



# SIM7020 Series\_ AT Command Manual

LPWA Module

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# Version History

Version	Date	Chapter	What is new
V1.00	2018.4.10		New version
V1.01.	2018.7.16	AT+CATWAKEUP	Delete commands
		AT+CSGACT	Delete commands
		4.2.3 AT+CLTS	Modify parameters
		4.2.15 AT+CPSMSTATUS	Add command
		4.2.17 AT+CRESET	Add command
		4.2.18 AT+CREVHEX	Add command
		5.2.3 AT+CSOB	Add command
		5.2.5 AT+CSODSEND	Add command
		5.2.8 AT+CSORCVFLAG	Add command
		7.2.8 AT+CHTTPPARA	Add command
		10.2.3 +CMQDISCON	Add command
		11.2.1 AT+CCOAPNEW	Add test command
		11.2.2 AT+CCOAPSEND	Add test command
		11.2.3 AT+CCOAPDEL	Add test command
		12.2.1 +CSNTP	Modify parameters
		14.2.2 AT+MIPLCREATEEXT	Add test command
		14.2.17 AT+MIPLBOOTSTRAPPARA	Add test command
15 AT Commands for NVRAM	Add test command		
16 AT Commands for CT IOT Platform	Add test command		
V1.02	2018.12.13	1.1 Scope	Add SIM7020G
		AT+CCOAPSTA	Delete command
		3.2.41 AT+IPCONFIG	Add command
		3.2.54 AT+CEREG	Add parameter <rac>
		3.2.55 AT+CGDATA	Add command
		4.2.5 AT+CBANDSL	Modify command
		4.2.19 AT+CDISAUPDN	Modify command
		4.2.20 AT+CNWRCCFG	Add command
		4.2.21 AT+CURTC	Add command
		4.2.22 AT+CHOMENW	Add command
		4.2.23 AT+CBATCHK	Add command
		4.2.24 AT+CGPIO	Add command
		4.2.25 AT*MEDRXCFG	Add command
		5.2.4 AT+RETENTION	Add command
5.2.12 AT+CSOALIVE	Add command		

		Chapter 6	AT Commands for TCPIP Application Toolkit to Compatible with SIM800 Serials
		7.2.2 AT+CHTTPCREATEEXT	Add command
		7.2.7 AT+CHTTPSENDEXT	Add command
		7.2.9 AT+CHTTPTOFS	Add command
		7.2.10 AT+CHTTPCLRMULCRTBUF	Add command
		7.2.11 AT+CHTTPCLRMULSNDBUF	Add command
		7.2.12 AT+CHTTPRESUMESEND	Add command
		7.2.16 +CHTTPTOFS	Add command
		7.2.17 +CHTTPTOFSOK	Add command
		10.2.8 AT+CMQALICFG	Add command
		10.2.9 AT+CMQALICON	Add command
		16.2.4 AT+CM2MCLIGET	Add command
		Chapter 17 AT Commands for Network Command-DM	Add command
		Chapter 18 AT Commands for FOTA	Add command
		Chapter 19 Supported Unsolicited Result Codes	Add
		Chapter 21 ATC Differences among SIM7020 Series	Add
V1.03	2019.05.10	ATP	Delete command
		ATT	Delete command
		AT+MIPLBOOTSTRAPPARA	Delete command
		3.2.19 AT+CMUX?	Modify range of parameters <port_speed> and <T1>
		3.2.44 AT+CGCONTRDP	Add parameters
		Chapter 4	Add AT commands of 3GPP TS 27.005
		5.2.26 AT*MSACL	Move from Chapter 3 to Chapter 5
		5.2.27 AT*MLACL	Move from Chapter 3 to Chapter 5
		5.2.28 AT*MWACL	Move from Chapter 3 to Chapter 5
		5.2.29 AT*MDACL	Move from Chapter 3 to Chapter 5
		5.2.30 AT+CNBIOTDT	Move from Chapter 3 to Chapter 5
		5.2.31 AT+CNBIOTRAI	Add command
		110.2.10 AT+CMQTTSNEW	Add command
		11.2.11 AT+CMQTTSNEWEXT	Add command
14.2.6 AT+CSETCA	Add command		
		20.4 Summary of TLS ERROR Codes	Add
V1.04	2020.03.10	AT+DR	Delete command
		AT+DS	Delete command
		AT+FCLASS	Delete command

		AT+ILRR	Delete command
		AT+MSACL	Delete command
		AT+MLACL	Delete command
		AT+MWACL	Delete command
		AT+MDACL	Delete command
		AT+CMMS	Delete command
		AT+CRES	Delete command
		AT+CSAS	Delete command
		AT+CR	Delete command
		AT+CMAR	Delete command
		AT+GCAP	Delete command
		3.2.49 AT*MGCOUNT	Add command
		5.2.28 AT+ICCID	Add command
		5.2.29 AT+CTRJ	Add command
		5.2.30 AT+NIDD	Add command
		5.2.31 AT+CFGRI	Add command
		6.2.4 AT+CSOLIS	Add command
		6.2.14 AT+CSORXGET	Add command
		11.2.12 AT+CMQAZURECFG	Add command
		11.2.13 AT+CMQAZURECON	Add command
		14.2.7 AT+CSETCIPHER	Add command
		17.2.5 AT+CCTUPNUM	Add command
		17.2.6 AT+CCTLASTSTAT	Add command
		Chapter 20	AT Commands for SIM Toolkit
		Chapter 22	Add difference
V1.05	2020.06.10	All	Change Format

# Contents

<b>Version History</b> .....	<b>1</b>
<b>Contents</b> .....	<b>4</b>
<b>1 Introduction</b> .....	<b>13</b>
1.1 Scope of the document .....	13
1.2 Related documents .....	13
1.3 Conventions and abbreviations .....	13
1.4 AT Command syntax .....	13
1.4.1 Basic syntax .....	14
1.4.2 S Parameter syntax.....	14
1.4.3 Extended Syntax .....	14
1.4.4 Combining AT commands on the same Command line.....	15
1.4.5 Entering successive AT commands on separate lines.....	15
1.5 Supported character sets .....	15
1.6 Flow control.....	15
1.6.1 Software flow control (XON/XOFF flow control) .....	16
1.6.2 Hardware flow control (RTS/CTS flow control).....	16
1.7 Definitions.....	16
1.7.1 Parameter Saving Mode.....	16
1.7.2 Max Response Time.....	17
<b>2 AT Commands According to V.25TER</b> .....	<b>18</b>
2.1 Overview of AT Commands According to V.25TER .....	18
2.2 Detailed Description of AT Commands According to V.25TER .....	19
2.2.1 ATE Set Command Echo Mode .....	19
2.2.2 ATI Display Product Identification Information .....	20
2.2.3 ATL Set Monitor Speaker Loudness .....	20
2.2.4 ATM Set Monitor Speaker Mode.....	21
2.2.5 ATN1 Some PC Modem Driver Initial Setting to Handshake at Highest Speed Larger Than S37 .....	21
2.2.6 ATO Switch from Command Mode to Data Mode .....	22
2.2.7 ATQ Set Result Code Presentation Mode .....	22
2.2.8 ATS0 Set Number of Rings before Automatically Answering the call.....	23
2.2.9 ATS1 Ring Counter.....	24
2.2.10 ATS2 Set Escape Sequence Character .....	25
2.2.11 ATS3 Set Command Line Termination Character .....	26
2.2.12 ATS4 Set Response Formatting .....	27
2.2.13 ATS5 Set Command Line Editing Character.....	28
2.2.14 ATS6 Pause Before Blind Dialling.....	29
2.2.15 ATS7 Set Number of Seconds to Wait for Connection Completion.....	30

2.2.16	ATS8	Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command .....	31
2.2.17	ATS10	Set Disconnect Delay after indicating the Absence of Data Carrier .....	32
2.2.18	ATS12	Set Escape Code Guard Time .....	33
2.2.19	ATS25	Set DTR Change Time .....	34
2.2.20	ATS95	Some PC Modem Driver Initial Setting to Enable Extended Result Codes .....	35
2.2.21	ATV	TA Response Format .....	35
2.2.22	ATX	Set CONNECT Result Code Format and Monitor Call Progress.....	37
2.2.23	ATZ	Reset Default Configuration .....	38
2.2.24	AT&C	Set DCD Function Mode.....	38
2.2.25	AT&D	Set DTR Function Mode .....	39
2.2.26	AT&F	Factory Defined Configuration .....	40
2.2.27	AT&K	Flow Control Setting .....	40
2.2.28	AT&V	Display Current Configuration.....	41
2.2.29	AT&W	Store Active Profile .....	42
2.2.30	AT+GMI	Request Manufacturer Identification .....	44
2.2.31	AT+GMM	Request TA Model Identification .....	44
2.2.32	AT+GMR	Request TA Revision Identification of Software Release.....	45
2.2.33	AT+GOI	Request Global Object Identification .....	46
2.2.34	AT+GSN	Request TA Serial Number Identification(IMEI).....	46
2.2.35	AT+ICF	Set TE-TA Control Character Framing .....	47
2.2.36	AT+IFC	Set TE-TA Local Data Flow Control .....	48
2.2.37	AT+IPR	Set TE-TA Fixed Local Rate .....	50
<b>3</b>	<b>AT Commands According to 3GPP TS 27.007 .....</b>	<b>52</b>	
3.1	Overview of AT Commands According to 3GPP TS 27.007.....	52	
3.2	Detailed Description of AT Commands According to 3GPP TS 27.007 .....	53	
3.2.1	AT+CEER	Extended Error Report .....	53
3.2.2	AT+CGMI	Request Manufacturer Identification .....	56
3.2.3	AT+CGMM	Request Model Identification.....	56
3.2.4	AT+CGMR	Request TA Revision Identification of Software Release.....	57
3.2.5	AT+CGOI	Request Global Object Identification .....	58
3.2.6	AT+CGSN	Request Product Serial Number Identification .....	58
3.2.7	AT+CIMI	Request International Mobile Subscriber Identity.....	59
3.2.8	AT+CLCK	Facility Lock.....	60
3.2.9	AT+CMEE	Report Mobile Equipment Error.....	61
3.2.10	AT+COPS	Operator Selection .....	62
3.2.11	AT+CPIN	Enter PIN .....	64
3.2.12	AT+CPWD	Change Password .....	65
3.2.13	AT+CREG	Network Registration.....	66
3.2.14	AT+CRSM	Restricted SIM Access.....	68
3.2.15	AT+CSCS	Select TE Character Set.....	69
3.2.16	AT+CSQ	Signal Quality Report.....	71
3.2.17	AT+CMUX	Multiplexer Control.....	72
3.2.18	AT+CNUM	Subscriber Number.....	74
3.2.19	AT+CPOL	Preferred Operator List.....	75

3.2.20	AT+CFUN	Set Phone Functionality .....	76
3.2.21	AT+CLCK	Clock.....	77
3.2.22	AT+CSIM	Generic SIM Access .....	79
3.2.23	AT+CBC	Battery Charge.....	79
3.2.24	AT+CTZR	Time Zone Reporting .....	80
3.2.25	AT+CTZU	Automatic Time Update .....	81
3.2.26	AT+CPLS	Selection of preferred PLMN List .....	82
3.2.27	AT+CPSMS	Power Saving Mode Setting .....	83
3.2.28	AT+CCIOPT	CloT optimization configuration.....	85
3.2.29	AT+CEDRXS	eDRX Setting.....	86
3.2.30	AT+CEDRXRDP	eDRX Read Dynamic Parameters.....	88
3.2.31	AT+CCHO	Open UICC Logical Channel.....	89
3.2.32	AT+CCHC	Close UICC Logical Channel .....	90
3.2.33	AT+CGLA	Generic UICC Logical Channel Access .....	91
3.2.34	AT+CPINR	Remaining PIN Retries.....	92
3.2.35	AT+CGATT	GPRS/Packet Domain Attach or Detach.....	93
3.2.36	AT+CGDCONT	Define PDP Context .....	94
3.2.37	AT+CGACT	PDP Context Active or Deactive.....	96
3.2.38	AT+CGPADDR	Show PDP Address.....	97
3.2.39	AT+IPCONFIG	Show the Complete PDP Address.....	98
3.2.40	AT+CGEREP	Packet Domain Event Reporting .....	99
3.2.41	AT+CGREG	Network Registration Status .....	102
3.2.42	AT+CGCONTRDP	PDP Context Read Dynamic Parameters.....	104
3.2.43	AT+CGPIAF	Printing IP Address Format .....	106
3.2.44	AT+CGDEL	Delete Non-Active PDP Contexts .....	108
3.2.45	AT+CGAUTH	Define PDP Context Authentication Parameters.....	108
3.2.46	AT*MCGDEFCONT	Set Default PSD Connection Settings.....	109
3.2.47	AT+CEREG	EPS Network Registration Status .....	110
3.2.48	AT+CGDATA	Enter Data State.....	113
3.2.49	AT*MGCOUNT	GPRS/Packet Domian Packet Counters.....	113
<b>4</b>	<b>AT Commands According to 3GPP TS 27.005.....</b>		<b>116</b>
4.1	Overview of AT Commands According to 3GPP TS 27.005.....		116
4.2	Detailed Description of AT Commands According to 3GPP TS 27.005 .....		116
4.2.1	AT+CMGD	Delete SMS Message.....	116
4.2.2	AT+CMGF	Select SMS Message Format .....	118
4.2.3	AT+CMGL	List SMS Message from Preferred Store.....	119
4.2.4	AT+CMGR	Read SMS Message .....	122
4.2.5	AT+CMGS	Send SMS Message.....	125
4.2.6	AT+CMGW	Write SMS Message to Memory .....	126
4.2.7	AT+CMSS	Send SMS Message From Storage .....	127
4.2.8	AT+CMGC	Send SMS Command.....	128
4.2.9	AT+CNMI	New SMS Message Indications.....	129
4.2.10	AT+CPMS	Preferred SMS Message Storage .....	131
4.2.11	AT+CSCA	SMS Service Center Address .....	133
4.2.12	AT+CSDH	Show SMS Text Mode Parameters .....	133



4.2.13	AT+CSMP	Set SMS Text Mode Parameters .....	134
4.2.14	AT+CSMS	Select Message Service .....	135
4.2.15	AT+CNMA	New Message Acknowledgement to ME/TA.....	136
<b>5</b>	<b>AT Commands Special for SIMCom .....</b>		<b>138</b>
5.1	Overview of AT Commands for SIMCom .....		138
5.2	Detailed Description of AT Commands Special for SIMCom .....		139
5.2.1	AT+CPOWD	Power Off.....	139
5.2.2	AT+CADC	Read ADC .....	139
5.2.3	AT+CLTS	Get Local Timestamp .....	140
5.2.4	AT+CBAND	Get and Set Mobile Operation Band .....	140
5.2.5	AT+CBANDSL	Set Modem NB-IOT Search Prefer Band List .....	141
5.2.6	AT+CENG	Report Network State.....	142
5.2.7	AT+CCID	Show ICCID.....	146
5.2.8	AT+EXUNSOL	Enable or Disable Proprietary Unsolicited Indications .....	146
5.2.9	AT+GSV	Display Product Identification Information.....	147
5.2.10	AT*CELLLOCK	Set the List of ARFCN Which Needs to Be Locked .....	147
5.2.11	AT+SLEDS	Set the Timer Period of Net Light.....	148
5.2.12	AT+CNETLIGHT	Close the Net Light or Open it to shining.....	149
5.2.13	AT+CSMINS	SIM Inserted Status Reporting .....	150
5.2.14	AT+CSPCHSC	Set Scrambling Algorithm for NPDSCH .....	151
5.2.15	AT+CPSMSTATUS	Enable Deep Sleep Wakeup Indication .....	151
5.2.16	AT+CSCLK	Configure Slow Clock .....	152
5.2.17	AT+CRESET	Trigger WDT Reset .....	153
5.2.18	AT+CREVHEX	Control the Data Output Format.....	153
5.2.19	AT+CDISAUPDN	Control the Auto PDN Status.....	154
5.2.20	AT+CNWRCCFG	Network Recovery Configure .....	154
5.2.21	AT+CURTC	Control CCLK Show UTC Or RTC Time .....	155
5.2.22	AT+CHOMENW	Display Home Network Information.....	156
5.2.23	AT+CBATCHK	Set VBAT Checking Feature ON/OFF .....	157
5.2.24	AT+CGPIO	Control the GPIO by PIN Index.....	157
5.2.25	AT*MEDRXCFCG	eDRX Configuration.....	158
5.2.26	AT+CNBIOTDT	NB-IOT Data Type.....	160
5.2.27	AT+CNBIOTRAI	NB-IOT Release Assistance Indication .....	161
5.2.28	AT+ICCID	Show ICCID.....	162
5.2.29	AT+CTRJ	Inquire the Value of Timer 3346 .....	162
5.2.30	AT+NIDD	Send NIDD(Non-IP Data Delivery) .....	163
5.2.31	AT+CFGRI	Indicate RI When Using URC.....	163
<b>6</b>	<b>AT Command for TCPIP Application .....</b>		<b>165</b>
6.1	Overview of AT Commands for TCPIP Application .....		165
6.2	Detailed Description of AT Commands for TCPIP Application .....		165
6.2.1	AT+CSOC	Create a TCP/UDP Socket.....	165
6.2.2	AT+CSOCON	Connect Socket to Remote Address and Port .....	166
6.2.3	AT+CSOB	Bind Local Address and Local Port .....	167
6.2.4	AT+CSOLIS	Open Listening Function of the Server.....	168
6.2.5	AT+RETENTION	Retention of Socket Scene .....	168

6.2.6	AT+CSOSEND	Send Data to Remote Via Socket .....	169
6.2.7	AT+CSODSEND	Send Data to Remote Via Socket With Data Mode .....	170
6.2.8	AT+CSOCL	Close Socket .....	170
6.2.9	AT+CSOSENDFLAG	Set TCP Send Flag .....	171
6.2.10	AT+CSORCVFLAG	Set Receive Flag .....	171
6.2.11	AT+CSOSTATUS	Get Socket Status .....	172
6.2.12	AT+CSOACK	Query Previous Connection Data Transmitting State .....	173
6.2.13	AT+CSOALIVE	Set TCP Keepalive Parameters.....	173
6.2.14	AT+CSORXGET	Get Data from Network Manually .....	174
6.2.15	+CSONMI	Socket Message arrived indicator .....	175
6.2.16	+CSOERR	Socket Error indicator .....	176
<b>7</b>	<b>AT Commands for TCPIP Application to Compatible with SIM800 Serials .....</b>		<b>177</b>
7.1	Overview of AT Commands .....		177
7.2	Detailed Descriptions of Commands .....		178
7.2.1	AT+CIPMUX	Start Up Multi-IP Connection .....	178
7.2.2	AT+CIPSTART	Start Up TCP or UDP Connection .....	179
7.2.3	AT+CIPSEND	Send Data Through TCP or UDP Connection .....	181
7.2.4	AT+CIPQSEND	Select Data Transmitting Mode.....	184
7.2.5	AT+CIPACK	Query Previous Connection Data Transmitting State .....	185
7.2.6	AT+CIPCLOSE	Close TCP or UDP Connection .....	185
7.2.7	AT+CIPSHUT	Deactivate GPRS PDP Context.....	186
7.2.8	AT+CLPORT	Set Local Port .....	187
7.2.9	AT+CSTT	Start Task and Set APN,USER NAME,PASSWORD.....	189
7.2.10	AT+CIICR	Bring Up Wireless Connection.....	190
7.2.11	AT+CIFSR	Get Local IP Address .....	191
7.2.12	AT+CIPSTATUS	Query Current Connection Status.....	192
7.2.13	AT+CDNSCFG	Configure Domain Name Server.....	193
7.2.14	AT+CDNSGIP	Query the IP Address of Given Domain Name .....	194
7.2.15	AT+CIPHEAD	Add an IP Head at the Beginning of a Package Received.....	195
7.2.16	AT+CIPHEXS	Show Data in Hex Mode of a Package Received .....	196
7.2.17	AT+CIFSREX	Get Local IP Address .....	197
7.2.18	AT+CIPATS	Set Auto Sending Time .....	198
7.2.19	AT+CIPSPRT	Set Prompt of '>' When Module Sends Data.....	199
7.2.20	AT+CIPCSGP	Set CSD or GPRS for Connection Mode.....	200
7.2.21	AT+CIPSRIP	Show Remote IP Address and Port When Received Data .....	201
7.2.22	AT+CIPSHOWTP	Display Transfer Protocol in IP Head When Received Data .....	202
7.2.23	AT+CIPUDPMODE	UDP Extended Mode .....	204
7.2.24	AT+CIPRXGET	Get Data from Network Manually .....	205
7.2.25	AT+CIPTKA	Set TCP Keepalive Parameters .....	207
7.2.26	AT+CIPMODE	Open Transparent Mode.....	209
7.2.27	AT+CIPCHAN	Enter Transparent Mode.....	210
<b>8</b>	<b>AT Commands for HTTP(S) Application .....</b>		<b>212</b>
8.1	Overview of AT Commands for HTTP(S) Application.....		212
8.2	Detailed Descriptions of AT Commands for HTTP(S) Application.....		212
8.2.1	AT+CHTTPCREATE	Create a HTTP Client Instance .....	212

8.2.2	AT+CHTTPCREATEEXT	Create a HTTPS Client Instance by Multi Packages for a Long Size Command.....	214
8.2.3	AT+CHTTPCON	Establish the HTTP(S) Connection.....	215
8.2.4	AT+CHTTPDISCON	Close the HTTP(S) Connection.....	216
8.2.5	AT+CHTTPDESTROY	Destroy the HTTP(S) Client Instance.....	217
8.2.6	AT+CHTTPSEND	Send HTTP(S) Package.....	218
8.2.7	AT+CHTTPSENDEXT	Send HTTP(S) Package by Multi Packages for a Long Size Command.....	220
8.2.8	AT+CHTTPPARA	Set Parameter for AT Command of AT+CHTTPSEND.....	221
8.2.9	AT+CHTTPTOFS	Download File to Module System.....	222
8.2.10	AT+CHTTPCLRMULCRTBUF	Clear Multi Create Buffer of AT+CHTTPCREATEEXT 223	
8.2.11	AT+CHTTPCLRMULSNDBUF	Clear Multi Send Buffer of AT+CHTTPSENDEXT.....	224
8.2.12	AT+CHTTPRESUMESSEND	Set Resume Send Package or not when HTTP(S) Disconnected.....	224
8.2.13	+CHTTPNMIH	Header of the Response from Host.....	225
8.2.14	+CHTTPNMIC	Content of The Response from Host.....	226
8.2.15	+CHTTPERR	HTTP(S) Client Connection Error Indicator.....	227
8.2.16	+CHTTPTOFS	HTTP(S) Download Indicate from Host.....	228
8.2.17	+CHTTPTOFSOK	HTTP(S) Download Finished Indicate.....	228
<b>9</b>	<b>AT Commands for PING Application.....</b>		<b>229</b>
9.1	Overview of AT Commands for PING Application.....		229
9.2	Detailed Descriptions of AT Commands for PING Application.....		229
9.2.1	AT+CIPPING	Test IP Network Connectivity to A Remote Host.....	229
<b>10</b>	<b>AT Commands for LwM2M Application.....</b>		<b>231</b>
10.1	Overview of AT Commands for LwM2M Application.....		231
10.2	Detailed Descriptions of AT Commands for LwM2M Application.....		231
10.2.1	AT+CLMCONF	Configure LwM2M Instance and Create the Connection.....	231
10.2.2	AT+CLMADDOBJ	Add LwM2M Object.....	232
10.2.3	AT+CLMDELOBJ	Delete LwM2M Object.....	233
10.2.4	AT+CLMREAD	Read Notification and Command.....	233
10.2.5	AT+CLMWRITE	Write Notification and Command.....	234
10.2.6	AT+CLMEXECUTE	Execute Notification and Command.....	235
10.2.7	AT+CLMNOTIFY	Notify Data Change.....	236
10.2.8	AT+CLMDEL	Delete LwM2M Instance.....	236
10.2.9	+CLMOBSERVE	Indicated an observe command.....	237
10.2.10	+CLMPARAMETER	Indicated an observer's parameter.....	237
10.2.11	+CLMERR	Indicated there are Some Errors.....	238
<b>11</b>	<b>AT Commands for MQTT Application.....</b>		<b>239</b>
11.1	Overview of AT Commands for MQTT Application.....		239
11.2	Detailed Descriptions of AT Commands for MQTT Application.....		239
11.2.1	AT+CMQNEW	New MQTT.....	239
11.2.2	AT+CMQCON	Send MQTT Connection Packet.....	240
11.2.3	AT+CMQDISCON	Disconnect MQTT.....	242

11.2.4	AT+CMQSUB	Send MQTT Subscribe Packet .....	243
11.2.5	AT+CMQUNSUB	Send MQTT Unsubscribe Packet .....	243
11.2.6	AT+CMQPUB	Send MQTT Publish Packet .....	244
11.2.7	+CMQDISCON	MQTT Disconnect Indication .....	245
11.2.8	AT+CMQALICFG	Configure Alibaba Cloud Parameters .....	245
11.2.9	AT+CMQALICON	Send MQTT Connection Packet to Alibaba Cloud .....	246
11.2.10	AT+CMQTTSNEW	New MQTTS .....	247
11.2.11	AT+CMQTTSNEWEXT	NEW a MQTTS Instance by Multi Packages for a Long Size Command .....	248
11.2.12	AT+CMQAZURECFG	Configure Microsoft Azure IoT Parameters .....	250
11.2.13	AT+CMQAZURECON	Send MQTT Connection Packet to Azure IoT .....	251
11.2.14	AT+CMQTSYNC	Configure MQTT Synchronization Mode .....	252
<b>12</b>	<b>AT Commands for CoAP Application .....</b>	<b>253</b>	
12.1	Overview of AT Commands for CoAP Application .....	253	
12.2	Detailed Descriptions of AT Commands for CoAP Application .....	253	
12.2.1	AT+CCOAPNEW	Create a CoAP Client Instance .....	253
12.2.2	AT+CCOAPSEND	Send CoAP Data .....	254
12.2.3	AT+CCOAPCSEND	Send CoAP Data .....	255
12.2.4	AT+CCOAPDEL	Destroy the CoAP Client Instance .....	257
12.2.5	+CCOAPNMI	Content from CoAP server .....	258
<b>13</b>	<b>AT Commands for SNTP Application .....</b>	<b>259</b>	
13.1	Overview of AT Commands for SNTP Application .....	259	
13.2	Detailed Descriptions of AT Commands for SNTP Application .....	259	
13.2.1	AT+CSNTPSTART	Start to Query Network Time .....	259
13.2.2	+CSNTP	Received Network Time .....	260
<b>14</b>	<b>AT Commands for TLS Application .....</b>	<b>261</b>	
14.1	Overview of AT Commands for TLS Application .....	261	
14.2	Detailed Descriptions of AT Commands for TLS Application .....	261	
14.2.1	AT+CTLSCFG	Configure TLS Parameters .....	261
14.2.2	AT+CTLSCONN	Create a TLS Connection .....	262
14.2.3	AT+CTLSCLOSE	Close a TLS Connection .....	263
14.2.4	AT+CTLSEND	Send Data .....	263
14.2.5	AT+CTLSRECV	Receive Data .....	264
14.2.6	AT+CSETCA	Set the Certificate Parameters .....	264
14.2.7	AT+CSETCIPHER	Set the Encryption Suite Used by the TLS Handshake .....	265
<b>15</b>	<b>AT Commands for OneNet Application .....</b>	<b>267</b>	
15.1	Overview of AT Commands for OneNet Application .....	267	
15.2	Detailed Descriptions of AT Commands OneNet Application .....	267	
15.2.1	AT+MIPLCREATE	Create a OneNet Instance .....	268
15.2.2	AT+MIPLCREATEEXT	Another Method to Create a OneNet Instance .....	269
15.2.3	AT+MIPLDELETE	Delete a OneNet Instance .....	270
15.2.4	AT+MIPLOPEN	Register to OneNet .....	271
15.2.5	AT+MIPLCLOSE	Deregister to OneNet .....	272
15.2.6	AT+MIPLADDOBJ	Add an Object .....	273

15.2.7	AT+MIPLDELOBJ	Delete an Object .....	274
15.2.8	AT+MIPLUPDATE	Update Registration .....	275
15.2.9	AT+MIPLREADRSP	Read Response from User .....	275
15.2.10	AT+MIPLWRITERSP	Write Response from User .....	277
15.2.11	AT+MIPLEXECUTERSP	Execute Response from User.....	278
15.2.12	AT+MIPLOBSERVERSP	Observe Response from User.....	279
15.2.13	AT+MIPLDISCOVERRSP	Discover Response from User .....	280
15.2.14	AT+MIPLPARAMETERRSP	Set Parameter from User.....	281
15.2.15	AT+MIPLNOTIFY	Notify Data Value Change from User.....	282
15.2.16	AT+MIPLVER	Read Version .....	283
15.2.17	+MIPLREAD	Read Request to User.....	284
15.2.18	+MIPLWRITE	Write Request to User.....	284
15.2.19	+MIPLEXECUTE	Execute Request to User .....	285
15.2.20	+MIPLOBSERVE	Observe Request to User .....	285
15.2.21	+MIPLDISCOVER	Discover request to User.....	286
15.2.22	+MIPLPARAMETER	Set Parameter Request to User .....	286
15.2.23	+MIPLEVENT	Event Indication to User .....	287
<b>16</b>	<b>AT Commands for NVRAM Application .....</b>	<b>288</b>	
16.1	Overview of AT Commands for NVRAM Application.....	288	
16.2	Detailed Descriptions of AT Commands for NVRAM Application.....	288	
16.2.1	AT+CNVMR	Read Data from NVRAM .....	288
16.2.2	AT+CNVMW	Write Data to NVRAM.....	289
16.2.3	AT+CNVMIVD	Invalidate a Specific Data Item in NVRAM.....	290
16.2.4	AT+CNVMGET	Get all Customer Data Item IDs from NVRAM.....	291
<b>17</b>	<b>AT Commands for CT IOT Platform .....</b>	<b>292</b>	
17.1	Overview of AT Commands for CT IOT Platform .....	292	
17.2	Detailed Descriptions of AT Commands for CT IOT Platform .....	292	
17.2.1	AT+CM2MCLINEW	Register to CT IOT Platform.....	292
17.2.2	AT+CM2MCLISEND	Send Data to CT IOT Platform .....	293
17.2.3	AT+CM2MCLIDEL	Deregister to CT IOT Platform .....	293
17.2.4	AT+CM2MCLIGET	Get the Latest 6 Received Data.....	294
17.2.5	AT+CCTUPNUM	Set Update Registration Retry Times.....	294
17.2.6	AT+CCTLASTSTAT	Query the Latest Status of IoT.....	295
17.2.7	+CM2MCLI	CT IOT Client Notification .....	296
17.2.8	+CM2MCLIRECV	Receive data from CT IOT Platform .....	296
<b>18</b>	<b>AT Commands for DM Application.....</b>	<b>298</b>	
18.1	Overview of AT Commands for DM Application .....	298	
18.2	Detailed Descriptions of AT Commands for DM Application .....	298	
18.2.1	AT+DMCONFIGEXT	Configure parameters for DM.....	298
18.2.2	AT+DMSET	Set DM State .....	299
<b>19</b>	<b>AT Commands for FOTA Application .....</b>	<b>301</b>	
19.1	Overview of AT Commands for FOTA Application.....	301	
19.2	Detailed Descriptions of AT Commands for FOTA Application.....	301	
19.2.1	AT+CFOTA	FOTA Operation .....	301

19.2.2	AT+CFLE	Flash Erase .....	302
19.2.3	AT+CFLW	Flash Write .....	303
19.2.4	AT+CFLR	Flash Read.....	304
<b>20</b>	<b>AT Commands for SIM Toolkit Application .....</b>		<b>305</b>
20.1	Overview of AT Commands for SIM Toolkit Application .....		305
20.2	Detailed Descriptions of AT Commands for SIM Toolkit Application .....		305
20.2.1	AT*MSTLOCK	APP Registering for SIM Toolkit (and locking to a channel) .....	305
20.2.2	AT*MSTPD	SIM Toolkit Terminal Profile Download.....	306
20.2.3	AT*MSTMODE	Setting format for SIM Toolkit Output .....	307
20.2.4	AT*MSTICREC	Obtaining Icon records .....	308
20.2.5	AT*MSTICIMG	Obtaining Icon image .....	309
20.2.6	AT*MSTGC	APP request for parameters associated with a previously reported Proactive Command.....	309
20.2.7	AT*MSTCR	APP Informing PS of Response to Proactive Command .....	310
20.2.8	AT*MSTMS	Menu Selection by User .....	310
20.2.9	AT*MSTEV	APP specific monitored event occurrence .....	311
20.2.10	*MSTC:<cmdId>	Proactive Command Indication .....	313
<b>21</b>	<b>Supported Unsolicited Result Codes and Error Codes .....</b>		<b>315</b>
21.1	Summary of CME ERROR Codes.....		315
21.1.1	CME Error Codes Related to mobile equipment or network.....		315
21.1.2	CME Error Codes related to PSD and Packet Domain .....		316
21.1.3	CME Error Codes related to select TE character set.....		320
21.1.4	CME Error Codes related to preferred operator list.....		320
21.1.5	CME Error Codes related to Restricted/Generic SIM Access.....		321
21.1.6	CME Error Codes related to Miscellaneous Proprietary .....		321
21.1.7	CME Error Codes related to report Network State .....		322
21.1.8	CME Errors Codes related to SIM Toolkit Operations .....		322
21.2	Summary of CMS ERROR Codes.....		323
21.3	Summary of CIS ERROR Codes.....		325
21.4	Summary of TLS ERROR Codes .....		325
21.5	Summary of Unsolicited Result Codes .....		327
<b>22</b>	<b>ATC Differences among SIM7020 Series .....</b>		<b>329</b>
22.1	AT+CSCLK.....		329
22.2	AT+CEER.....		329
22.3	AT+CPLS .....		329
22.4	AT*MEDRXCFG .....		329
22.5	OneNet.....		329

# 1 Introduction

## 1.1 Scope of the document

This document presents the AT Command Set for SIMCom SIM7020 Series, including SIM7020C, SIM7020E, SIM7020G, SIM7030, SIM7060, SIM7060C, SIM7060G and SIM7060R.

