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	Modify these commands

	21.2.3 AT+CREC	
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	Modify this command

	26.2.9 AT+BLESSCAD 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
	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
V1.05	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

Contents

THIS DOCUMENT IS A REFERENCE GUIDE TO ALL THE AT COMMANDS.

1 Introduction

1.1 Scope of the document

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

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

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

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

1.2 Related documents

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

You can visit the SIMCom Website for more information by the following link:
http://www.simcom.com

1.3 Terms and Abbreviations

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

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

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

1.4 Definitions and Conventions

1. Definitions

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

♦ **<CR>** Carriage return character.

  <LF> Linefeed character.

  <…> Name enclosed in angle brackets is a syntactical element. Brackets themselves do not appear in the command line.

  […] Optional subparameter of AT command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. If subparameter is not given, its value equals to its previous value or the recommended default value.

  underline Underlined and defined subparameter value is the recommended default setting or factory setting.

♦ Parameter Saving Mode

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

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

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

  AT&W_SAVE: The parameter of the current AT command will be kept 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.

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

NOTE

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

1.5 AT Interface Synopsis

1.5.1 Interface Settings

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

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

1.5.2 AT Commands Syntax

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

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

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

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

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

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

2. S Parameter syntax

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

3. Extended Syntax

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

Table 1: Types of AT commands and responses	
Test Command **AT+<x>=?**	The mobile equipment returns the list of parameters and value ranges set with the corresponding Write Command or by internal processes.
Read Command **AT+<x>?**	This command returns the currently set value of the parameter or parameters.
Write Command **AT+<x>=<…>**	This command sets the user-definable parameter values.
Execution Command **AT+<x>**	The execution command reads non-variable parameters affected by internal processes in the GSM engine.

NOTE

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

4. Combining AT commands on the same Command line

You can enter several AT commands on the same line. In this case, you do not need to type the "AT" or "at" prefix before every command. Instead, you only need type "AT" or "at" the beginning of the command line. Please note to use a semicolon as the command delimiter after an extended command; in basic syntax or S parameter syntax, the semicolon need not enter, for Examples:
ATE1Q0S0=1S3=13V1X4;+IFC=0,0;+IPR=115200.

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

5. Entering successive AT commands on separate lines

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

the next AT Command.

1.5.3 Supported character sets

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

GSM format

UCS2

IRA

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

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

2 AT Commands According to V.25TER

2.1 Overview of AT Commands According to V.25TER

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

2.2 Detailed Description of AT Commands for V.25TER

2.2.1 ATD Mobile originated call to dial a number

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

ATD Mobile originated call to dial a number	
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	-
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

	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	NO_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; +IPR: 115200; +IPREX: 115200; +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.
Every ongoing or incoming call will be terminated.

AT&F Set all current parameters to manufacturer defaults	
Execution Command	Response
AT&F[<value>]	**OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

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

Examples

AT&F
OK

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

2.2.12 ATQ Set Result Code Presentation Mode

Specify whether the TA transmits any result code to the TE or not. Text information transmitted in response is not affected by this setting

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

Defined Values

\<n>	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, AT+IFC 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\>	<u>0</u> 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\>	<u>0</u> 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
INCORPORATED

OK
AT+CGMI=?
OK

2.2.17 AT+CGMM Request model identification

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

AT+CGMM Request model identification	
Test Command **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
35160200330570

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

<chest>	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.

Examples

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

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

OK
AT+CSCS
OK

2.2.21 AT+GCAP   Request overall capabilities

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

AT+GCAP Request overall capabilities	
	Response
Test Command	1)
AT+GCAP=?	**OK**
	2)

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

Defined Values

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

Examples

AT+GCAP
+GCAP: +CGSM,+FCLASS,+DS

OK
AT+GCAP=?
OK

3 AT Commands for Status Control

3.1 Overview of AT Commands for Status Control

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

3.2 Detailed Description of AT Commands for Status Control

3.2.1 AT+CFUN Set phone functionality

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

AT+CFUN Set phone functionality	
Test Command **AT+CFUN=?**	Response **+CFUN: (**range of supported **<fun>**s**),(**range of supported **<rst>**s**)**

Read Command **AT+CFUN?**	**OK**
	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 (The A7600's 5 and 1 have the same function)
	6 Reset
	7 Offline Mode
<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: (0-1,4-7),(0-1)

OK
AT+CFUN?
+CFUN: 1

OK

AT+CFUN=1
OK

NOTE

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 **AT+AUTOCSQ=<auto>[,<mode>]**	Response 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 <u>5</u>.

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	Response

AT+CPOF	OK
Parameter Saving Mode	-
Max Response Time	9000ms
Reference	Vendor

Examples

```
AT+CPOF=?
OK
AT+CPOF
OK
```

3.2.6 AT+CRESET   Reset the module

This command is used to reset the module.

AT+CRESET Reset the module	
Execution Command **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

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	Response

AT+CCLK=?	OK
Read Command **AT+CCLK?**	Response **+CCLK: \<time\>** **OK**
Write Command **AT+CCLK=\<time\>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_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 zone is nonvolatile, and the factory value is invalid time zone. 2. 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. <u>2</u> 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=35739012183175
OK

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	Response

AT+CREG=?	+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)
<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.
<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	Response
AT+CUSD=?	**+CUSD: (**range of supported **<n>s)**
	OK
Read Command	Response
AT+CUSD?	**+CUSD: <n>**
	OK
Write Command	Response
AT+CUSD=<n>[,<str>[,<dcs>]]	1)
	OK
	2)
	ERROR
	3)
	+CME ERROR: <err>
Execution Command	Response
AT+CUSD	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 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).
<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_AcT** **1>,<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>,<G** **SM_Compact_AcT1>,<UTRA** **N_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=?
+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>]** **OK**
Write Command **AT+CNBP=<mode>[,<lte_mode>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<mode>	64bit number, the value is "1" << "<pos>", then or by bit.

<pos>	Value:
	    0xFFFFFFFF7FFFFFFF Any (any value)
	    7 GSM_DCS_1800

	8 GSM_EGSM_900
	9 GSM_PGSM_900
	16 GSM_450
	17 GSM_480
	18 GSM_750
	19 GSM_850
	20 GSM_RGSM_900
	21 GSM_PCS_1900
	22 WCDMA_IMT_2000
	23 WCDMA_PCS_1900
	24 WCDMA_III_1700
	25 WCDMA_IV_1700
	26 WCDMA_850
	27 WCDMA_800
	48 WCDMA_VII_2600
	49 WCDMA_VIII_900
	50 WCDMA_IX_1700
\<lte_mode\>	64 bit number, the value is "1" << "\<lte_pos\>", then or by bit.
	NOTE: FDD(band1 ~ band32), TDD(band33 ~ band42)
\<lte_pos\>	Value:
	0x000007FF3FDF3FFF Any (any value)
	0 EUTRAN_BAND1(UL:1920-1980; DL:2110-2170)
	1 EUTRAN_BAND2(UL:1850-1910; DL:1930-1990)
	2 EUTRAN_BAND3(UL:1710-1785; DL:1805-1880)
	3 EUTRAN_BAND4(UL:1710-1755; DL:2110-2155)
	4 EUTRAN_BAND5(UL: 824-849; DL: 869-894)
	5 EUTRAN_BAND6(UL: 830-840; DL: 875-885)
	6 EUTRAN_BAND7(UL:2500-2570; DL:2620-2690)
	7 EUTRAN_BAND8(UL: 880-915; DL: 925-960)
	8 EUTRAN_BAND9(UL:1749.9-1784.9; DL:1844.9-1879.9)
	9 EUTRAN_BAND10(UL:1710-1770; DL:2110-2170)
	10 EUTRAN_BAND11(UL:1427.9-1452.9; DL:1475.9-1500.9)
	11 EUTRAN_BAND12(UL:698-716; DL:728-746)
	12 EUTRAN_BAND13(UL: 777-787; DL: 746-756)
	13 EUTRAN_BAND14(UL: 788-798; DL: 758-768)
	16 EUTRAN_BAND17(UL: 704-716; DL: 734-746)
	17 EUTRAN_BAND18(UL: 815-830; DL: 860-875)
	18 EUTRAN_BAND19(UL: 830-845; DL: 875-890)
	19 EUTRAN_BAND20(UL: 832-862; DL: 791-821)
	20 EUTRAN_BAND21(UL:1447.9-1462.9; DL: 1495.9-1510.9)
	22 EUTRAN_BAND23(UL: 2000-2020; DL: 2180-2200)
	23 EUTRAN_BAND24(UL: 1626.5-1660.5; DL: 1525 -1559)
	24 EUTRAN_BAND25(UL: 1850-1915; DL: 1930 -1995)
	25 EUTRAN_BAND26(UL: 814-849; DL: 859 -894)

	26	EUTRAN_BAND27(UL: 807.5-824; DL: 852 -869)
	27	EUTRAN_BAND28(703-748; DL: 758-803)
	28	EUTRAN_BAND29(UL:1850-1910 or 1710-1755; DL:716-728)
	29	EUTRAN_BAND30(UL: 2305-2315 ; DL: 2350 - 2360)
	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)

Examples

AT+CNBP?
+CNBP: 0X0002000000400180,0X000001E200000095

OK
AT+CNBP=0X0002000000400180,0X000001E200000095
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 -1/10 dBm. Available for LTE
<RSRQ>	Current reference signal receive quality as measured by L1.
<RSSNR>	Average reference signal signal-to-noise ratio of the serving cell
<SCellID>	String type. cell ID in decimal format for serving cell
<RSSI>	Number format. Received signal strength indication.

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.

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

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

Defined Values

<on/off>	Integer type value indicating: 0 Disable automatic time zone update via NITZ. 1 Enable automatic time zone update via NITZ. **NOTE:** 1. The value of <on/off> is nonvolatile, and factory value is 0. 2. For automatic time and time zone update is enabled (+CTZU=1): If time zone is only received from network and it isn't equal to local time zone (AT+CCLK), time zone is updated automatically, and real time clock is updated based on local time and the difference between time zone from network and local time zone (Local time zone must be valid). If Universal Time and time zone are received from network, both time zone and real time clock is updated automatically, and real time clock is based on Universal Time and time zone from network.