## 1.2 Related documents

You can visit the SIMCom Website using the following link:

<http://www.simcom.com>

## 1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:

ME (Mobile Equipment);

MS (Mobile Station);

TA (Terminal Adapter);

DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface.

The controlling device at the other end of the serial line is referred to as following term:

TE (Terminal Equipment);

DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system;

## 1.4 AT Command syntax

The "AT" or "at" or "aT" or "At" prefix must be set at the beginning of each Command line. To terminate a Command line enter **<CR>**.

Commands are usually followed by a response that includes. "**<CR><LF><response><CR><LF>**"

Throughout this document, only the responses are presented, **<CR><LF>** are omitted intentionally.

The AT Command set implemented by SIM7020 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.

**NOTE**

Only enter AT Command through serial port after SIM7020 Series is powered on and Unsolicited Result Code "RDY" is received from serial port. If auto-bauding is enabled, the Unsolicited Result Codes "RDY" and so on are not indicated when you start up the ME, and the "AT" prefix, or "at" prefix must be set at the beginning of each command line.

All these AT commands can be split into three categories syntactically: "basic", "S parameter", and "extended". These are as follows:

### 1.4.1 Basic syntax

These AT commands have the format of "AT<x><n>", or "AT&<x><n>", where "<x>" is the Command, and "<n>" is/are the argument(s) for that Command. An example of this is "ATE<n>", which tells the DCE whether received characters should be echoed back to the DTE according to the value of "<n>". "<n>" is optional and a default will be used if missing.

### 1.4.2 S Parameter syntax

These AT commands have the format of "ATS<n>=<m>", where "<n>" is the index of the S register to set, and "<m>" is the value to assign to it. "<m>" is optional; if it is missing, then a default value is assigned.

### 1.4.3 Extended Syntax

These commands can operate in several modes, as in the following table:

**Table 1: Types of AT commands and responses**

<b>Test Command</b> AT+<x>=?	The mobile equipment returns the list of parameters and value ranges set with the corresponding Write Command or by internal processes.
<b>Read Command</b> AT+<x>?	This command returns the currently set value of the parameter or parameters.
<b>Write Command</b> 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.

### 1.4.4 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 example:  
ATE1Q0S0=1S3=13V1X4;+IFC=0,0;+IPR=115200.

The Command line buffer can accept a maximum of 2048 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".

### 1.4.5 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 example OK, CME error, CMS error) of last AT Command you entered before you enter the next AT Command.

## 1.5 Supported character sets

The SIM7020 Series AT Command interface defaults to the **IRA** character set. The SIM7020 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.

## 1.6 Flow control

Flow control is very important for correct communication between the GSM engine and DTE. For in the case such as a data or fax call, the sending device is transferring data faster than the receiving side is ready

to accept. When the receiving buffer reaches its capacity, the receiving device should be capable to cause the sending device to pause until it catches up.

There are basically two approaches to achieve data flow control: software flow control and hardware flow control. SIM7020 Series support both two kinds of flow control.

In Multiplex mode, it is recommended to use the hardware flow control.

### 1.6.1 Software flow control (XON/XOFF flow control)

Software flow control sends different characters to stop (XOFF, decimal 19) and resume (XON, decimal 17) data flow. It is quite useful in some applications that only use three wires on the serial interface.

The default flow control approach of SIM7020 Series is hardware flow control (RTS/CTS flow control), to enable software flow control in the DTE interface and within GSM engine, type the following AT Command:

**AT+IFC=1,1**

Ensure that any communications software package (e.g. Hyper terminal) uses software flow control.

#### NOTE

Software Flow control should not be used for data calls where binary data will be transmitted or received (e.g. TCP/IP) as the DTE interface may interpret binary data as flow control characters.

### 1.6.2 Hardware flow control (RTS/CTS flow control)

Hardware flow control achieves the data flow control by controlling the RTS/CTS line. When the data transfer should be suspended, the CTS line is set inactive until the transfer from the receiving buffer has completed. When the receiving buffer is ok to receive more data, CTS goes active once again.

To achieve hardware flow control, ensure that the RTS/CTS lines are present on your application platform.

## 1.7 Definitions

### 1.7.1 Parameter Saving Mode

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

- **NO\_SAVE**: The parameter of the current AT command will be lost if module is rebooted or current AT

command doesn't have parameter.

- **AUTO\_SAVE**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect immediately, and it won't be lost if module is rebooted.
- **AUTO\_SAVE\_REBOOT**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect after reboot, and it won't be lost if module is rebooted.
- **AT&W\_SAVE**: The parameter of the current AT command will be kept in NVRAM by sending the command of "AT&W".
- -: "-" means this AT command doesn't care the parameter saving mode.

### 1.7.2 Max Response Time

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

"-" means this AT command does not care the response time.

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## 2 AT Commands According to V.25TER

### 2.1 Overview of AT Commands According to V.25TER

Command	Description
ATE	Set command echo mode
ATI	Display product identification information
ATL	Set monitor speaker loudness
ATM	Set monitor speaker mode
ATN1	Some PC modem driver initial setting to handshake at highest speed larger than S37
ATO	Switch from command mode to data mode
ATQ	Set result code presentation mode
ATS0	Set number of rings before automatically answering the call
ATS1	Ring counter
ATS2	Set escape sequence character
ATS3	Set command line termination character
ATS4	Set response formatting character
ATS5	Set command line editing character
ATS6	Pause before blind dialling
ATS7	Set number of seconds to wait for connection completion
ATS8	Set number of seconds to wait for comma dial modifier encountered in dial string of D command
ATS10	Set disconnect delay after indicating the absence of data carrier
ATS12	Set escape code guard time
ATS25	Set DTR change time
ATS95	Some PC modem driver initial setting to enable extended result codes
ATV	TA response format
ATX	Set connect result code format and monitor call progress
ATZ	Reset default configuration
AT&C	Set DCD function mode
AT&D	Set DTR function mode
AT&F	Factory defined configuration
AT&K	Flow control setting

<b>AT&amp;V</b>	Display current configuration
<b>AT&amp;W</b>	Store Active Profile
<b>AT+GMI</b>	Request manufacturer identification
<b>AT+GMM</b>	Request TA model identification
<b>AT+GMR</b>	Request TA revision identification of software release
<b>AT+GOI</b>	Request global object identification
<b>AT+GSN</b>	Request TA serial number identification (IMEI)
<b>AT+ICF</b>	Set TE-TA control character framing
<b>AT+IFC</b>	Set TE-TA local data flow control
<b>AT+IPR</b>	Set TE-TA fixed local rate

## 2.2 Detailed Description of AT Commands According to V.25TER

### 2.2.1 ATE Set Command Echo Mode

#### ATE Set Command Echo Mode

Execution Command <b>ATE&lt;value&gt;</b>	Response This setting determines whether or not the TA echoes characters received from TE during Command state. <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;value&gt;</b>	0 Echo mode off
	<u>1</u> Echo mode on

#### Example

**ATE0**

**OK**

## 2.2.2 ATI Display Product Identification Information

### ATI Display Product Identification Information

Execution Command <b>ATI</b>	Response TA issues product information text.  Example: <b>SIM7020 R1752</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Example

```
ATI
SIM7020 R1752

OK
```

## 2.2.3 ATL Set Monitor Speaker Loudness

### ATL Set Monitor Speaker Loudness

Execution Command <b>ATL&lt;value&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<value>	0..3 Volume
---------	-------------

#### Example

```
ATLO
OK
```

**NOTE**

- No effect in GSM

## 2.2.4 ATM Set Monitor Speaker Mode

### ATM Set Monitor Speaker Mode

Execution Command <b>ATM&lt;value&gt;</b>	Response <b>OK</b>
	Parameters <b>&lt;value&gt;</b> 0..2 Mode
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Example

```
ATM0
OK
```

**NOTE**

- No effect in GSM

## 2.2.5 ATN1 Some PC Modem Driver Initial Setting to Handshake at Highest Speed Larger Than S37

### ATN1 Some PC Modem Driver Initial Setting to Handshake at Highest Speed Larger Than S37

Execution Command <b>ATN1</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Example

```
ATN1
OK
```

## 2.2.6 ATO Switch from Command Mode to Data Mode

### ATO Switch from Command Mode to Data Mode

Execution Command <b>ATO[n]</b>	Response TA resumes the connection and switches back from command mode to data mode.  <b>CONNECT</b> If connection is not successfully resumed <b>ERROR</b> else TA returns to data mode from command mode <b>CONNECT &lt;text&gt;</b> Note: <b>&lt;text&gt;</b> only if parameter setting <b>ATX&gt;0</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	0 Switch from command mode to data mode
-----	---

## Example

```
ATO
CONNECT 150000000
```

## 2.2.7 ATQ Set Result Code Presentation Mode

### ATQ Set Result Code Presentation Mode

Execution Command <b>ATQ&lt;n&gt;</b>	Response This parameter setting determines whether or not the TA transmits any
--	---



	<p>result code to the TE. Information text transmitted in response is not affected by this setting.</p> <p>If &lt;n&gt;=0: <b>OK</b></p> <p>If &lt;n&gt;=1: (none)</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	<p>0 TA transmit result code</p> <p>1 Result codes are suppressed and not transmitted</p>
-----	---

### Example

ATQ1

OK

#### NOTE

- This command only affects V.250 AT commands and not all other AT commands in this specification (either 3GPP or MediaTek proprietary).

## 2.2.8 ATSO Set Number of Rings before Automatically Answering the call

### ATSO Set Number of Rings before Automatically Answering the call

<p>Read Command</p> <p><b>ATSO?</b></p>	<p>Response</p> <p>&lt;n&gt;</p> <p><b>OK</b></p>
<p>Write Command</p> <p><b>ATSO=&lt;n&gt;</b></p>	<p>Response</p> <p>This parameter setting determines the number of rings before auto-answer.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>
Parameter Saving Mode	-

Max Response Time	-
Reference	

### Defined Values

<n>	<p><u>0</u> Automatic answering is disabling. 1-255 Number of rings the modem will wait for before answering the phone if a ring is detected.</p>
-----	---

### Example

```

ATS0?
0

OK
ATS0=3
OK

```

**NOTE**

- If <n> is set too high, the calling party may hang up before the call can be answered automatically.
- If using cmux port, ATH and AT+CHUP can hang up the call (automatically answering) only in the CMUX channel 0.
- If using dual-physical serial port, ATH and AT+CHUP can hang up the call (automatically answering) only in UART1.

### 2.2.9 ATS1 Ring Counter

ATS1 Ring Counter	
Read Command <b>ATS1?</b>	Response <n>  OK
Write Command <b>ATS1=&lt;n&gt;</b>	Response This command will not alert the RING counter, but simply display OK or ERROR

Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

## Defined Values

<n>	The number of "RING" strings sent to the TE as a result of receiving an incoming call. 0-255
-----	---

## Example

ATS1?

0

OK

ATS1=3

OK

### NOTE

- If "RING" is not displayed on a particular channel due to other settings (such as suppression of all unsolicited events (ATQ)) then this value should not be incremented. This value is reset to 0 when receiving a new incoming call. Note that this command should also be made channel specific as with other ATS<x> commands.

## 2.2.10 ATS2 Set Escape Sequence Character

### ATS2 Set Escape Sequence Character

Read Command ATS2?	Response <n>  OK
Write Command ATS2=<n>	Response This parameter setting determines the character recognized by the TA to indicate the escape sequence. OK or ERROR

Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	
V.25ter	

### Defined Values

<n>	0-43-255 escape sequence character Note: default 43='+'
-----	--

### Example

```

ATS2?
43

OK
ATS2=43
OK

```

### 2.2.11 ATS3 Set Command Line Termination Character

#### ATS3 Set Command Line Termination Character

Read Command <b>ATS3?</b>	Response <b>&lt;n&gt;</b>  <b>OK</b>
Write Command <b>ATS3=&lt;n&gt;</b>	Response This parameter setting determines the character recognized by TA to terminate an incoming command line. The TA also returns this character in output. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<n>	0-13-127 Command line termination character
-----	---

### Example

```
ATS3?
13

OK
ATS3=13
OK
```

#### NOTE

- Default 13=CR. It only supports default value.

## 2.2.12 ATS4 Set Response Formatting

### ATS4 Set Response Formatting

Read Command <b>ATS4?</b>	Response <n>  <b>OK</b>
Write Command <b>ATS4=&lt;n&gt;</b>	Response This parameter setting determines the character generated by the TA for result code and information text. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

### Defined Values

<n>	0-10-127 Response formatting character
-----	--

### Example

ATS4?

10

OK

ATS4=10

OK

**NOTE**

- Default 10=LF. It only supports default value.

### 2.2.13 ATS5 Set Command Line Editing Character

#### ATS5 Set Command Line Editing Character

Read Command ATS5?	Response <n>  OK
Write Command ATS5=<n>	Response This parameter setting determines the character recognized by TA as a request to delete from the command line the immediately preceding character. OK or ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<n>	0-8-127 Response formatting character
-----	---------------------------------------

#### Example

ATS5?

8

```
OK
ATS5=8
OK
```

**NOTE**

- Default 8=Backspace

### 2.2.14 ATS6 Pause Before Blind Dialling

#### ATS6 Pause Before Blind Dialling

Read Command <b>ATS6?</b>	Response <b>&lt;n&gt;</b>  <b>OK</b>
Write Command <b>ATS6=&lt;n&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;n&gt;</b>	0-2-10 Time
------------------	-------------

#### Example

```
ATS6?
2

OK
ATS6=2
OK
```

**NOTE**

- No effect in GSM

## 2.2.15 AT57 Set Number of Seconds to Wait for Connection Completion

### AT57 Set Number of Seconds to Wait for Connection Completion

Read Command <b>AT57?</b>	Response <b>&lt;n&gt;</b>  <b>OK</b>
Write Command <b>AT57=&lt;n&gt;</b>	Response This parameter setting determines the amount of time to wait for the connection completion in case of answering or originating a call.  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	1-60-255	Number of seconds to wait for connection completion
------------------	----------	---

### Example

```
AT57?
60

OK
AT57=60
OK
```

#### NOTE

- If called party has specified a high value for AT50=<n>, call setup may fail. The correlation between AT57 and AT50 is important



- Example: Call may fail if AT $S7=30$  and AT $S0=20$ .
- AT $S7$  is only applicable to data call.

## 2.2.16 AT $S8$ Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command

### AT $S8$ Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command

Read Command <b>AT<math>S8?</math></b>	Response <n>  OK
Write Command <b>AT<math>S8=&lt;n&gt;</math></b>	Response OK or ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<n>	0 no pause when comma encountered in dial string 1-255 The value of this register determines how long the modem should pause when it sees a comma in the dialing string.
-----	---

#### Example

**AT $S8?$**

2

OK

**AT $S8=2$**

OK

#### NOTE

- No effect in GSM

## 2.2.17 ATS10 Set Disconnect Delay after indicating the Absence of Data Carrier

### ATS10 Set Disconnect Delay after indicating the Absence of Data Carrier

Read Command <b>ATS10?</b>	Response <n>  OK
Write Command <b>ATS10=&lt;n&gt;</b>	Response This parameter setting determines the amount of time that the TA will remain connected in absence of data carrier. If the data carrier is once more detected before disconnecting, the TA remains connected. OK or ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<n>	1-15-254 Number of tenths seconds of delay
-----	--

#### Example

```
ATS10?
15
OK
ATS10=15
OK
```

#### NOTE

- This command is not used, as there have been issues with in-band DCD dropping unexpectedly for CSD calls on some networks.

### 2.2.18 ATS12 Set Escape Code Guard Time

This command sets the escape code guard time in fiftieths of a second. The escape guard time is used to measure when to detect the +++ escape sequence has been entered by the PC in order to drop out of data mode back to AT command mode.

The guard time determines the time that forms a guard period before and after three escape sequence characters. In order to distinguish an escape sequence from just three escape sequence characters in the data stream there is timing associated to the three escape sequence characters of an escape sequence.

The time between the last byte of the data stream and the first escape sequence character must be at least the guard time and the time between each escape sequence character of the escape sequence must be less than the guard time and no other byte is received after the third escape sequence character for the time of the guard time. If an escape sequence is detected, the OK result code will be sent to the DTE. Otherwise, the DCE will stay in data mode.

For example: "<Guard time>+++<Guard time>"

#### ATS12 Set Escape Code Guard Time

Read Command <b>ATS12?</b>	Response <b>&lt;n&gt;</b>  <b>OK</b> NB: <n> is in 3 decimal digits format (e.g. Default value is given as 050). If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>ATS12=&lt;n&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

#### Defined Values

<n>	0-50-255 Number of 20 ms.
-----	---------------------------

#### Example

**ATS12?**

50

```
OK
ATS12=50
OK
```

### 2.2.19 ATS25 Set DTR Change Time

This command sets the S-register 25 Detect DTR change time that contain the threshold for noticing a change in DTR. This time permits to the modem to ignore DTR before taking action specified by &Dn (See AT&D Circuit 108 behavior).

The value unit is in 1/100 seconds. Default value is set to 5 (50ms delay after a DTR drop before the modem acts on it).

#### ATS25 Set DTR Change Time

Read Command <b>ATS25?</b>	Response <b>&lt;n&gt;</b>  <b>OK</b> NB: <n> is in 3 decimal digits format (e.g. Default value is given as 000). If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>ATS25=&lt;n&gt;</b>	Response <b>OK</b> or <b>ERROR</b>  Parameters <b>&lt;n&gt;</b> 0- <u>5</u> -255 Number of 10 ms.
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

#### Defined Values

<n>	0- <u>5</u> -255 Number of 10 ms.
-----	-----------------------------------

#### Example

```
ATS25?
5
OK
ATS25=5
```

OK

## 2.2.20 ATS95 Some PC Modem Driver Initial Setting to Enable Extended Result Codes

### ATS25 Some PC Modem Driver Initial Setting to Enable Extended Result Codes

Read Command <b>ATS95?</b>	Response <b>&lt;n&gt;</b>  <b>OK</b>
Write Command <b>ATS95=&lt;n&gt;</b>	Response  <b>OK</b> Some standard PC modem drivers will send this AT command to initialize the setting, but it is meaningless in the 3GPP standard. So we just return " <b>OK</b> " and no effect for the setting.
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	
Parameters <b>&lt;n&gt;</b> 0-255 Meaningless for the GSM, and GPRS/Packet Domain setting.	

#### Defined Values

<b>&lt;n&gt;</b>	0-255 Meaningless for the GSM, and GPRS/Packet Domain setting.
------------------	--

#### Example

```

ATS95?
000

OK
ATS95=100
OK
  
```

## 2.2.21 ATV TA Response Format

### ATV TA Response Format

Execution Command <b>ATV&lt;value&gt;</b>	Response This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses. When <value>=0 <b>0</b> When <value>=1 <b>OK</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

ATV1	ATV0	Description
OK	0	Acknowledges execution of a Command
CONNECT	1	A connection has been established; the DCE is moving from Command state to online data state
RING	2	The DCE has detected an incoming call signal from network
NO CARRIER	3	The connection has been terminated or the attempt to establish a connection failed
ERROR	4	Command not recognized, Command line maximum length exceeded, parameter value invalid, or other problem with processing the Command line
NO DIALTONE	6	No dial tone detected
BUSY	7	Engaged (busy) signal detected
NO ANSWER	8	"@" (Wait for Quiet Answer) dial modifier was used, but remote ringing followed by five seconds of silence was not detected before expiration of the connection timer (S7)
PROCEEDING	9	An AT command is being processed
CONNECT <text>	Manufacturer-specific	Same as CONNECT, but includes manufacturer-specific text that may specify DTE speed, line speed, error control, data compression, or other status

## Defined Values

<value>	<p>0 Information response: &lt;text&gt;&lt;CR&gt;&lt;LF&gt; Short result code format: &lt;numeric code&gt;&lt;CR&gt;</p> <p>1 Information response: &lt;CR&gt;&lt;LF&gt;&lt;text&gt;&lt;CR&gt;&lt;LF&gt; Long result code format: &lt;CR&gt;&lt;LF&gt;&lt;verbose code&gt;&lt;CR&gt;&lt;LF&gt;</p> <p>The result codes, their numeric equivalents and brief descriptions of the use of each are listed in the following table.</p>
---------	--

## Example

```
ATV0
0
ATV1
OK
```

## 2.2.22 ATX Set CONNECT Result Code Format and Monitor Call Progress

### ATV Set CONNECT Result Code Format and Monitor Call Progress

Execution Command <b>ATX&lt;value&gt;</b>	Response This parameter setting determines whether or not the TA detected the presence of dial tone and busy signal and whether or not TA transmits particular result codes. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	Note

### Defined Values

<b>&lt;value&gt;</b>	<p>0 <b>CONNECT</b> result code only returned, dial tone and busy detection are both disabled.</p> <p>1 <b>CONNECT&lt;text&gt;</b> result code only returned, dial tone and busy detection are both disabled.</p> <p>2 <b>CONNECT&lt;text&gt;</b> result code returned, dial tone detection is enabled, busy detection is disabled.</p> <p>3 <b>CONNECT&lt;text&gt;</b> result code returned, dial tone detection is disabled, busy detection is enabled.</p> <p>4 <b>CONNECT&lt;text&gt;</b> result code returned, dial tone and busy detection are both enabled.</p>
----------------------	--

## Example

```
ATX1
OK
ATX2
```

OK

### 2.2.23 ATZ Reset Default Configuration

#### ATZ Reset Default Configuration

Execution Command <b>ATX[&lt;value&gt;]</b>	Response TA sets all current parameters to the user defined profile. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

#### Defined Values

<value>	<u>0</u> Restore profile 0
---------	----------------------------

#### Example

**ATZ0**

OK

### 2.2.24 AT&C Set DCD Function Mode

#### AT&C Set DCD Function Mode

Execution Command <b>AT&amp;C&lt;value&gt;</b>	Response This parameter determines how the state of circuit 109 (DCD) relates to the detection of received line signal from the distant end. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note



## Defined Values

<value>	0 DCD line is always ON
	<u>1</u> DCD line is ON only in the presence of data carrier

## Example

```
AT&C1
OK
AT&C0
OK
```

### 2.2.25 AT&D Set DTR Function Mode

#### AT&D Set DTR Function Mode

Execution Command <b>AT&amp;D&lt;value&gt;</b>	Response This parameter determines how the TA responds when circuit 108/2 (DTR) is changed from the ON to the OFF condition during data mode. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
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.

## Example

```
AT&D1
OK
AT&D0
```

OK

## 2.2.26 AT&F Factory Defined Configuration

### AT&F Factory Defined Configuration

Execution Command <b>AT&amp;F[&lt;value&gt;]</b>	Response TA sets all current parameters to the manufacturer defined profile.  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<value>	<u>0</u> Set all TA parameters to manufacturer defaults.
---------	--

#### Example

**AT&F0**

OK

## 2.2.27 AT&K Flow Control Setting

### AT&K Flow Control Setting

Execution Command <b>AT&amp;K[&lt;value&gt;]</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;value&gt;</b>	<p>0 No flow control</p> <p>3 RTS /CTS flow control (hardware)</p> <p>4 XON/XOFF flow control (software)</p>
----------------------	--

### Example

**AT&K0**

OK

#### NOTE

This command does not store anything in the profile data because it sets the AT+IFC settings when used:

- AT&K0 is equivalent of entering AT+IFC=0,0
- AT&K3 is equivalent of entering AT+IFC=2,2
- AT&K4 is equivalent of entering AT+IFC=1,1

## 2.2.28 AT&V Display Current Configuration

### AT&V Display Current Configuration

Execution Command <b>AT&amp;V[&lt;n&gt;]</b>	Response TA returns the current parameter setting. <b>&lt;current configurations text&gt;</b> OK or ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	0 Responses in numeric format
------------------	-------------------------------

### Example

**AT&V**

**ACTIVE PROFILE**

**E: 1**  
**L: 0**  
**M: 0**  
**Q: 0**  
**V: 1**  
**X: 4**  
**S0: 0**  
**S1: 0**  
**S2: 43**  
**S3: 13**  
**S4: 10**  
**S5: 8**  
**S6: 2**  
**S7: 60**  
**S8: 2**  
**S10: 15**  
**S12: 50**  
**S25: 5**  
**+CR: 0**  
**+CMEE: 0**  
**+IFC: 0,0**  
**+ICF: 3,3**  
**+CSCS: "IRA"**  
**+IPR: 0**  
**&C: 1**  
**&D: 2**  
**+CGEREP: 0**  
**+CEER: 0**  
**+CGPIAF: 0,0,0,0**  
**+CPSMSTATUS: 1**  
**+CMGF: 0**  
**+CSDH: 0**  
**+CSMINS: 0**  
**+CMUX: 0,0,0,31,10,3,30,10,2**

OK

**2.2.29 AT&W Store Active Profile**

**AT&W Store Active Profile**

Execution Command

**AT&W[<n>]**

Response

TA stores the current parameter setting in the user defined profile.

	<current configurations text> <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Parameter stored by &W

Command	Parameter name	Displayed by &v
ATS0	<num>	Y
ATS3	<char>	Y
ATS4	<char>	Y
ATS5	<char>	Y
ATS6	<short>	Y
ATS7	<time>	Y
ATS8	<time>	Y
ATS10	<time>	Y
ATV	<format>	Y
ATE	<echo>	Y
ATQ	<result>	Y
ATX	<result>	Y
AT&C	<behavior>	Y
AT&D	<behavior>	Y
AT+CREG	<n>	Y
AT+CGREG	<n>	Y
AT+CMEE	<n>	Y
AT+CSCS	<chest>	Y
AT+CSMINS	<n>	Y
AT+EXUNSOL	<exunsol>	

### Defined Values

<n>	<u>0</u> Store the current configuration in profile 0
-----	---

### Example

**AT&W**  
OK

**NOTE**

- The user defined profile is stored in non volatile memory.

### 2.2.30 AT+GMI Request Manufacturer Identification

#### AT+GMI Request Manufacturer Identification

Test Command <b>AT+GMI=?</b>	Response <b>OK</b>
Execution Command <b>AT+GMI</b>	Response TA reports one or more lines of information text which permit the user to identify the manufacturer. <b>SIMCOM_Ltd</b> <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

#### Example

```
AT+GMI
SIMCOM_Ltd

OK
```

### 2.2.31 AT+GMM Request TA Model Identification

#### AT+GMM Request TA Model Identification

Test Command <b>AT+GMM=?</b>	Response <b>OK</b>
Execution Command <b>AT+GMM</b>	Response TA reports one or more lines of information text which permit the user to identify the specific model of device. <b>Model</b>

	<b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

### Defined Values

<model>	Product model identification text
---------	-----------------------------------

### Example

**AT+GMM**

**SIM7020C**

**OK**

### 2.2.32 AT+GMR Request TA Revision Identification of Software Release

#### AT+GMR Request TA Revision Identification of Software Release

Test Command <b>AT+GMR=?</b>	Response <b>OK</b>
Execution Command <b>AT+GMR</b>	Response TA reports one or more lines of information text which permit the user to identify the revision of software release. <b>&lt;revision&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

### Defined Values

< revisionom >	Revision of software release
----------------	------------------------------

### Example

**AT+GMR**

1752B01V01SIM7020C

OK

**2.2.33 AT+GOI Request Global Object Identification**

**AT+GOI Request Global Object Identification**

Test Command <b>AT+GOI=?</b>	Response <b>OK</b>
Execution Command <b>AT+GOI</b>	Response TA reports one or more lines of information text which permit the user to identify the device, based on the ISO system for registering unique object identifiers. <b>&lt;Object Id&gt;</b> <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

**Defined Values**

<b>&lt; Object Id &gt;</b>	Identifier of device type see X.208, 209 for the format of <b>&lt;Object Id&gt;</b>
----------------------------	--

**Example**

**AT+GOI**

SIM7020C

OK

**2.2.34 AT+GSN Request TA Serial Number Identification(IMEI)**

**AT+GSN Request TA Serial Number Identification(IMEI)**

Test Command	Response
--------------	----------



<b>AT+GSN=?</b>	<b>OK</b>
Execution Command <b>AT+GSN</b>	Response TA reports the IMEI (international mobile equipment identifier) number in information text which permit the user to identify the individual ME device. <b>&lt;sn&gt;</b>
	<b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;sn&gt;</b>	IMEI of the telephone(International Mobile station Equipment Identity)
-------------------	--

### Example

```
AT+GSN
0000000000000000
OK
```

#### NOTE

- The serial number (IMEI) is varied by individual ME device.