Examples

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

OK
AT+CTZU?
+CTZU: 0

OK
AT+CTZU=0
OK
```

4.2.12 AT+CTZR Time and time zone reporting

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

AT+CTZR Time and time zone reporting	
Test Command **AT+CTZR=?**	Response **+CTZR: (**range of supported **<on/off>s)** **OK**
Read Command **AT+CTZR?**	Response **+CTZR: <on/off>** **OK**
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 11 attached for emergency bearer services only
<lac>	Two byte location area code in hexadecimal format(e.g."00C3" equals 193 in decimal).
<ci>	Cell ID in hexadecimal format. GSM: Maximum is two byte. WCDMA: Maximum is four byte.

Examples

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

OK
AT+CGREG?
+CGREG: 0,1

OK
AT+CGREG=1
OK
AT+CGREG
OK
```

5.2.2 AT+CEREG EPS network registration status

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

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

AT+CEREG EPS network registration status	
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	Response

AT+CEREG=<n>	1)
	OK
	2)
	ERROR
	3)
	+CME ERROR: <err>
	Response
Execution Command	1)
AT+CEREG	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)
	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	Response

AT+CGATT?	1)
	+CGATT: <state>
	OK
	2)
	ERROR
Write Command	Response
	1)
	OK
AT+CGATT=<state>	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
	<u>1</u> attached

Examples

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

OK
AT+CGATT?
+CGATT: 1

OK
AT+CGATT=1
OK

5.2.4   AT+CGACT   PDP context activate or deactivate

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

AT+CGACT   PDP context activate or deactivate

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

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_Signa lling_Flag_Ind>]<CR><LF>** **+CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>, <ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signa lling_Flag_Ind>]** **OK** 2) **ERROR**
Write Command **AT+CGDCONT=<cid>[,<PDP _type>[,<APN>[,<PDP_addr> [,<d_comp>[,<h_comp>][,<ip v4_ctrl>[,<request_type>]]]]]]**	Response 1) **OK** 2) **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
	    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
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)** **OK** 2) **ERROR**
Read Command **AT+CGDSCONT?**	Response 1) **+CGDSCONT: [<cid>,<p_cid>,<d_comp>,<h_comp>** **[<CR><LF>+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>** **[..]]]** **OK** 2) **ERROR**
Write Command **AT+CGDSCONT=<cid>[,<p_cid>[,<d_comp>[,<h_comp>]]]**	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.

Examples

AT+CGDSCONT=?
+CGDSCONT: (2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IP",(0-2),(0-1)
+CGDSCONT: (2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IPV6",(0-2),(0-1)
+CGDSCONT: (2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IPV4V6",(0-2),(0-1)

OK
AT+CGDSCONT?
+CGDSCONT:

OK
AT+CGDSCONT=4,2
+CME ERROR: operation not supported

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),**(list of supported **<local address and subnet mask>s),**(range of supported **<QRI>s),**(list of supported **<traffic_segregation>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),**(list of supported **<local address and subnet mask>s),**(range of supported **<QRI>s),**(list of supported **<traffic_segregation>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	string type The string is given as dot-separated numeric

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

Examples

AT+CGTFT=?
+CGTFT:
"IP",(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFFFF)
+CGTFT:
"IPV6",(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFFFF)
+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>[,<prece** **dence>[,<delay>[,<reliability** **>[,<peak>[,<mean>]]]]]**	Response 1) **OK** 2)

	ERROR
Execution Command **AT+CGQREQ**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). The range is from 1 to 15
<PDP_type>	(Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol
<precedence>	A numeric parameter which specifies the precedence class: 0 network subscribed value 1 high priority 2 normal priority 3 low priority
<delay>	A numeric parameter which specifies the delay class: 0 network subscribed value 1 delay class 1 2 delay class 2 3 delay class 3 4 delay class 4
<reliability>	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)
	31	optimization

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 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",.).
	"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","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0-950),(0-3),(0-1),(0-1)

OK
AT+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 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)

A76XX Series_AT Command Manual_V1.05

4	1000 (~2.2 bit/s)
5	2000 (~4.4 bit/s)
6	5000 (~11.1 bit/s)
7	10000 (~22 bit/s)
8	20000 (~44 bit/s)
9	50000 (~111 bit/s)
10	100000 (~0.22 kbit/s)
11	200000 (~0.44 kbit/s)
12	500000 (~1.11 kbit/s)
13	1000000 (~2.2 kbit/s)
14	2000000 (~4.4 kbit/s)
15	5000000 (~11.1 kbit/s)
16	10000000 (~22 kbit/s)
17	20000000 (~44 kbit/s)
18	50000000 (~111 kbit/s)
31	optimization

Examples

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

OK
AT+CGQMIN?
+CGQMIN: 1,3,4,5,1,1

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

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

The test command returns values supported as a compound value.

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

The write command allow the TE to specify a 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.

www.simcom.com   **118 / 512**

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**	Response 1) **OK** 2) **ERROR**

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>]]]]]]]]]]]]	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,…). 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"
	"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
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	Response

AT+CGDATA=[<L2P>,[<cid>]]	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	Response

AT+CGPADDR=?	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

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	The network has activated a context. The context represents a

<cid>[,<WLAN_Offload>]	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.

+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 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_t ype>[,<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
<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

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

AT+CPING=?
+CPING: IP
address,(1,2),(1-5),(4-188),(1000-10000),(10000-100000),(16-255)

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

+CPING: 2

+CPING: 2

+CPING: 2

+CPING: 2

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

6 AT Commands for SIM Card

6.1 Overview of AT Commands for SIM Card

Command	Description
AT+CICCID	Read ICCID from SIM card
AT+CPIN	Enter PIN
AT+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

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 AT+CICCID=?	Response **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

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

6.2.4　AT+CPWD　Change password

Write command sets a new password for the facility lock function defined by command Facility Lock

AT+CLCK.

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

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

Defined Values

<fac>	Refer Facility Lock +CLCK for other values: "SC" SIM or USIM PIN1 "P2" SIM or USIM PIN2 "AB" All Barring services "AC" All inComing barring services (only for <mode>=0) "AG" All outGoing barring services (only for <mode>=0) "AI" Barr All Incoming Calls "AO" Barr All Outgoing Calls "IR" Barr Incoming Calls when roaming outside the home country "OI" Barr Outgoing International Calls "OX" Barr Outgoing International Calls except to Home Country
<oldpwd>	String type, it shall be the same as password specified for the facility from the ME user interface or with command Change Password AT+CPWD.
<newpwd>	String type, it is the new password; maximum length of password can be determined with <pwdlength>.

<pwdlength>	Integer type, max length of password.

Examples

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

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

6.2.5   AT+CIMI   Request international mobile subscriber identity

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

AT+CIMI Request international mobile subscriber identity	
Test Command **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>[,<fil eID>[,<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
	0x6F46 Service Provider Name
	0x6F41 Price Per Unit and Currency table
	0x6F45 Cell Bcast Msg identifier selection

0x6F78	Access control class
0x6F7B	Forbidden PLMNs
0x6F7E	Location information
0x6FAD	Administrative data
0x6F48	Cell Bcast msg id for data download
0x6FB7	Emergency call codes
0x6F50	Cell bcast msg id range selection
0x6F73	Packet switched location information
0x6F3B	Fixed dialling numbers
0x6F3C	Short messages
0x6F40	MSISDN
0x6F42	SMS parameters
0x6F43	SMS Status
0x6F49	Service dialling numbers
0x6F4B	Extension 2
0x6F4C	Extension 3
0x6F47	SMS reports
0x6F80	Incoming call information
0x6F81	Outgoing call information
0x6F82	Incoming call timer
0x6F83	Outgoing call timer
0x6F4E	Extension 5
0x6F4F	Capability Config Parameters 2
0x6FB5	Enh Multi Level Precedence and Pri
0x6FB6	Automatic answer for eMLPP service
0x6FC2	Group identity
0x6FC3	Key for hidden phonebook entries
0x6F4D	Barred dialling numbers
0x6F55	Extension 4
0x6F58	Comparison Method information
0x6F56	Enabled services table
0x6F57	Access Point Name Control List
0x6F2C	De-personalization Control Keys
0x6F32	Co-operative network list
0x6F5B	Hyperframe number
0x6F5C	Maximum value of Hyperframe number
0x6F61	OPLMN selector with access tech
0x6F5D	OPLMN selector
0x6F62	HPLMN selector with access technology
0x6F06	Access Rule reference
0x6F65	RPLMN last used access tech
0x6FC4	Network Parameters
0x6F11	CPHS: Voice Mail Waiting Indicator
0x6F12	CPHS: Service String Table
0x6F13	CPHS: Call Forwarding Flag
0x6F14	CPHS: Operator Name String

	0x6F15	CPHS: Customer Service Profile
	0x6F16	CPHS: CPHS Information
	0x6F17	CPHS: Mailbox Number
	0x6FC5	PLMN Network Name
	0x6FC6	Operator PLMN List
	0x6F9F	Dynamic Flags Status
	0x6F92	Dynamic2 Flag Setting
	0x6F98	Customer Service Profile Line2
	0x6F9B	EF PARAMS - Welcome Message
	0x4F30	Phone book reference file
	0x4F22	Phone book synchronization center
	0x4F23	Change counter
	0x4F24	Previous Unique Identifier
	0x4F20	GSM ciphering key Kc
	0x4F52	GPRS ciphering key
	0x4F63	CPBCCH information
	0x4F64	Investigation scan
	0x4F40	MExE Service table
	0x4F41	Operator Root Public Key
	0x4F42	Administrator Root Public Key
	0x4F43	Third party Root public key
	0x6FC7	Mail Box Dialing Number
	0x6FC8	Extension 6
	0x6FC9	Mailbox Identifier
	0x6FCA	Message Waiting Indication Status
	0x6FCD	Service Provider Display Information
	0x6FD2	UIM_USIM_SPT_TABLE
	0x6FD9	Equivalent HPLMN
	0x6FCB	Call Forwarding Indicator Status
	0x6FD6	GBA Bootstrapping parameters
	0x6FDA	GBA NAF List
	0x6FD7	MBMS Service Key
	0x6FD8	MBMS User Key
	0x6FCE	MMS Notification
	0x6FD0	MMS Issuer connectivity parameters
	0x6FD1	MMS User Preferences
	0x6FD2	MMS User connectivity parameters
	0x6FCF	Extension 8
	0x5031	Object Directory File
	0x5032	Token Information File
	0x5033	Unused space Information File EFs under Telecom DF
	0x6F3A	Abbreviated Dialing Numbers
	0x6F3B	Fixed dialling numbers
	0x6F3C	Short messages
	0x6F3D	Capability Configuration Parameters
	0x6F4F	Extended CCP

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

Examples

```
AT+CRSM=?
OK
AT+CRSM=242
+CRSM:
144,0,"000000003F00040000FFBB01020000"

OK
```

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

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

AT+SPIC Times remain to input SIM PIN/PUK	
Test Command **AT+SPIC=?**	Response **OK**
Execution Command **AT+SPIC**	Response **+SPIC: <pin1>,<puk1>,<pin2>,<puk2>** **OK**
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

6.2.10 AT+UIMHOTSWAPON Set UIM Hotswap Function On

AT+UIMHOTSWAPON Set UIM hotswap function on

Test Command **AT+UIMHOTSWAPON=?**	Response 1) **+UIMHOTSWAPON: (0-1)** **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

Examples

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

OK
AT+UIMHOTSWAPON?
+UIMHOTSWAPON: 0

OK
AT+UIMHOTSWAPON=1
OK

6.2.11 AT+UIMHOTSWAPLEVEL Set UIM Card Detection Level

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

Defined Values

\<level>	0 ACTIVE LOW 1 ACTIVE HIGH

Examples

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

OK
AT+UIMHOTSWAPLEVEL?
+UIMHOTSWAPLEVEL: 0

OK
AT+UIMHOTSWAPLEVEL=1

OK

6.2.12 AT+SWITCHSIM   Switch master SIM

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

AT+SWITCHSIM Switch master SIM	
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	NO_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
```

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	NO_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

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 **AT+BINDSIM=<simID>**	Response 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

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
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)

	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

	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

<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)

Execution Command **AT+CLCC**	OK 2) **ERROR**
	Response 1) **+CLCC:** **<id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alph** **a>]]** **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>]][** **+CLCC:** **<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[** **,<alpha>]]**	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.	

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

OK

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 <u>1</u> enable

<mode>	When <mode> parameter is not given, network is not interrogated:
	    0 disable
	    1 enable
	    2 query status

<class>	It is a sum of integers each representing a class of information (default 7)
	    1 voice (telephony)
	    2 data (refers to all bearer services)
	    4 fax (facsimile services)
	    7 voice,data and fax(1+2+4)
	    8 short message service
	    16 data circuit sync
	    32 data circuit async
	    64 dedicated packet access

	128 dedicated PAD access
	255 The value 255 covers all classes
<status>	0 not active
	1 active
<number>	String type phone number of calling address in format specified by <type>.
<type>	Type of address octet in integer format;
	128 Restricted number type includes unknown type and format
	145 International number type
	129 Otherwise

Examples

AT+CCWA=?
+CCWA: (0-1),(0-2),(1-255)

OK
AT+CCWA?
+CCWA: 1

OK
AT+CCWA=1
OK
AT+CCWA=1,2,7
+CCWA: 1,1
+CCWA: 0,2
+CCWA: 0,4

OK
AT+CCWA
OK

7.2.9   AT+CCFC   Call forwarding number and conditions

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

AT+CCFC Call forwarding number and conditions	
Test Command	Response
AT+CCFC=?	**+CCFC:** (list of supported **<reason>**s)

Write Command **AT+CCFC=\<reason\>,\<mode\>[,\<number\>[,\<type\>[,\<class\>[,\<subaddr\>[,\<satype\>[,\<time\>]]]]]]**	**OK**
	Response 1)When \<mode\>=2 and command successful: **+CCFC:** **\<status\>,\<class1\>[,\<number\>,\<type\>[,\<subaddr\>,\<satype\>[,\<time\>]]][** **+CCFC:** **\<status\>,\<class2\>[,\<number\>,\<type\>[,\<subaddr\>,\<satype\>[,\<time\>]]][..]]** **OK** 2) **OK** 3) **ERROR** 4) **+CME ERROR: \<err\>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

\<reason\>	0 unconditional 1 mobile busy 2 no reply 3 not reachable 4 all call forwarding 5 all conditional call forwarding
\<mode\>	0 disable 1 enable 2 query status 3 registration 4 erasure
\<number\>	String type phone number of forwarding address in format specified by \<type\>.

\<type\>	Type of address octet in integer format:
	    145 dialing string \<number\> includes international access code character '+'
	    129 otherwise

\<subaddr\>	String type sub address of format specified by \<satype\>.
\<satype\>	Type of sub address octet in integer format, default 128.

<classX>	It is a sum of integers each representing a class of information (default 7):
	1 voice (telephony)
	2 data (refers to all bearer services)
	4 fax (facsimile services)
	16 data circuit sync
	32 data circuit async
	64 dedicated packet access
	128 dedicated PAD access
	255 The value 255 covers all classes
<time>	1..30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded, default value 20.
<status>	0 not active
	1 active

Examples

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

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

OK

7.2.10 AT+CLIP   Calling line identification presentation

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

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

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

AT+CLIP Calling line identification presentation	
Test Command	Response
AT+CLIP=?	**+CLIP: (**range of supported **<n>s)**

	OK
Read Command **AT+CLIP?**	Response 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
	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>	<u>0</u> presentation indicator is used according to the subscription of the CLIR service
	1 CLIR invocation
	2 CLIR suppression
<m>	0 CLIR not provisioned
	1 CLIR provisioned in permanent mode
	2 unknown (e.g. no network, etc.)
	3 CLIR temporary mode presentation restricted
	4 CLIR temporary mode presentation allowed

Examples

AT+CLIR=?
+CLIR: (0-2)

OK
AT+CLIR?
+CLIR: 0,0

OK
AT+CLIR=1
OK

7.2.12 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+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. The command can only be used in voice mode of operation (active voice call).

AT+VTS DTMF and tone generation	
Test Command **AT+VTS=?**	Response **+VTS: (**list of supported**<dtmf>s)** **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, from 300 to 600. 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: (0-9,*,#,A,B,C,D)

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.

7.2.14 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)** **OK**
Read Command **AT+VTD?**	Response **+VTD: <n>** **OK**
Write Command **AT+VTD=<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>	300-600 Tone duration of every single tone in 1/10 seconds.

Examples

AT+VTD=?
+VTD: (300-600)

OK
AT+VTD?
+VTD: 300

OK
AT+VTD=400
OK

7.2.15 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
	    <u>129</u> 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.

7.2.16 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.

7.2.17 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

7.2.18 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

7.2.19 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

7.2.20 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

7.2.21 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

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	Set default value "SM"
AT+CPBS	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
AT+CPBF="lly"
+CPBF: 500,"1234567890123456789012345678901234567890",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. 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>[,<type>[,<text>]]]**	Response 1) **OK** 2) **+CME ERROR: <err>**
Execution Command	Response

AT+CNUM	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

NOTE

CAT1 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

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 OK before last SMS input.	Only CAT1 Modules

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>	<u>0</u>	SMS at command is compatible with GSM phase 2.
	1	SMS at command is compatible with GSM phase 2+.
<mt>	0	type not supported.
	<u>1</u>	type supported.
<mo>	0	type not supported.
	<u>1</u>	type supported.
<bm>	0	type not supported.
	<u>1</u>	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	Response
AT+CPMS	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(default is empty string)

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**
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>	<u>0</u> 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
AT+CNMA=?
	Response
	if text mode(AT+CMGF=1):
	OK
	if PDU mode (AT+CMGF=0):
	+CNMA: (range of supported **<n>s)**
	
	OK

Write Command	Response

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

AT+CNMA   //send ACK to the network
OK   //the second time return error, it needs ACK
AT+CNMA   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.

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: +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	NO_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)
	<u>3</u> circuit switched preferred (use GPRS if circuit switched not available)

Examples

AT+CGSMS?
+CGSMS: 3

OK
AT+CGSMS=?
+CGSMS: (0-3)

OK
AT+CGSMS=3
OK

9.2.11 AT+CMGL List SMS messages from preferred store

This command is used to return messages with status value <stat> from message storage <mem1> to the TE.

If the status of the message is 'received unread', the status in the storage changes to 'received read'.

AT+CMGL	List SMS messages from preferred store
Test Command **AT+CMGL=?**	Response **+CMGL: (**list of supported **<stat>s)** **OK**
Write Command **AT+CMGL=<stat>**	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
<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set AT+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 GSM 03.40 TP-Recipient-Address Address-Value field in string format;BCD numbers (or GSM default alphabet characters)are converted to characters of the currently selected TE character set(refer to command AT+CSCS);type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time GSM 03.40 TP-Discharge-Time in time-string

	format:"yy/MM/dd,hh:mm:ss+zz",where characters indicate year (two last digits),month,day,hour,minutes,seconds and time zone.
<st>	Status GSM 03.40 TP-Status in integer format 0…255
<ct>	Status GSM 03.40 TP-Status in integer format 0…255
<ct>	Command Type GSM 03.40 TP-Command-Type in integer format 0…255
<sn>	Serial Number GSM 03.41 CBM Serial Number in integer format
<mid>	Message Identifier GSM 03.41 CBM Message Identifier in integer format
<page>	Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format
<pages>	Page Parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Examples

AT+CMGL=?
+CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL")

OK
AT+CMGL="ALL"
+CMGL: 1,"STO UNSENT","+10011",,,145,4
Hello World

OK

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	Response
AT+CMGR=?	**OK**
	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>**

where the row label for the response column is:

Write Command
AT+CMGR=\<index>

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\>).
\<fo\>	Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2)in integer format. SMS status report is supported under text mode if \<fo\> is set to 49.
\<pid\>	Protocol Identifier GSM 03.40 TP-Protocol-Identifier in integer format 0…255
\<dcs\>	Depending on the command or result code: SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
\<sca\>	RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of

	address given by <tosca>.
<tosca>	RP SC address Type-of-Address octet in integer format (default refer <toda>).
<length>	Integer type value indicating in the text mode (AT+CMGF=1)the length of the message body <data> in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length)
<data>	In the case of SMS: TP-User-Data in text mode responses; format: 1. If <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. (e.g. character (GSM 7 bit default alphabet 23)is presented as 17 (IRA 49 and 55)) 2. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dcs> indicates that GSM 7 bit default alphabet is used: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255.
<vp>	Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default 167)or in time-string format (refer <dt>).
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<ra>	Recipient Address GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters)are

	converted to characters of the currently selected TE character set(refer to command AT+CSCS);type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time GSM 03.40 TP-Discharge-Time in time-string format:"yy/MM/dd,hh:mm:ss+zz",where characters indicate year (two last digits),month,day,hour,minutes,seconds and time zone.
<st>	Status GSM 03.40 TP-Status in integer format 0…255
<ct>	Command Type GSM 03.40 TP-Command-Type in integer format 0…255
<mn>	Message Number GSM 03.40 TP-Message-Number in integer format
<sn>	Serial Number GSM 03.41 CBM Serial Number in integer format
<mid>	Message Identifier GSM 03.41 CBM Message Identifier in integer format
<page>	Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format
<pages>	Page parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (eg. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Examples

AT+CMGR=?
OK
AT+CMGR=1
+CMGR: "STO UNSENT","+10011",,145,17,0,0,167,"+8613800100500",145,11
Hello World

OK

9.2.13 AT+CMGS Send message

This command is used to send message from a TE to the network (SMS-SUBMIT).

<table>
<tr><td colspan="2" style="background:red;color:white">AT+CMGS Send message</td></tr>
<tr>
<td>Test Command
AT+CMGS=?</td>
<td>Response
OK</td>
</tr>
<tr>
<td>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></td>
<td>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></td>
</tr>
<tr><td>Parameter Saving Mode</td><td>NO_SAVE</td></tr>
<tr><td>Max Response Time</td><td>40s</td></tr>
<tr><td>Reference</td><td>3GPP TS 27.005</td></tr>
</table>

Defined Values

<table>
<tr>
<td><da></td>
<td>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>.</td>
</tr>
<tr>
<td><toda></td>
<td>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.</td>
</tr>
<tr>
<td><length></td>
<td>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)</td>
</tr>
<tr>
<td><mr></td>
<td>Message Reference
GSM 03.40 TP-Message-Reference in integer format.</td>
</tr>
</table>

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>/	Response 1)If write successfully: +CMGW: <index>

<toda>[,<stat>]]	
Text is entered.	**OK**
<CTRL-Z/ESC>	2)If write fails:
If PDU mode(AT+CMGF=0):	**ERROR**
AT+CMGW=<length>[,<stat>]	3)If write fails:
PDU is entered.	**+CMS ERROR: <err>**
<CTRL-Z/ESC>	
Parameter Saving Mode	NO_SAVE
Max Response Time	40s
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255.
<length>	Integer type value indicating in the text mode (AT+CMGF=1)the length of the message body <data> > (or <cdata>)in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length).
<stat>	1 Text Mode: "STO UNSENT" stored unsent message "STO SENT" stored sent message 2 PDU Mode: 2 stored unsent message 3 stored sent message

Examples

AT+CMGW=?	//TEXT MODE

OK
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.

9.2.17 AT+CMGMT   Change message status

This command is used to change the message status. If the status is unread, it will be changed read. Other statuses don't change.

AT+CMGMT Change message status	
Test Command	Response
AT+CMGMT=?	**OK**
Write Command	Response
AT+CMGMT=<index>	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

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 **AT+CMGSEX=?**	Response **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 from1to 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
> EFGH<ctrl-Z/ESC>   //TEXT MODE
+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.

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.

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	NO_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	NO_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, <u>115200</u>, 230400, 460800, 921600, 1842000, 3686400.

Examples

AT+IPR?

+IPR: 115200