## 2.2.35 AT+ICF Set TE-TA Control Character Framing

<b>AT+ICF Set TE-TA Control Character Framing</b>	
Test Command <b>AT+ICF=?</b>	Response <b>+ICF:</b> (list of supported <b>&lt;format&gt;</b> s),(list of supported <b>&lt;parity&gt;</b> s)  <b>OK</b>
Read Command <b>AT+ICF?</b>	Response <b>+ICF:</b> <b>&lt;format&gt;</b> , <b>&lt;parity&gt;</b>  <b>OK</b>

Write Command <b>AT+ICF=&lt;format&gt;,&lt;parity&gt; ]</b>	Response This parameter setting determines the serial interface character framing format and parity received by TA from TE. <b>OK</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

< format >	1 8 data 0 parity 2 stop 2 8 data 1 parity 1 stop <u>3</u> 8 data 0 parity 1 stop 4 7 data 0 parity 2 stop 5 7 data 1 parity 1 stop 6 7 data 0 parity 1 stop
<parity>	0 odd 1 even 2 mark(1) <u>3</u> space (0)

### Example

```

AT+ICF?
+ICF:3,3

OK
AT+ICF=3,3
OK
  
```

#### NOTE

- The Command is applied for Command state;
- In <format> parameter, "0 parity" means no parity;
- The <parity> field is ignored if the <format> field specifies no parity and string "+ICF: <format>,255" will be response to "AT+ICF?" Command

## 2.2.36 AT+ICF Set TE-TA Local Data Flow Control

## AT+IFC Set TE-TA Local Data Flow Control

Test Command <b>AT+IFC=?</b>	Response <b>+IFC:</b> (list of supported <b>&lt;dce_by_dte&gt;</b> s),(list of supported <b>&lt;dte_by_dce&gt;</b> s)  <b>OK</b>
Read Command <b>AT+IFC?</b>	Response <b>+IFC:</b> <b>&lt;dce_by_dte&gt;</b> , <b>&lt;dte_by_dce&gt;</b>  <b>OK</b>
Write Command <b>AT+IFC=&lt;dce_by_dte&gt;,[&lt;dte_by_dce&gt;]</b>	Response This parameter setting determines the data flow control on the serial interface for data mode. <b>OK</b> Parameters <b>&lt;dce_by_dte&gt;</b> Specifies the method will be used by TE at receive of data from TA <ul style="list-style-type: none"> <li><u>0</u> No flow control</li> <li>1 Software flow control</li> <li>2 Hardware flow control</li> </ul> <b>&lt;dte_by_dce&gt;</b> Specifies the method will be used by TA at receive of data from TE <ul style="list-style-type: none"> <li><u>0</u> No flow control</li> <li>1 Software flow control</li> <li>2 Hardware flow control</li> </ul>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

### Defined Values

<b>dce_by_dte</b>	Specifies the method will be used by TE at receive of data from TA <ul style="list-style-type: none"> <li><u>0</u> No flow control</li> <li>1 Software flow control</li> <li>2 Hardware flow control</li> </ul>
<b>&lt;dte_by_dce&gt;</b>	Specifies the method will be used by TA at receive of data from TE <ul style="list-style-type: none"> <li><u>0</u> No flow control</li> <li>1 Software flow control</li> <li>2 Hardware flow control</li> </ul>

### Example

**AT+IFC?**

+ICF:0,0

OK

AT+IFC=0,0

OK

### 2.2.37 AT+IPR Set TE-TA Fixed Local Rate

#### AT+IPR Set TE-TA Fixed Local Rate

Test Command <b>AT+IPR=?</b>	Response <b>+IPR:</b> (list of supported auto detectable <b>&lt;rate&gt;s</b> ),(list of supported fixed-only <b>&lt;rate&gt;s</b> )  <b>OK</b>
Read Command <b>AT+IPR?</b>	Response <b>+IPR: &lt;rate&gt;</b>  <b>OK</b>
Write Command <b>AT+IPR=&lt;rate&gt;</b>	Response This parameter setting determines the data rate of the TA on the serial interface. The rate of Command takes effect following the issuance of any result code associated with the current Command line. <b>OK</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;rate&gt;</b>	Baud rate per second 0 110 300 1200 2400 4800 9600 19200 38400 57600 115200
---------------------	--

230400
460800
921600
3000000

### Example

```
AT+IPR?  
+IPR:0  
  
OK  
AT+IPR=0  
OK
```

#### NOTE

- Factory setting is "AT+IPR=0"(auto-bauding).

## 3 AT Commands According to 3GPP TS 27.007

### 3.1 Overview of AT Commands According to 3GPP TS 27.007

Command	Description
AT+CEER	Extended error report
AT+CGMI	Request manufacturer identification
AT+CGMM	Request model identification
AT+CGMR	Request TA revision identification of software release
AT+CGOI	Request global object identification
AT+CGSN	Request product serial number identification (identical with +GSN)
AT+CSCS	Select TE character set
AT+CIMI	Request international mobile subscriber identity
AT+CLCK	Facility lock
AT+CMEE	Report mobile equipment error
AT+COPS	Operator selection
AT+CPIN	Enter PIN
AT+CPWD	Change password
AT+CR	Service reporting control
AT+CREG	Network registration
AT+CRSM	Restricted SIM access
AT+CSCS	Select TE character set
AT+CSQ	Signal quality report
AT+CMUX	Multiplexer control
AT+CNUM	Subscriber number
AT+CPOL	Preferred operator list
AT+CFUN	Set phone functionality
AT+CCLK	Clock
AT+CSIM	Generic SIM access
AT+CBC	Battery charge
AT+CTZR	Time zone reporting
AT+CTZU	Automatic time zone update
AT+CPLS	Selection of preferred PLMN list
AT+CPSMS	Power saving mode selection

<b>AT+CIPCA</b>	Enable/disable activation of PDN connection on attach.
<b>AT+CEDRXS</b>	eDRX setting
<b>AT+CEDRXRDP</b>	eDRX read dynamic parameters
<b>AT+CCHO</b>	Open UICC logical channel
<b>AT+CCHC</b>	Close UICC logical channel
<b>AT+CGLA</b>	Generic UICC logical channel access
<b>AT+CPINR</b>	Remaining PIN retries
<b>AT+CGATT</b>	GPRS/Packet Domain attach or detach
<b>AT+CGDCONT</b>	Define PDP context
<b>AT+CGACT</b>	PDP context activate or deactivate
<b>AT+CGPADDR</b>	Show PDP address
<b>AT+IPCONFIG</b>	Show the Complete PDP Address
<b>AT+CGEREP</b>	Packet Domain Event Reporting
<b>AT+CGREG</b>	Network registration status
<b>AT+CGCONTRDP</b>	PDP Context Read Dynamic Parameters
<b>AT+CGPIAF</b>	Printing IP Address Format
<b>AT+CGDEL</b>	Delete Non-Active PDP Contexts
<b>AT+CGAUTH</b>	Define PDP Context Authentication Parameters
<b>AT*MCGDEFCONT</b>	Set Default PSD Connection Settings
<b>AT+CEREG</b>	EPS Network Registration Status
<b>AT+CGDATA</b>	Enter Data State
<b>AT*MGCOUNT</b>	GPRS/Packet Domain Packet Counters

## 3.2 Detailed Description of AT Commands According to 3GPP TS

27.007

### 3.2.1 AT+CEER Extended Error Report

<b>AT+CEER Extended Error Report</b>	
Test Command <b>AT+CEER=?</b>	Response <b>+CEER:</b> (list of supported <n>s)  <b>OK</b>
	Parameters See Write Command
Read Command <b>AT+CEER?</b>	Response <b>+CEER:</b> <n>

	<b>OK</b>
	Parameters See Write Command
Write Command <b>AT+CEER=&lt;n&gt;</b>	Response <b>OK</b>
Execution Command <b>AT+CEER</b>	Response TA returns an extended report of the reason for the last call release. <b>+CEER: &lt;report&gt;</b>
	<b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

### Defined Values

<b>&lt;n&gt;</b>	<p><u>0</u> The reason for last call release as text code</p> <p>1 The reason for last call release as number code</p>
<b>&lt;report&gt;</b>	<p>If AT+CEER=0, return <b>&lt;s&gt;</b></p> <p><b>&lt;s&gt;</b> a string that represents the Cause</p> <p>If AT+CEER=1, return Cause: <b>&lt;c&gt;</b></p> <p><b>&lt;c&gt;</b> number representing the Cause</p>
<b>&lt;c&gt;(number) &lt;s&gt;(string)</b>	<p>0 (No cause)</p> <p>1 (unassigned (unallocated) number)</p> <p>3 (no route to destination)</p> <p>6 (channel unacceptable)</p> <p>8 (operator determined barring)</p> <p>16 (normal call clearing)</p> <p>17 (user busy)</p> <p>18 (no user responding)</p> <p>19 (user alerting, no answer)</p> <p>21 (call rejected)</p> <p>22 (number changed)</p> <p>26 (non-selected user clearing)</p> <p>27 (destination out of order)</p> <p>28 (invalid number format (incomplete number))</p> <p>29 (facility rejected)</p> <p>30 (response to STATUS ENQUIRY)</p> <p>31 (normal, unspecified)</p> <p>34 (emergency call not possible)</p> <p>38 (network out of order)</p> <p>41 (temporary failure)</p> <p>42 (switching equipment congestion)</p>



43	(access information discarded)
44	(requested circuit/channel not available)
47	(resource 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 presently available)
63	(service or option not available, unspecified)
68	(ACM equal to or greater than ACMmax)
65	(bearer service not implemented)
69	(Requested facility not implemented)
70	(only restricted digital information bearer capability is available)
79	(service or option not implemented,unspecified)
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 type non-existent or not implemented)
98	(message type not compatible with protocol state)
99	(information element non-existent or not implemented)
100	(conditional IE error)
101	(message not compatible with protocol state)
102	(recovery on timer expiry)
111	(protocol error, unspecified)
127	(interworking, unspecified)

### Example

**AT+CEER?**

**+CEER:0**

OK

**AT+CEER=0**

OK

### NOTE

- Only part of projects support this command, please refer to chapter 22 for details.

### 3.2.2 AT+CGMI Request Manufacturer Identification

#### AT+CGMI Request Manufacturer Identification

Test Command <b>AT+CGMI=?</b>	Response <b>OK</b>
Execution Command <b>AT+CGMI</b>	Response TA returns manufacturer identification text. <b>&lt;manufacturer&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

#### Defined Values

<b>&lt;manufacturer&gt;</b>	The ID of manufacturer
-----------------------------	------------------------

#### Example

```
AT+CGMI=?
OK
AT+CGMI
SIMCOM_Ltd
OK
```

### 3.2.3 AT+CGMM Request Model Identification

#### AT+CGMM Request Model Identification

Test Command <b>AT+CGMM=?</b>	Response <b>OK</b>
Execution Command <b>AT+CGMM</b>	Response TA returns manufacturer identification text. <b>&lt;model&gt;</b>  <b>OK</b>

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<model>	Product model identification text
---------	-----------------------------------

#### Example

**AT+CGMM=?**

OK

**AT+CGMI**

SIM7020C

OK

### 3.2.4 AT+CGMR Request TA Revision Identification of Software Release

#### AT+CGMR Request TA Revision Identification of Software Release

Test Command	Response
<b>AT+CGMR=?</b>	<b>OK</b>
Execution Command	Response
<b>AT+CGMR</b>	TA returns manufacturer identification text. <b>&lt;revision&gt;</b>
	<b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<revision>	Product software version identification text
------------	--

#### Example

**AT+CGMR=?**

```
OK
AT+CGMR
1752B01V01SIM7020C

OK
```

### 3.2.5 AT+CGOI Request Global Object Identification

#### AT+CGOI Request Global Object Identification

Test Command <b>AT+CGOI=?</b>	Response <b>OK</b>
Execution Command <b>AT+CGOI</b>	Response TA returns manufacturer identification text. <b>&lt;Object Id&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;Object Id&gt;</b>	Identifier of device type
--------------------------	---------------------------

#### Example

```
AT+CGOI=?
OK
AT+CGOI
SIM7020C

OK
```

### 3.2.6 AT+CGSN Request Product Serial Number Identification

#### AT+CGSN Request Product Serial Number Identification

Test Command <b>AT+CGSN=?</b>	Response <b>OK</b>
----------------------------------	-----------------------

Execution Command <b>AT+CGSN</b>	Response see +GSN <sn>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<sn>	International mobile equipment identity (IMEI)
------	--

### Example

```
AT+CGSN
0000000000000000
OK
```

### 3.2.7 AT+CIMI Request International Mobile Subscriber Identity

#### AT+CIMI Request International Mobile Subscriber Identity

Test Command <b>AT+CIMI=?</b>	Response <b>OK</b>
Execution Command <b>AT+CIMI</b>	Response TA returns <IMSI> for identifying the individual SIM which is attached to ME. <IMSI>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	20s
Reference	

### Defined Values

<MISI>	International Mobile Subscriber Identity (string without double quotes)
--------	---

### Example

```
AT+CIMI=?
OK
AT+CIMI
460028216590952
OK
```

### 3.2.8 AT+CLCK Facility Lock

<b>AT+CLCK Facility Lock</b>	
Test Command <b>AT+CLCK=?</b>	Response <b>+CLCK:</b> (list of supported <fac>s)  <b>OK</b>
Write Command <b>AT+CLCK=&lt;fac&gt;,&lt;mode&gt;,&lt;password&gt;,&lt;class&gt;]</b>	Response 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>.  If <mode>≠2 and Command is successful <b>OK</b> If <mode>=2 and Command is successful <b>+CLCK: &lt;status&gt;,&lt;class1&gt;[&lt;CR&gt;&lt;LF&gt;+CLCK: &lt;status&gt;,&lt;class2&gt;[...]]</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	15s
Reference	

### Defined Values

<fac>	"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code
<mode>	0 unlock 1 lock 2 query status
<passwd>	String type (Shall be the same as password specified for the facility from the MT user interface or with command Change Password
<class>	Field not required for NB-IOT, so will be ignored
<status>	0 Not active 1 Active

### Example

```

AT+CLCK=?
+CLCK: ("SC")

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

OK

```

#### NOTE

- CME errors if SIM not inserted or PIN is not entered.

### 3.2.9 AT+CMEE Report Mobile Equipment Error

#### AT+CMEE Report Mobile Equipment Error

Test Command <b>AT+CMEE=?</b>	Response <b>+CMEE:</b> (list of supported <n>s)  <b>OK</b>
Read Command <b>AT+CMEE?</b>	Response <b>+CMEE:</b> <n>  <b>OK</b>

Write Command <b>AT+CMEE=[&lt;n&gt;]</b>	Response TA disables or enables the use of result code <b>+CME ERROR: &lt;err&gt;</b> as an indication of an error relating to the functionality of the ME. <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	<p>0 Disable <b>+CME ERROR: &lt;err&gt;</b> result code and use <b>ERROR</b> instead.</p> <p>1 Enable <b>+CME ERROR: &lt;err&gt;</b> result code and use numeric <b>&lt;err&gt;</b></p> <p>2 Enable <b>+CME ERROR: &lt;err&gt;</b> result code and use verbose <b>&lt;err&gt;</b> values</p>
-----	--

### Example

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

```
OK
```

```
AT+CMEE=0
```

```
OK
```

### 3.2.10 AT+COPS Operator Selection

#### AT+COPS Operator Selection

Test Command <b>AT+COPS=?</b>	Response TA returns a list of quadruplets, each representing an operator present in the network. 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.  <b>+COPS:</b> (list of supported<stat>,long alphanumeric<oper>,short alphanumeric<oper>,numeric <oper>[,<AcT>])s[,,(list of supported <mode>s), (list of supported <format>s)]
----------------------------------	---



	<p><b>OK</b></p> <p>If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Read Command <b>AT+COPS?</b></p>	<p>Response</p> <p>TA returns the current mode and the currently selected operator. If no operator is selected, <b>&lt;format&gt;</b> and <b>&lt;oper&gt;</b> are omitted. <b>+COPS: &lt;mode&gt;[,&lt;format&gt;,&lt;oper&gt;,&lt;AcT&gt;]</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command <b>AT+COPS=&lt;mode&gt;[,&lt;format&gt;,&lt;oper&gt;]</b></p>	<p>Response</p> <p>TA forces an attempt to select and register the GSM network operator. If the selected operator is not available, no other operator shall be selected (except <b>&lt;mode&gt;=4</b>). The selected operator name format shall apply to further read commands (AT+COPS?).</p> <p><b>OK</b></p> <p>If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;stat&gt;</b>	<p>0 Unknown</p> <p>1 Operator available</p> <p>2 Operator current</p> <p>3 Operator forbidden</p>
<b>&lt;oper&gt;</b>	<p>Refer to [27.007] operator in format as per <b>&lt;format&gt;</b></p>
<b>&lt;mode&gt;</b>	<p>0 Automatic mode; <b>&lt;oper&gt;</b> field is ignored</p> <p>1 Manual (<b>&lt;oper&gt;</b> field shall be present, and <b>&lt;AcT&gt;</b> optionally)</p> <p>2 Manual deregister from network</p> <p>3 Set only <b>&lt;format&gt;</b> (for read Command +COPS?) - not shown in Read Command response</p> <p>4 Manual/automatic (<b>&lt;oper&gt;</b> field shall be present); if manual selection fails, automatic mode (<b>&lt;mode&gt;=0</b>) is entered</p>
<b>&lt;format&gt;</b>	<p>0 Long format alphanumeric <b>&lt;oper&gt;</b></p> <p>1 Short format alphanumeric <b>&lt;oper&gt;</b></p> <p>2 Numeric <b>&lt;oper&gt;</b>; GSM Location Area Identification number</p>
<b>&lt;AcT&gt;</b>	<p>9 NB-IoT</p>

## Example

**AT+COPS=?**

+COPS: (2,"CHINA MOBILE","CMCC","46000",0),(1,"CHINA MOBILE","CMCC","46000",9),(3,"CHN-UNICOM","UNICOM","46001",0),(1,"CHN-CT","CT","46011",9),(3,"CHN-UNICOM","UNICOM","46001",9),,(0,1,2,3,4),(0,1,2)

OK

**AT+COPS?**

+COPS: 0,0,"CHINA MOBILE CMCC",0

OK

**AT+COPS=0**

OK

### 3.2.11 AT+CPIN Enter PIN

#### AT+CPIN Enter PIN

Test Command	Response
<b>AT+CPIN=?</b>	<b>OK</b>
Read Command <b>AT+CPIN?</b>	Response TA returns an alphanumeric string indicating whether some password is required or not. <b>+CPIN: &lt;code&gt;</b>  <b>OK</b>
Write Command <b>AT+CPIN=&lt;pin&gt;[,&lt;newpin&gt;]</b>	Response TA stores a required password (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 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, <b>&lt;new pin&gt;</b> , is used to replace the old pin in the SIM. When a new password is set, a third optional parameter may also be specified. This extra parameter is compared to the new password to check they are equivalent as an additional security feature. <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE

Max Response Time	5s
Reference	

### Defined Values

<code>	<p>An alphanumeric string indicating whether some password is required or not</p> <p>READY MT is not pending for any password</p> <p>SIM PIN MT is waiting SIM PIN to be given</p> <p>SIM PUK MT is waiting for SIM PUK to be given</p> <p>PH_SIM PIN ME is waiting for phone to SIM card (antitheft)</p> <p>PH_SIM PUK ME is waiting for SIM PUK (antitheft)</p> <p>SIM PIN2 PIN2, e.g. for editing the FDN book possible only if preceding Command was acknowledged with +CME ERROR:17</p> <p>SIM PUK2 Possible only if preceding Command was acknowledged with error +CME ERROR: 18.</p> <p>PH-SIM PIN ME is waiting for phone to SIM card (antitheft)</p> <p>PH-NET PIN Network personalization password is required.</p> <p>PH-NETSUB PIN Network subset is required.</p> <p>PH-SP PIN Service provider personalization password is required.</p> <p>PH-CORP PIN Corporate personalization password is required.</p>
<pin>	String type; password
<new pin>	String type; If the PIN required is SIM PUK or SIMPUK2: new password

### Example

```

AT+CPIN=?
OK
AT+CPIN?
+CPIN: READY

OK
AT+CPIN=1234
OK
  
```

### 3.2.12 AT+CPWD Change Password

#### AT+CPWD Change Password

Test Command	Response
--------------	----------

<b>AT+CPWD=?</b>	TA returns a list of pairs which present the available facilities and the maximum length of their password. <b>+CPWD:</b> (list of supported <fac>s, list of supported <pwdlength>s)  <b>OK</b>
Write Command <b>AT+CPWD=&lt;fac&gt;,&lt;oldpwd&gt;,&lt;newpwd&gt;</b>	Response TA sets a new password for the facility lock function. <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	15s
Reference	

### Defined Values

<fac>	"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code.
<pwdlength>	Integer max. length of password
<oldpwd>	String type (string should be included in quotation marks): password specified for the facility from the user interface or with command. If an old password has not yet been set, <oldpwd> is not to enter.
<newpwd>	String type (string should be included in quotation marks): new password

### Example

```
AT+CPWD=?
+CPWD: ("SC",8)

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

### 3.2.13 AT+CREG Network Registration

#### AT+CREG Network Registration

Test Command <b>AT+CREG=?</b>	Response <b>+CREG:</b> (list of supported <n>s)  <b>OK</b>
----------------------------------	---

<p>Read Command <b>AT+CREG?</b></p>	<p>Response TA returns the status of result code presentation and an integer <b>&lt;stat&gt;</b> which shows whether the network has currently indicated the registration of the ME. Location information elements <b>&lt;lac&gt;</b> and <b>&lt;ci&gt;</b> are returned only when <b>&lt;n&gt;=2</b> and ME is registered in the network. <b>+CREG: &lt;n&gt;,&lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;[,&lt;AcT&gt;]]</b></p> <p><b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command <b>AT+CREG=&lt;n&gt;</b></p>	<p>Response TA controls the presentation of an unsolicited result code <b>+CREG: &lt;stat&gt;</b> when <b>&lt;n&gt;=1</b> and there is a change in the ME network registration status. <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p> <p>Unsolicited Result Code If <b>&lt;n&gt;=1</b> and there is a change in the MT network registration status <b>+CREG: &lt;stat&gt;</b> If <b>&lt;n&gt;=2</b> and there is a change in the MT network registration status or a change of the network cell: <b>+CREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;[,&lt;AcT&gt;]]</b></p>
<p>Parameter Saving Mode</p>	<p>-</p>
<p>Max Response Time</p>	<p>-</p>
<p>Reference</p>	<p>-</p>

### Defined Values

<p><b>&lt;n&gt;</b></p>	<p>0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code <b>+CREG: &lt;stat&gt;</b> 2 Enable network registration unsolicited result code with location information <b>+CREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;[,&lt;AcT&gt;]]</b></p>
<p><b>&lt;stat&gt;</b></p>	<p>0 Not registered, MT is not currently searching a new operator to register to 1 Registered, home network 2 Not registered, but MT 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 <b>&lt;Act&gt;</b> indicates NB-IOT)</p>

	7 Registered for "SMS only", roaming (applicable only when <Act> indicates NB-IOT)
<lac>	String type (string should be included in quotation marks); two byte location area code in hexadecimal format
<ci>	String type (string should be included in quotation marks); four byte cell ID in hexadecimal format
<Act>	Access technology of the registered network 9 NB-IoT

### Example

**AT+CREG=?**

**+CREG: (0-2)**

OK

**AT+CREG?**

**+CREG: 0,2**

OK

**AT+CREG=2**

OK

### 3.2.14 AT+CRSM Restricted SIM Access

#### AT+CRSM Restricted SIM Access

Test Command	Response
<b>AT+CRSM=?</b>	<b>OK</b>
Write Command	Response
<b>AT+CRSM=&lt;Command&gt;[,&lt;fileid&gt;[,&lt;P1&gt;,&lt;P2&gt;,&lt;P3&gt;[,&lt;data&gt;[,&lt;pathid&gt;]]]]</b>	<b>+CRSM: &lt;sw1&gt;,&lt;sw2&gt;[,&lt;response&gt;]</b>  <b>OK</b> <b>ERROR</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

### Defined Values

<Command>	176 READ BINARY
-----------	-----------------

	<p>178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS</p> <p>All other values are reserved; refer GSM 11.11.</p>
<b>&lt;fileid&gt;</b>	<p>Integer type; this is the identifier for an elementary data file on SIM. Mandatory for every command except STATUS</p> <p><b>&lt;P1&gt;,&lt;P2&gt;,&lt;P3&gt;</b> Integer type, range 0-255</p> <p>Parameters to be passed on by the ME to the SIM; refer GSM 11.11</p>
<b>&lt;data&gt;</b>	<p>Information which shall be written to the SIM (hex-decimal character format)</p>
<b>&lt;sw1&gt;,&lt;sw2&gt;</b>	<p>Integer type, range 0-255</p> <p>Status information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command; refer GSM 11.11.</p>
<b>&lt;response&gt;</b>	<p>Response of a successful completion of the command previously issued (hexadecimal character format)</p>
<b>&lt;pathid&gt;</b>	<p>String type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102.211 (e.g. "7F205F70" in SIM and UICC case). The <b>&lt;pathid&gt;</b> only used in the mode "select path from MF" as defined in ETSI TS 102.211.</p>

### Example

```

AT+CRSM=?
OK
AT+CRSM=242
+CRSM:
144,0,"62358202782183023F00A509800171830400080F608A01058B032F0611C6189001BC9501008
3011183010183010A83010B83010C83010D"
OK

```

### 3.2.15 AT+CSCS Select TE Character Set

#### AT+CSCS Select Character Set

Test Command	Response
<b>AT+CSCS=?</b>	<b>+CSCS:</b> (list of supported <b>&lt;chset&gt;</b> s)
	OK

Read Command <b>AT+CSCS?</b>	Response <b>+CSCS: &lt;chset&gt;</b>  <b>OK</b>
Write Command <b>AT+CSCS=&lt;chset&gt;</b>	Response Sets which character set <b>&lt;chset&gt;</b> are used by the TE. The TA can then convert character strings correctly between the TE and ME character sets. <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AT&W_SVAE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;chset&gt;</b>	Character type "GSM" GSM 7 bit default alphabet (3GPP TS 23.038); "UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC10646); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99 "IRA" International reference alphabet (ITU-T T.50) "HEX" Character strings consist only of hexadecimal numbers from 00 to FF; "PCCP" PC character set Code "PCDN" PC Danish/Norwegian character set "8859-1" ISO 8859 Latin 1 character set
----------------------	--

### Example

```

AT+CSCS=?
+CSCS:
("GSM","HEX","IRA","PCCP","PCDN","UCS2","8859-1")

OK
AT+CSCS?
+CSCS: "IRA"

OK
AT+CSCS="IRA"
OK
  
```



### 3.2.16 AT+CSQ Signal Quality Report

AT+CSQ Signal Quality Report	
Test Command <b>AT+CSQ=?</b>	Response <b>+CSQ:</b> (list of supported <b>&lt;rssi&gt;</b> s),(list of supported <b>&lt;ber&gt;</b> s)  <b>OK</b>
Execution Command <b>AT+CSQ</b>	Response <b>+CSQ:</b> <b>&lt;rssi&gt;</b> , <b>&lt;ber&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR:</b> <b>&lt;err&gt;</b> Execution Command returns received signal strength indication <b>&lt;rssi&gt;</b> and channel bit error rate <b>&lt;ber&gt;</b> from the ME. Test Command returns values supported by the TA.
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;rssi&gt;</b>	Integer type. Rx signal strength level 0 -110 dBm or less 1 -109 dBm $\leq$ rssi<-107 dBm 2 -107 dBm $\leq$ rssi<-105 dBm 3...30 -105dBm $\leq$ rssi<-48 dBm 31 -48dBm $\leq$ rssi 99 Not known or not detectable
<b>&lt;ber&gt;</b>	(in percent): 0...7 As RXQUAL values in the table in GSM 05.08 [20] subclause 7.2.4 99 Not known or not detectable

#### Example

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

```
OK
AT+CSQ
+CSQ: 0,0
OK
```

### 3.2.17 AT+CMUX Multiplexer Control

#### AT+CMUX Multiplexer Control

Test Command <b>AT+CMUX=?</b>	Response <b>+CMUX:</b> (list of supported <b>&lt;mode&gt;</b> s),(list of supported <b>&lt;subset&gt;</b> s),(list of supported <b>&lt;port_speed&gt;</b> s),(list of supported <b>&lt;N1&gt;</b> s),(list of supported <b>&lt;T1&gt;</b> s),(list of supported <b>&lt;N2&gt;</b> s),(list if supported <b>&lt;T2&gt;</b> s),(list of supported <b>&lt;T3&gt;</b> s),<list of supported <b>&lt;k&gt;</b> s)  <b>OK</b>
Read Command <b>AT+CMUX?</b>	Response <b>+CMUX:</b> [<mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>,<k>]]]]]]]  <b>OK</b> or <b>ERROR</b>
Write Command <b>AT+CMUX=&lt;mode&gt;,&lt;subset&gt;,&lt;port_speed&gt;,&lt;N1&gt;,&lt;T1&gt;,&lt;N2&gt;,&lt;T2&gt;,&lt;T3&gt;,&lt;k&gt;]]]]]]]</b>	Response If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mode&gt;</b>	0 27.010 multiplexer
<b>&lt;subset&gt;</b>	The way in which the multiplexer control channel is set up 0 UIH frames used only
<b>&lt;port_speed&gt;</b>	Transmission rate <u>0</u> autobaud

	1 110 2 300 3 1200 4 2400 5 4800 6 9600 7 19200 8 38400 9 57600 10 115200 11 230400 12 460800 Proprietary values, available if MUX NEW PORT SPEED FTR is activated
<N1>	Max frame size 31-4096 (default value 31 for basic option)
<T1>	Acknowledgement timer in units of ten milliseconds 1-254      Default:10 (100 ms)
<N2>	Max number of re-transmissions 0-100      Default:3
<T2>	Max Response Timer for the multiplexer control channel in units of ten milliseconds
<T3>	Wake up Max Response Timers in seconds 1-255      Default:10
<k>	Window size, for Advanced operation with Error Recovery options 1-7      Default:2

### Example

```

AT+CMUX=?
+CMUX: (0),(0),(0-12),(31-4096),(1-254),(0-100),(2-255),(1-255),(1-7)

OK
AT+CMUX?
+CMUX: 0,0,0,31,10,3,30,10,2

OK
  
```

#### NOTE

- The values of <subset>,<port\_speed>,<N1>,<T>,<N2>,<T2>,<T3>,<k> are only relevant to the 27.010 MUX control channel.
- <port\_speed> set to 0 will set the MUX port rate at whatever the AT+IPR setting is for the channel.

### 3.2.18 AT+CNUM Subscriber Number

AT+CNUM Subscriber Number	
Test Command <b>AT+CNUM=?</b>	Response <b>OK</b>
Execution Command <b>AT+CNUM</b>	Response <b>+CNUM:</b> [<alpha1>],<number1>,<type1>[<CR><LF>+CNUM:[<alpha2>],<number2>,<type2> [...]]  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

#### Defined Values

<alphax>	Optional alphanumeric string associated with <numberx>; used character set should be the one selected with Command Select TE Character Set +CSCS
<numberx>	String type (string should be included in quotation marks) phone number of format specified by <typex>.
<typex>	Type of address octet in integer format (refer GSM04.08[8] subclause 10.5.4.7)

#### Example

```
AT+CNUM=?
OK
AT+CNUM
+CNUM: "", "13817825065", 129
OK
```

### 3.2.19 AT+CPOL Preferred Operator List

AT+CPOL Preferred Operator List	
Test Command <b>AT+CPOL=?</b>	Response <b>+CPOL:</b> (list of supported <index>s),(list of supported <format>s)  <b>OK</b>
Read Command <b>AT+CPOL?</b>	Response <b>+CPOL:</b> <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSMcomp_AcT1>,<UTRAN_AcT1>,<E-UTRAN_Act1>][<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSMcomp_AcT2>,<UTRAN_AcT2>,<E-UTRAN_Act2>]  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+CPOL=&lt;index&gt;[,&lt;format&gt;,&lt;oper&gt;]</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

#### Defined Values

<index>	Integer type: order number of operator in SIM preferred operator list
<format>	Indicates whether alphanumeric or numeric format used (see +COPS Command) 0 Long format alphanumeric <oper> 1 Short format alphanumeric <oper> 2 Numeric <oper>
<oper>	String type(string should be included in quotation marks)
<GSM_AcTn>	GSM Access technology 0 Access technology not selected 1 Access technology selected
<GSM_Comp_AcTn>	GSM compact Access technology 0 Access technology not selected 1 Access technology selected
<UTRAN_AcTn>	UTRA Access technology 0 Access technology not selected 1 Access technology selected

<E-UTRAN_AcTn>	E-UTRAN Access technology 0 Access technology not selected 1 Access technology selected
----------------	---

### Example

```

AT+CPOL=?
+CPOL: (1-80),(0-2)

OK
AT+CPOL?
+CPOL: 1,2,"46000",1,0,1,0

OK

```

#### NOTE

- Not all USIMs support the preferred operator list.

### 3.2.20 AT+CFUN Set Phone Functionality

#### AT+CFUN Set Phone Functionality

Test Command <b>AT+CFUN=?</b>	Response <b>+CFUN:</b> (list of supported <fun>s),(list of supported <rst>s)  <b>OK</b>
Read Command <b>AT+CFUN?</b>	Response <b>+CFUN:</b> <fun>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR:</b> <err>
Write Command <b>AT+CFUN=&lt;fun&gt;[,&lt;rst&gt;]</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR:</b> <err>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;fun&gt;</b>	<ul style="list-style-type: none"> <li>0 Minimum functionality</li> <li>1 Full functionality (Default)</li> <li>4 Disable phone both transmit and receive RF circuits.</li> <li>7 Disable phone SIM only. Transmit and receive circuits still active</li> </ul>
<b>&lt;rst&gt;</b>	<ul style="list-style-type: none"> <li>0 Set it to &lt;fun&gt; power level now, but do not reset the MT</li> <li>1 Do not set it to &lt;fun&gt; power level, either do not reset the MT before rebooting</li> <li>2 Set it to &lt;fun&gt; power level now, and reset the MT after rebooting</li> </ul>

## Example

```
AT+CFUN=?
+CFUN: (0,1,4,7),(0-2)
```

```
OK
AT+CFUN?
+CFUN: 1
```

```
OK
AT+CFUN=1,1
OK
```

```
RDY
```

```
+CFUN: 1
```

```
+CPIN: READY
```

```
SMS Ready
```

### 3.2.21 AT+CLCK Clock

#### AT+CLCK Clock

Test Command <b>AT+CLCK=?</b>	Response <b>OK</b>
Read Command <b>AT+CLCK?</b>	Response <b>+CCLK: &lt;time&gt;</b>  <b>OK</b>

	If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+CLCK=&lt;time&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;time&gt;</b>	String type, format is: yy/MM/dd,hh:mm:ss±zz, where characters indicate year (two last digits),month, day, hour, minutes, seconds and time zone. E.g. 10/05/06,00:01:52+08.
---------------------	---

### Example

**AT+CCLK=?**

**OK**

**AT+CCLK?**

**+CCLK: 00/01/01,00:18:15+32**

**OK**

**AT+CCLK="20/03/20,15:34:15+32"**

**OK**

**AT+CCLK?**

**+CCLK: 20/03/20,15:34:33+32**

**OK**

### NOTE

- If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK?.



### 3.2.22 AT+CSIM Generic SIM Access

AT+CSIM Generic SIM Access	
Test Command <b>AT+CSIM=?</b>	Response <b>OK</b>
Write Command <b>AT+CSIM=&lt;length&gt;,&lt;Command and&gt;</b>	Response <b>+CSIM: &lt;length&gt;,&lt;response&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;length&gt;</b>	Integer type: length of characters sent to the TE in <Command> or <response> (i.e. twice the number of octets in the raw data).
<b>&lt;Command&gt;</b>	String type (string should be included in quotation marks): hex format: GSM 11.11 SIM Command sent from the ME to the SIM.
<b>&lt;response&gt;</b>	String type(string should be included in quotation marks): hex format: GSM 11.11 response from SIM to <Command>.

#### Example

```
AT+CSIM=?
OK
```

### 3.2.23 AT+CBC Battery Charge

AT+CBC Battery Charge	
Test Command <b>AT+CBC=?</b>	Response <b>+CBC: (list of supported &lt;bcl&gt;),(&lt;voltage&gt;)</b>  <b>OK</b>
Execution Command <b>AT+CBC</b>	Response <b>+CBC: &lt;bcl&gt;,&lt;voltage&gt;</b>

	<b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SVAE
Max Response Time	-
Reference	

### Defined Values

<bcl>	Battery connection level 0...100 battery has 1-100 percent of capacity remaining vent
<voltage>	Battery voltage(mV)

### Example

```
AT+CBC=?
+CBC: (0-100),(voltage)
```

```
OK
AT+CBC
+CBC: 88,3418
```

```
OK
```

### 3.2.24 AT+CTZR Time Zone Reporting

#### AT+CTZR Time Zone Reporting

Test Command <b>AT+CTZR=?</b>	Response <b>+CTZR: (list of supported &lt;onoff&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CTZR?</b>	Response <b>+CTZR: &lt;onoff&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+CTZR=&lt;onoff&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>

	<b>Unsolicited result code:</b> <b>+CTZV: &lt;zone&gt;</b>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

### Defined Values

<b>&lt;onoff&gt;</b>	0 Disable time zone event reporting 1 Enable time zone event reporting
<b>&lt;zone&gt;</b>	String type value; On behalf of the time zone, range -47...+48. The eastern region is denoted as "+32".

### Example

**AT+CTZR=?**

**+CTZR: (0-1)**

OK

**AT+CTZR?**

**+CTZR: 0**

OK

**AT+CTZR=1**

OK

### 3.2.25 AT+CTZU Automatic Time Update

#### AT+CTZU Automatic Time Update

Test Command <b>AT+CTZU=?</b>	Response <b>+CTZU:</b> (list of supported <b>&lt;onoff&gt;</b> s)  <b>OK</b>
Read Command <b>AT+CTZU?</b>	Response <b>+CTZU: &lt;onoff&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Write Command	Response

<b>AT+CTZU=&lt;onoff&gt;</b>	<b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

### Defined Values

<b>&lt;onoff&gt;</b>	<u>0</u> Disable automatic time update via NITZ 1 Automatic time update via NITZ
----------------------	---

### Example

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

```
OK
AT+CTZU?
+CCTZU: 0
```

```
OK
AT+CTZU=1
OK
```

### 3.2.26 AT+CPLS Selection of preferred PLMN List

#### AT+CPLS Selection of preferred PLMN List

Test Command <b>AT+CPLS=?</b>	Response <b>+CPLS:</b> (list of supported <list>s)  <b>OK</b>
Read Command <b>AT+CPLS?</b>	Response <b>+CPLS:</b> <list>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+CPLS=&lt;list&gt;</b>	Response <b>OK</b>

	If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<list>	<p>0 User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only on SIM card or GSM application in UICC.</p> <p>1 Operator controlled PLMN selector with Access Technology EFOPLMNwAcT</p> <p>2 HPLMN selector with Access Technology EFHPLMNwAcT</p>
--------	---

### Example

```
AT+CPLS=?
+CPLS: (0,1,2)
```

OK

```
AT+CPLS?
+CPLS: 0
```

OK

```
AT+CPLS=0
OK
```

#### NOTE

- Only part of projects support this command, please refer to chapter 22 for details.

### 3.2.27 AT+CPSMS Power Saving Mode Setting

#### AT+CPSMS Power Saving Mode Setting

Test Command	Response
--------------	----------

<b>AT+CPSMS=?</b>	<p><b>+CPSMS:</b> (list of supported <b>&lt;mode&gt;</b>s),(list of supported <b>&lt;Requested_Periodic-RAU&gt;</b>s),(list of supported <b>&lt;Requested_GPRS-READY-timer&gt;</b>s),(list of supported <b>&lt;Requested_Periodic-TAU&gt;</b>s),(list of supported <b>&lt;Requested_Active-Time&gt;</b>s)</p> <p><b>OK</b></p>
Read Command <b>AT+CPSMS?</b>	<p>Response</p> <p><b>+CPSMS:</b> <b>&lt;mode&gt;</b>],[<b>&lt;Requested_Periodic-RAU&gt;</b>],[<b>&lt;Requested_GPRS-READY-timer&gt;</b>],[<b>&lt;Requested_Periodic-TAU&gt;</b>],[<b>&lt;Requested_Active-Time&gt;</b>]</p> <p><b>OK</b></p> <p>If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Write Command <b>AT+CPSMS=[&lt;mode&gt;],[&lt;Requested_Periodic-RAU&gt;],[&lt;Requested_GPRS-READY-timer&gt;],[&lt;Requested_Periodic-TAU&gt;],[&lt;Requested_Active-Time&gt;]]]</b>	<p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	<p>Integer type. Indication to disable or enable the use of PSM in the UE.</p> <p>0 Disable the use of PSM</p> <p>1 Enable the use of PSM</p> <p>2 Disable the use of PSM and discard all parameters for PSM or, if available reset to the manufacturer specific default values.</p>
<b>&lt;Requested_Periodic-RAU&gt;</b>	N/A for NB-IoT
<b>&lt;Requested_GPRS-READY-timer&gt;</b>	N/A for NB-IoT
<b>&lt;Requested_Periodic-TAU&gt;</b>	<p>String type; one byte in an 8-bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401. The default</p>

	value, if available, is manufacturer specific.
<b>&lt;Requested_Active-Time&gt;</b>	String type; one byte in an 8-bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682, 3GPP TS 23.060 and 3GPP TS 23.401. The default value, if available, is manufacturer specific.

### Example

```

AT+CPSMS=?
+CPSMS: (0-2),,("00000000"-11011111"),("00000000"-11111111")

OK
AT+CPSMS?
+CPSMS: 0

OK
AT+CPSMS=1
OK

```

### 3.2.28 AT+CCIOTOPT CloT optimization configuration

#### AT+CPSMS Power Saving Mode Setting

Test Command <b>AT+CCIOTOPT=?</b>	Response <b>+CCIOTOPT:</b> (list of supported <n>s),(list of supported <supported_UE_opt>s),(list of supported <preferred_UE_opt>s)  OK
Read Command <b>AT+CCIOTOPT?</b>	Response <b>+CCIOTOPT:</b> <n>,<supported_UE_opt>,<preferred_UE_opt>  OK If error is related to ME functionality: <b>+CME ERROR:</b> <err>
Write Command <b>AT+CCIOTOPT=[&lt;n&gt;,&lt;supported_UE_opt&gt;,&lt;preferred_UE_opt&gt;]</b>	Response OK If error is related to ME functionality: <b>+CME ERROR:</b> <err>

<b>t&gt;]]]</b>	
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	Integer type, enables or disables reporting of unsolicited result code +CCIOTOPTI. <ul style="list-style-type: none"> <li>0 Disable reporting.</li> <li>1 Enable reporting.</li> <li>2 Disable reporting and reset the parameters for CloT EPS optimization to the default values.</li> </ul>
<b>&lt;supported_UE_opt&gt;</b>	Integer type; indicates the UE's support for CloT EPS optimizations. <ul style="list-style-type: none"> <li>1 Support for control plane CloT EPS optimization.</li> <li>3 Support for both control plane CloT EPS optimization and user plane CloT EPS optimization.</li> </ul>
<b>&lt;preferred_UE_opt&gt;</b>	Integer type; indicates the UE's preference for CloT EPS optimizations. <ul style="list-style-type: none"> <li>0 No preference</li> <li>1 Preference for control plane CloT EPS optimization</li> <li>2 Preference for user plane CloT EPS optimization</li> </ul>

### Example

```

AT+CCIOTOPT=?
+CCIOTOPT: (0-2),(1,3),(0-2)

OK
AT+CCIOTOPT?
+CCIOTOPT: 1,1,1

OK
AT+CCIOTOPT=1,1,1
OK

```

### 3.2.29 AT+CEDRXS eDRX Setting

#### AT+CEDRXS eDRX Setting

Test Command	Response
--------------	----------



<b>AT+CEDRXS=?</b>	<p><b>+CEDRXS:</b> (list of supported &lt;mode&gt;s),(list of supported &lt;AcT-type&gt;s),(list of supported &lt;Requested_eDRX_value&gt;s)</p> <p><b>OK</b></p>
Read Command <b>AT+CEDRXS?</b>	<p>Response</p> <p><b>[+CEDRXS:</b>          &lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;[&lt;CR&gt;&lt;LF&gt;+CEDRXS:          &lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;          [...]]]</p> <p><b>OK</b></p> <p>If error is related to ME functionality:  <b>+CME ERROR: &lt;err&gt;</b></p>
Write Command <b>AT+CEDRXS=&lt;mode&gt;[,&lt;AcT-type&gt;[,&lt;Requested_eDRX_value&gt;]]</b>	<p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:  <b>+CME ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	<p>Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of &lt;mode&gt; will take effect for all specified values of &lt;AcT&gt;.</p> <p>0 Disable the use of eDRX          1 Enable the use of eDRX          2 Enable the use of eDRX and enable the unsolicited result code <b>+CEDRXP:</b>  <b>&lt;AcT-type&gt;[,&lt;Requested_eDRX_value&gt;[,&lt;NW-provided_eDRX_value&gt;[,&lt;Paging_time_window&gt;]]]</b></p> <p>3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</p>
<b>&lt;AcT-type&gt;</b>	<p>Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <p>5 E-UTRAN (NB-S1 mode)</p>
<b>&lt;Requested_eDRX_value&gt;</b>	<p>String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. The default</p>

	value, if available, is manufacturer specific.
<NW-provided_eDRX_value>	String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<Paging_time_window>	String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

### Example

**AT+CEDRXS=?**

+CEDRXS: (0-3),(5),("0000"- "1111")

OK

**AT+CEDRXS?**

+CEDRXS: 5,"0000"

OK

**AT+CEDRXS=1**

OK

### 3.2.30 AT+CEDRXRDP eDRX Read Dynamic Parameters

AT+CEDRXRDP eDRX Read Dynamic Parameters	
Test Command <b>AT+CEDRXRDP=?</b>	Response <b>OK</b>
Execution Command <b>AT+CEDRXRDP</b>	Response <b>+CEDRXRDP:</b> <b>&lt;AcT-type&gt;[,&lt;Requested_eDRX_value&gt;[,&lt;NW-provided_eDRX_value&gt;[,&lt;Paging_time_window&gt;]]]</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference

Defined Values

<b>&lt;AcT-type&gt;</b>	Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value. 0 Access technology is not using eDRX 5 E-UTRAN (NB-S1 mode)
<b>&lt;Requested_eDRX_value&gt;</b>	String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<b>&lt;NW-provided_eDRX_value &gt;</b>	String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<b>&lt;Paging_time_window&gt;</b>	String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

Example

AT+CEDRXRDP=?

OK

AT+CEDRXRDP

+CEDRXRDP: 0

OK

3.2.31 AT+CCHO Open UICC Logical Channel

**AT+CCHO Open UICC Logical Channel**

Write Command

AT+CCHO=<dfname>

Response

+CCHO: <sessionid>

	<b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<dfname>	String type in hexadecimal character format. All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes
<sessionid>	Integer type; a session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism

### Example

```
AT+CCHO=
OK
```

### 3.2.32 AT+CCHC Close UICC Logical Channel

#### AT+CCHC Close UICC Logical Channel

Write Command <b>AT+CCHC=&lt;sessionid&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<sessionid>	Integer type; a session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism
-------------	--

## Example

```
AT+CCHO=
OK
```

### 3.2.33 AT+CGLA Generic UICC Logical Channel Access

#### AT+CGLA Generic UICC Logical Channel Access

Write Command <b>AT+CGLA=&lt;sessionid&gt;,&lt;length&gt;,&lt;command&gt;</b>	Response <b>+CGLA: &lt;length&gt;,&lt;response&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;sessionid&gt;</b>	Integer type; this is the identifier of the session used to send the APDU commands to the UICC. It is mandatory to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").
<b>&lt;length&gt;</b>	Integer type; length of the characters that are sent to TE in <b>&lt;command&gt;</b> or <b>&lt;response&gt;</b> (two times the actual length of the command or response)
<b>&lt;command&gt;</b>	Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format)
<b>&lt;response&gt;</b>	Response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 (hexadecimal character format)

## Example

```
AT+CCHO=
OK
```

### 3.2.34 AT+CPINR Remaining PIN Retries

AT+CPINR Remaining PIN Retries	
Test Command <b>AT+CPINR=?</b>	Response <b>OK</b>
Write Command <b>AT+CPINR[=&lt;sel_code&gt;]</b>	Response <b>[+CPINR:</b> <b>&lt;code&gt;,&lt;retries&gt;[,&lt;default_retries&gt;][&lt;CR&gt;,&lt;LF&gt;+CPINR:</b> <b>&lt;code&gt;,&lt;retries&gt;[,&lt;default_retries&gt;]</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;sel_code&gt;</b>	String type. Same values as for the <b>&lt;code&gt;</b> parameter. These values are strings and shall be indicated within double quotes. Wildcard match by '*', meaning match any (sub-)string, or '?' meaning an character can be used.
<b>&lt;retries&gt;</b>	Integer type. Number of remaining retries per PIN.
<b>&lt;default_retries&gt;</b>	Integer type. Number of default/initial retries per PIN.
<b>&lt;code&gt;</b>	Type of PIN. All values listed under the description of the <b>AT+CPIN</b> Command, <b>&lt;code&gt;</b> parameter except <b>"READY"</b> .

#### Example

```

AT+CPINR=?
OK
AT+CPINR
+CPINR: "SIM PIN",3,3
+CPINR: "SIM PUK",10,10
+CPINR: "SIM PIN2",3,3
+CPINR: "SIM PUK2",10,10

OK

```

### 3.2.35 AT+CGATT GPRS/Packet Domain Attach or Detach

#### AT+CGATT GPRS/Packet Domain Attach or Detach

Test Command <b>AT+CGATT=?</b>	Response <b>+CGATT:</b> (list of supported <state>s)  <b>OK</b>
Read Command <b>AT+CGATT?</b>	Response <b>+CGATT:</b> <state>  <b>OK</b>
Write Command <b>AT+CGATT=&lt;state&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<state>	Indicates the state of GPRS/Packet Domain attachment 0 Detached 1 Attached Other values are reserved and will result in an ERROR response to the Write Command.
---------	--

#### Example

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

```
OK
AT+CGATT?
+CGATT: 0
```

```
OK
AT+CGATT=1
OK
```

### 3.2.36 AT+CGDCONT Define PDP Context

AT+CGDCONT Define PDP Context	
Test Command <b>AT+CGDCONT=?</b>	Response <b>+CGDCONT:</b> (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported <Local_Addr_Ind>s),(list of supported <Non-IPMTUdiscovery>s) [<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported <Local_Addr_Ind>s),(list of supported <Non-IP_MTU_discovery>s)[...]]
Read Command <b>AT+CGDCONT?</b>	Response <b>+CGDCONT:</b> <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>]]]]]]]]]]] [<CR><LF> <b>+CGDCONT:</b> <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>]]]]]]]]]]]
Write Command <b>AT+CGDCONT=&lt;cid&gt;[,&lt;PDP_type&gt;[,&lt;APN&gt;[,&lt;PDP_addr&gt;[,&lt;d_comp&gt;[,&lt;h_comp&gt;]]]]]</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-



Reference

Defined Values

<b>&lt;cid&gt;</b>	<p>(PDP Context Identifier) a numeric parameter that specifies a particular PDP context definition.</p> <p>The parameter is local to the UE-TE interface and is used in other PDP context-related commands.</p> <p>The range of permitted values (minimum value=1 or if the initial PDP context is supported minimum value=0) is returned by the test form of the command.</p>
<b>&lt;PDP_type&gt;</b>	<p>(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol:</p> <p>IP           Internet Protocol (IETF STD 5)</p> <p>IPV6        Internet Protocol, version 6 (IETF RFC 2460)</p> <p>IPV4V6     Virtual &lt;PDP_type&gt;) introduced to handle dual IP stack UE capability (see 3GPP Technical Specifications 24.301).</p> <p>Non-IP     Transfer of Non-IP data to external packet data Network (see 3GPP Technical Specifications 24.301).</p>
<b>&lt;APN&gt;</b>	<p>(Access Point Name) a string parameter, a logical name to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.</p>
<b>&lt;PDP_addr&gt;</b>	<p>A string parameter that identifies the UE in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the 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 the +CGPADDR command.</p> <p>NOTE: For EPS, this field is omitted.</p>
<b>&lt;d_comp&gt;</b>	<p>A numeric parameter that controls PDP data compression (applicable for SNDTCP only) (refer 3GPP TS 04.65)</p> <p>0   off (default if value is omitted)</p> <p>1   on (manufacturer preferred compression)</p> <p>2   V.42bis</p> <p>Other values are reserved.</p>
<b>&lt;h_comp&gt;</b>	<p>A numeric parameter that controls PDP header compression (refer 3GPP TS 04.65)</p> <p>0   off (default if value is omitted)</p> <p>1   on (manufacturer preferred compression)</p> <p>2   RFC1144 (applicable for SNDTCP only)</p> <p>3   RFC 2507</p> <p>4   RFC 3095 (ROHC) (applicable for PDCCP only)</p> <p>Other values are reserved.</p>

<b>&lt;IPv4_MTU_discovery&gt;</b>	<p>Integer type; influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 sub-clause 10.5.6.3.</p> <p>0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT</p> <p>1 Preference of IPv4 MTU size discovery through NAS signaling</p>
<b>&lt;Non-IP_MTU_discovery&gt;</b>	<p>Integer type; influences how the MT/TA requests to get the Non-IP MTU size, see 3GPP TS 24.008 sub-clause 10.5.6.3.</p> <p>0 Preference of Non-IP MTU size discovery not influenced by +CGDCONT</p> <p>1 Preference of Non-IP MTU size discovery through NAS signaling</p>

### Example

**AT+CGDCONT=?**

```
+CGDCONT: (1-15),"IP",,,(0-2),(0-4),(0),,,,(0-1),,(0-1),,(0-1)
+CGDCONT: (1-15),"IPV6",,,(0-2),(0-4),(0),,,,(0-1),,(0-1),,(0-1)
+CGDCONT: (1-15),"IPV4V6",,,(0-2),(0-4),(0),,,,(0-1),,(0-1),,(0-1)
+CGDCONT: (1-15),"Non-IP",,,(0-2),(0-4),(0),,,,(0-1),,(0-1),,(0-1)
```

OK

**AT+CGDCONT?**

OK

**AT+CGDCONT=1**

OK

### 3.2.37 AT+CGACT PDP Context Active or Deactive

<b>AT+CGACT</b>	<b>PDP Context Active or Deactive</b>
<p>Test Command</p> <p><b>AT+CGACT=?</b></p>	<p>Response</p> <p><b>+CGACT:</b> (list of supported &lt;state&gt;s)</p> <p><b>OK</b></p>
<p>Read Command</p> <p><b>AT+CGACT?</b></p>	<p>Response</p> <p><b>+CGACT:</b> &lt;cid&gt;,&lt;state&gt;[&lt;CR&gt;&lt;LF&gt;+CGACT: &lt;cid&gt;,&lt;state&gt;...]</p> <p><b>OK</b></p>
<p>Write Command</p> <p><b>AT+CGACT=&lt;state&gt;[,&lt;cid&gt;]</b></p>	<p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR:</b> &lt;err&gt;</p>

Parameter Saving Mode	NO_SAVE
Max Response Time	150 Seconds
Reference	

### Defined Values

<b>&lt;state&gt;</b>	<p>Indicates the state of PDP context activation</p> <p>0 Deactivated 1 Activated</p> <p>Other values are reserved and will result in an ERROR response to the Write Command.</p>
<b>&lt;cid&gt;</b>	<p>A numeric parameter which specifies a particular PDP context definition (see <b>+CGDCONT</b> Command). If the <b>&lt;cid&gt;</b> is omitted, it only affects the first cid.</p>

### Example

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

```
OK
AT+CGACT?
+CGACT: 0
```

```
OK
AT+CGACT=1
OK
```

#### NOTE

- If context is deactivated successfully, NO CARRIER is returned
- If **<cid>=0** for PDN activated during attach is enabled, then **AT+CGACT=<0>** or **<1>**, 0 will cause **ERROR** response.

### 3.2.38 AT+CGPADDR Show PDP Address

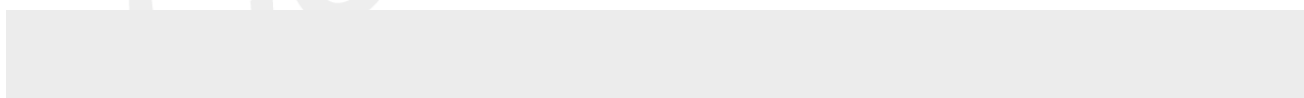
AT+CGPADDR Show PDP Address	
Test Command	Response
<b>AT+CGPADDR=?</b>	<b>+CGPADDR:</b> (list of defined <b>&lt;cid&gt;</b> s)

	OK or OK
Write Command <b>AT+CGPADDR=[&lt;cid&gt;[,&lt;cid&gt;[,...]]]</b>	Response <b>+CGPADDR: &lt;cid&gt;[,&lt;PDP_addr&gt;][&lt;CR&gt;&lt;LF&gt;+CGPADDR: &lt;cid&gt;[,&lt;PDP_addr&gt;][...]]</b>
	OK or ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;cid&gt;</b>	A numeric parameter which specifies a particular PDP context definition (see +CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned.
<b>&lt;PDP_addr&gt;</b>	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 +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>.
<b>&lt;PDP_address&gt;</b>	is omitted if none is available.

### Example



#### NOTE

- Write command returns address provided by the network if a connection has been established.

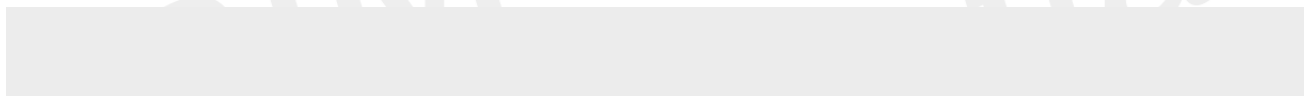
### 3.2.39 AT+IPCONFIG Show the Complete PDP Address

<b>AT+IPCONFIG Show the Complete PDP Address</b>	
Execution Command <b>AT+IPCONFIG</b>	Response <b>[+IPCONFIG: &lt;PDP_addr&gt;]</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;PDP_addr&gt;</b>	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 +CGDCONT command when the context was defined.
-------------------------	--

### Example



#### NOTE

- Write command returns address provided by the network if a connection has been established.

### 3.2.40 AT+CGEREP Packet Domain Event Reporting

<b>AT+CGEREP Packet Domain Event Reporting</b>	
Test Command <b>AT+CGEREP=?</b>	Response <b>+CGEREP: (list of supported &lt;mode&gt;s),(list of supported &lt;bfr&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CGEREP?</b>	Response <b>+CGEREP: &lt;mode&gt;,&lt;bfr&gt;</b>  ok
Write Command <b>AT+CGEREP=&lt;mode&gt;</b>	Response <b>OK</b>

or

## **ERROR**

Unsolicited Result Codes supported:

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

### **+CGEV: NW PDN ACT <cid>**

The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE 1: This event is not applicable for EPS.

### **+CGEV: ME PDN ACT <cid>[,<reason>[,<cid\_other>]]**

The mobile termination has activated a context. The context represents a PDN connection in NB-IOT. 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 parameter <cid> and <cid other> are found in command +CGDCONT.

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

### **+CGEV: NW PDN DEACT <cid>**

The network has deactivated a context. The context represents a PDN connection in NB-IOT. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE 2: 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 NB-IOT. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE 3: Occurrence of this event replaces usage of the event

### **+CGEV: ME DEACT <PDP\_type>,<PDP\_addr>[,<cid>]**

	<p><b>For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:</b></p> <p><b>+CGEV: REJECT &lt;PDP_type&gt;,&lt;PDP_addr&gt;</b></p> <p>A network request for context activation occurred when the UE was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters &lt;PDP_type&gt; and &lt;PDP_addr&gt; are found in command +CGDCONT.</p> <p>NOTE 6: This event is not applicable for EPS.</p> <p><b>+CGEV: NW REACT &lt;PDP_type&gt;,&lt;PDP_addr&gt;,&lt;cid&gt;</b></p> <p>The network has requested a context reactivation. The &lt;cid&gt; that was used to reactivate the context is provided if known to the UE. The format of the parameters &lt;PDP_type&gt;,&lt;PDP_addr&gt; and &lt;cid&gt; are found in command +CGDCONT.</p> <p>NOTE 7: This event is not applicable for EPS.</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<mode>	<p>0 buffer unsolicited result codes in the UE; if UE result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.</p> <p>1 discard unsolicited result codes when UE-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE</p> <p>2 buffer unsolicited result codes in the UE when UE-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when UE-TE link becomes available; otherwise forward them directly to the TE</p>
<bfr>	<p>0 UE buffer of unsolicited result codes defined within this command is cleared when &lt;mode&gt; 1 or 2 is entered</p> <p>1 UE buffer of unsolicited result codes defined within this command is flushed to the TE when &lt;mode&gt; 1 or 2 is entered (OK response shall be given before flushing the codes)</p>
<PDP_addr>	Packet Data Protocol address (see +CGDCONT command)
<cid>	Context Id (see +CGDCONT command) Note: <cid> only given if known to the UE.
<class>	GPRS mobile class (see +CGCLASS command)
<event_type>	<p>Integer type parameter indicates whether this is an informational event of whether the TE as acknowledged it.</p> <p>0 Informational event</p> <p>1 Information request: Acknowledgement required. The Acknowledgement can be accept or reject, see AT+CGANS.</p>
<change_reason>	Integer type parameter indicates what kind of change occurred.

	<ul style="list-style-type: none"> <li>1 TFT only changed</li> <li>2 QoS only changed</li> <li>3 Both TFT and QoS changed</li> </ul>
<b>&lt;reason&gt;</b>	<p>Integer type parameter 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 &lt;cid&gt; is IPV4V6, and the PDP type assign by the network for &lt;cid&gt; is either IPV4 or IPV6</p> <ul style="list-style-type: none"> <li>0 IPV4 only allowed</li> <li>1 IPV6 only allowed</li> <li>2 single address bearers only allowed</li> <li>3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful</li> </ul>
<b>&lt;cid_other&gt;</b>	<p>Indicated the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if &lt;reason&gt; parameter indicates single address bearers only allowed, and MT support MT initiated context activation of a second address type without additional commands from the TE, and MT has activated the PDN connection or PDP context associated with &lt;cid_other&gt;.</p>

### Example

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

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