```
OK
```
AT+IPR=?
```
+IPR:
(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1842000,3686400
)

OK
```
AT+IPR=115200
```
OK
```

10.2.4 AT+IPREX   Set local baud rate permanently

This command sets the baud rate of module's serial interface permanently, after reboot the baud rate is also valid.

AT+IPREX Set local baud rate permanently	
Test Command **AT+IPREX=?**	Response **+IPREX: (**list of supported **<speed>s)** **OK**
Read Command **AT+IPREX?**	Response **+IPREX: <speed>** **OK**
Write Command **AT+IPREX=<speed>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+IPREX**	Response Set default value 115200: **OK**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<speed>	Baud rate per second: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 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. A7600X(X)-MNSE and A7600E-MASE does not support flow control function.

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
	2 RTS hardware flow control
<DTE>	0 none
	2 CTS hardware flow control

Examples

AT+IFC?
+ICF: 0,0

OK
AT+IFC=?
+IFC: (0,2),(0,2)

OK
AT+IFC=2,2
OK
AT+IFC
OK

10.2.7 AT+CSCLK   Control UART Sleep

This command is used to enable UART Sleep or always work. If set to 0, UART always work. If set to 1, ensure that DTR is pulled high and the module can go to DTR sleep. If set to 2, the module will enter RX sleep. RX wakeup directly sends data through the serial port (for example: AT) to wake up.

AT+CSCLK Control UART Sleep	
Test Command **AT+CSCLK=?**	Response **+CSCLK: (**range of supported **<status>s**)

	OK
Read Command **AT+CSCLK?**	Response **+CSCLK: \<status>** **OK**
Write Command **AT+CSCLK=\<status>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CSCLK**	Response Set \<status>=0: **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

\<status>	0 off 1 DTR sleep 2 RX sleep

NOTE

The RX sleep is not supported by 1802S.

Examples

AT+CSCLK?
+CSCLK: 0

OK
AT+CSCLK=?
+CSCLK: (0-2)

OK
AT+CSCLK=1
OK

AT+CSCLK=2

OK

AT+CSCLK

OK

10.2.8 AT+CMUX Enable the multiplexer over the UART

This command is used to enable the multiplexer over the UART, after enabled four virtual ports can be used as AT command port or MODEM port, the physical UART can no longer transfer data directly under this case. By default all of the four virtual ports are used as AT command port. Second serial port is not support this command.

AT+CMUX Enable the multiplexer over the UART	
Test Command **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

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 **AT+CATR=<port>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<port>	**0** all ports

	1	use UART port to output URCs
	2	use MODEM port to output URCs
	3	use ATCOM port to output URCs
	4	use cmux virtual port1 to output URCs
	5	use cmux virtual port2 to output URCs
	6	use cmux virtual port3 to output URCs
	7	use cmux virtual port4 to output URCs

Examples

AT+CATR?
+CATR: 0

OK
AT+CATR=?
+CATR: (0-7)

OK
AT+CATR=1
OK

10.2.10 AT+CFGRI   Configure RI pin

This command configures the time of pulling RI down. These places are going to use it, for Examples: SMS, FTP, NETWORK, PB, CM, OS and so on.

AT+CFGRI Configure RI pin	
Test Command **AT+CFGRI=?**	Response **+CFGRI:** (list of supported**<status>**),(list of supported**<URC_time>**ms), (list of supported**<SMS_time>**ms) **OK**
Read Command **AT+CFGRI?**	Response **+CFGRI: <status>,<URC_time>,<SMS_time>** **OK**
Write Command **AT+CFGRI=<status>[,<time1>[,<time2>]]**	Response 1) **OK** 2) **ERROR**

Execution Command	Response
AT+CFGRI	Set default value:
	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<status>	0 off.
	1 on.
<URC_time>	a numeric parameter which is number of milliseconds to assert RI delay to reset RI. The range is 10 to 6000, default value is 60ms.
<SMS_time>	a numeric parameter which is number of milliseconds to assert RI delay to reset RI. The range is 20 to 6000, default value is 120ms.

Examples

AT+CFGRI?
+CFGRI: 0,60,120

OK
AT+CFGRI=?
+CFGRI: (0-1),(10-6000),(20-6000)

OK
AT+CFGRI=0,60,120
OK
AT+CFGRI
OK

10.2.11 AT+CURCD   Configure the delay time and number of URC

This command is used to configure delay time when output URC and the number of cached URCs. You can control delay time if some URC supports delay output. You can also set size to store URCs, they will output together when the delay time ends. For Examples, if you set delay time to 10ms and set the number of cached URCs to 1, there is only one URC output after 10ms.

AT+CURCD Configure the delay time and number of URC	
Test Command	Response

AT+CURCD=?	+CURCD: (range of supported **\<delay_time\>ms**),(1)
	OK
Read Command	Response
AT+CURCD?	**+CURCD: \<delay_time\>,1**
	OK
Write Command	Response
AT+CURCD=\<delay_time\>,\<	1)
cache_size\>	**OK**
	2)
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

\<delay_time\>	0-10000 the unit is ms
\<cache_size\>	1 currently only 1 is supported

Examples

AT+CURCD?
+CURCD: 0,1

OK
AT+CURCD=?
+CURCD: (0-10000),(1)

OK
AT+CURCD=100,1
OK

> **NOTE**
>
> Currently only support delay time setting, the default cache size for URC is one. This command applies to platform 1601 related projects, such as A7600E, A7600C-C1SE etc.

11 AT Commands for Hardware

11.1 Overview of AT Commands for Hardware

Command	Description
AT+CVALARM	Low and high voltage Alarm
AT+CVAUXS	Set state of the pin named VDD_AUX
AT+CVAUXV	Set voltage value of the pin named VDD_AUX
AT+CADC	Read ADC value
AT+CADC2	Read ADC2 value
AT+CMTE	Control the module critical temperature URC alarm
AT+CPMVT	Low and high voltage Power Off
AT+CRIIC	Read values from register of IIC device nau8810
AT+CWIIC	Write values to register of IIC device nau8810
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

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\>[,\<l ow voltage\>],[\<high voltage\>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	-

Defined Values

\<enable\>	<u>0</u> 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

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	-
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

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	-
Max Response Time	-
Reference	-

Defined Values

<voltage>	Voltage value of the pin which is named VDD_AUX. The unit is in mv.

Examples

AT+CVAUXV=?
+CVAUXV:
(1200,1250,1700,1800,1850,1900,2500,2600,2700,2750,2800,2850,2900,3000,3100,3300)

OK
AT+CVAUXV=3000
OK
AT+CVAUXV?
+CVAUXV: 3000

OK

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),(3300-4000),(4001-4300)

OK

11.2.8 AT+CRIIC   Read values from register of IIC device nau8810

This command is used to read values from register of IIC device nau8810.

AT+CRIIC Read values from register of IIC device nau8810	
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

11.2.9 AT+CWIIC Write values to register of IIC device nau8810

This command is used to write values to register of IIC device nau8810.

AT+CWIIC Write values to register of IIC device nau8810	
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

11.2.10 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

11.2.11 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

11.2.12 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**
Read 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	

11.2.13 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

11.2.14 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

11.3 Unsolicited Result Codes

URC	Description	AT Command
CMTE: <temp_level>	While module's temperature over the high threshold and below the low threshold, the URC will occur.	AT+CMTE
UNDER-VOLTAGE WARNING	This is a URC ALARM when Current voltage is UNDER the value which you set.	AT+CVALARM
OVER-VOLTAGE WARNING	This is a URC ALARM when Current voltage is OVER the value which you set.	AT+CVALARM
UNDER-VOLTAGE WARNING POWER DOWN	This is a URC ALARM when Current voltage is UNDER the value which you set.	AT+CPMVT
OVER-VOLTAGE WARNING POWER DOWN	This is a URC ALARM when Current voltage is OVER the value which you set.	AT+CPMVT

Defined Values

<temp_level>	-2 below -45 celsius degree.
	-1 (-45,-30] celsius degree.
	1 (80,85] celsius degree.
	2 over 85 celsius degree.

12 AT Commands for File System

12.1 Overview of AT Commands for File System

Command	Description
AT+FSCD	Select directory as current directory
AT+FSMKDIR	Make new directory in current directory
AT+FSRMDIR	Delete directory in current directory
AT+FSLS	List directories/files in current directory
AT+FSDEL	Delete file in current directory
AT+FSRENAME	Rename file in current directory
AT+FSATTRI	Request file attributes
AT+FSMEM	Check the size of available memory
AT+FSCOPY	Copy an appointed file

Command	Description	Supported Modules
AT+FSRENAME	D:/ directory file rename	Only Cat1 modules
AT+FSDEL AT+FSATTRI	Non ASCII characters in file path	Only CAT4 modules
AT+FSATTRI	Get creating date and time message	Only CAT4 modules

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.

b)The length of actual fully qualified names of directories and files(D:/)can not exceed 250.

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 "." .

If the last character of names is period "."; the flash (C:/)will auto delete this character; the SD card can support this character, but the compatibility is not good.

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

This command is used to create a new directory in current directory. Support "D:".

AT+FSMKDIR Make new directory in current directory	
Test Command **AT+FSMKDIR=?**	Response **OK**
Write Command **AT+FSMKDIR=<dir>**	Response 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**
>
> Only support "D:".

12.2.3 AT+FSRMDIR Delete directory in current directory

This command is used to delete existing directory in current directory. Support "D:".

AT+FSRMDIR Delete directory in current directory	
Test Command **AT+FSRMDIR=?**	Response **OK**
Write Command **AT+FSRMDIR=\<dir>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

\<dir>	The directory name which already exists in current directory.

Examples

AT+FSRMDIR=SIMTech
OK

```
AT+FSCD?
+FSCD: D:/

OK
AT+FSLS
+FSLS: SUBDIRECTORIES:

OK
```

NOTE

Only support "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
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 in current directory. 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 in current directory. Support "C:", "D:".

AT+FSRENAME Rename file in current directory	
Test Command **AT+FSRENAME=?**	Response **OK**
Write Command **AT+FSRENAME=<old_name**	Response 1)If successfully:

>,<new_name>	**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

12.2.7 AT+FSATTRI   Request file attributes

This command is used to request the attributes of file which exists in current directory. 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:/, the new file name should give in parameter. Support "C:", "D:".

AT+FSCOPY Copy an appointed file	
Test Command **AT+FSCOPY=?**	Response **OK**
	Response 1)If successfully, synchronous mode: **+FSCOPY: <percent>** **[+FSCOPY: <percent>]** **OK** 2)If successfully, asynchronous mode: **OK**
Write Command **AT+FSCOPY=<file1>,<file2>[,<sync_mode>]**	**+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.

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 A7678

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>**	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.

Examples

AT+CFTRANRX="c:/t1.txt",10
>
OK
AT+CFTRANRX="d:/MyDir/t1.txt",10
>
OK

NOTE

1.The <filepath> must be a full path with the directory path, 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** support Non-ASCII characters in file path.

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>]**	Response 1)If successfully: **[+CFTRANTX: DATA,<len>** **…** **+CFTRANTX: DATA,<len>]** **+CFTRANTX: 0** **OK** 2)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.

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

> **NOTE**
>
> The <filepath> must be a full path with the directory path.
> 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+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>,<ho**	Response 1)If successfully:

st_or_idx>[,<port>,<http_version>[,<proxy>,<proxy_port>]]	**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

14.2.2 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

14.2.3 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_code>** 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="202.120.2.101",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 acitve PDP context's profile

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.

AT+NETOPEN   Start Socket Service

Read Command **AT+NETOPEN?**	Response **+NETOPEN: <net_state>** **OK**
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

<net_state>	Integer type, indicates the state of PDP context activation. <u>0</u> 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

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.

AT+NETCLOSE Stop Socket Service	
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 and transparent mode, response: **OK** **CLOSED** **+CIPCLOSE: <link_num>,<err>** **+NETCLOSE: <err>** 3)If the PDP context has not been activated, response: **+NETCLOSE: <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

<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

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.

AT+CIPOPEN Establish Connection in Multi-Socket Mode	
Test Command **AT+CIPOPEN=?**	Response **+CIPOPEN: (0-9),("TCP","UDP")** **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>,"TC P",<serverIP>,<serverPort>[,<lo calPort>]**	Response 1)if PDP context has been activated successfully, response: **OK** **+CIPOPEN: <link_num>,<err>** 2)when the <link_num> is greater than 10, or when AT+CIPMODE=1 is set, the <link_num> is greater than 0,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 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 10, response: **+IP ERROR: Invalid parameter** **ERROR** 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** 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. 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
<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, 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")

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

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**
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>** 2)If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully. 3)If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** 4)Others: **ERROR**
Write Command If service type is "TCP", send data with fixed length **AT+CIPSEND=<link_num>,<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 <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully. 3)If the connection has not been established, abnormally closed,

	or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** 4)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. But, for Qualcomm, connecting the port 0 is regarded as an invalid operation.
<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: 8,1,1

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.

AT+CIPRXGET Set the Mode to Retrieve Data	
Test Command **AT+CIPRXGET=?**	Response **+CIPRXGET: (0-4),(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**
Parameter Saving Mode	NO_SAVE
Max Response Time	8s
Reference	

Defined Values

<mode>	Integer type, sets the mode to retrieve data
	<u>0</u> 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
<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: (0-4),(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

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>,<link 4_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

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 Set default value:(<mode>=0) **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, sets TCP/IP application mode <u>0</u> 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)** **OK**
Read Command **AT+CIPCCFG?**	Response **+CIPCCFG:** **<NmRetry>,<DelayTm>,<Ack>,<errMode>,<Header-Type>,<AsyncMode>,<TimeoutVal>** **OK**
Write Command **AT+CIPCCFG=[<NmRetry>][,[<DelayTm>][,[<Ack>][,[<errMode>][,]<HeaderType>][,[[<AsyncM**	Response 1)If the parameter is correct, response: **OK** 2)

ode>][,[<TimeoutVal>]]]]]]]]	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.

Examples

AT+CIPCCFG=?
+CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000)

OK
AT+CIPCCFG?
+CIPCCFG: 10,0,0,1,0,0,500

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	
	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>**
Write Command **AT+SERVERSTOP=<server_index>**	**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>** **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_num>[,<ip_family>]**	Response 1)If the parameter is correct, response: **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. Now only 1 is supported for this parameter value.
<ip_family>	Packet Data Protocol type <u>1</u> 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

15.3 Command Result Codes

15.3.1 Description of <err_info>

The fourth parameter <errMode> of AT+CIPCCFG (TODO)is used to determine how <err_info> is displayed.
If <errMode> is set to 0, the <err_info> is displayed with numeric value.
If <errMode>is set to 1, the <err_info> is displayed with string value.
The default is displayed with string value.

Numeric Value	String Value
0	Connection time out
1	Bind port failed
2	Port overflow
3	Create socket failed
4	Network is already opened
5	Network is already closed
6	No clients connected
7	No active client
8	Network not opened
9	Client index overflow
10	Connection is already created
11	Connection is not created
12	Invalid parameter
13	Operation not supported
14	DNS query failed
15	TCP busy
16	Net close failed for socket opened
17	Sending time out
18	Sending failure for network error
19	Open failure for network error

20	Server is already listening
21	Operation failed
22	No data

15.3.2 Description of <err>

<err>	Description of <err>
0	operation succeeded
1	Network failure
2	Network not opened
3	Wrong parameter
4	Operation not supported
5	Failed to create socket
6	Failed to bind socket
7	TCP server is already listening
8	Busy
9	Sockets opened
10	Timeout
11	DNS parse failed for AT+CIPOPEN
12	Unknown error

15.4 Unsolicited Result Codes

URC	Description
+CIPEVENT: NETWORK CLOSED UNEXPECTEDLY	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.
+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>.

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 **OK**
Execute Command **AT+HTTPINIT**	Response 1)If start HTTP service successfully: **OK** 2)If failed: **ERROR**
Parameter Saving Mode	-

Max Response Time	120000ms
Reference	-

Defined Values

<err>	The type of error please refer to Section 16.4

Examples

AT+HTTPINIT
OK

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 **OK**
Execute Command **AT+HTTPTERM**	Response 1)If stop HTTP service successfully: **OK** 2)If failed: **ERROR**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Examples

AT+HTTPTERM
OK

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'/'path':'tcpPort'. b)https://'server'/'path':'tcpPort' "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.
<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

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)** **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
\<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

<dat_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>**

Write Command **AT+HTTPREAD=[<start_offset>,]<byte_size>**	**OK** 2)If failed (no more data other error): **ERROR**
	Response 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
<datalen>	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.
Due to the max size of protocol stack is 64K bytes(the CAT4 module is 10K bytes), when the total size of the data from server is bigger than that and 'READMODE' is 0, you should read the data quickly, or you will fail to read it.

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: <httpstatuscode>,<content_length>

AT+HTTPPOSTFILE Send HTTP Request to HTTP(S)server by File	
Test Command **AT+HTTPPOSTFILE=?**	Response **+HTTPPOSTFILE: <filename>[,(1-2)[,(0-3)[,(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>,<content_len>** b)if parameter <method> is ignored: **OK** **+HTTPPOSTFILE: <statuscode>,<content_len>** 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 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 HTTP header and body 1 Send file as Body

Examples

AT+HTTPPOSTFILE=?
+HTTPPOSTFILE: <filename>[,(1-2)[,(0-3)[,(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>,<httpstatuscode>,<content_len>" or "+HTTPPOSTFILE: <httpsatuscode>,<content_len>" 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. <u>1</u> 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	It's a notification message. While received, it means now the network is unavailable.

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

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

AT+CFTPSSTART	Start FTP(S)service
Test Command **AT+CFTPSSTART=?**	Response **OK**
Execution Command **AT+CFTPSSTART**	Response 1) **OK** **+CFTPSSTART: 0** 2) **OK** **+CFTPSSTART: <errcode>** 3) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<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

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 **OK**

Execution Command **AT+CFTPSSTOP**	Response 1) **OK** **+CFTPSSTOP: 0** 2) **OK** **+CFTPSSTOP: \<errcode\>** 3) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

\<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

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**
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.

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
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
	Response
	1)
	OK
	+CFTPSRMD: 0
	2)
	OK
Write Command	
AT+CFTPSRMD=<dir>	**+CFTPSRMD: <errcode>**
	3)
	ERROR
	4)
	+ CFTPSRMD: <errcode>
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<dir>	The directory to be deleted, string type, maximum length is 112.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 17.3

Examples

AT+CFTPSRMD=?
+CFTPSRMD: "DIR"

OK
AT+CFTPSRMD="test"
OK

+CFTPSRMD: 0

17.2.8 AT+CFTPSCWD   Change the current directory on FTP(S)server

You can use this command to change the current directory on FTP(S)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**
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>]**	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) <u>1</u> C:/(local storage)

	2 D:/(sd card)
\<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 to save the downloaded 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>[,<re**	Response 1)

st_size>]	**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
<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>[,<dat a_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

<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.

0x03, and <Ctrl+Z> is 0x1A.

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)
	+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

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

17.3 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

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

Execute Command	Response
AT+CMQTTSTART	1)If start MQTT service successfully:
	OK
	+CMQTTSTART: 0
	2)If failed:
	OK
	+CMQTTSTART: <errcode>
	3)If MQTT service have started successfully and you executed AT+CMQTTSTART again:
	ERROR
Max Response Time	12000ms
Parameter Saving Mode	-
Reference	

Defined Values

<errcode>	The result code, please refer to Chapter 18.3

Examples

AT+CMQTTSTART
OK

+CMQTTSTART: 0

NOTE

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

Execute Command **AT+CMQTTSTOP**	Response 1)If stop MQTT service successfully: **OK** **+CMQTTSTOP: 0** 2)If failed: **+CMQTTSTOP: <errcode>** **ERROR** 3)If MQTT service have stopped successfully and you executed AT+CMQTTSTOP again: **ERROR**
Max Response Time	12000ms
Parameter Saving Mode	-
Reference	

Defined Values

<errcode>	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. <u>0</u> MQTT server with TCP 1 MQTT server with SSL/TLS
<errcode>	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.
<errcode>	The result code, please refer to chapter 18.3

Examples

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

OK
AT+CMQTTREL=0
OK
AT+CMQTTREL?
OK

18.2.5 AT+CMQTTSSLCFG   Set the SSL context (only for SSL/TLS MQTT)

AT+CMQTTSSLCFG is used to set the SSL context which to be used in the SSL connection when it will connect to a SSL/TLS MQTT server. It must be called before AT+CMQTTCONNECT and after AT+CMQTTSTART. The setting will be cleared after AT+CMQTTCONNECT failed or AT+CMQTTDISC.

AT+CMQTTSSLCFG Set the SSL context (only for SSL/TLS MQTT)	
Test Command **AT+CMQTTSSLCFG=?**	Response **+CMQTTSSLCFG: (0,1),(0-9)** **OK**
Read Command **AT+CMQTTSSLCFG?**	Response **+CMQTTSSLCFG: <session_id>,[<ssl_ctx_index>]** **+CMQTTSSLCFG: <session_id>,[<ssl_ctx_index>]** **OK**
Write Command **AT+CMQTTSSLCFG=<session_id>,<ssl_ctx_index>**	Response 1)If successfully: **OK** 2)If failed: **ERROR**
Parameter Saving Mode	-
Max Response Time	-

| Reference | - |

Defined Values

| <session_id> | The session_id to operate. It's from 0 to 1 |
| <ssl_ctx_index> | The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG |

Examples

AT+CMQTTSSLCFG?
+CMQTTSSLCFG: 0,0
+CMQTTSSLCFG: 1,0

OK
AT+CMQTTSSLCFG=?
+CMQTTSSLCFG: (0,1),(0-9)

OK
AT+CMQTTSSLCFG=0,1
OK

18.2.6 AT+CMQTTWILLTOPIC   Input the topic of will message

AT+CMQTTWILLTOPIC is used to input the topic of will message.

AT+CMQTTWILLTOPIC Input the topic of will message	
Test Command **AT+CMQTTWILLTOPIC=?**	Response **+CMQTTWILLTOPIC: (0-1),(1-1024)** **OK**
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=<clien**	Response 1)If successfully:

t_index>,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]	**OK** **+CMQTTCONNECT: <client_index>,0** 2)If failed: **OK** **+CMQTTCONNECT: <client_index>,<err>** 3)If failed: **+CMQTTCONNECT: <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.
<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

+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, 60-180)** **OK**
Read Command **AT+CMQTTDISC?**	Response: **+CMQTTDISC: 0,\<disc_state\>** **+CMQTTDISC: 1,\<disc_state\>** **OK**

	Response
	1)If disconnect successfully:
	+CMQTTDISC: <client_index>,0
	OK
	2)If disconnect successfully:
	OK
Write Command	**+CMQTTDISC: <client_index>,0**
AT+CMQTTDISC=<client_index>,<timeout>	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 60s 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 **AT+CMQTTTOPIC=<client_index>,<req_length>**	Response 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
```