```
OK
AT+CGEREP=0
OK
```

### 3.2.41 AT+CGREG Network Registration Status

AT+CGREG Network Registration Status	
Test Command <b>AT+CGREG=?</b>	Response <b>+CGREG: (list of supported &lt;n&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CGREG?</b>	Response <b>+CGREG: &lt;n&gt;,&lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;,&lt;AcT&gt;,&lt;rac&gt;]</b>



	<p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p>
Write Command <b>AT+CGREG=&lt;n&gt;</b>	<p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	<p>0 Disable network registration unsolicited result code</p> <p>1 Enable network registration unsolicited result code</p> <p><b>+CGREG: &lt;stat&gt;</b></p> <p>2 Enable network registration and location information unsolicited result code <b>+CGREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;,&lt;Act&gt;,&lt;rac&gt;]</b></p>
<b>&lt;stat&gt;</b>	<p>0 Not registered, MT is not currently searching an operator to register to.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but MT is currently trying to attach or searching an operator to register to.</p> <p>3 Registration denied.</p> <p>4 Unknown</p> <p>5 Registered, roaming</p> <p>6 Registered for "SMS only", home network (applicable only when &lt;Act&gt; indicates E-UTRAN)</p> <p>7 Registered for "SMS only", roaming (applicable only when &lt;Act&gt; indicates E-UTRAN)</p>
<b>&lt;lac&gt;</b>	String type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<b>&lt;ci&gt;</b>	String type; four byte UTRAN/GERAN/E-UTRAN cell ID in hexadecimal format
<b>&lt;Act&gt;</b>	Access technology of the registered network
<b>&lt;rac&gt;</b>	String type; one byte routing area code in hexadecimal format

### Example

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

OK  
**AT+CGREG?**  
 +CGREG: 0,2

OK  
**AT+CGREG=2**  
 OK

### 3.2.42 AT+CGCONTRDP PDP Context Read Dynamic Parameters

AT+CGCONTRDP	PDP Context Read Dynamic Parameters
Test Command <b>AT+CGCONTRDP=?</b>	Response <b>+CGCONTRDP: (list of &lt;cid&gt;s associated with active contexts)</b>  OK or OK
Write Command <b>AT+CGCONTRDP=&lt;cid&gt;</b>	Response <b>+CGCONTRDP: &lt;cid&gt;,&lt;bearer_id&gt;,&lt;apn&gt;[,&lt;local address and subnet mask&gt;[,&lt;gw_addr&gt;[,&lt;DNS_prim_addr&gt;[,&lt;DNS_sec_addr&gt;[,&lt;P_C SCF_prim_addr&gt;[,&lt;P_CSCF_sec_addr&gt;[,&lt;IM_CN_Signalling_Flag&gt;[,&lt;LIPA_indication&gt;[,&lt;IPv4_MTU&gt;[,&lt;WLAN_Offload&gt;[,&lt;Local_A ddr_Ind&gt;[,&lt;Non-IP_MTU&gt;[,&lt;Serving_PLMN_rate_control_value&gt;]]]]]]]]]]]]</b> <b>[&lt;CR&gt;&lt;LF&gt;+CGCONTRDP: &lt;cid&gt;,&lt;bearer_id&gt;,&lt;apn&gt;[,&lt;local address and subnet mask&gt;[,&lt;gw_addr&gt;[,&lt;DNS_prim_addr&gt;[,&lt;DNS_sec_addr&gt;[,&lt;P_C SCF_prim_addr&gt;[,&lt;P_CSCF_sec_addr&gt;[,&lt;IM_CN_Signalling_Flag&gt;[,&lt;LIPA_indication&gt;[,&lt;IPv4_MTU&gt;[,&lt;WLAN_Offload&gt;[,&lt;Local_A ddr_Ind&gt;[,&lt;Non-IP_MTU&gt;[,&lt;Serving_PLMN_rate_control_value&gt;]]]]]]]]]]]]</b> [...]  OK or OK If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

## Defined Values

<cid>	A numeric parameter which specifies a particular primary PDP context definition. The parameter is local to the TE-UE interface and is used in other PDP context-related commands.
<bearer_id>	A numeric parameter which identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.
<APN>	A string parameter which is a logical name that was used to select the GGSN or the external packet data network.
<local address and subnet mask>	A string parameter which shows the IP Address and subnet mask of the UE. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.
<gw_addr>	A string parameter which shows the Gateway Address of the UE. The string is given as dot-separated numeric (0-255) parameters.
<DNS_prim_addr>	A string parameter which shows the IP Address of the primary DNS Server.
<DNS_sec_addr>	A string parameter which shows the IP address of the secondary DNS Server.
<IPv4_MTU>	Integer type; show the IPv4 MTU size in octets.
<Non-IP_MTU>	Integer type; show the Non-IP MTU size in octets.
<Serving_PLMN_rate_control_value>	Integer type; indicates the maximum number of uplink messages the UE is allowed to send in a 6-minute interval. This refers to octet 3 to 4 of the Serving PLMN rate control IE as specified in 3GPP TS 24.301 sub-clause 9.9.4.28.

## Example

```

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

OK
AT+CGREG?
+CGREG: 0,2

OK
AT+CGREG=2
OK

```

**NOTE**

- <P\_CSCF\_prim\_addr>,<P\_CSCF\_sec\_addr>,<IM\_CN\_Signalling\_Flag>,<LIPA\_indication>,<WLAN\_Offload>,<Local\_Addr\_Ind> are not displayed for MTK NB-IOT solution.

### 3.2.43 AT+CGPIAF Printing IP Address Format

AT+CGPIAF Printing IP Address Format	
Test Command <b>AT+CGPIAF=?</b>	Response <b>+CGPIAF:</b> (list of supported <IPv6_AddressFormat>s),(list of supported <IPv6_SubnetNotation>s),(list of supported <IPv6_LeadingZeros>s),(list of supported <IPv6_CompressZeros>s)  OK
Read Command <b>AT+CGPIAF?</b>	Response <b>+CGPIAF:</b> <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>  OK or <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+CGPIAF=[IPv6_AddressFormat],[&lt;IPv6_SubnetNotation&gt;],[&lt;IPv6_LeadingZeros&gt;],[&lt;IPv6_CompressZeros&gt;]]]</b>	Response OK If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<IPv6_AddressFormat>	Integer type, decides the IPV6 address format. Relevant for all AT command parameters that can hold an IPV6 address. 0 Use IPV4-like dot-notation. IP address, and Subnetwork mask if applicable, are dot-separated.
----------------------	--

	<p>Example:</p> <p>For <b>&lt;source address and subnet mask&gt;</b>:</p> <p>"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0.0.255.255.255.255.255.255.255.255.255.255.255.255"</p> <p>For other IP address parameters:</p> <p>"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0"</p> <p>1 Use IPV6-like colon notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space.</p> <p>Example:</p> <p>For <b>&lt;source address and subnet mask&gt;</b>:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFFFF:FFF0:0000:0000:0000:0000"</p> <p>For other IP address parameters:</p> <p>"2001:0DB8:0000:CD80:0000:0000:0000:0000"</p>
<b>&lt;IPv6_SubnetNotation&gt;</b>	<p>Integer type, decides the subnet-notation for &lt;source Address and subnet mask&gt;. Setting does not apply</p> <p>If &lt;IPv6_AddressFormat&gt;=0.</p> <p>0 Both IP Address and subnet mask are stated. Explicitly, separated by a space. (Example:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFFFF:FFF0:0000:0000:0000:0000")</p> <p>1 The printout format is applying / (forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation. (Example:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000/60" )</p>
<b>&lt;IPv6_LeadingZeros&gt;</b>	<p>Integer type, decides whether leading zeros are Omitted or not. Setting does not apply if &lt;IPv6_AddressFormat&gt;=0.</p> <p>0 Leading zeros are omitted. (Example:</p> <p>"2001:DB8:0:CD30:0:0:0:0")</p> <p>1 Leading zeros are included. (Example:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000")</p>
<b>&lt;IPv6_CompressZeros&gt;</b>	<p>Integer type, decides whether 1-n instances of 16 bit zero-values are replaced by only "..". This applies only once. Setting does not apply if &lt;IPv6_AddressFormat&gt;=0.</p> <p>0 No zero compression. (Example: "2001:DB8:0:CD30:0:0:0:0")</p> <p>1 Use zero compression. (Example: "2001:DB8:0:CD30::")</p>

**Example**

```

AT+CGPAIF=?
+CGPIAF: (0,1),(0,1),(0,1),(0,1)

OK
AT+CGPIAF?
+CGPIAF: 0,0,0,0

```

OK  
**AT+CGPIAF=0,0,0,0**  
 OK

### 3.2.44 AT+CGDEL Delete Non-Active PDP Contexts

<b>AT+CGDEL Delete Non-Active PDP Contexts</b>	
Test Command <b>AT+CGDEL=?</b>	Response <b>OK</b>
Write Command <b>AT+CGDEL=[&lt;cid&gt;]</b>	Response <b>+CGDEL: &lt;cid&gt;[,&lt;cid&gt;[,...]]</b>  <b>OK</b> If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;cid&gt;</b>	A numeric parameter which specifies a particular PDP context definition.
--------------------	--

### 3.2.45 AT+CGAUTH Define PDP Context Authentication Parameters

<b>AT+CGAUTH Define PDP Context Authentication Parameters</b>	
Test Command <b>AT+CGAUTH=?</b>	Response <b>+CGAUTH: (range of supported &lt;cid&gt;s),(list of supported &lt;auth_prot&gt;s),(range of supported &lt;userid&gt;s),(range of supported &lt;password&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CGAUTH?</b>	Response <b>[+CGAUTH: &lt;cid&gt;,&lt;auth_prot&gt;,&lt;userid&gt;,&lt;password&gt;][&lt;CR&gt;&lt;LF&gt;+CGAUTH: &lt;cid&gt;,&lt;auth_prot&gt;,&lt;userid&gt;,&lt;password&gt; [...]]</b>

	<b>OK</b>
Write Command <b>AT+CGAUTH=&lt;cid&gt;[,&lt;auth_prot&gt;[,&lt;userid&gt;[,&lt;password&gt;]]]</b>	Response When <auth_prot>/<username>/<password> set: <b>OK</b> When no <auth_prot>/<username>/<password> set displays current auth_prot username and password for <cid>: <b>+CGAUTH: &lt;cid&gt;,&lt;auth_prot&gt;,&lt;username&gt;,&lt;password&gt;</b>
	<b>OK</b> If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;cid&gt;</b>	A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
<b>&lt;auth_prot&gt;</b>	Numeric parameter. Authentication protocol used for this PDP context. 0 None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified. 1 PAP
<b>&lt;userid&gt;</b>	String type. User name for access to the IP network.
<b>&lt;password&gt;</b>	String type. Password for access to the IP network.

### 3.2.46 AT\*MCGDEFCONT Set Default PSD Connection Settings

<b>AT*MCGDEFCONT Set Default PSD Connection Settings</b>	
Test Command <b>AT*MCGDEFCONT=?</b>	Response <b>*MCGDEFCONT: (list of supported &lt;PDP_type&gt;)</b>  <b>OK</b>
Read Command <b>AT*MCGDEFCONT?</b>	Response <b>*MCGDEFCONT: &lt;PDP_type&gt;[,&lt;APN&gt;,&lt;username&gt;,&lt;password&gt;]</b>  <b>OK</b>
Write Command <b>AT*MCGDEFCONT=&lt;PDP_type&gt;[,&lt;APN&gt;[,&lt;username&gt;[,&lt;password&gt;]]]</b>	Response <b>OK</b> If error is related to wrong AT syntax:

<b>&lt;password&gt;]]]</b>	<b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

### Defined Values

<b>&lt;PDP_type&gt;</b>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol: IP Internet Protocol (IETF STD 5) IPV6 Internet Protocol, version 6 (IETF RFC 2460) IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability(see 3GPP TS 24.301). Non-IP Transfer of Non-IP data to external packet data Network (see 3GPP TS 24.301).
<b>&lt;APN&gt;</b>	(Access Point Name) a string parameter that is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.
<b>&lt;username&gt;</b>	String value. Username for the connection to the service provider.
<b>&lt;password&gt;</b>	String value. Password for the connection to the service provider

### 3.2.47 AT+CEREG EPS Network Registration Status

AT+CEREG EPS Network Registration Status	
Test Command <b>AT+CEREG=?</b>	Response <b>+CEREG: (list of supported &lt;n&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CEREG?</b>	Response when <n>=0, 1, 2 or 3 and command successful: <b>+CEREG: &lt;n&gt;,&lt;stat&gt;[,&lt;tac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;],[&lt;cause_type&gt;,&lt;reject_cause&gt;]]]</b> when <n>=4 or 5 and command successful: <b>+CEREG: &lt;n&gt;,&lt;stat&gt;[,&lt;tac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;],[&lt;cause_type&gt;],[&lt;reject_cause&gt;],[&lt;Active-Time&gt;],[&lt;Periodic-TAU&gt;]]]</b> If error is related to wrong AT syntax or operation not allowed: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+CEREG=&lt;n&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b>



Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<p>&lt;n&gt;</p>	<p>0 Disable network registration unsolicited result code  1 Enable network registration unsolicited result code  <b>+CEREG: &lt;stat&gt;</b>  2 Enable network registration and location information unsolicited result code <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],&lt;ci&gt;,&lt;AcT&gt;]]</b>  3 Enable network registration, location information and EMM cause value information unsolicited result code  <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],&lt;ci&gt;,&lt;AcT&gt;][,&lt;cause_type&gt;,&lt;reject_cause&gt;]]</b>  4 For a UE that wants to apply PSM, enable network registration and location information unsolicited result code  <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],&lt;ci&gt;,&lt;AcT&gt;][,],[&lt;Active-Time&gt;],[&lt;Periodic-TAU&gt;]]]]</b>  5 For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code  <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],&lt;ci&gt;,&lt;AcT&gt;][,&lt;cause_type&gt;],[&lt;reject_cause&gt;][,&lt;Active-Time&gt;],[&lt;Periodic-TAU&gt;]]]]</b></p>
<p>&lt;stat&gt;</p>	<p>EPS registration status  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 for a new operator to register to  3 Registration denied  4 Unknown  5 Registered, roaming  6 Registered for "SMS only", home network (applicable only when &lt;Act&gt; indicates NB-IOT)  7 Registered for "SMS only", roaming (applicable only when &lt;Act&gt; indicates NB-IOT)  100 Network has been found but attach is pended,ME is waiting for AT+CGATT=1 to perform attach procedure</p>
<p>&lt;tac&gt;</p>	<p>String type; two byte tracking area code in hex adecimal format (e.g. "00C3" equals 195 in decimal).</p>
<p>&lt;ci&gt;</p>	<p>String type; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format</p>

<AcT>	Access technology of the registered network 9 NB-IoT
<cause_type>	Integer type; indicates the type of <reject_cause> 0 Indicates that <reject_cause> contains an EMM cause value, see <a href="#">3GPP TS 24.301 Annex A</a> . 1 Indicates that <reject_cause> contains a manufacturer-specific cause.
<reject_cause>	Integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.
<Active-Time>	String type; one byte in an 8-bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401.
<Periodic-TAU>	String type; one byte in an 8-bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008, Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401.

## Example

```
AT+CEREG=?
+CGREG: (0-5)
```

```
OK
AT+CEREG?
+CGREG: 0,0
```

```
OK
AT+CEREG=0
OK
```

### NOTE

- For NB-IoT product, only <AcT> value of 9 is valid.

### 3.2.48 AT+CGDATA Enter Data State

AT+CGDATA Enter Data State	
Test Command <b>AT+CGDATA=?</b>	Response <b>+CGDATA:</b> (list of supported <L2P>s)  <b>OK</b>
Write Command <b>AT+CGDATA=[&lt;L2P&gt;[,&lt;cid&gt;[,&lt;cid&gt;[,...]]]]</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<L2P>	A string parameter that indicates the layer 2 protocol to be used between the TE and MT. M-PT Packet Transport Mechanism protocol for a PDP such as IP Other values are not supported and will result in an ERROR response to the write command.
<cid>	A numeric parameter which specifies a particular PDP context definition (see +CGDCONT command).

#### NOTE

- The command will enter data state once the PDP context has been activated <L2P> value M-PT is MTK proprietary and represents no <L2P> but raw IP packet transfer.

### 3.2.49 AT\*MGCOUNT GPRS/Packet Domain Packet Counters

AT*MGCOUNT GPRS/Packet Domain Packet Counters	
Test Command <b>AT*MGCOUNT=?</b>	Response <b>*MGCOUNT:</b> (list of supported <actions>s),(list of supported <cid>s),(list of supported <period>s)  <b>OK</b>

Read Command <b>AT*MGCOUNT?</b>	Response <b>*MGCOUNT: &lt;cid&gt;,&lt;state&gt;[,&lt;period&gt;][&lt;CR&gt;&lt;LF&gt;*MGCOUNT: &lt;cid&gt;,&lt;state&gt;[,&lt;period&gt;][...]]</b>  <b>OK</b>
Write Command <b>AT*MGCOUNT=&lt;action&gt;,&lt;cid&gt;[,&lt;period&gt;]</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;action&gt;</b>	indicates the action to be performed 0 reset counter for specified <cid> 1 read counter for specified <cid> 2 start reporting counter periodically for specified <cid> defined by <period>. Counter is also reported on context deactivation. 3 report counter on context deactivation for specified <cid> 4 stop reporting counter on specified <cid>
<b>&lt;cid&gt;</b>	a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command)
<b>&lt;period&gt;</b>	period for periodic packet counter reporting in seconds  Unsolicited Result Once a counter has been setup for a <cid> the counter will be displayed as Following either periodically or when the context has been deactivated: <b>*MGCOUNT: &lt;cid&gt;,&lt;uc&gt;,&lt;uu&gt;,&lt;un&gt;,&lt;dc&gt;,&lt;du&gt;,&lt;dn&gt;</b>
<b>&lt;uc&gt;</b>	A numeric 32 bit parameter which indicates the number of compressed bytes transferred in the uplink direction displayed in decimal format
<b>&lt;uu&gt;</b>	A numeric 32 bit parameter which indicates the number of uncompressed bytes transferred in the uplink direction displayed in decimal format
<b>&lt;un&gt;</b>	A numeric 32 bit parameter which indicates the number of N-PDUs (i.e. IP packets) transferred in the uplink direction displayed in decimal format
<b>&lt;dc&gt;</b>	A numeric 32 bit parameter which indicates the number of compressed bytes transferred in the downlink direction displayed in decimal format
<b>&lt;du&gt;</b>	A numeric 32 bit parameter which indicates the number of uncompressed bytes transferred in the downlink direction displayed in

	decimal format
<dn>	<p>A numeric 32 bit parameter which indicates the number of N-PDUs (i.e. IP packets) transferred in the downlink direction displayed in decimal format</p> <p>Note that the current counter values will be displayed immediately this command is entered for any action (i.e. even stopping the counter display will generate the above unsolicited result code for the cancelled &lt;cid&gt;).</p>

**NOTE**

- This command displays byte and IP packet counters for PDP contexts. It is proprietary to MediaTek.
- If counters are displayed periodically, they will only be displayed if: there is a separate multiplexer channel for unsolicited result codes, or the user switches to command mode using the “+++” escape sequence. Entering <action> range 0 to 3 will lock the counter for the specified <cid> to the channel on which the AT command was entered. Entering <action> of 4 will unlock the counter for the specified <cid> from the channel on which the AT command was entered.

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## 4 AT Commands According to 3GPP TS 27.005

The 3GPP TS 27.005 commands are for performing SMS and CBS related operations for both Text and PDU modes.

### 4.1 Overview of AT Commands According to 3GPP TS 27.005

Command	Description
<b>AT+CMGD</b>	Delete SMS message
<b>AT+CMGF</b>	Select SMS message format
<b>AT+CMGL</b>	List SMS messages from preferred store
<b>AT+CMGR</b>	Read SMS message
<b>AT+CMGS</b>	Send SMS message
<b>AT+CMGW</b>	Write SMS message to memory
<b>AT+CMSS</b>	Send SMS message from storage
<b>AT+CMGC</b>	Send SMS Command
<b>AT+CNMI</b>	New SMS message indications
<b>AT+CPMS</b>	Preferred SMS message storage
<b>AT+CSCA</b>	SMS service center address
<b>AT+CSDH</b>	Show SMS text mode parameters
<b>AT+CSMP</b>	Set SMS text mode parameters
<b>AT+CSMS</b>	Select message service
<b>AT+CNMA</b>	New SMS Message Acknowledgment

### 4.2 Detailed Description of AT Commands According to 3GPP TS 27.005

#### 4.2.1 AT+CMGD Delete SMS Message

## AT+CMGD Delete SMS Message

Test Command <b>AT+CMGD=?</b>	Response <b>+CMGD:</b> (list of supported <index>s)  <b>OK</b>
Write Command <b>AT+CMGD=&lt;index&gt;[,&lt;delflag&gt;]</b>	Response TA deletes message from preferred message storage <mem1> location <index>. <b>OK</b> or <b>ERROR</b> If error is related to ME functionality: <b>+CMS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	5s (delete 1 message) 25s (delete 50 messages) 25s (delete 150 messages)
Reference	

### Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory, This value is only used if <DelFlag>=0.
<delflag>	<ul style="list-style-type: none"> <li>0 Delete message at location &lt;index&gt; (Default value)</li> <li>1 Delete all read messages</li> <li>2 Delete all READ and SENT messages</li> <li>3 Delete all READ, SENT and UNSENT messages</li> <li>4 Delete all messages</li> </ul>

### Example

```
AT+CGMD=?
+CMGD: (1-50)

OK
AT+CGMD=0
OK
```

**NOTE**

- When the MT2625 software has concatenated SMS handling in modem enabled (see AT command AT\*MFTRCFG) the user can delete a concatenated text SMS up to 1024 characters in length. A concatenated SMS is stored on the SIM as number of smaller SMSs. (This is not possible when MMI is present).
- When the MT2625 software does not have concatenated SMS handling in the modem enabled, the maximum text SMS length is restricted depending on the data coding scheme (160 for 7-bit, 140 for 8-bit, 80 for 16-bit).
- An attempt to delete anything other than the first segment of a concatenated SMS, when concatenated SMS is enabled, will result in ERROR response.  
Deleting an empty entry will result in OK response rather than ERROR.

#### 4.2.2 AT+CMGF Select SMS Message Format

##### AT+CMGF Select SMS Message Format

Test Command <b>AT+CMGF=?</b>	Response <b>+CMGF:</b> (list of supported <mode>s)  <b>OK</b>
Read Command <b>AT+CMGF?</b>	Response <b>+CMGF:</b> <mode>  <b>OK</b>
Write Command <b>AT+CMGF=[&lt;mode&gt;]</b>	Response TA sets parameter to denote which input and output format of messages to use.  <b>OK</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

##### Defined Values

<mode>	0 PDU mode 1 Text mode
--------	---------------------------



## Example

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

OK
AT+CMGF=1
OK
AT+CMGF?
+CMGF: 1

OK
```

### 4.2.3 AT+CMGL List SMS Message from Preferred Store

#### AT+CMGL List SMS Message from Preferred Store

Test Command

**AT+CMGL=?**

Response

**+CMGL:** (list of supported <stat>s)

**OK**

Write Command

**AT+CMGL=<stat>**

Response

TA returns messages with status value <stat> from message storage <mem1> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'.

1) If text mode (**+CMGF=1**) and Command successful:  
for SMS-SUBMITs and/or SMS-DELIVERs:

**+CMGL:**

<index>,<stat>,<oa/da>[,<alpha>][,<scts>][,<toa/toda>,<length>]

<CR><LF><data><CR><LF>**+CMGL:**

<index>,<stat>,<da/oa>[,<alpha>][,<scts>][,<toa/toda>,<length>]

<CR><LF><data>[...]

**OK**

If SMS-STATUS-REPORT and text mode:

**+CMGL:** <index>,<stat>,<fo>,<mr>,[<ra>],

[<tora>],<scts>,<dt>,<st>[<CR><LF>**+CMGL:**

<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> [...]

**OK**

2) If PDU mode (**+CMGF=0**) and Command successful:

**+CMGL:**

<index>,<stat>[,<alpha>],<length><CR><LF><pdu><CR><LF>**+C**

	<p><b>MGL:</b> &lt;index&gt;,&lt;stat&gt;[,alpha],&lt;length&gt;&lt;CR&gt;&lt;LF&gt;&lt;pdu&gt;[...]]</p> <p><b>OK</b></p> <p>3)If error is related to ME functionality: <b>+CMS ERROR:</b> &lt;err&gt;</p>
<p>Execution Command <b>AT+CMGL</b></p>	<p>1) If text mode: the same as AT+CMGL="REC UNREAD",received unread messages.</p> <p>2) If PDU mode: the same as AT+CMGL=0, received unread messages.</p> <p>See more messages please refer to Write Command.</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	20s(list 50 messages) 20s(list 150 messages)
Reference	

### Defined Values

<stat>	<p>If text mode:</p> <p><u>"REC UNREAD"</u> Received unread messages</p> <p>"REC READ" Received read messages</p> <p>"STO UNSENT" Stored unsent messages</p> <p>"STO SENT" Stored sent messages</p> <p>"ALL" All messages</p> <p>If PDU mode:</p> <p><u>0</u> Received unread messages</p> <p>1 Received read messages</p> <p>2 Stored unsent messages</p> <p>3 Stored sent messages</p> <p>4 All messages</p>
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific
<da>	3GPP 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <toda>
<data>	<p>In the case of SMS: 3GPP 23.040 TP-User-Data in text mode responses; format:</p> <p>if &lt;dcs&gt; indicates that 3GPP 23.038 default alphabet is used and &lt;fo&gt; indicates that 3GPP 23.040 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A</p> <p>if &lt;dcs&gt; indicates that 8-bit or UCS2 data coding scheme is used, or &lt;fo&gt; indicates that 3GPP 23.040 TP-User-Data-Header-Indication is</p>

	<p>set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))</p> <p>In the case of CBS: 3GPP 23.041 CBM Content of Message in text mode responses; format:</p> <p>if &lt;dc&gt; indicates that 3GPP 23.038 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A.</p> <p>if &lt;dc&gt; indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number.</p>
<length>	Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <ldata>) in characters; or in PDU mode (+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)
<index>	Integer type; value in the range of location numbers supported by the associated memory
<oa>	3GPP 23.040 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <toa>
<pdu>	In the case of SMS: 3GPP 24.011 SC address followed by 3GPP 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: 3GPP 23.041 TPDU in hexadecimal format.
<scts>	3GPP 23.040 TP-Service-Center-Time-Stamp in time-string format (refer <dt>)
<toa>	3GPP 24.011 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)
<toa>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer<toa>)

## Example

```

AT+CMGL=? //PDU mode
+CMGL: (0-4)

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

```

OK

**AT+CMGL=4**

+CMGL: 1,2,,18

0891683108200105F011640B813118662902F40011A70441E19008

+CMGL: 2,2,,19

0891683108200105F011000D91683118662902F40018010400410042

OK

#### 4.2.4 AT+CMGR Read SMS Message

##### AT+CMGR Read SMS Message

Test Command

**AT+CMGR=?**

Response

**OK**

Write Command

**AT+CMGR=<index>**

Response

TA returns SMS message with location value <index> from message storage <mem1> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'.

If text mode (+CMGF=1) and command successful:  
for SMS-DELIVER:

**+CMGR:**

<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>

**OK**

for SMS-SUBMIT:

**+CMGR:**

<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>

**OK**

If SMS-STATUS-REPORT and text mode:

**+CMGR:** <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>

**OK**

If PDU mode (+CMGF=0) and command successful:

**+CMGR:** <stat>,[<alpha>],<length><CR><LF><pdu>

**OK**

If error is related to ME functionality:

**+CMS ERROR:** <err>

Parameter Saving Mode

NO\_SAVE

Max Response Time	5s
Reference	

### Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific
<da>	3GPP 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <toa>
<data>	In the case of SMS: 3GPP 23.040 TP-User-Data in text mode responses; format: if <dc> indicates that 3GPP 23.038 default alphabet is used and <fo> indicates that 3GPP 23.040 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A if <dc> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that 3GPP 23.040 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: 3GPP 23.041 CBM Content of Message in text mode responses; format: if <dc> indicates that 3GPP 23.038 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A. if <dc> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number.
<dc>	Depending on the command or result code: 3GPP 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<fo>	Depending on the command or result code: first octet of 3GPP 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format
<length>	Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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)
<mid>	3GPP 23.041 CBM Message Identifier in integer format
<oa>	3GPP 23.040 TP-Originating-Address Address-Value field in string

	format; BCD numbers (or GSM default alphabet characters) are converted characters of the currently selected TE character set (specified by +CSCS);; type of address given by <tooa>.
<pdu>	In the case of SMS: 3GPP 24.011 SC address followed by 3GPP 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: 3GPP 23.041 TPDU in hexadecimal format.
<sca>	3GPP 24.011 RP SC 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 (specified by +CSCS); type of address given by <tosca>
<scts>	3GPP 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
<stat>	0 "REC UNREAD" Received unread messages 1 "REC READ" Received read messages 2 "STO UNSENT" Stored unsent messages 3 "STO SENT" Stored sent messages 4 "ALL" All messages
<toda>	3GPP 24.011 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)
<tooa>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<tosca>	3GPP 24.011 RP SC address Type-of-Address octet in integer format (default refer <toda>)
<vp>	Depending on SMS-SUBMIT <fo> setting: 3GPP 23.040 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)
<mr>	Message reference. Integer format.
<ra>	Recipient address. String type.
<tora>	Type of address of <ra>. 145 International number 129 National number
<dt>	Discharge time. String format: "yy/MM/dd,hh:mm:ss+/-zz" (Year/Month/Dat,Hour:Seconds+/TimeZone)
<st>	Status of an SMS-STATUS-REPORT. Integer format.

## Example

```
AT+CMGR=?
OK
AT+CMGR=1
```

```
+CMGR: "STO UNSENT","13816692204",
ABCD

OK
```

#### 4.2.5 AT+CMGS Send SMS Message

##### AT+CMGS Send SMS Message

Test Command	Response
<b>AT+CMGS=?</b>	<b>OK</b>
Write Command	Response
1) If text mode (+CMGF=1): <b>+CMGS=&lt;da&gt;[,&lt;toda&gt;]</b> <b>&lt;CR&gt;text is entered</b> <b>&lt;ctrl-Z/ESC&gt;</b> ESC quits without sending	TA sends message from a TE to the network (SMS-SUBMIT). Message reference value <b>&lt;mr&gt;</b> is returned to the TE on successful message delivery. Optionally (when <b>+CSMS &lt;service&gt;</b> value is 1 and network supports) <b>&lt;scts&gt;</b> is returned. Values can be used to identify message upon unsolicited delivery status report result code. 1) If text mode(+CMGF=1) and sending successful: <b>+CMGS: &lt;mr&gt;</b>
2) If PDU mode (+CMGF=0): <b>+CMGS=&lt;length&gt;</b> <b>&lt;CR&gt;PDU is given</b> <b>&lt;ctrl-Z/ESC&gt;</b>	<b>OK</b> 2) If PDU mode(+CMGF=0) and sending successful: <b>+CMGS: &lt;mr&gt;</b>
	<b>OK</b> 3)If error is related to ME functionality: <b>+CMS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference	

##### Defined Values

<b>&lt;da&gt;</b>	3GPP 23.040 TP-Destination-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 (specified by <b>+CSCS</b> ); type of address given by <b>&lt;toda&gt;</b>
<b>&lt;toda&gt;</b>	3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)
<b>&lt;length&gt;</b>	Integer type value indicating in the text mode (+CMGF=1) the length of the message body <b>&lt;data&gt;</b> (or <b>&lt;cdata&gt;</b> ) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP

	layer SMSC address octets are not counted in the length)
<mr>	3GPP 23.040 TP-Message-Reference in integer format

### Example

```

AT+CMGS=?
OK
AT+CMGS="13816692204"
> 451212SFACDS#4
+CMGS: 213

OK

```

### 4.2.6 AT+CMGW Write SMS Message to Memory

AT+CMGW Write SMS Message to Memory	
Test Command <b>AT+CMGW=?</b>	Response <b>OK</b>
Write Command 1) If text mode (+CMGF=1): <b>AT+CMGW=&lt;oa/da&gt;[,&lt;toa/oda&gt;][,&lt;stat&gt;]</b> <b>&lt;CR&gt; text is entered</b> <b>&lt;ctrl-Z/ESC&gt;</b> <ESC> quits without sending  2) If PDU mode (+CMGF=0): <b>AT+CMGW=&lt;length&gt;[,&lt;stat&gt;]</b> <b>&lt;CR&gt;PDU is given</b> <b>&lt;ctrl-Z/ESC&gt;</b>	Response TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given.  If writing is successful: <b>+CMGW: &lt;index&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CMS ERROR: &lt;err&gt;</b>
Execution Command <b>AT+CMGW</b>	Response TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given.  If writing is successful: <b>+CMGW: &lt;index&gt;</b>



	<b>OK</b> If error is related to ME functionality: <b>+CMS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference	

### Defined Values

<oa>	3GPP 23.040 TP-Originating-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);type of address given by <tooa>
<da>	3GPP 23.040 TP-Destination-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 (specified by +CSCS); type of address given by <toda>
<tooa>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<toda>	3GPP 24.011 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)
<length>	Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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)
<pdu>	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.
<index>	Index of message in selected storage <mem2>

### 4.2.7 AT+CMSS Send SMS Message From Storage

AT+CMSS Send SMS Message From Storage	
Test Command <b>AT+CMSS=?</b>	Response <b>OK</b>
Write Command <b>AT+CMSS=&lt;index&gt;[,&lt;da&gt;,&lt;t</b>	Response TA sends message with location value <index> from message storage

<b>oda&gt;]</b>	<p><b>&lt;mem2&gt;</b> to the network (SMS-SUBMIT). If new recipient address <b>&lt;da&gt;</b> is given, it shall be used instead of the one stored with the message. Reference value <b>&lt;mr&gt;</b> is returned to the TE on successful message delivery. Values can be used to identify message upon unsolicited delivery status report result code.</p> <p>1) If text mode(<b>+CMGF=1</b>) and sending successful: <b>+CMSS: &lt;mr&gt;</b></p> <p><b>OK</b></p> <p>2) If PDU mode(<b>+CMGF=0</b>) and sending successful: <b>+CMSS: &lt;mr&gt;</b></p> <p><b>OK</b></p> <p>3)If error is related to ME functionality: <b>+CMS ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference	

#### Defined Values

<b>&lt;index&gt;</b>	Integer type; value in the range of location numbers supported by the associated memory
<b>&lt;da&gt;</b>	3GPP 23.040 TP-Destination-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 (specified by <b>+CSCS</b> ); type of address given by <b>&lt;toda&gt;</b>
<b>&lt;toda&gt;</b>	3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)
<b>&lt;toda&gt;</b>	3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)
<b>&lt;mr&gt;</b>	3GPP 23.040 TP-Message-Reference in integer format

#### 4.2.8 AT+CMGC Send SMS Command

AT+CMSS Send SMS Command	
Test Command	Response
<b>AT+CMGC=?</b>	<b>OK</b>
Execute command	Response

<p>1) If text mode (+CMGF=1):  <b>AT+CMGC=&lt;fo&gt;,&lt;ct&gt;[&lt;pid&gt;[,&lt;mn&gt;[,&lt;da&gt;[,&lt;toda&gt;]]]]&lt;CR&gt;</b>  <b>&gt;</b>  text is entered  <b>&lt;ctrl-Z/ESC&gt;</b>  ESC quits without sending</p> <p>2) If PDU mode (+CMGF=0):  <b>AT+CMGC=&lt;length&gt;&lt;CR&gt;</b>  <b>PDU is given &lt;ctrl-Z/ESC&gt;</b></p>	<p>TA transmits SMS Command message from a TE to the network (SMS-COMMAND). Message reference value &lt;mr&gt; is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code.</p> <p>If text mode (+CMGF=1) and sending successful:  <b>+CMGC: &lt;mr&gt;</b></p> <p><b>OK</b>  If PDU mode (+CMGF=0) and sending successful:  <b>+CMGC: &lt;mr&gt;</b></p> <p><b>OK</b>  If error is related to ME functionality:  <b>+CMS ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference	

#### Defined Values

<b>&lt;fo&gt;</b>	First octet of 3GPP 23.040 SMS-COMMAND (default 2) in integer format
<b>&lt;ct&gt;</b>	3GPP 23.040 TP-Command-Type in integer format (default 0)
<b>&lt;pid&gt;</b>	3GPP 23.040 TP-Protocol-Identifier in integer format (default 0)
<b>&lt;mn&gt;</b>	3GPP 23.040 TP-Message-Number in integer format
<b>&lt;da&gt;</b>	3GPP 23.040 TP-Destination-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 (specified by +CSCS); type of address given by <b>&lt;toda&gt;</b>
<b>&lt;toda&gt;</b>	3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)
<b>&lt;length&gt;</b>	Integer type value indicating in PDU mode ( <b>+CMGF=0</b> ), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
<b>&lt;mr&gt;</b>	3GPP 23.040 TP-Message-Reference in integer format

#### 4.2.9 AT+CNMI New SMS Message Indications

AT+CNMI New SMS Message Indications	
Test Command <b>AT+CNMI=?</b>	Response <b>+CNMI:</b> (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)  <b>OK</b>
Read Command <b>AT+CNMI?</b>	Response <b>+CNMI:</b> <mode>,<mt>,<bm>,<ds>,<bfr>  <b>OK</b>
Write Command <b>AT+CNMI=&lt;mode&gt;[,&lt;mt&gt;[,&lt;bm&gt;[,&lt;ds&gt;[,&lt;bfr&gt;]]]]</b>	Response TA selects the procedure for how the 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), message receiving should be done as specified in 3GPP 23.038.  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	<p>0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.</p> <p>1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.</p> <p style="padding-left: 20px;">2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.</p> <p>3 Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.</p>
<b>&lt;mt&gt;</b>	<p>(the rules for storing received SMS depend on its data coding scheme (refer 3GPP 23.038 [2]), preferred memory storage (+CPMS) setting and this value):</p> <p>0 No SMS-DELIVER indications are routed to the TE.</p> <p>1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: &lt;mem&gt;,&lt;index&gt;</p>

	<p>2 SMS-DELIVERs (except class 2) are routed directly to the TE using unsolicited result code:  <b>+CMT: [&lt;alpha&gt;],&lt;length&gt;&lt;CR&gt;&lt;LF&gt;&lt;pdu&gt;</b> (PDU mode enabled)  or  <b>+CMT:</b>  <b>&lt;oa&gt;,[&lt;alpha&gt;],&lt;scts&gt;[,&lt;tooa&gt;,&lt;fo&gt;,&lt;pid&gt;,&lt;dcs&gt;,&lt;sca&gt;,&lt;tosca&gt;,&lt;length&gt;]&lt;CR&gt;&lt;LF&gt;&lt;data&gt;</b> (text mode enabled; about parameters in italics, refer Command Show Text Mode Parameters +CSDH). Class 2 messages result in indication as defined in <b>&lt;mt&gt;=1</b>.</p> <p>3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <b>&lt;mt&gt;=2</b>. Messages of other classes result in indication as defined in <b>&lt;mt&gt;=1</b>.</p>
<b>&lt;bm&gt;</b>	<p>(the rules for storing received CBMs depend on its data coding scheme (refer 3GPP 23.038 [2]), the setting of Select CBM Types (+CSCB) and this value):</p> <p><u>0</u> No CBM indications are routed to the TE</p>
<b>&lt;ds&gt;</b>	<p><u>0</u> No SMS-STATUS-REPORTs are routed to the TE.</p> <p>1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: <b>+CDS: &lt;length&gt;&lt;CR&gt;&lt;LF&gt;&lt;pdu&gt;</b> (PDU mode enabled) or <b>+CDS: &lt;fo&gt;,&lt;mr&gt;[,&lt;ra&gt;][,&lt;tora&gt;],&lt;scts&gt;,&lt;dt&gt;,&lt;st&gt;</b> (text mode enabled)</p> <p>2 SMS status reports are stored and indication of memory location routed to TE using unsolicited result <b>+CDSI: "SR",&lt;index&gt;</b></p>
<b>&lt;bfr&gt;</b>	<p><u>0</u> TA buffer of unsolicited result codes defined within this Command is flushed to the TE when <b>&lt;mode&gt;</b> 1...3 is entered (OK response shall be given before flushing the codes).</p> <p>1 TA buffer of unsolicited result codes defined within this command is cleared when <b>&lt;mode&gt;</b> 1...3 is entered</p>
<b>&lt;mem&gt;</b>	<p>Memory storage (for <b>+CMTI</b> and <b>+CBMI</b> indications)</p> <p><b>"SM"</b> SMS message storage in SIM</p> <p><b>"SR"</b> status report message storage (in SIM if EF-SMR file present) or in MMI NVRAM if MMI present.</p>
<b>&lt;index&gt;</b>	<p>Integer type indicating storage location (for <b>+CMTI</b> and <b>+CBMI</b> indications)</p>

**NOTE**

- CB messages are not supported for NB-IoT.

#### 4.2.10 AT+CPMS Preferred SMS Message Storage

AT+CPMS Preferred SMS Message Storage	
Test Command <b>AT+CPMS=?</b>	Response <b>+CPMS:</b> (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)  <b>OK</b>
Read Command <b>AT+CPMS?</b>	Response <b>+CPMS:</b> <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>  <b>OK</b> or <b>ERROR</b>
Write Command <b>AT+CPMS=&lt;mem1&gt;[,&lt;mem2&gt;[,&lt;mem3&gt;]]</b>	Response TA selects memory storages <mem1>,<mem2> and <mem3> to be used for reading, writing, etc. <b>+CPMS:</b> <used1>,<total1>,<used2>,<total2>,<used3>,<total3>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<mem1>	Messages to be read and deleted from this memory storage "SM" SIM message storage "SR" Status Report message storage (EF-SMR if available on SIM). SR in SIM are only associated with SMSs stored on SIM. If EF-SMR not available and MMI is present then status reports are stored in NVRAM. In addition MMI can store status reports in NVRAM as well as ones stored on SIM (EF-SMR file), if available.
<mem2>	Messages will be written and sent to this memory storage "SM" SIM message storage
<mem3>	Received messages will be placed in this memory storage if routing to PC is not set ("+CNMI") "SM" SIM message storage
<usedx>	Integer type; Number of messages currently in <memx>
<totalx>	Integer type; Number of messages storable in <memx>

#### 4.2.11 AT+CSCA SMS Service Center Address

AT+CSCA SMS Service Center Address	
Test Command <b>AT+CSCA=?</b>	Response <b>OK</b>
Read Command <b>AT+CSCA?</b>	Response <b>+CSCA: &lt;sca&gt;,&lt;tosca&gt;</b>  <b>OK</b>
Write Command <b>AT+CSCA=&lt;sca&gt;[,&lt;tosca&gt;]</b>	Response TA updates the SMSC address, through which mobile originated SMS are transmitted. In text mode, setting is used by send and writes commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.  Note: The Command writes the parameters in NON-VOLATILE memory. <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference	

#### Defined Values

<b>&lt;sca&gt;</b>	3GPP 24.011 RP SC address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <tosca>
<b>&lt;tosca&gt;</b>	Service center address format 3GPP 24.011 RP SC address Type-of-Address octet in integer format (default refer <toda>)

#### 4.2.12 AT+CSDH Show SMS Text Mode Parameters

AT+CSDH Show SMS Text Mode Parameters	
Test Command	Response

<b>AT+CSDH=?</b>	<b>+CSDH:</b> (list of supported <show>s)  <b>OK</b>
Read Command <b>AT+CSDH?</b>	Response <b>+CSDH:</b> <show>  <b>OK</b>
Write Command <b>AT+CSDH=[&lt;show&gt;]</b>	Response TA determines whether detailed header information is shown in text mode result codes.  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;show&gt;</b>	<p>0 Do not show header values defined in commands +CSCA and +CSMP (&lt;sca&gt;,&lt;tosca&gt;,&lt;fo&gt;,&lt;vp&gt;,&lt;pid&gt; and &lt;dc&gt;) nor &lt;length&gt;,&lt;toda&gt; or &lt;toa&gt; in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode</p> <p>1 Show the values in result codes</p>
---------------------	--

#### 4.2.13 AT+CSMP Set SMS Text Mode Parameters

<b>AT+CSMP Set SMS Text Mode Parameters</b>	
Test Command <b>AT+CSMP=?</b>	Response <b>OK</b>
Read Command <b>AT+CSMP?</b>	Response <b>+CSMP:</b> <fo>,<vp>,<pid>,<dc>  <b>OK</b>
Write Command <b>AT+CSMP=[&lt;fo&gt;,&lt;vp&gt;,&lt;pid&gt;,&lt;dc&gt;]</b>	Response TA selects values for additional parameters needed when SM is sent to the network or placed in a storage when text mode is selected (+CMGF=1). It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) .  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	



## Defined Values

<fo>	<p>first octet of 3GPP 23.040 SMS-DELIVER, SMS-SUBMIT in integer format. The following fields can be modified:</p> <ul style="list-style-type: none"> <li>TP-Message-Type-Indicator (bits 0-1) (SMS-DELIVER or SMS-SUBMIT)</li> <li>TP-Reject-Duplicates (bit 2)</li> <li>TP-Validity-Period-Format (bits 3-4)</li> <li>TP-Status-Report-Request (bit 5)</li> <li>TP-User-Data-Header-Indicator (bit 6)</li> <li>TP-Reply-Path (bit 7).</li> </ul> <p>Default value is 17 (SMS-SUBMIT and Validity Period in relative format)</p> <p>When concatenated SMS is supported by MT2625, attempts to change the following fields from the default will produce an <b>ERROR</b>:</p> <ul style="list-style-type: none"> <li>TP-User-Data-Header-Indicator (bit 6) – the UDHI field is used for concatenated SMSs and is set by the Background Layer where appropriate.</li> </ul>
<vp>	3GPP 23.040 TP-Validity-Period in integer format (default 167)
<pid>	3GPP 23.040 TP-Protocol-Identifier in integer format (default 0)
<dcs>	3GPP 23.038 SMS Data Coding Scheme in Integer format (default 0 i.e. 7-bit coding).

### NOTE

- The command writes the settings <vp>,<pid> and <dcs> in SIM memory. <fo> field is not stored anywhere.
- On startup, the settings <vp>,<pid> and <dcs> are read from the SIM and used for SMS AT commands. If they cannot be found in the SIM they are set to the default values.
- The <fo> field is always set to the default value at startup.

## 4.2.14 AT+CSMS Select Message Service

### AT+CSMS Select Message Service

<p>Test Command</p> <p><b>AT+CSMS=?</b></p>	<p>Response</p> <p><b>+CSMS:</b> (list of supported &lt;service&gt;s)</p> <p><b>OK</b></p>
---	--

Read Command <b>AT+CSMS?</b>	Response <b>+CSMS: &lt;service&gt;,&lt;mt&gt;,&lt;mo&gt;,&lt;bm&gt;</b>  <b>OK</b>
Write Command <b>AT+CSMS=&lt;service&gt;</b>	Response <b>+CSMS: &lt;mt&gt;,&lt;mo&gt;,&lt;bm&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;service&gt;</b>	0 3GPP 23.040 and 23.041. 1 3GPP 23.040 and 23.041, with a requirement that a message routed directly to TE should be acknowledged via +CNMA. 128 SMS PDU mode - TPDU only used for sending/receiving SMSs
<b>&lt;mt&gt;</b>	Mobile Terminated Messages: 0 Type not supported 1 Type supported
<b>&lt;mo&gt;</b>	Mobile Originated Messages: 0 Type not supported 1 Type supported
<b>&lt;bm&gt;</b>	Broadcast Type Messages: 0 Type not supported

#### NOTE

- <service> value 128 is MediaTek proprietary
- <bm> message type is not supported

### 4.2.15 AT+CNMA New Message Acknowledgement to ME/TA

<b>AT+CNMA New Message Acknowledgement to ME/TA</b>	
Test Command <b>AT+CNMA=?</b>	Response

	<p>If PDU mode (<b>+CMGF=0</b>):</p> <p><b>+CNMA</b>: (list of supported &lt;n&gt;s)</p> <p><b>OK</b></p> <p>If Text mode (<b>+CMGF=1</b>):</p> <p><b>OK</b></p>
<p>Write Command</p> <p><b>AT+CNMA[=&lt;n&gt;[,&lt;length[&lt;C R&gt; PDU is entered &lt;CTRL-Z/ESC&gt;]]]</b></p>	<p>Response</p> <p>After SMS is routed to the TA (based on message class and +CNMI settings as defined in 27.005), TA sends acknowledgement command to the network. Note: this functionality shall be used only when +CSMS parameter &lt;service&gt; equals 1.</p> <p>If command is executed but no acknowledgement is expected, or some other error ME related error occurs:</p> <p><b>+CMS ERROR: &lt;err&gt;</b></p> <p>If PDU mode (<b>+CMGF=0</b>):</p> <p><b>OK</b></p> <p>If Text mode (<b>+CMGF=1</b>):</p> <p><b>ERROR</b></p>
<p>Execution Command</p> <p><b>AT+CNMA</b></p>	<p>Response</p> <p><b>OK</b></p> <p>If command is executed but no acknowledgement is expected, or some other error ME related error occurs:</p> <p><b>+CMS ERROR: &lt;err&gt;</b></p>
<p>Parameter Saving Mode</p>	NO_SAVE
<p>Max Response Time</p>	-
<p>Reference</p>	

### Defined Values

<n>	<p>0 Operates similarly as defined for text mode (if ME doesn't get acknowledgement within required time, ME should respond as specified in 3GPP 24.011, and ME shall automatically disable routing to TE setting both &lt;mt&gt; and &lt;ds&gt;values of CNMI to zero).</p> <p>1 Send positive acknowledgement to the network with optional PDU message</p> <p>2 Send negative acknowledgement to the network with optional PDU message</p>
<length>	Length of the optional PDU message. Integer type

## 5 AT Commands Special for SIMCom

### 5.1 Overview of AT Commands for SIMCom

Command	Description
AT+CPOWD	Power off
AT+CADC	Read ADC
AT+CLTS	Get local timestamp
AT+CBAND	Get and set mobile operation band
AT+CBANDSL	Set modem NB-IOT search prefer band list
AT+CENG	Switch on or off engineering mode
AT+CCID	Show ICCID
AT+EXUNSOL	Enable or disable proprietary unsolicited indications
AT+GSV	Display product identification information
AT*CELLLOCK	Set the list of ARFCN which needs to be locked
AT+SLEDS	Set the timer period of net light
AT+CNETLIGHT	Close the net light or open it to shining
AT+CSMINS	SIM inserted status reporting
AT+CSPCHSC	Set Scrambling Algorithm for NPDSCH
AT+CPSMSTATUS	Enable Deep Sleep Wakeup Indication
AT+CSCLK	Configure Slow Clock
AT+CRESET	Trigger WDT Reset
AT+CREVHEX	Control the Data Output Format
AT+CDISAUPDN	Control the Auto PDN Status
AT+CNWRCCFG	Network Recovery Configure
AT+CURTC	Control CCLK Show UTC Or RTC Time
AT+CHOMENW	Display Home Network Information
AT+CBATCHK	Set VBAT checking feature ON/OFF
AT+CGPIO	Control the GPIO by PIN index
AT*MEDRXCFCG	eDRX configuration
AT+CNBIOTDT	NB-IOT Data Type
AT+CNBIOTRAI	NB-IOT Release Assistance Indication
AT+ICCID	Show ICCID
AT+CTRJ	Inquire the Value of Timer 3346
AT+NIDD	Send NIDD(Non-IP Data Delivery)

**AT+CFGR1**

Indicate RI When Using URC

## 5.2 Detailed Description of AT Commands Special for SIMCom

### 5.2.1 AT+CPOWD Power Off

#### AT+CPOWD Power Off

Write Command <b>AT+CPOWD=&lt;n&gt;</b>	Response <b>[NORMAL POWER DOWN]</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<n>	0	Power off urgently (Will not send out NORMAL POWER DOWN)
	1	Normal power off (Will send out NORMAL POWER DOWN)

### 5.2.2 AT+CADC Read ADC

#### AT+CADC Read ADC

Test Command <b>AT+CADC=?</b>	Response <b>+CADC: (list of supported &lt;status&gt;s),(list of supported &lt;value&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CADC?</b>	Response <b>+CADC: &lt;status&gt;,&lt;value&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	2S
Reference	

#### Defined Values

<b>&lt;status&gt;</b>	1 Success 0 Fail
<b>&lt;value&gt;</b>	Integer 0-1400

### 5.2.3 AT+CLTS Get Local Timestamp

AT+CLTS Get Local Timestamp	
Test Command <b>AT+CLTS=?</b>	Response <b>+CLTS:</b> (list of supported <b>&lt;mode&gt;</b> s)  <b>OK</b>
Read Command <b>AT+CLTS?</b>	Response <b>+CLTS:</b> <b>&lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CLTS=&lt;mode&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b> Unsolicited Result Code <b>+CLTS: &lt;time&gt;</b>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mode&gt;</b>	0 Disable 1 Enable
<b>&lt;time&gt;</b>	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. E.g 10/05/06,00:01:52+32. If there is daylight saving time on the network then display: <b>+CLTS: 18/06/22,09:27:49+32,"DST +2 in use"</b> or <b>+CLTS: 18/06/22,09:27:49+32,"DST +1 in use"</b> .

### 5.2.4 AT+CBAND Get and Set Mobile Operation Band

### AT+CBAND Get and Set Mobile Operation Band

Test Command <b>AT+CBAND=?</b>	Response <b>+CBAND:</b> (list of supported <band>s)  <b>OK</b>
Read Command <b>AT+CBAND?</b>	Response <b>+CBAND:</b> <op_band>  <b>OK</b>
Write Command <b>AT+CBAND=&lt;op_band&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR:</b> <err>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

#### Defined Values

<op_band>	Integer value indicating current selected NB-IOT band Valid values: <band> response of test command.
<band>	Integer value indicating supported band.

### 5.2.5 AT+CBANDSL Set Modem NB-IOT Search Prefer Band List

#### AT+CBANDSL Set Modem NB-IOT Search Prefer Band List

Test Command <b>AT+CBANDSL=?</b>	Response <b>+CBANDSL:</b> (list of supported <enable>s),(list of supported <band number>s),(list of supported <band>s)  <b>OK</b>
Write Command <b>AT+CBANDSL=&lt;enable&gt;[,&lt;band number&gt;,&lt;band1&gt;,&lt;band2&gt;[,&lt;band3&gt;[,&lt;band4&gt;]]]</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR:</b> <err>
Read Command <b>AT+CBANDSL?</b>	Response <b>[+CBANDSL:</b> <band>] <b>OK</b>
Parameter Saving Mode	AUTO_SAVE

Max Response Time	-
Reference	

### Defined Values

<b>&lt;enable&gt;</b>	Integer value indicating search prefer band list enable or disable 0 Disable 1 Enable
<b>&lt;band number&gt;</b>	Integer value indicating search prefer band number. Valid values: 1,2,3,4
<b>&lt;band<i>n</i>&gt;</b>	Integer value indicating current search prefer NB-IOT band. Valid values: <b>&lt;band&gt;</b> response of test command.

### 5.2.6 AT+CENG Report Network State

#### AT+CENG Report Network State

Test Command <b>AT+CENG=?</b>	Response TA returns the list of supported modes. <b>+CENG: (list of supported &lt;mode&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CENG?</b>	Response <mode>=0 display serving cell and up to 4 neighbor cell information: <b>+CENG:</b> <b>&lt;sc_earfcn&gt;,&lt;sc_earfcn_offset&gt;,&lt;sc_pci&gt;,&lt;sc_cellid&gt;[,&lt;sc_rsrp&gt;][,&lt;sc_rsrq&gt;][,&lt;sc_rssi&gt;][,&lt;sc_snr&gt;],&lt;sc_band&gt;,&lt;sc_tac&gt;[,&lt;sc_ecl&gt;][,&lt;sc_tx_pwr&gt;][,&lt;sc_re_rsrp&gt;][&lt;CR&gt;&lt;LF&gt;+CENG:</b> <b>&lt;nc_earfcn&gt;,&lt;nc_earfcn_offset&gt;,&lt;nc_pci&gt;,&lt;nc_rsrp&gt;[...]]</b>  <b>OK</b>  <mode>=1 display data transfer information only if modem in RRC-CONNECTED state: <b>+CENG:</b> <b>&lt;RLC_UL_BLER&gt;,&lt;RLC_DL_BLER&gt;,&lt;MAC_UL_BLER&gt;,&lt;MAC_DL_BLER&gt;,&lt;MAC_UL_total_bytes&gt;,&lt;MAC_DL_total_bytes&gt;,&lt;MAC_UL_total_HARQ_TX&gt;,&lt;MAC_DL_total_HARQ_TX&gt;,&lt;MAC_UL_HARQ_re_TX&gt;,&lt;MAC_DL_HARQ_re_TX&gt;,&lt;RLC_UL_tput&gt;,&lt;RLC_DL_tput&gt;,&lt;MAC_UL_tput&gt;,&lt;MAC_DL_tput&gt;</b>



	<p><b>OK</b></p> <p>If error is related to wrong AT syntax or incorrect &lt;mode&gt; or UE in incorrect state</p> <p><b>+CME ERROR: &lt;err&gt;</b></p>
Write Command <b>AT+CENG=&lt;mode&gt;</b>	<p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<mode>	<p>Integer value indicating requested engineering information.</p> <p>0 Radio information for serving and neighbor cells</p> <p>1 Serving Cell/Neighbor Cell information</p>
<sc_earfcn>	<p>Integer value indicating the EARFCN for serving cell. Range 0-262143</p>
<sc_earfcn_offset>	<p>Integer value indicating the EARFCN offset for serving cell:</p> <p>0 Offset of -2</p> <p>1 Offset of -1</p> <p>2 Offset of -0.5</p> <p>3 Offset of 0</p> <p>4 Offset of 1</p>
<sc_pci>	<p>Integer value indicating the serving cell physical cell ID. Range 0-503.</p>
<sc_cellid>	<p>String type; four byte (28 bit) cell ID in hexadecimal format for serving cell.</p>
<sc_rsrp>	<p>Signed integer indicating serving cell RSRP value in units of dBm (can be negative value). Available only in RRC-IDLE state.</p>
<sc_rsrq>	<p>Signed integer indicating serving cell RSRQ value in units of dB (can be negative value). Available only in RRC-IDLE state.</p>
<sc_rssi>	<p>Signed integer indicating serving cell RSSI value in units of dBm (can be negative value). Available only in RRC-IDLE state.</p>
<sc_snr>	<p>Signed integer value. Last SNR value for serving cell in units of dB. Available only in RRC-IDLE state.</p>
<sc_band>	<p>Integer value; current serving cell band</p>
<sc_tac>	<p>String type; two byte tracking area code (TAC) in hexadecimal format (e.g. "00C3" equals 195 in decimal).</p>
<sc_ecl>	<p>Integer value. Last Coverage Enhanced Level (CE Level) value for serving cell. Range 0-2.</p>
<sc_tx_pwr>	<p>Signed integer value indicating current UE transmit power. Units of cBm Centibels relative to one milliwatt (can be negative value).</p>
<sc_re_rsrp>	<p>Signed integer indicating serving cell RSRP value (the modified) in</p>

	units of dBm (can be negative value). Available only in RRC-IDLE state.
<nc_earfcn>	Integer value indicating the EARFCN for neighbor cell. Range 0-262143
<nc_earfcn_offset>	Integer value indicating the EARFCN offset for neighbor cell: 0 Offset of -2 1 Offset of -1 2 Offset of -0.5 3 Offset of 0 4 Offset of 1
<nc_pci>	Integer value indicating the neighbor cell physical cell ID. Range 0-503.
<nc_rsrp>	Signed integer indicating neighbor cell RSRP value in units of dBm (can be negative value). Data Transfer Information: s
<RLC_UL_BLER>	Integer value. Represented in % value (range 0 to 100). UL block error rate (as per IRQ) in RLC. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established/resumed RRC connection or since previous AT+CENG query with <mode>=1, whichever is later. Only valid in RRC-CONNECTED state.
<RLC_DL_BLER>	Integer value Represented in % value (range 0 to 100). DL block error rate (as per ARQ) in RLC. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.
<MAC_UL_BLER>	Integer value. Represented in % value (range 0 to 100). UL block error rate (as per HARQ) in MAC for UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.
<MAC_DL_BLER>	Integer value. Represented in % value (range 0 to 100). DL block error rate (as per HARQ) in MAC for DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.  <MAC_UL_total_bytes> Integer value. Total number of transport block bytes (re)transmitted on UL-SCH. Calculated for UL-SCH over all HARQ transmissions and retransmissions. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous <b>AT+CENG</b> query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: bytes

<MAC_DL_total_bytes>	Integer value. Total number of transport block bytes (re)transmitted on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous <b>AT+CENG</b> query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: bytes
<MAC_UL_total_HARQ_TX>	Integer value. Total number of HARQ (re)transmissions for transport blocks on UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: (re)transmissions
<MAC_DL_total_HARQ_TX>	Integer value. Total number of HARQ (re)transmissions for transport blocks on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous <b>AT+CENG</b> query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: (re)transmissions
<MAC_UL_HARQ_re_TX>	Integer value. Number of HARQ retransmissions for transport blocks on UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous <b>AT+CENG</b> query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: retransmissions
<MAC_DL_HARQ_re_TX>	Integer value. Number of HARQ retransmissions for transport blocks on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous <b>AT+CENG</b> query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: retransmissions.
<RLC_UL_tput>	Integer value. RLC uplink throughput. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s
<RLC_DL_tput>	Integer value. RLC downlink throughput. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s
<MAC_UL_tput>	Integer value. UL throughput in MAC for UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s

<MAC_DL_tput>	Integer value. DL throughput in MAC for DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s
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**NOTE**

- If modem is not in RRC-CONNECTED state then +CENG will not be generated for <mode>=1. Only OK response will be generated.