The topic will be clean after execute AT+CMQTTPUB.

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),(60-180),(0-1),(0-1)** **OK**
Write Command **AT+CMQTTPUB=<client_ind ex>,<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 60s to 180s.
<ratained>	The retain flag of the publish message. The value is 0 or 1. The default value is 0.
	When a client sends a PUBLISH to a server, if the retain flag is set to 1, the server should hold on to the message after it has been delivered to the current subscribers.
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

AT+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
	Response
	1)If successfully:
	>
	<input data here>
	OK
Write Command	2)If failed:
AT+CMQTTSUBTOPIC=<client_index>,<req_length>,<qos>	**+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**
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.

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

+CMQTTUNSUB: 0,0
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)
	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="checkUTF 8",\<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**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

\<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.

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.
+CMQTTRXSTART: **<client_index>,<topic_total_len>,<payload_total_len>** **+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>**	If a client subscribes to one or more topics, any message published to 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

\<sub_payload\> /*for long payload, split to multiple packets to report*/ **[+CMQTTRXPAYLOAD: \<client_index\>,\<sub_payload_len\>** **\<sub_payload\>]** **+CMQTTRXEND: \<client_index\>**	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.

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

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 **AT+CSSLCFG=?**	Response +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: "enableSNI",(0-9),(0,1) **OK**
Read Command **AT+CSSLCFG?**	Response **+CSSLCFG:** **0,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **1,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **2,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **3,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **4,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **5,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **6,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **7,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **8,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **+CSSLCFG:** **9,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI>** **OK**
Write Command /*Query the configuration of the specified SSL context*/ **AT+CSSLCFG=<ssl_ctx_inde x>**	Response **+CSSLCFG:** **<ssl_ctxindex>,<sslversion>,<authmode>,<ignoreltime>,<nego tiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<enableS NI>**

	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_ctx_index>,<ca_file>**	Response 1)If successfully: **OK** 2)If failed: **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 enableSNI flag of the specified SSL context */	Response 1)If successfully: **OK**

AT+CSSLCFG="enableSNI",<ssl_ctx_index>,<enableSNI_flag>	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 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.
\<enalbeSNI_flag\>	The flag to indicate that enable the SNI flag or not, the default value is 0. 0 not enable SNI. 1 enable SNI.

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: "enableSNI",(0-9),(0,1)
```

OK
AT+CSSLCFG?
+CSSLCFG: 0,4,0,1,300,"","","",0
+CSSLCFG: 1,4,0,1,300,"","","",0
+CSSLCFG: 2,4,0,1,300,"","","",0
+CSSLCFG: 3,4,0,1,300,"","","",0
+CSSLCFG: 4,4,0,1,300,"","","",0
+CSSLCFG: 5,4,0,1,300,"","","",0
+CSSLCFG: 6,4,0,1,300,"","","",0
+CSSLCFG: 7,4,0,1,300,"","","",0
+CSSLCFG: 8,4,0,1,300,"","","",0
+CSSLCFG: 9,4,0,1,300,"","","",0

OK
AT+CSSLCFG="authmode",0,0
OK
AT+CSSLCFG=6
+CSSLCFG: 6,4,0,1,300,"","","",0

OK

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 file. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes. If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code). For Examples: If you want to download a file with name "中华.pem" in UTF8, you'd better convert the "中华.pem" to UTF8 coding (中华.pem), then input the hexadecimal (262378344532443B262378353334453B2E70656D)of UTF8 coding.
\<len>	The length of the file data to send. The range is from 1 to 10240 bytes. User should note than every packet data should be no larger than 3072 bytes.

Examples

```
AT+CCERTDOWN=?
+CCERTDOWN: (5-108),(1-10240)

OK
AT+CCERTDOWN="ls.pem",1970
>

OK
```

19.2.3 AT+CCERTLIST   List certificates

AT+CCERTLIST List certificates	
Execute Command **AT+CCERTLIST**	Response **[+CCERTLIST: \<file_name>** **[+CCERTLIST: \<file_name>]** **...** **]** **OK**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	The certificate/key 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/key 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 **AT+CCHMODE=?**	Response **+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>**

Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

\<err\>	The result code, please refer to the end of this chapter

Examples

AT+CCHSTART

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**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

\<err\>	The result code, please refer to the end of this chapter

Examples

AT+CCHSTOP

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.
<ssl_ctx_index>	The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG.

Examples

AT+CCHSSLCFG=?
+CCHSSLCFG: (0,1),(0-9)

OK
AT+CCHSSLCFG?
+CCHSSLCFG: 0,
+CCHSSLCFG: 1,

OK
AT+CCHSSLCFG=0,1
OK

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

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 AT+CCHSSLCFG*/ **AT+CCHCFG="sslctx",<session_id>,<sslctx_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.
\<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.

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

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\>**

<table>
<tr>
<td rowspan="4"></td>
<td>**+CCHOPEN: 1,<host>,<port>,<client_type>,<bind_port>**

OK</td>
</tr>
<tr>
<td rowspan="3">Write Command
AT+CCHOPEN=<session_id>,<host>,<port>[,<client_type>,[<bind_port>]]</td>
</tr>
<tr>
<td>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</td>
</tr>
</table>

Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session index to operate. It's from 0 to 1.
<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 **AT+CCHCLOSE=<session_id>**	Response 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.
<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.

<len>	The length of data to send. Its range is from 1 to 2048 bytes.
<unsent_len_0>	The data of connection 0 cached in sending buffer which is waiting to be sent.
<unsent_len_1>	The data of connection 1 cached in sending buffer which is waiting to be sent.

Examples

AT+CCHSEND=?
+CCHSEND: (0,1),(1-2048)

OK
AT+CCHSEND?
+CCHSEND: 0,0,1,0

OK
AT+CCHSEND=0,121
> GET / HTTP/1.1
Host: www.baidu.com
User-Agent: MAUI htp User Agent
Proxy-Connection: keep-alive
Content-Length: 0

OK

19.2.15 AT+CCHRECV   Read the cached data that received from the server

AT+CCHRECV Read the cached data that received from the server	
Read Command **AT+CCHRECV?**	Response **+CCHRECV: LEN,<cache_len_0>,<cache_len_1>** **OK**
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.
\<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 cached(the maximum of cached is 5496). 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

: 15850168300404147722109623143970447227978

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="鐗惧害鐎滅储" /><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>鐗惧害涓€涓?

+CCHRECV: DATA,0,1024

紝浣犲氨鐭ラ亾</title><style type="text/css" id="css_index" index="index">body,html{height:100%}html{overflow-y:auto}body{font:12px arial;background:#fff}body,form,li,p,ul{margin:0;padding:0;list-style:none}#fm,body,form{position: relative}td{text-align:left}img{border:0}a{text-decoration:none}a:active{color:#f60}input{border:0;p

adding:0}.clearfix:after{content:'\20';display:block;height:0;clear:both}.clearfix{zoom:1}#wrapper{position:relative;min-height:100%}#head{padding-bottom:100px;text-align:center;*z-index:1}#ftCon{height:50px;position:absolute;text-align:left;width:100%;margin:0 auto;z-index:0;overflow:hidden}#ftConw{display:inline-block;text-align:left;margin-left:33px;line-height:22px;position:relative;top:-2px;*float:right;*margin-left:0;*position:static}#ftConw,#ftConw a{color:#999}#ftConw{text-align:center;margin-left:0}.bg{background-image:url(http://ss.bdimg.com/static/superman/img/icons-5859e577e2.png);background-repeat:no-repeat;_background-image:url(http://ss.bdimg.com/static/superman/img/icon

+CCHRECV: 0,0

+CCHEVENT: 0,RECV EVENT

NOTE

If connection is closed by server, the cached data will not be cleaned.

19.2.16 AT+CCERTMOVE   Move the cert from file system to cert content

AT+CCERTMOVE Move the cert from file system to cert content	
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.
+CCH_PEER_CLOSED: <session_id>	The connection is closed by the server.
+CCH:CCH STOP	CCH stopped caused by network error.

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: 0** **OK** 2)If \<mode\>is 0, and tts is not playing： **OK** 3)If \<mode\>is 1 or 2: **+CTTS:** **OK**

	+CTTS: 0 // transform end 4)If <mode>is 3 or 4: **+CTTS:** **OK** **+CTTS: 0** **//** transform end 5) **ERROR**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<status>	<u>0</u> NO_WORKING 6 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 texi 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 Chinese polyphonic characters, pronunciation can be specified. format: 多音字<pinyin=发音读音>
<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.

> **NOTE**
>
> 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.

Examples

20.2.2 AT+CTTSPARAM   Set TTS Parameters

The write command is used to Set TTS Parameters

AT+CTTSPARAM Set TTS Parameters	
Test Command **AT+CTTSPARAM=?**	Response **+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>,<digitr** **eading>**

	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 mix volume
	1	The normal volume
	2	The max volume
\<sysvolume>	0	The mix 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 mix 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)
\<digitreading>	0	Read the numbers in Chinese
	1	Read the numbers in English

Examples

AT+CTTSPARAM=?
+CTTSPARAM: (0-2),(0-3),(0-3),(0-2),(0-2|10-30),(0-1)

OK
AT+CTTSPARAM?
+CTTSPARAM: 1,3,0,1,1,0

OK

AT+CTTSPARAM=2,3,0,1,1,1

OK

AT+CTTSPARAM=2,3,0,1,10,1

OK

20.2.3 AT+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
```