### 5.2.7 AT+CCID Show ICCID

#### AT+CBANDSL Set Modem NB-IOT Search Prefer Band List

Test Command <b>AT+CCID=?</b>	Response <b>OK</b>
Execution Command <b>AT+CCID</b>	Response <b>Ccid data</b> [ex. 898600810906F8048812]  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### 5.2.8 AT+EXUNSOL Enable or Disable Proprietary Unsolicited Indications

#### AT+EXUNSOL Enable or Disable Proprietary Unsolicited Indications

Test Command <b>AT+EXUNSOL=?</b>	Response <b>+EXUNSOL:</b> (list of supported <exunsol>s)  <b>OK</b>
Write Command <b>AT+EXUNSOL=&lt;exunsol&gt;,&lt;mode&gt;</b>	Response <b>OK</b>  If <mode>=2 <b>+EXUNSOL:</b> <mode>  <b>OK</b>

	If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;exunsol&gt;</b>	String type(string should be included in quotation marks). values are currently reserved by the present document "SQ" Signal Quality Report Displays signal strength and channel bit error rate (similar to AT+CSQ) in form <b>+CSQN: &lt;rsssi&gt;,&lt;ber&gt;</b> when values change.
<b>&lt;mode&gt;</b>	0 Disable 1 Enable 2 Query

## 5.2.9 AT+GSV Display Product Identification Information

### AT+GSV Display Product Identification Information

Execution Command <b>AT+GSV</b>	Response TA returns product information text  Example: <b>SIMCOM_Ltd</b> <b>SIM7020C</b> <b>Revision: 1752B01SIM7020C</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## 5.2.10 AT\*CELLLOCK Set the List of ARFCN Which Needs to Be Locked

### AT\*CELLLOCK Set the List of ARFCN Which Needs to Be Locked

Test Command <b>AT*CELLLOCK=?</b>	Response <b>OK</b>
Read Command	Response

<b>AT*CELLLOCK?</b>	<b>*CELLLOCK: &lt;lock&gt;[,&lt;earfcn&gt;,&lt;earfcn_offset&gt;[,&lt;pci&gt;]]</b>
	<b>OK</b>
Write Command <b>AT*CELLLOCK=&lt;lock&gt;[,&lt;earfcn&gt;,&lt;earfcn_offset&gt;[,&lt;pci&gt;]]</b>	Response <b>OK</b> If error is related to wrong AT syntax or incorrect parameters. <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;lock&gt;</b>	Integer value indicating whether to activate lock, or remove lock: 0 Remove lock 1 Activate lock
<b>&lt;earfcn&gt;</b>	Integer value indicating requested EARFCN on which to lock. Range 0- 262143. Value of 0 indicates to remove any lock for EARFCN and Cell.
<b>&lt;earfcn_offset&gt;</b>	Integer value indicating requested EARFCN offset: 0 Offset of -2 1 Offset of -1 2 Offset of -0.5 3 Offset of 0 4 Offset of 1
<b>&lt;pci&gt;</b>	Integer value: Physical cell ID. Range: 0-503

### 5.2.11 AT+SLEDS Set the Timer Period of Net Light

<b>AT+SLEDS Set the Timer Period of Net Light</b>	
Test Command <b>AT+SLEDS=?</b>	Response <b>+SLEDS: (1-3),(0,40-65535),(0,40-65535)</b>  <b>OK</b>
Read Command <b>AT+SLEDS?</b>	Response <b>+SLEDS: &lt;mode&gt;,&lt;timer_on&gt;,&lt;timer_off&gt;</b>  <b>OK</b>
Write Command <b>AT+SLEDS=&lt;mode&gt;,&lt;timer_on&gt;,&lt;timer_off&gt;</b>	Response <b>OK</b> <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE

Max Response Time	-
Reference	

### Defined Values

<mode>	<ol style="list-style-type: none"> <li>1 Set the timer period of net light while SIM7020 series does not register to the network</li> <li>2 Set the timer period net light while SIM7020 series has already registered to the network</li> <li>3 Set the timer period net light while SIM7020 series is in the state of PPP communication</li> </ol>
<timer_on>	Timer period of "LED ON" in decimal format which range is 0 or 40-65535(ms)
<timer_off>	Timer period of "LED OFF" in decimal format which range is 0 or 40-65535(ms)

### NOTE

The default value is:

<mode>,<timer\_on>,<timer\_off>

1,64,800

2,64,3000

3,64,300

### 5.2.12 AT+CNETLIGHT Close the Net Light or Open it to shining

AT+CNETLIGHT Close the Net Light or Open it to shining	
Test Command <b>AT+CNETLIGHT=?</b>	Response <b>+CNETLIGHT: (0,1)</b>  <b>OK</b>
Read Command <b>AT+CNETLIGHT?</b>	Response <b>+CNETLIGHT: &lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CNETLIGHT=&lt;mode&gt;</b>	Response <b>OK</b> or <b>ERROR</b>

Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	0 Close the net light 1 Open the net light to shining
---------------------	--

## 5.2.13 AT+CSMINS SIM Inserted Status Reporting

AT+CSMINS SIM Inserted Status Reporting	
Test Command <b>AT+CSMINS=?</b>	Response <b>+CSMINS:</b> (list of supported <n>s)  <b>OK</b>
Read Command <b>AT+CSMINS?</b>	Response <b>+CSMINS:</b> <n>,<SIM inserted>  <b>OK</b>
Write Command <b>AT+CSMINS=&lt;n&gt;</b>	Response <b>OK</b> or <b>ERROR</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	A numeric parameter to show an unsolicited event code indicating whether the SIM has been inserted or removed. 0 Disable 1 Enable
<b>&lt;SIM inserted&gt;</b>	A numeric parameter which indicates whether SIM card has been inserted. 0 Not inserted 1 Inserted



### 5.2.14 AT+CSPCHSC Set Scrambling Algorithm for NPDSCH

#### AT+CSPCHSC Set Scrambling Algorithm for NPDSCH

Test Command <b>AT+CSPCHSC=?</b>	Response <b>+CSPCHSC: (0-1)</b>  <b>OK</b>
Read Command <b>AT+CSPCHSC?</b>	Response <b>+CSPCHSC: &lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CSPCHSC=&lt;mode&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax or incorrect parameters. <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mode&gt;</b>	0 Close scrambling algorithm 1 Open scrambling algorithm
---------------------	---

### 5.2.15 AT+CPSMSTATUS Enable Deep Sleep Wakeup Indication

#### AT+CPSMSTATUS Enable Deep Sleep Wakeup Indication

Test Command <b>AT+CPSMSTATUS=?</b>	Response <b>+CPSMSTATUS: (0-1)</b>  <b>OK</b>
Read Command <b>AT+CPSMSTATUS?</b>	Response <b>+CPSMSTATUS: &lt;enable&gt;</b>  <b>OK</b>
Write Command <b>AT+CPSMSTATUS=&lt;enable&gt;</b> <b>&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax or incorrect parameters. <b>ERROR</b>

Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	

### Defined Values

<enable>	<p>0 Disable indication on this channel when modem wakes up from deep sleep</p> <p>1 Enable indication on this channel when modem wakes up from Deep sleep</p>
----------	--

### 5.2.16 AT+CSCLK Configure Slow Clock

AT+CSCLK Configure Slow Clock	
Test Command <b>AT+CSCLK=?</b>	<p>Response</p> <p><b>+CSCLK:</b> (list of supported &lt;n&gt;s)</p> <p><b>OK</b></p>
Read Command <b>AT+CSCLK?</b>	<p>Response</p> <p><b>+CSCLK:</b> &lt;n&gt;</p> <p><b>OK</b></p>
Write Command <b>AT+CSCLK=&lt;n&gt;</b>	<p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	<p>0 Disable slow clock, module will not enter sleep mode.</p> <p>1 Enable slow clock, it is controlled by DTR. When DTR is high, module can enter sleep mode. When DTR changes to low level, module can quit sleep mode.</p> <p>2 Enable slow clock automatically. When there is no interrupt (on air and hardware such as GPIO interrupt or data in serial port), module can enter sleep mode. Otherwise, it will quit sleep mode.</p>
-----	--

**NOTE**

- Only UART1 can enable csclk as 1 or 2.
- There are two caveats when you want to quit sleep mode in mode 2:
  - 1, You should input some characters (at least one) to awake module
  - 2, An interval time of 100ms more is necessary between waking characters and following AT commands, otherwise the waking characters will not be discarded completely, and messy codes will be produced which may lead to UART baudrate re-adaptation.
- Scope of parameter <n> is different among SIM7020 series project, please refer to chapter 22 for details.

### 5.2.17 AT+CRESET Trigger WDT Reset

#### AT+CRESET Trigger WDT Reset

Test Command <b>AT+CRESET=?</b>	Response <b>OK</b>
Execution Command <b>AT+CRESET</b>	Response If it succeeds, the system will reboot immediately.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### 5.2.18 AT+CREVHEX Control the Data Output Format

#### AT+CREVHEX Control the Data Output Format

Test Command <b>AT+CREVHEX=?</b>	Response <b>+CREVHEX: (list of supported &lt;n&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CREVHEX?</b>	Response <b>+CREVHEX: &lt;n&gt;</b>  <b>OK</b>
Write Command <b>AT+CREVHEX=&lt;n&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax or incorrect parameters. <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-

Reference

Defined Values

<n>	0	The data output format is raw data.
	1	The data output format is hexadecimal.

### 5.2.19 AT+CDISAUPDN Control the Auto PDN Status

AT+CDISAUPDN Control the Auto PDN Status	
Test Command <b>AT+CDISAUPDN=?</b>	Response <b>+CDISAUPDN:</b> (list of supported <n>s)  <b>OK</b>
Read Command <b>AT+CDISAUPDN?</b>	Response <b>+CDISAUPDN:</b> <n>  <b>OK</b>
Write Command <b>AT+CDISAUPDN=&lt;n&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax or incorrect parameters. <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<n>	0	Disable auto PDN, should reboot the module to check.
	1	Enable auto PDN, should reboot the module to check.

### 5.2.20 AT+CNWRCCFG Network Recovery Configure

AT+CNWRCCFG Network Recovery Configure	
Test Command <b>AT+CNWRCCFG=?</b>	Response <b>+CNWRCCFG:</b> (5-28800),(5-28800),(5-28800),(5-28800),(5-28800),(5-28800)

	<b>OK</b>
Read Command <b>AT+CNWRCCFG?</b>	Response <b>+CNWRCCFG:</b> <b>&lt;recovery_internal1&gt;,&lt;recovery_internal2&gt;,&lt;recovery_internal3&gt;</b> <b>,&lt;recovery_internal4&gt;,&lt;recovery_internal5&gt;,&lt;recovery_internal6</b> <b>&gt;</b>
	<b>OK</b>
Write Command <b>AT+CNWRCCFG=&lt;recovery_internal1&gt;,&lt;recovery_internal2&gt;,&lt;recovery_internal3&gt;,&lt;recovery_internal4&gt;,&lt;recovery_internal5&gt;,&lt;recovery_internal6&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;recovery_internal1&gt;</b>	1 step network searching interval after out of service Range: 5-28800(s) Default: 5(s)
<b>&lt;recovery_internal2&gt;</b>	2 step network searching interval after out of service Range: 5-28800(s) Default: 10(s)
<b>&lt;recovery_internal3&gt;</b>	3 step network searching interval after out of service Range: 5-28800(s) Default: 10(s)
<b>&lt;recovery_internal4&gt;</b>	4 step network searching interval after out of service Range: 5-28800(s) Default: 1(s)
<b>&lt;recovery_internal5&gt;</b>	5 step network searching interval after out of service Range: 5-28800(s) Default: 120(s)
<b>&lt;recovery_internal6&gt;</b>	6 step network searching interval after out of service Range: 5-28800(s) Default: 7200(s)

### NOTE

- The config will effect after rebooting.

## 5.2.21 AT+CURTC Control CCLK Show UTC Or RTC Time

### AT+CURTC Control CCLK Show UTC Or RTC Time

Test Command <b>AT+CURTC=?</b>	Response <b>+CURTC: (0,1)</b>  <b>OK</b>
Read Command <b>AT+CURTC?</b>	Response <b>+CURTC: &lt;opt&gt;</b>  <b>OK</b>
Write Command <b>AT+CURTC=&lt;opt&gt;</b>	Response <b>+CURTC: &lt;opt&gt;</b>  <b>OK</b>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

#### Defined Values

<opt>	A numeric parameter. 0 CCLK show UTC time after network time synchronization 1 CCLK show RTC time after network time synchronization
-------	--

### 5.2.22 AT+CHOMENW Display Home Network Information

#### AT+CHOMENW Display Home Network Information

Test Command <b>AT+CHOMENW=?</b>	Response <b>OK</b>
Read Command <b>AT+CHOMENW?</b>	Response UE returns the home network information (extracted from the IMSI) in long alpha, short alpha and numeric formats. <b>+CHOMENW: &lt;oper_long&gt;,&lt;oper_short&gt;,&lt;oper_numeric&gt;</b>  <b>OK</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<oper_long>	Home operator in long alphanumeric format
<oper_short>	Home operator in short alphanumeric format
<oper_numeric>	Home operator in numeric GSM Location Area Identification number format

### 5.2.23 AT+CBATCHK Set VBAT Checking Feature ON/OFF

AT+CBATCHK Set VBAT Checking Feature ON/OFF	
Test Command <b>AT+CBATCHK=?</b>	Response <b>+CBATCHK: (0,1)</b>  <b>OK</b>
Read Command <b>AT+CBATCHK?</b>	Response <b>+CBATCHK: &lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CBATCHK=&lt;mode&gt;</b>	Response <b>OK</b> If failed: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<mode>	<u>0</u> Close the function of VBAT checking 1 Open the function of VBAT checking
--------	--

### 5.2.24 AT+CGPIO Control the GPIO by PIN Index

AT+CGPIO Control the GPIO by PIN Index	
Test Command <b>AT+CGPIO=?</b>	Response <b>+CGPIO: (0-1),(list of supported &lt;pin&gt;s),(0-1),(0-1)</b>  <b>OK</b>
Write Command <b>AT+CGPIO=&lt;operation&gt;,&lt;pin&gt;,&lt;function&gt;,&lt;level&gt;</b>	Response <b>OK</b> or

	<b>ERROR</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<b>&lt;operation&gt;</b>	0 Set the GPIO function including the GPIO output . 1 Read the GPIO level. Please note that only when the gpio is set as input, user can use parameter 1 to read the GPIO level, otherwise the module will return " <b>ERROR</b> ".
<b>&lt;pin&gt;</b>	The PIN index you want to be set. (It has relations with the hardware, please refer to the hardware manual)
<b>&lt;function&gt;</b>	Only when <b>&lt;operation&gt;</b> is set to 0, this option takes effect. 0 Set the GPIO to input 1 Set the GPIO to output
<b>&lt;level&gt;</b>	0 Set the GPIO low level 1 Set the GPIO high level

### 5.2.25 AT\*MEDRXCFCG eDRX Configuration

<b>AT*MEDRXCFCG eDRX Configuration</b>	
Test Command <b>AT*MEDRXCFCG=?</b>	Response <b>*MEDRXCFCG:</b> (list of supported <b>&lt;mode&gt;</b> s),(list of supported <b>&lt;AcT-type&gt;</b> s),(list of supported <b>&lt;Requested_eDRX_value&gt;</b> s),(list of supported <b>&lt;Requested_Paging_time_window_value&gt;</b> s)  <b>OK</b>
Read Command <b>AT*MEDRXCFCG?</b>	Response <b>[*MEDRXCFCG:</b> <b>&lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;,&lt;Requested_Paging_time_window_value&gt;][&lt;CR&gt;&lt;LF&gt;*MEDRXCFCG:</b> <b>&lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;,&lt;Requested_Paging_time_window_value&gt;</b> <b>[...]]]</b>  <b>OK</b>
Write Command <b>AT*MEDRXCFCG=[&lt;mode&gt;,&lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;,&lt;Requested_Pa</b>	Response <b>OK</b> or <b>+CME ERROR: &lt;err&gt;</b>



<code>ging_time_window_value&gt;]]</code>	
<code>]]</code>	
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<code>&lt;mode&gt;</code>	<p>Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <code>&lt;mode&gt;</code> will take effect for all specified values of <code>&lt;AcT&gt;</code>.</p> <p>0 Disable the use of eDRX  1 Enable the use of eDRX  2 Enable the use of eDRX and enable the unsolicited result code <b>+CEDRXP:</b>  <b>&lt;AcT-type&gt;[,&lt;Requested_eDRX_value&gt;[,&lt;NW-provided_eDRX_value&gt;[,&lt;Paging_time_window&gt;]]]</b>  3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</p>
<code>&lt;AcT-type&gt;</code>	<p>Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <p>0 Access technology is not using eDRX. This parameter value is only use in the unsolicited result code.  5 E-UTRAN (NB-S1 mode)</p>
<code>&lt;Requested_eDRX_value&gt;</code>	<p>String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.</p>
<code>&lt;Requested_Paging_time_window_value&gt;</code>	<p>String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008</p>
<code>&lt;NW-provided_eDRX_value&gt;</code>	<p>String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.</p>
<code>&lt;Paging_time_window&gt;</code>	<p>String type; half a byte in a 4-bit format. The paging time window</p>

refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

**NOTE**

- Only part of projects support this command, please refer to chapter 22 for details.

### 5.2.26 AT+CNBIOTDT NB-IOT Data Type

AT+CNBIOTDT NB-IOT Data Type	
Test Command <b>AT+CNBIOTDT=?</b>	Response <b>+CNBIOTDT:</b> (list of supported <b>&lt;type&gt;s</b> )  <b>OK</b>
Read Command <b>AT+CNBIOTDT?</b>	Response Displays <b>&lt;type&gt;</b> for all active PDP contexts: <b>[+CNBIOTDT: &lt;cid&gt;,&lt;type&gt;][&lt;CR&gt;&lt;LF&gt;+CNBIOTDT: &lt;cid&gt;,&lt;type&gt;]</b> <b>[...]</b>  <b>OK</b>
Write Command <b>AT+CNBIOTDT=&lt;type&gt;[,&lt;cid&gt;[,&lt;cid&gt;[...]]]</b>	Response <b>OK</b> If error is related to wrong AT syntax: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;type&gt;</b>	Integer type <u>0</u> Normal data 1 Exceptional data
---------------------	--

<b>&lt;cid&gt;</b>	Integer type. Specifies a particular PDP context definition. If no <b>&lt;cid&gt;</b> s are specified the command sets <b>&lt;type&gt;</b> for all active PDP contexts.
--------------------	--

**NOTE**

- The UE will not remember this setting over sleep cycles (i.e. the UE will fall back to default setting after sleep)

### 5.2.27 AT+CNBIOTRAI NB-IOT Release Assistance Indication

<b>AT+CNBIOTRAI NB-IOT Release Assistance Indication</b>	
Test Command <b>AT+CNBIOTRAI=?</b>	Response <b>+CNBIOTRAI:</b> (list of supported <b>&lt;rai&gt;</b> s)  <b>OK</b>
Read Command <b>AT+CNBIOTRAI?</b>	Response <b>+CNBIOTRAI:</b> <b>&lt;rai&gt;</b>  <b>OK</b>
Write Command <b>AT+CNBIOTRAI=&lt;rai&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax: <b>+CME ERROR:</b> <b>&lt;err&gt;</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;rai&gt;</b>	Integer type. Specifies release assistance information. <u>0</u> No information available (or none of the other options apply) 1 TE will send only 1 UL packet and no DL packets expected 2 TE will send only 1 UL packet and only 1 DL packet expected
--------------------	--

**NOTE**

- This command may never be required as it is likely that the TE will not

know this information.

- Modem applies specified <rai> value only to next UL packet sent by TE.
- TE will not remember this setting over sleep cycles (i.e. will fall back to default after sleep).

### 5.2.28 AT+ICCID Show ICCID

AT+ICCID Show ICCID	
Test Command <b>AT+ICCID=?</b>	Response <b>OK</b>
Execution Command <b>AT+ICCID</b>	Response <b>Ccid data</b> [ex. 898600810906F8048812]  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### 5.2.29 AT+CTRJ Inquire the Value of Timer 3346

AT+CTRJ Inquire the Value of Timer 3346	
Test Command <b>AT+CTRJ=?</b>	Response <b>OK</b>
Read Command <b>AT+CTRJ?</b>	Response <b>+CTRJ: &lt;t3346&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<t3346>	The value of Timer 3346
---------	-------------------------

#### NOTE

- Customer can use it to inquiry the value of Timer 3346, Refer to 3GPP, T3346 is sent to UE when

the base station reject the attach request from UE. While T3346 is running, the module will not send attach request after booting up until it is expired.

### 5.2.30 AT+NIDD Send NIDD(Non-IP Data Delivery)

#### AT+NIDD Send NIDD(Non-IP Data Delivery)

Write Command <b>AT+NIDD=&lt;mode&gt;,&lt;apn&gt;,&lt;send data&gt;]</b>	Response <b>OK</b>  If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mode&gt;</b>	Operation type 1 Creat NIDD 2 Send data via NIDD
<b>&lt;apn&gt;</b>	A string parameter which indicates the GPRS access point name. The max length is 32 bytes.
<b>&lt;send data&gt;</b>	The data need to send via NIDD

#### NOTE

- When <mode>=1  
The command is creat NIDD.  
Send this quickly, need before attach complete
- When<mode>=2  
The command is send data via NIDD
- When NIDD receive data there will be a URC report on serial port  
**+NIDD: 4,"id","length","index","data"**

### 5.2.31 AT+CFGRI Indicate RI When Using URC

## AT+CFGRI Indicate RI When Using URC

Test Command <b>AT+CFGRI=?</b>	Response <b>+CFGRI: (0-2)</b>  <b>OK</b>
Read Command <b>AT+CFGRI?</b>	Response <b>+CFGRI: &lt;status&gt;</b>  <b>OK</b>
Write Command <b>AT+CFGRI=&lt;status&gt;</b>	Response <b>OK</b>  If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;status&gt;</b>	<u>0</u> Off
	1 On(TCPIP, HTTP, LWM2M, COAP, ONENET, MQTT, TLS, SMS)
	2 On(only TCPIP control RI pin)

### NOTE

- The RI will be pulled down 120ms by default.

# 6 AT Command for TCPIP Application

## 6.1 Overview of AT Commands for TCPIP Application

Command	Description
AT+CSOC	Create a TCP/UDP socket
AT+CSOCON	Connect socket to remote address and port
AT+CSOB	Bind local address and local port
AT+CSOLIS	Open Listening Function of the Server
AT+RETENTION	Retention of socket scene
AT+CSOSEND	Send data to remote via socket
AT+CSODSEND	Send data to remote via socket with data mode
AT+CSOCL	Close socket
AT+CSOSENDFLAG	Set TCP send flag
AT+CSORCVFLAG	Set receive flag
AT+CSOSTATUS	Get socket status
AT+CSOACK	Query previous connection data transmitting state
AT+CSOALIVE	Set TCP keepalive parameters
AT+CSORXGET	Get Data from Network Manually
+CSONMI	Socket message arrived indicator
+CSOERR	Socket error indicator

## 6.2 Detailed Description of AT Commands for TCPIP Application

### 6.2.1 AT+CSOC Create a TCP/UDP Socket

AT+CSOC Create a TCP/UDP Socket	
Test Command AT+CSOC=?	Response +CSOC: (1-2),(1-3),(1-2)

	<b>OK</b>
Read Command <b>AT+CSOC?</b>	Response <b>OK</b> or <b>+CSOC: &lt;socket_id&gt;,&lt;domain&gt;,&lt;type&gt;,&lt;protocol&gt;[&lt;CR&gt;&lt;LF&gt;+CSOC: &lt;socket_id&gt;[...]]</b>
Write Command <b>AT+CSOC=&lt;domain&gt;,&lt;type&gt;,&lt;protocol&gt;[,&lt;cid&gt;]</b>	<b>OK</b> Response <b>+CSOC: &lt;socket_id&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;socket_id&gt;</b>	Integer socket_id. Range is 0-4.
<b>&lt;domain&gt;</b>	Integer 1 IPv4 2 IPv6
<b>&lt;type&gt;</b>	Integer 1 TCP 2 UDP 3 RAW
<b>&lt;protocol&gt;</b>	Integer 1 IP 2 ICMP
<b>&lt;cid&gt;</b>	Integer, PDP context ID, AT+CGACT response. [option]

## 6.2.2 AT+CSOCON Connect Socket to Remote Address and Port

<b>AT+CSOCON Connect Socket to Remote Address and Port</b>	
Test Command <b>AT+CSOCON=?</b>	Response <b>OK</b>
Read Command <b>AT+CSOCON?</b>	Response <b>OK</b> or If connection exist. <b>+CSOCON: &lt;socket_id&gt;,&lt;type&gt;[&lt;CR&gt;&lt;LF&gt;+CSOCON: &lt;socket_i</b>



	<b>d&gt;,&lt;type&gt;[...]</b>
	<b>OK</b>
Write Command <b>AT+CSOCON=&lt;socket_id&gt;,&lt;remote_port&gt;,&lt;remote_address&gt;</b>	Response <b>OK</b> If format is wrong or connection exists: <b>ERROR</b> If connection is failed: <b>ERROR</b>  <b>+CSOERR: &lt;socket_id&gt;,&lt;error_code&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;socket_id&gt;</b>	Integer, socket_id, response of AT+CSOC.
<b>&lt;remote_port&gt;</b>	Integer, remote port.(1-65535)
<b>&lt;remote_address&gt;</b>	String, remote address.
<b>&lt;type&gt;</b>	Integer 1 TCP 2 UDP 3 RAW
<b>&lt;error_code&gt;</b>	Reference section 5.2.16.

### 6.2.3 AT+CSOB Bind Local Address and Local Port

<b>AT+CSOB Bind Local Address and Local Port</b>	
Test Command <b>AT+CSOB=?</b>	Response <b>OK</b>
Read Command <b>AT+CSOB?</b>	Response <b>OK</b>
Write Command <b>AT+CSOB=&lt;socket_id&gt;,&lt;port&gt;[,&lt;address&gt;]</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<socket_id>	Integer type, socket_id, AT+CSOC's response.
<port>	Integer type, port,(1-65535).
<address>	String type, address.

## 6.2.4 AT+CSOLIS Open Listening Function of the Server

### AT+CSOLIS Open Listening Function of the Server

Test Command <b>AT+CSOLIS=?</b>	Response <b>OK</b>
Read Command <b>AT+CSOLIS?</b>	Response <b>OK</b>
Write Command <b>AT+CSOLIS=&lt;socket_id&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<socket_id>	Integer type, socket_id, AT+CSOC's response.
-------------	--

## 6.2.5 AT+RETENTION Retention of Socktet Scene

### AT+RETENTION Retention of Socket Scene

Test Command <b>AT+RETENTION=?</b>	Response <b>+RETENTION: (0-1)</b>  <b>OK</b>
Read Command <b>AT+RETENTION?</b>	Response <b>+RETENTION: &lt;retention_socket&gt;</b>  <b>OK</b>
Write Command <b>AT+RETENTION=&lt;retention_socket&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	

### Defined Values

<retention_socket>	Integer type 0 Not recovery scene when module exited PSM mode 1 Recovery scene when module exited PSM mode
--------------------	--

### NOTE

- AT+CPSMS should be set before this command.