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

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 AT+CCMXPLAY=<file_na me>,<play_path>,<repeat>	Response 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 and wav.
<play_path>	0 local path
	1 remote path (just support voice call)
<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: (0-1),(0-255)

OK
AT+CCMXPLAY="c:/recording.amr",0,255
+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop
AT+CCMXPLAY="c:/recording.wav",0,255
+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop

> **NOTE**
>
> support file type: AMR,WAV,MP3,PCM

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.The record path 3 only supported on A7600 Series(1601) and A7678 Series(1603) and others support 1 and 2.

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)
\<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.
- Mixd recording function(**record_path** set value 3) is just for A7600 Series(1600) and A7678 Series(1603).

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>**	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 255 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.

Examples

AT+CFOTA=0,0,"183.230.174.137:6047/fbf_dfota.bin",simcom,simcom
+CFOTA: FOTA,START

+CFOTA: DOWNLOADING:17

+CFOTA: DOWNLOADING:50

+CFOTA: DOWNLOADING:83

+CFOTA: DOWNLOADING:99

+CFOTA: DOWNLOADING:100
AT+CFOTA=0,1," 183.230.174.137:6022/bin/fbf_dfota.bin",simcom,simcom
+CFOTA: FOTA,START

+CFOTA: DOWNLOADING:17

+CFOTA: DOWNLOADING:50

+CFOTA: DOWNLOADING:83

+CFOTA: DOWNLOADING:99

+CFOTA: DOWNLOADING:100

22.2.2 AT+LFOTA Start Local Fota Service

AT+LFOTA Start Local Fota Service	
Test Command **AT+LFOTA=?**	Response **+LFOTA=<0-1>,<File Size>** **OK**
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

<div style="background:#eee">

AT+LFOTA=0,5358979
OK
AT+LFOTA=1,5358979
>
OK

</div>

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

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

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

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 and AP-Flash 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. 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>** **OK**
Read Command **AT+CGNSSPWR?**	Response **+CGNSSPWR: <GNSS_Power_status>,<AP_Flash_status>** **OK**
Write Command **AT+CGNSSPWR=<GNSS_Power_status>[,<AP_Flash_status>]**	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.

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.

Examples

AT+CGNSSPWR=?

+CGNSSPWR: (0,1),(0,1)

OK
AT+CGNSSPWR?
+CGNSSPWR: 1,1

OK
AT+CGNSSPWR=1,1
OK

+CGNSSPWR: READY!

24.2.2 AT+CGNSSTST   Send data received from UART3 to NMEA port

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

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	
Test Command AT+CGPSCOLD=?	Response OK
Execution Command AT+CGPSCOLD	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Examples

AT+CGPSCOLD=?
OK
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

Test Command	Response
AT+CGPSWARM=?	**OK**
Execution Command	Response
AT+CGPSWARM	**OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

NOTE

This command is valid on the ASR1603 projects and ASR1803S projects.

Examples

AT+CGPSWARM=?
OK
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

Test Command	Response
AT+CGPSHOT=?	**OK**
Execution Command	Response
AT+CGPSHOT	**OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Examples

AT+CGPSHOT=?
OK

```
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>	4800 9600 19200 38400 57600 115200 The function will take effect immediately.

NOTE

1. The baud-rate is supported by the ASR1603 projects and ASR1803S projects:
   9600, 115200 and 230400.
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.

Examples

AT+CGNSSIPR=?
+CGNSSIPR: (4800,9600,19200,38400,57600,115200)

OK
AT+CGNSSIPR?
+CGNSSIPR: 9600

OK
AT+CGNSSIPR=4800
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
	2 BDS
	3 GPS + BDS
	4 GLONASS
	5 GPS + GLONASS
	6 BDS + GLONASS
	7 GPS + BDS + GLONASS
	The function will take effect immediately.

NOTE

The mode is supported by the ASR1603 projects and ASR1803S projects in the domestic module:

1 GPS L1 + BDS B1 + QZSS
2 BDS B1
3 GPS L1+QZSS

The mode is supported by the ASR1603 projects and ASR1803S projects in foreign module:

1 GPS L1+SBAS+QZSS
2 BDS B1
3 GPS+GLONASS+GALILEO+SBAS+QZSS
4 GPS+BDS+GALILEO+SBAS+QZSS

Examples

AT+CGNSSMODE=?
+CGNSSMODE: (1-7)

OK
AT+CGNSSMODE?
+CGNSSMODE: 3

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:** **(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(** **0-9),(0-9)** **OK**
Read Command **AT+CGNSSNMEA?**	Response **+CGNSSNMEA: 1,1,1,1,1,1,1,1,0,0,0,0,0,0** **OK**
Write Command **AT+CGNSSNMEA=[nGGA,[nGL L,[nGSA,[nGSV,[nRMC,[nVTG,[nZDA,[nANT,[nDHV,[nLPS,[res1 ,[res2,[nUTC,[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,[nANT, [nDHV,[nLPS,[res1,[res2,[nU TC,[nGST]]]]]]]]]]]]]]	The range of n is 0-9. 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 1 nANT ANT output rate,default is 1 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
	The function will take effect immediately.

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

Examples

AT+CGNSSNMEA=?
+CGNSSNMEA: (0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9),(0-9)

OK
AT+CGNSSNMEA?
+CGNSSNMEA: 1,1,1,1,1,1,1,1,0,0,0,0,0,0

OK
AT+CGNSSNMEA=1,0,0,0,0,0,0,0,0,0,,,1,1
OK

24.2.9 AT+CGPSNMEARATE   Set NMEA output rate

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

AT+CGPSNMEARATE Set NMEA output rate	
Test Command	Response

AT+CGPSNMEARATE=?	+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
	4 4Hz, four anchor points is output per second
	5 5Hz, five anchor points is output per second
	10 10Hz, ten anchor points is output per second
	The function will take effect immediately.

NOTE

The rate is supported by the ASR1603 projects and ASR1803S projects:

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
10 10Hz, ten anchor points is output per second

Examples

AT+CGPSNMEARATE=?
+CGPSNMEARATE: (1,2,4,5,10)

OK
AT+CGPSNMEARATE?
+CGPSNMEARATE: 1

OK
AT+CGPSNMEARATE=4
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.s.
<alt>	MSL Altitude. Unit is meters.
<speed>	Speed Over Ground. Unit is knots.
<course>	Course. Degrees.

Examples

AT+CGPSINFO=?
+CGPSINFO: (0-255)

OK
AT+CGPSINFO?
+CGPSINFO: 0

OK
AT+CGPSINFO
+CGPSINFO:3113.343286,N,12121.234064,E,250311,072809.3,44.1,0.0,0

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>],[<GLONASS-SVs>],[BEIDOU-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>],[<GLONASS-SVs>],[BEIDOU-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 valid numbers scope: 00-12

<GLONASS-SVs>	GLONASS satellite valid numbers scope: 00-12 (the A7678C project do not support this field)
<BEIDOU-SVs>	BEIDOU satellite valid numbers scope: 00-12
<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.s.
<alt>	MSL Altitude. Unit is meters.
<speed>	Speed Over Ground. Unit is knots.
<course>	Course. Degrees.
<PDOP>	Position Dilution Of Precision.
<HDOP>	Horizontal Dilution Of Precision.
<VDOP>	Vertical Dilution Of Precision.

Examples

AT+CGNSSINFO=?
+CGNSSINFO: (0-255)

OK
AT+CGNSSINFO?
+CGNSSINFO: 0

OK
AT+CGNSSINFO
+CGNSSINFO:
2,09,05,00,3113.330650,N,12121.262554,E,131117,091918.0,32.9,0.0,255.0,1.1,0.8,0.7

OK
AT+CGNSSINFO (if not fix, will report null)
+CGNSSINFO:,,,,,,,,,,,,,,,
OK

NOTE

In the ASR1603 projects and ASR1803S projects, GLONASS satellites are not supported, so this command <GLONASS-SVs> does not support.

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: (0-1),"CmdString"** **OK**
Write Command **AT+CGNSSCMD=<CmdType>,< CmdString>**	Response 1)If send OK: **OK** 2)If send false: **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<CmdType>	0 NMEA style command. 1 HEX style command.
<CmdString>	Command string, max length of string is 510. For example: if you want to send "$PCAS02,1000*2E<CR><LF>" command to GNSS. You can use: AT+CGNSSCMD=0,"$PCAS02,1000*2E" Or: AT+CGNSSCMD=1,"245043415330322C313030302A3245"

Examples

AT+CGNSSCMD=?
+CGNSSCMD: (0,1),"CmdString"

OK
AT+CGNSSCMD=0,"$PCAS02,1000*2E"
OK

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=<par se_data_port>[,<nmea_data_po rt>]**	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.

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: **PRODUCTION: <prodname>** **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.

Examples

AT+CGNSSPROD=?
OK
AT+CGNSSPROD
PRODUCTION: CASIC

OK
AT+CGNSSPROD
PRODUCTION: UNICORECOMM

OK
AT+CGNSSPROD
ERROR

25 AT Commands for WIFI

25.1 Overview of AT Commands for WIFI

Command	Description
AT+CWSTASCAN	Scan WIFI network
AT+CWSTASCANEX	Scan WIFI network extension command

25.2 Detailed Description of AT Commands for WIFI

25.2.1 AT+CWSTASCAN   Scan WIFI network

AT+CWSTASCAN Scan WIFI network	
Test Command **AT+CWSTASCAN=?**	Response **+CWSTASCAN: (0-1)** **OK**
Read Command **AT+CWSTASCAN?**	Response **+CWSTASCAN: <flag_show_signal>** **OK**
Write Command **AT+CWSTASCAN=<flag_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

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_**	Response 1)

show_signal>[,<scan_round_num>[,<scan_max_bssid_num>[,<scan_timeout>[,<scan_priority>]]]]	**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

92:32:4B:9F:E2:EB, 1, -66

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	Inquiry Current 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 service
AT+BLESSDRM	Remove a descriptor
AT+BLESSSTART	Start a service
AT+BLESSSTOP	Stop a service
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

NOTE

Currently, only A7678 Series support at commands for Bluetooth.

26.2 Detailed Description of AT Commands for Bluetooth

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	Response
AT+BLEPOWER=<op>	**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

26.2.2 AT+BLESTATUS   Inquiry Current BLE Connect Status

AT+BLESTATUS Inquiry Current BLE Connect Status	
Test Command	Response
AT+BLESTATUS=?	**OK**
Read Command **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

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	NO_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 Device Address

AT+BLEADDR	Inquiry Device Address
Test Command AT+BLEADDR=?	Response OK
Read Command AT+BLEADDR?	Response +BLEADDR: <address> OK
Parameter Saving Mode	NO_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

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>	Not use.

<service_handle>	The handle of this service. Dec format.

Examples

AT+BLESSAD=?
OK
AT+BLESSAD=0,"1802",30,1,4
+BLESSAD: 0,ABCDEF50,1802,1,4,0
OK
AT+BLESSAD?
+BLESSAD: 0,ABCDEF50,1802,1,4,0
OK

26.2.8 AT+BLESSRM   Remove a Service

AT+BLESSRM Remove a Service	
Test Command **AT+BLESSRM=?**	Response **OK**
Read Command **AT+BLESSRM?**	Response **OK**
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

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>,<char_handle>** … **+BLESSCAD:** **<char_index>,<user_id>,<char_uuid>,<inst>,<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.
<service_handle>	The handle of this service. Dec format.
<inst>	Not use.
<prop>	The characteristic's properties. It should be a combination of the following values: 1 Broadcast 2 Read 4 Write without response 8 Write 16 Notify 32 Indicate 64 Authenticated Signed Writes 128 Extended properties
<permission>	Permission of this characteristic. It should be a combination of the following values: Read 1 Write 2
<char_handle>	The handle of this Characteristic. Dec format.

Examples

AT+BLESSCAD=?
OK
AT+BLESSCAD=0,"2A06",4,38,3
+BLESSCAD: 0,ABCDEF50,2A06,4,0

OK
AT+BLESSCAD?
+BLESSCAD: 0,ABCDEF50,2A06,4,38,3,0

OK

26.2.10 AT+BLESSCRM   Remove a Characteristic

AT+BLESSCRM   Remove a Characteristic

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 Service

AT+BLESSDAD Add a Descriptor to an Existed Service	
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_handl**

	e>
	…
	+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, the number of registered desciptor is limited to 64.
<char_uuid>	The UUID of the characteristic, Max length is 32.
<desc_uuid>	The UUID of the descriptor, Max length is 32.
<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+BLESSDAD=?
OK
AT+BLESSDAD=0,"0210",4,0
+BLESSDAD: 0,1802,0210,0,0

OK

26.2.12 AT+BLESSDRM   Remove a Descriptor

AT+BLESSDRM Add a Descriptor to an Existed Service	
Test Command **AT+BLESSDRM=?**	Response **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 Service

AT+BLESSSTART Start a Service	
Test Command **AT+BLESSSTART=?**	Response **OK**
Read Command **AT+BLESSSTART?**	Response If no started device:

	OK
	Else
	+BLESSSTART: <service_index>,<user_id>,<service_handle>
	OK
Write Command	Response
AT+BLESSSTART=<service_index>,<transport>	**+BLESSSTART: <service_index>,<user_id>,<service_handle>**
	OK
	or
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	-

Defined Values

<service_index>	Service index. Generated when the service 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.
<service_handle>	The handle of this service. Dec format.

Examples

AT+BLESSSTART=?
OK
AT+BLESSSTART=0,0
+BLESSSTART: 0,ABCDEF50,0

OK

26.2.14 AT+BLESSSTOP   Stop a Service

AT+BLESSSTOP Stop a Service	
Test Command	Response
AT+BLESSSTOP=?	**OK**
Read Command	Response
AT+BLESSSTOP?	**OK**

Write Command **AT+BLESSSTOP=<service_inde x>**	Response **+BLESSSTOP: <service_index>,<user_id>,<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.
<service_handle>	The handle of this service. Dec format.

Examples

AT+BLESSSTOP=?
OK
AT+BLESSSTOP?
OK
AT+BLESSSTOP=0
+BLESLSTOP: 0,ABCDEF50,0

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=<serve**	Response 1)if <type> and <value> is ignored:

r_index>[,<type>,<value>]	+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.
<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

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	Response

AT+BLESCLRADVDATA=?	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>** **OK**
Write Command **AT+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>]]]]]]**	Response **+BLESSETDAVDPARAM:** **<adv_interval_min>,<adv_interval_max>,<adv_type>,<own_address_type>,<peer_address_type>,<peer_address>,<adv_channel_map>,<adv_filter_policy>** **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 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.

Examples

AT+BLESSETADVPARAM=?
+BLESSETADVPARAM:
<server_index>,<adv_interval_min>,<adv_interval_max>,<adv_type>,<own_address_type>,<peer_address_type>,<peer_address>,<adv_channel_map>,<adv_filter_policy>

OK
AT+BLESSETADVPARAM=0
+BLESSETADVPARAM: 0x0800,0x0800,0,0,0,"00:00:00:00:00:00",7,0

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

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
<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+BLESLSTART=?
OK
AT+BLESLSTART=0
+BLESLSTART: 0,ABCDEF50

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=<service_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
<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

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>,< scan_rsp>,<include_name>,<in clude_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.
<scan_rsp>	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, each char of it should in set { '0'~'9','a'~'f','A'~'F'}.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

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
```

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

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 1 Write
<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_long>,<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

Notify When 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

Notify When Connection's Status Change	
	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	Response
AT+BLECCON=?	**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

<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+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+BLECSS=<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>** … **+BLECGC:** **<characteristic_index>,<descriptor_index>,<uuid>** **OK** else only response **OK**

Write Command **AT+BLECGD=<descriptor_index>**	Response **+BLECGC: <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?
+BLECGC: 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 3) If write the characteristic succefully: **OK** 2) If send write request succefully and receive error response: **OK** **+BLECWC: <characteristic_index>,<error_code>** 3) 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: 6,"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 3) If write the characteristic succefully: **OK** 2) If send write request succefully and receive error response: **OK** **+BLECWD: <descriptor_index>,<error_code>** 3) 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"

26.3 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

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=\<option\>,\<band\>,\<power\>,\<gsmband\>,\<para\>**
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. 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)

27.3.1 AT+CTBURST   The RF TX Burst Test

AT+CTBURST The RF TX Burst Test	
Test Command **AT+CTBURST=?**	Response **+CTBURST=<option>,<channel>,<arfcn>,<power>**
Write Command **AT+CTBURST=<option>,<b and>,<power>,<gsmband>, <para>**	Response 1)LTE RF TX successfully: **+CTBURST:0,OK; RX:rssiPri=0,rssiSec=0** **OK** 2)GSM RF TX successfully: **+CTBURST:0** **OK** RF TX failed: ***RADIOPOWER: 0** **+CME ERROR: unknown error**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<option>	0 – start TX. 1 – start RX. 3 – stop GSM Tx or Rx.
<channel>	LTE: 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. GSM: 101 – PGSM 900. 102 – DCS GSM 1800. 103 – PCS GSM 1900. 104 – EGSM 900. 105 – GSM 450. 106 – GSM 480. 107 – GSM 850.
<arfcn>	Absolute Radio Frequency Channel Number: For PGSM 900, range: (1-124) For DCS1800, range: (512-885) For PCS1900, range: (512-810) For EGSM 900, range: (0-124) and (975-1023) For GSM 450, range: (259-293) For GSM 480, range: (306-340) For GSM850, range: (128-251)
<power>	0 – LTE max power. 1 – LTE 10 dBm. 9 – LTE turn off TX.

Examples

//Example of GSM TX
AT+CFUN=0
+SIMCARD: NOT AVAILABLE

+CGEV: ME DETACH

OK
AT+CTBURST=0,101,10   //GSM 900 arfcn10 Maximum power emission
+CTBURST:0

OK
AT+CTBURST=3   //GSM turn off emission.
+CTBURST:0

OK

//Example of LTE TX
AT+CFUN=0
+SIMCARD: NOT AVAILABLE

+CGEV: ME DETACH

OK
AT+CTBURST=0,1,0,0   //BAND1 Maximum power emission
+CTBURST:0,OK; RX:rssiPri=0,rssiSec=0

OK
AT+CTBURST=0,1,0,9   //LTE turn off emission.
+CTBURST:0,OK; RX:rssiPri=0,rssiSec=0

OK

NOTE

To test each item, close the previous item first.

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
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 ACK EXPECTED
341	Buffer overflow
342	SMS size more than expected
500	unknown error

Examples

AT+CMGS=02112345678
+CMS ERROR: 304