## 6.2.6 AT+CSOSEND Send Data to Remote Via Socket

### AT+CSOSEND Send Data to Remote Via Socket

Test Command <b>AT+CSOSEND=?</b>	Response <b>OK</b>
Write Command <b>AT+CSOSEND=&lt;socket_id&gt; ,&lt;data_len&gt;,&lt;data&gt;</b>	Response If CSOSENDFLAG is 0. <b>OK</b> If CSOSENDFLAG is 1 and socket type is TCP. <b>OK</b> <b>SEND: &lt;socket_id&gt;,&lt;len&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<socket_id>	Integer type, socket_id, AT+CSOC's response.
<data_len>	Integer type, length of data
<data>	Raw_data, data context. Max data size is 512 bytes. If <data_len> is 0 you can send str to remote socket with double quotation, otherwise the format of data should be hex and the length must be equal to the <data_len>.
<len>	Integer type, length of data

## 6.2.7 AT+CSODSEND Send Data to Remote Via Socket With Data Mode

### AT+CSODSEND Send Data to Remote Via Socket With Data Mode

Test Command <b>AT+CSODSEND=?</b>	Response <b>OK</b>
Write Command <b>AT+CSODSEND=&lt;socket_id&gt;,&lt;data_len&gt;</b> response">", then tap data for send	Response If CSOSENDFLAG is 0. <b>DATA ACCEPT: &lt;len&gt;</b> If CSOSENDFLAG is 1 and socket type is TCP. <b>DATA ACCEPT: &lt;len&gt;</b>  <b>SEND: &lt;socket_id&gt;,&lt;len&gt;</b>
Execution Command <b>AT+CSODSEND=&lt;socket_id&gt;&gt;</b> response">", then tap data for send, tap CTRL+Z to send, tap ESC to cancel the operation	Response If CSOSENDFLAG is 0. <b>DATA ACCEPT: &lt;len&gt;</b> If CSOSENDFLAG is 1 and socket type is TCP. <b>DATA ACCEPT: &lt;len&gt;</b>  <b>SEND: &lt;socket_id&gt;,&lt;len&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;socket_id&gt;</b>	Integer type, socket_id, AT+CSOC's response.
<b>&lt;data_len&gt;</b>	Integer type, length of data
<b>&lt;len&gt;</b>	Integer type, length of data

## 6.2.8 AT+CSOCL Close Socket

### AT+CSOCL Close Socket

Test Command <b>AT+CSOCL=?</b>	Response <b>OK</b>
Write Command <b>AT+CSOCL=&lt;socket_id&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	

### Defined Values

<socket_id>	Integer socket_id, AT+CSOC's response.
-------------	--

## 6.2.9 AT+CSOSENDFLAG Set TCP Send Flag

AT+CSOSENDFLAG Set TCP Send Flag	
Test Command <b>AT+CSOSENDFLAG=?</b>	Response <b>+CSOSENDFLAG: (0,1)</b>  <b>OK</b>
Read Command <b>AT+CSOSENDFLAG?</b>	Response <b>+CSOSENDFLAG: &lt;flag&gt;</b>  <b>OK</b>
Write Command <b>AT+CSOSENDFLAG=&lt;flag&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<flag>	TCP send flag 0 Disable send flag feature 1 Enable this feature
--------	---

## 6.2.10 AT+CSORCVFLAG Set Receive Flag

AT+CSORCVFLAG Set Receive Flag	
Test Command <b>AT+CSORCVFLAG=?</b>	Response <b>+CSORCVFLAG: (0,1)</b>  <b>OK</b>

Read Command <b>AT+CSORCVFLAG?</b>	Response <b>+CSORCVFLAG: &lt;flag&gt;</b>  <b>OK</b>
Write Command <b>AT+CSORCVFLAG=&lt;flag&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;flag&gt;</b>	TCP receive flag <u>0</u> Receive data form remote socket with hex. 1 Receive data form remote socket with string
---------------------	---

### 6.2.11 AT+CSOSTATUS Get Socket Status

<b>AT+CSOSTATUS Get Socket Status</b>	
Test Command <b>AT+CSOSTATUS=?</b>	Response <b>+CSOSTATUS: (0-4)</b>  <b>OK</b>
Write Command <b>AT+CSOSTATUS=&lt;socket_id&gt;</b>	Response <b>+CSOSTATUS: &lt;socket_id&gt;,&lt;status&gt;</b>  <b>OK</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<b>&lt;socket_id&gt;</b>	Integer type, socket id, AT+CSOC's response.
<b>&lt;status&gt;</b>	Integer type. 0 None socket 1 Socket create but not connect 2 Connected

## 6.2.12 AT+CSOACK Query Previous Connection Data Transmitting State

AT+CSOACK Query Previous Connection Data Transmitting State	
Test Command <b>AT+CSOACK=?</b>	Response <b>+CSOACK: (0-4)</b>  <b>OK</b>
Write Command <b>AT+CSOACK=&lt;socket_id&gt;</b>	Response <b>+CSOACK: &lt;socket_id&gt;,&lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b>  <b>OK</b>
Execution Command <b>AT+CSOACK</b>	Response <b>+CSOACK: &lt;socket_id&gt;,&lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;[&lt;CR&gt;&lt;LF&gt;</b> <b>+CSOACK: &lt;socket_id&gt;,&lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;[...]]</b>  <b>OK</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<b>&lt;socket_id&gt;</b>	Integer type, socket id, AT+CSOC's response.
<b>&lt;txlen&gt;</b>	The data amount which has been sent
<b>&lt;acklen&gt;</b>	The data amount confirmed successfully by the server
<b>&lt;nacklen&gt;</b>	The data amount without confirmation by the server

## 6.2.13 AT+CSOALIVE Set TCP Keepalive Parameters

AT+CSOALIVE Set TCP Keepalive Parameters	
Test Command <b>AT+CSOALIVE=?</b>	Response <b>+CSOALIVE: (0-4),(0-1),(30-7200),(30-600),(1-9)</b>  <b>OK</b>
Read Command <b>AT+CSOALIVE?</b>	Response <b>+CSOALIVE:</b> <b>&lt;socket_id&gt;,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;][&lt;</b> <b>CR&gt;&lt;LF&gt; +CSOALIVE:</b> <b>&lt;socket_id&gt;,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;][</b> <b>...]]</b>

	<b>OK</b>
Write Command <b>AT+CSOALIVE=&lt;socket_id&gt; ,&lt;mode&gt;[,&lt;keepIdle&gt;[,&lt;keepInterval&gt;[,&lt;keepCount&gt;]]]</b>	Response <b>OK</b> If error is related to ME functionality: <b>ERROR</b>
Parameter Saving Mode	-
Max Response Time	-
Reference	

### Defined Values

<b>&lt;socket_id&gt;</b>	Integer type, socket id, AT+CSOC's response.
<b>&lt;mode&gt;</b>	Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism If <b>&lt;mode&gt;</b> =0, executing "AT+CSOALIVE=<socket_id>,<mode>".
<b>&lt;keepIdle&gt;</b>	Integer type; Idle time (in second) before TCP send the initial keepalive probe. 30-7200 Default: 7200
<b>&lt;keepInterval&gt;</b>	Interval time (in second) between keepalive probes retransmission. 30-600 Default: 75
<b>&lt;keepCount&gt;</b>	Integer type; Max number of keepalive probes to be sent. 1-9 Default: 9

### 6.2.14 AT+CSORXGET Get Data from Network Manually

<b>AT+CSORXGET Get Data from Network Manually</b>	
Test Command <b>AT+CSORXGET=?</b>	Response <b>+CSORXGET:</b> (list of supported <b>&lt;mode&gt;</b> s),(list of supported <b>&lt;id&gt;</b> s),(list of supported <b>&lt;reqlength&gt;</b> )  <b>OK</b>
Read Command <b>AT+CSORXGET?</b>	Response <b>+CSORXGET:</b> <b>&lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CSORXGET=&lt;mode&gt;[,&lt;id&gt;[,&lt;reqlength&gt;]]</b>	Response <b>OK</b> or <b>ERROR</b> if <b>&lt;mode&gt;</b> =1



	<p><b>+CSORXGET: 1,&lt;id&gt;</b> if &lt;mode&gt;=2 <b>+CSORXGET: 2,&lt;id&gt;,&lt;reqlength&gt;,&lt;cnflength&gt;</b> 1234567890...</p> <p><b>OK</b> if &lt;mode&gt;=3 <b>+CSORXGET: 3,&lt;id&gt;,&lt;reqlength&gt;,&lt;cnflength&gt;</b> 5151...</p> <p><b>OK</b> if &lt;mode&gt;=4 <b>+CSORXGET: 4,&lt;id&gt;,&lt;cnflength&gt;</b></p> <p><b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	<p><u>0</u> Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly.</p> <p>1 Enable getting data from network manually.</p> <p>2 The module can get data, but the length of output data can not exceed 1460 bytes at a time.</p> <p>3 Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time.</p> <p>4 Query how many data are not read with a given ID.</p>
<b>&lt;id&gt;</b>	A numeric parameter which indicates the connection number
<b>&lt;reqlength&gt;</b>	Requested number of data bytes (1-1460 bytes) to be read
<b>&lt;cnflength&gt;</b>	Confirmed number of data bytes to be read, which may be less than <length>. 0 indicates that no data can be read.

### 6.2.15 +CSONMI Socket Message arrived indicator

<b>+CSONMI Socket Message arrived indicator</b>	
	Response
	Indicated there is received some data from network.

**+CSONMI: <socket\_id>,<data\_len>,<data>**

**Defined Values**

<b>&lt;socket_id&gt;</b>	Integer socket_id,AT+CSOC's response
<b>&lt;data_len&gt;</b>	Integer, length of data
<b>&lt;data&gt;</b>	Raw_data, data context.

**6.2.16 +CSOERR Socket Error indicator**

**+CSOERR Socket Error indicator**

Response  
Indicated there is some error.  
**+CSOERR: <socket\_id>,<error\_code>**

**Defined Values**

<b>&lt;socket_id&gt;</b>	Integer socket_id,AT+CSOC's response
<b>&lt;error_code&gt;</b>	<ul style="list-style-type: none"> <li>-1 Common error</li> <li>1 Route error</li> <li>2 Connection abort error</li> <li>3 Reset error</li> <li>4 Connected error</li> <li>5 Value error</li> <li>6 Buffer error</li> <li>7 Block error</li> <li>8 Addr in use error</li> <li>9 ALR connecting error</li> <li>10 ALR connected error</li> <li>11 NETIF error</li> <li>12 PARAMETER error</li> </ul>

# 7 AT Commands for TCPIP Application to Compatible with SIM800 Serials

## 7.1 Overview of AT Commands

Command	Description
AT+CIPMUX	Start Up multi-IP connection
AT+CIPSTART	Start Up TCP or UDP connection
AT+CIPSEND	Send data through TCP or UDP connection
AT+CIPQSEND	Select data transmitting mode
AT+CIPACK	Query previous connection data transmitting state
AT+CIPCLOSE	Close TCP or UDP connection
AT+CIPSHUT	Deactivate GPRS PDP context
AT+CLPORT	Set local port
AT+CSTT	Start task and set APN, user name, password
AT+CIICR	Bring up wireless connection
AT+CIFSR	Get local IP address
AT+CIPSTATUS	Query current connection status
AT+CDNSCFG	Configure domain name server
AT+CDNSGIP	Query the IP address of given domain name
AT+CIPHEAD	Add an IP head at the beginning of a package received
AT+CIPHEXS	Show data in hex mode of a package received
AT+CIFSREX	Get local IP address
AT+CIPATS	Set auto sending timer
AT+CIPSPRT	Set prompt of '>' when module sends data
AT+CIPSERVER	Configure module as server
AT+CIPCSGP	Set CSD or GPRS for connection mode
AT+CIPSRIP	Show remote IP address and port when received data
AT+CIPSHOWTP	Display transfer protocol in IP head when received data
AT+CIPUDPMODE	UDP extended mode
AT+CIPRXGET	Get data from network manually
AT+CIPTKA	Set TCP keep alive parameters
AT+CIPMODE	Open transparent mode

**AT+CIPCHAN** Enter transparent mode

## 7.2 Detailed Descriptions of Commands

### 7.2.1 AT+CIPMUX Start Up Multi-IP Connection

#### AT+CIPMUX Start Up Multi-IP Connection

Test Command <b>AT+CIPMUX=?</b>	Response <b>OK</b>
Read Command <b>AT+CIPMUX?</b>	Response <b>+CIPMUX: &lt;n&gt;</b>  <b>OK</b>
Write Command <b>AT+CIPMUX=&lt;n&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<n>	0	Single IP connection
	1	Multi IP connection

#### Example

```
AT+CIPMUX=?
+CIPMUX: (0,1)
```

OK

```
AT+CIPMUX?
+CIPMUX: 0
```

OK

**NOTE**

- Only in IP initial state, AT+CIPMUX=1 is effective
- Only when multi IP connection and GPRS application are both shut down, AT+CIPMUX=0 is effective

## 7.2.2 AT+CIPSTART Start Up TCP or UDP Connection

### AT+CIPSTART Start Up TCP or UDP Connection

Test Command	Response
<b>AT+CIPSTART=?</b>	1) If AT+CIPMUX=0 <b>+CIPSTART: (list of supported &lt;mode&gt;),( &lt;IP address&gt;),( &lt;port&gt;)</b> <b>+CIPSTART: (list of supported &lt;mode&gt;),( &lt;domain name&gt;),( &lt;port&gt;)</b>  <b>OK</b> 2) If AT+CIPMUX=1 <b>+CIPSTART: (list of supported &lt;n&gt;),(list of supported &lt;mode&gt;),( &lt;IP address&gt;),( &lt;port&gt;)</b> <b>+CIPSTART: (list of supported &lt;n&gt;),(list of supported &lt;mode&gt;),( &lt;domain name&gt;),( &lt;port&gt;)</b>  <b>OK</b>
Write Command 1)If single IP connection (+CIPMUX=0) <b>AT+CIPSTART=&lt;mode&gt;,&lt;IP address&gt;,&lt;port&gt;</b> or <b>AT+CIPSTART=&lt;mode&gt;,&lt;domain name&gt;,&lt;port&gt;</b>  2)If multi-IP connection (+CIPMUX=1) <b>AT+CIPSTART=&lt;n&gt;,&lt;mode&gt;,&lt;address&gt;,&lt;port&gt;</b> or <b>AT+CIPSTART=&lt;n&gt;,&lt;mode&gt;,&lt;domain name&gt;,&lt;port&gt;</b> <b>AT+CIPMUX=&lt;n&gt;</b>	Response 1)If single IP connection (+CIPMUX=0) If format is right response <b>OK</b> otherwise response If error is related to ME functionality: <b>+CME ERROR &lt;err&gt;</b> Response when connection exists <b>ALREADY CONNECT</b> Response when connection is successful <b>CONNECT OK</b> Otherwise <b>STATE: &lt;state&gt;</b>  <b>CONNECT FAIL</b> 2)If multi-IP connection(+CIPMUX=1) If format is right <b>OK</b> otherwise response

	<p>If error is related to ME functionality:  <b>+CME ERROR &lt;err&gt;</b>          Response when connection exists  <b>&lt;n&gt;,ALREADY CONNECT</b>          If connection is successful  <b>&lt;n&gt;,CONNECT OK</b>          Otherwise  <b>&lt;n&gt;,CONNECT FAIL</b>  <b>OK</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	<p>When mode is multi-IP state, the max response time 75 seconds.          When mode is single state, and the state is IP INITIAL, the max response time is 160 seconds.</p>
Reference	

### Defined Values

<n>	<p>Connection number          0..5 A numeric parameter which indicates the connection number</p>
<mode>	<p>A string parameter which indicates the connection type          "TCP" Establish a TCP connection          "UDP" Establish a UDP connection</p>
<IP address>	A string parameter which indicates remote server IP address
<port>	Remote server port,(1-65535).
<domain name>	A string parameter which indicates remote server domain name
<state>	<p>A string parameter which indicates the progress of connecting</p> <p>In single IP state:</p> <p>0 IP INITIAL          1 IP START          2 IP CONFIG          3 IP GPRSACT          4 IP STATUS          5 TCP CONNECTING/UDP CONNECTING/          SERVER LISTENING          6 CONNECT OK          7 TCP CLOSING/UDP CLOSING          8 TCP CLOSED/UDP CLOSED          9 PDP DEACT</p> <p>In Multi-IP state:</p> <p>0 IP INITIAL          1 IP START          2 IP CONFIG          3 IP GPRSACT          4 IP STATUS</p>

5	IP PROCESSING
9	PDP DEACT

## Example

**AT+CIPSTART=?**

OK

+CIPSTART: ("TCP", "UDP"), ("(0-255).(0-255).(0-255).(0-255)", (1-65535))

+CIPSTART: ("TCP", "UDP"), ("DOMAIN NAME", (1-65535))

OK

### NOTE

- This command allows establishment of a TCP/UDP connection only when the state is IP\_INITIAL or IP\_STATUS or IP\_CLOSED when it is in single state. In multi-IP state, the state is in IP\_STATUS only, or, if the module is deactivating. So it is necessary to process "AT+CIPSHUT" before user establishes a TCP/UDP connection with this command when the state is not IP\_INITIAL or IP\_STATUS.
- When module is in multi-IP state, before this command is executed, it is necessary to process "AT+CSTT, AT+CIICR, AT+CIFSR".

## 7.2.3 AT+CIPSEND Send Data Through TCP or UDP Connection

### AT+CIPSEND Send Data Through TCP or UDP Connection

Test Command

**AT+CIPSEND=?**

1) For single IP connection (+CIPMUX=0)

**+CIPSEND: <length>**

OK

2) For multi IP connection (+CIPMUX=1)

**+CIPSEND: (0-5), <length>**

OK

Read Command

**AT+CIPSEND?**

1) For single IP connection (+CIPMUX=0)

**+CIPSEND: <size>**

OK

2) For multi IP connection (+CIPMUX=1)

	<p><b>+CIPSEND: &lt;n&gt;,&lt;size&gt;</b></p> <p><b>OK</b></p>
<p>Write Command</p> <p>1) If single IP connection (+CIPMUX=0) <b>AT+CIPSEND=&lt;length&gt;</b></p> <p>2) If multi IP connection (+CIPMUX=1) <b>AT+CIPSEND=&lt;n&gt;[,&lt;length&gt;]</b></p> <p>response"&gt;", then tap data for send</p>	<p>Response</p> <p>This Command is used to send changeable length data</p> <p>If single IP is connected (+CIPMUX=0)</p> <p>If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality: <b>+CME ERROR &lt;err&gt;</b></p> <p>If sending is successful:</p> <p>When +CIPQSEND=0 <b>SEND OK</b></p> <p>When +CIPQSEND=1 <b>DATA ACCEPT: &lt;length&gt;</b></p> <p>If sending fails: <b>SEND FAIL</b></p> <p>If multi IP connection is established (+CIPMUX=1)</p> <p>If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality: <b>+CME ERROR &lt;err&gt;</b></p> <p>If sending is successful:</p> <p>When +CIPQSEND=0 <b>&lt;n&gt;,SEND OK</b></p> <p>When +CIPQSEND=1 <b>DATA ACCEPT: &lt;n&gt;,&lt;length&gt;</b></p> <p>If sending fails: <b>&lt;n&gt;,SEND FAIL</b></p>
<p>Execution Command</p> <p>1)If single IP connection (+CIPMUX=0) <b>AT+CIPSEND</b></p> <p>2)If multi IP connection (+CIPMUX=1) <b>AT+CIPSEND=&lt;n&gt;</b></p> <p>response"&gt;", then tap data for send, tap CTRL+Z to send, tap ESC to cancel the operation</p>	<p>Response</p> <p>This Command is used to send changeable length data.</p> <p>If single IP connection is established (+CIPMUX=0)</p> <p>If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality: <b>+CME ERROR &lt;err&gt;</b></p> <p>If sending is successful:</p> <p>When +CIPQSEND=0 <b>SEND OK</b></p> <p>When +CIPQSEND=1 <b>DATA ACCEPT: &lt;length&gt;</b></p> <p>If sending fails: <b>SEND FAIL</b></p> <p>If multi IP connection is established (+CIPMUX=1)</p> <p>If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality: <b>+CME ERROR &lt;n&gt;,&lt;err&gt;</b></p>



	<p>If sending is successful: When +CIPQSEND=0 <b>&lt;n&gt;,SEND OK</b> When +CIPQSEND=1 <b>DATA ACCEPT: &lt;n&gt;,&lt;length&gt;</b></p> <p>If sending fails: <b>&lt;n&gt;,SEND FAIL</b></p> <p>When mode is multi-IP state, the max response time 75 seconds. When mode is single state, and the state is IP INITIAL, the max response time is 160 seconds.</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	When +CIPQSEND=0 and the remote server no response, after 645 seconds, "CLOSE" will be reported.

### Defined Values

<n>	A numeric parameter which indicates the connection number
<size>	A numeric parameter which indicates the data length sent at a time. The value of <size> is 1460 if the connection is successful; otherwise <size> is 0.
<length>	A numeric parameter which indicates the length of sending data, it must be less than <size>.

### Example

```
AT+CIPSEND=?
+CIPSEND: <length>
```

OK

```
AT+CIPSEND?
+CIPSEND: 0
```

OK

#### NOTE

- The data length which can be sent depends on network status.
- Set the time that send data automatically with the command of AT+CIPATS.
- Only send data at the status of established connection.

## 7.2.4 AT+CIPQSEND Select Data Transmitting Mode

### AT+CIPQSEND Select Data Transmitting Mode

Test Command <b>AT+CIPQSEND=?</b>	Response <b>+CIPQSEND: (0,1)</b>  <b>OK</b>
Read Command <b>AT+CIPSEND?</b>	Response <b>+CIPQSEND: &lt;n&gt;</b>  <b>OK</b>
Write Command <b>AT+CIPQSEND=&lt;n&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	<p><u>0</u> Normal mode. When the server receives TCP data, it will response <b>SEND OK</b>.</p> <p>1 Quick send mode. When the data is sent by module, it will response <b>DATA ACCEPT: &lt;length&gt;</b>(For single IP connection (+CIPMUX=0)) or <b>DATA ACCEPT: &lt;n&gt;,&lt;length&gt;</b>(For multi IP connection (+CIPMUX=1)) while not responding <b>SEND OK</b>.</p>
-----	---

### Example

```
AT+CIPQSEND=?
+CIPQSEND: (0,1)
```

```
OK
```

```
AT+CIPSEND?
+CIPSEND: 0
```

```
OK
```

## 7.2.5 AT+CIPACK Query Previous Connection Data Transmitting State

### AT+CIPACK Query Previous Connection Data Transmitting State

Test Command <b>AT+CIPACK=?</b>	Response <b>OK</b>
Write Command If in multi IP connection (+CIPMUX=1) <b>AT+CIPACK=&lt;n&gt;</b>	Response <b>+CIPACK: &lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b> <b>OK</b>
Execution Command If in single IP connection (+CIPMUX=0) <b>AT+CIPACK</b>	Response <b>+CIPACK: &lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b> <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<n>	A numeric parameter which indicates the connection number
<txlen>	The data amount which has been sent
<acklen>	The data amount confirmed successfully by the server
<nacklen>	The data amount without confirmation by the server

#### Example

**AT+CIPACK=?**

**OK**

## 7.2.6 AT+CIPCLOSE Close TCP or UDP Connection

### AT+CIPCLOSE Close TCP or UDP Connection

Test Command <b>AT+CIPCLOSE=?</b>	Response <b>OK</b>
Write Command 1) If single IP connection (+CIPMUX=0) <b>AT+CIPCLOSE=&lt;n&gt;</b>	Response 1) For single IP connection (+CIPMUX=0) <b>CLOSE OK</b> 2) For multi IP connection (+CIPMUX=1)

2) If multi IP connection (+CIPMUX=1) <b>AT+CIPCLOSE=&lt;id&gt;[,&lt;n&gt;]</b>	<b>&lt;id&gt;,CLOSE OK</b>
Execution Command <b>AT+CIPCLOSE</b>	Response If close is successfully: <b>CLOSE OK</b> If close fails: <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	Close type 0 Slow close 1 Quick close
<b>&lt;id&gt;</b>	A numeric parameter which indicates the connection number

### Example

```
AT+CIPCLOSE=?
OK
```

#### NOTE

- AT+CIPCLOSE only closes connection at corresponding status of TCP/UDP stack. To see the status use AT+CIPSTATUS command. Status should be: TCP CONNECTING, UDP CONNECTING, SERVER LISTENING or CONNECT OK in single-connection mode (see **<state>** parameter); CONNECTING or CONNECTED in multi-connection mode (see **<client state>**); OPENING or LISTENING in multi-connection mode (see **<server state>**). Otherwise it will return ERROR.

## 7.2.7 AT+CIPSHUT Deactivate GPRS PDP Context

### AT+CIPSHUT Deactivate GPRS PDP Context

Test Command <b>AT+CIPSHUT=?</b>	Response <b>OK</b>
Execution Command <b>AT+CIPSHUT</b>	Response If close is successful: <b>SHUT OK</b> If close fails: <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	65 seconds
Reference	

### Example

```
AT+CIPSHUT=?
OK
```

#### NOTE

- If this command is executed in multi-connection mode, all of the IP connection will be shut.
- User can close GPS PDP context by AT+CIPSHUT. After it is closed, the status is IP INITIAL.
- If "+PDP: DEACT" URC is reported which means the GPRS is released by the network, then user still needs to execute "AT+CIPSHUT" command to make PDP context come back to original state.

### 7.2.8 AT+CLPORT Set Local Port

#### AT+CLPORT Set Local Port

Test Command <b>AT+CLPORT=?</b>	Response 1) For single IP connection (+CIPMUX=0) <b>+CLPORT: ("TCP", "UDP"),(0-65535)</b>  <b>OK</b> 2) For multi IP connection (+CIPMUX=1) <b>+CLPORT: (0-5),("TCP", "UDP"),(0-65535)</b>  <b>OK</b>
Read Command <b>AT+CLPORT?</b>	Response 1) For single IP connection (+CIPMUX=0) <b>+CLPORT: &lt;TCP port&gt;,&lt;UDP port&gt;</b>

	<p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)</p> <p><b>+CLPORT: 0,&lt;TCP port&gt;,&lt;UDP port&gt;</b></p> <p><b>+CLPORT: 1,&lt;TCP port&gt;,&lt;UDP port&gt;</b></p> <p><b>+CLPORT: 2,&lt;TCP port&gt;,&lt;UDP port&gt;</b></p> <p><b>+CLPORT: 3,&lt;TCP port&gt;,&lt;UDP port&gt;</b></p> <p><b>+CLPORT: 4,&lt;TCP port&gt;,&lt;UDP port&gt;</b></p> <p><b>+CLPORT: 5,&lt;TCP port&gt;,&lt;UDP port&gt;</b></p>
	<b>OK</b>
Write Command	Response
1) For single IP connection (+CIPMUX=0)	<b>OK</b>
<b>AT+CLPORT=&lt;mode&gt;,&lt;port&gt;</b>	If set fail
<b>&gt;</b>	<b>ERROR</b>
2) For multi IP connection (+CIPMUX=1)	
<b>AT+CLPORT=&lt;n&gt;,&lt;mode&gt;,&lt;port&gt;</b>	
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;n&gt;</b>	0..5 A numeric parameter which indicates the connection number this used in multi IP connection
<b>&lt;mode&gt;</b>	A string parameter which indicates the connection type "TCP" TCP local port "UDP" UDP local port
<b>&lt;port&gt;</b>	A numeric parameter which indicates the local port. A port can be dynamically allocated a port. If users want to set a port, the value is 1-65535. <u>0</u> -65535 Port number

### Example

```
AT+CLPORT=?
+CLPORT: ("TCP","UDP"),(0-65535)
```

OK

**AT+CLPORT?**

**+CLPORT: 0,0**

**OK**

**NOTE**

- This command will be effective when module is set as a client.

**7.2.9 AT+CSTT Start Task and Set APN,USER NAME,PASSWORD**

**AT+CSTT Start Task and Set APN,USER NAME,PASSWORD**

Test Command <b>AT+CSTT=?</b>	Response <b>+CSTT: "APN", "USER", "PWD"</b>  <b>OK</b>
Read Command <b>AT+CSTT?</b>	Response <b>+CSTT: &lt;apn&gt;, &lt;user name&gt;, &lt;password&gt;</b>  <b>OK</b>
Write Command <b>AT+CSTT=&lt;apn&gt;, &lt;user name&gt;, &lt;password&gt;</b>	Response <b>OK</b> If set fail <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Execution Command <b>AT+CSTT</b>	Response <b>OK</b> or <b>ERROR</b>
Reference	

**Defined Values**

<b>&lt;apn&gt;</b>	A string parameter which indicates the GPRS access point name. The max length is 32 bytes. Default value is "ctnb".(option)
<b>&lt;user name&gt;</b>	A string parameter which indicates the GPRS user name. The max length is 32 bytes.(option)
<b>&lt;password&gt;</b>	A string parameter which indicates the GPRS password. The max

length is 32 bytes.(option)

### Example

**AT+CSTT=?**

+CSTT: "APN","USER","PWD"

OK

**AT+CSTT?**

+CSTT: "", "", ""

OK

#### NOTE

- The write command and execution command of this command is valid only at the state of IP INITIAL. After this command is executed, the state will be changed to IP START.

### 7.2.10 AT+CIICR Bring Up Wireless Connection

#### AT+CIICR Bring Up Wireless Connection

Test Command	Response
<b>AT+CIICR=?</b>	<b>OK</b>
Execution Command	Response
<b>AT+CIICR</b>	<b>OK</b> If bring up fail <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	85 seconds
Reference	

### Example

**AT+CIICR=?**

OK



**NOTE**

- AT+CIICR only activates moving scene at the status of IP START, after operating this Command is executed, the state will be changed to IP CONFIG.
- After module accepts the activated operation, if it is activated successfully, module state will be changed to IP GPRSACT, and it responds OK, otherwise it will respond **ERROR**.

## 7.2.11 AT+CIFSR Get Local IP Address

### AT+CIFSR Get Local IP Address

Test Command <b>AT+CIFSR=?</b>	Response <b>OK</b>
Execution Command <b>AT+CIFSR</b>	Response <b>&lt;IP address&gt;</b> If get fail <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;IP address&gt;</b>	A string parameter which indicates the IP address assigned from GPRS or CSD.
---------------------------	--

### Example

```
AT+CIFSR=?
OK
```

**NOTE**

- Only after PDP context is activated, local IP address can be obtained by AT+CIFSR, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be: IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in

single-connection mode (see <state> parameter);  
IP STATUS, IP PROCESSING in multi-connection mode (see <state> parameter).

## 7.2.12 AT+CIPSTATUS Query Current Connection Status

AT+CIPSTATUS Query Current Connection Status	
Test Command <b>AT+CIPSTATUS=?</b>	Response <b>OK</b>
Write Command If multi IP connection mode (+CIPMUX=1) <b>AT+CIPSTATUS=&lt;n&gt;</b>	Response <b>+CIPSTATUS:</b> <b>&lt;n&gt;,&lt;bearer&gt;,&lt;TCP/UDP&gt;,&lt;IPaddress&gt;,&lt;port&gt;,&lt;client state&gt;</b>  <b>OK</b>
Execution Command <b>AT+CIPSTATUS</b>	Response 1) If in single connection mode (+CIPMUX=0) <b>OK</b>  <b>STATE: &lt;state&gt;</b> 2) If in multi-connection mode (+CIPMUX=1) <b>OK</b>  <b>STATE: &lt;state&gt;</b> If the module is set as server <b>S: 0,&lt;bearer&gt;,&lt;port&gt;,&lt;server state&gt;</b> If the module is set as client <b>C: &lt;n&gt;,&lt;bearer&gt;,&lt;TCP/UDP&gt;,&lt;IP address&gt;,&lt;port&gt;,&lt;client state&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	0-5 A numeric parameter which indicates the connection number
<bearer>	1 GPRS bearer, default is null
<server state>	Server state OPENING LISTENING CLOSING
<client state>	Client state

	INITIAL CONNECTING CONNECTED REMOTE CLOSING CLOSING CLOSED
<b>&lt;server state&gt;</b>	A string parameter which indicates the progress of connecting 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 TCP CONNECTING/UDP CONNECTING /SERVER LISTENING 6 CONNECT OK 7 TCP CLOSING/UDP CLOSING 8 TCP CLOSED/UDP CLOSED 9 PDP DEACT In Multi-IP state: 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 IP PROCESSING 9 PDP DEACT

### Example

```
AT+CIPSTATUS=?
OK
```

### 7.2.13 AT+CDNSCFG Configure Domain Name Server

AT+CDNSCFG Configure Domain Name Server	
Test Command <b>AT+CDNSCFG=?</b>	Response <b>+CDNSCFG: ("Primary DNS"),("Secondary DNS")</b>  <b>OK</b>
Read Command <b>AT+CDNSCFG?</b>	Response <b>PrimaryDns: &lt;pri_dns&gt;</b>

	<b>SecondaryDns: &lt;sec_dns&gt;</b>
	<b>OK</b>
Write Command <b>AT+CDNSCFG=&lt;pri_dns&gt;[,&lt;sec_dns&gt;]</b>	Response <b>OK</b> <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;pri_dns&gt;</b>	A string parameter which indicates the IP address of the primary domain name server. Default value is 208.67.222.222.
<b>&lt;sec_dns&gt;</b>	A string parameter which indicates the IP address of the secondary domain name server. Default value is 0.0.0.0. When you are on the network, <pri_dns><sec_dns> will use the DNS server address from the network, and the default DNS server address if the network is not.

## Example

```
AT+CDNSCFG=?
+CDNSCFG: ("Primary DNS"),("Secondary DNS")
```

OK

```
AT+CDNSCFG?
```

```
PrimaryDns: 114.114.114.114
```

```
SecondaryDns: 119.29.29.29
```

OK

### 7.2.14 AT+CDNSGIP Query the IP Address of Given Domain Name

#### AT+CDNSGIP Query the IP Address of Given Domain Name

Test Command <b>AT+CDNSGIP=?</b>	Response <b>OK</b>
Write Command <b>AT+CDNSGIP=&lt;domain name&gt;</b>	Response <b>OK</b> If query fail

	<p><b>ERROR</b></p> <p>If successful, return:  <b>+CDNSGIP: 1,&lt;domain name&gt;,&lt;IP1&gt;[,&lt;IP2&gt;]</b></p> <p>If fail, return:  <b>+CDNSGIP: 0,&lt;dns error code&gt;</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<domain name>	A string parameter which indicates the domain name.
<IP1>	A string parameter which indicates the first IP address corresponding to the domain name.
<IP2>	A string parameter which indicates the second IP address corresponding to the domain name.
<dns error code>	<p>A numeric parameter which indicates the error code</p> <p>8 DNS COMMON ERROR</p> <p>3 NETWORK ERROR</p> <p>There are some other error codes as well.</p>

### Example

```
AT+CDNSGIP=?
OK
```

### 7.2.15 AT+CIPHEAD Add an IP Head at the Beginning of a Package Received

#### AT+CIPHEAD Add an IP Head at the Beginning of a Package Received

Test Command <b>AT+CIPHEAD=?</b>	<p>Response</p> <p><b>+CIPHEAD:</b> (list of supported &lt;mode&gt;s)</p> <p><b>OK</b></p>
Read Command <b>AT+CIPHEAD?</b>	<p>Response</p> <p><b>+CIPHEAD:</b> &lt;mode&gt;</p> <p><b>OK</b></p>
Write Command <b>AT+CIPHEAD=&lt;mode&gt;</b>	<p>Response</p> <p><b>OK</b></p>

	or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;mode&gt;</b>	<p>A numeric parameter which indicates whether an IP header is added to the received data or not.</p> <p><u>0</u> Not add IP header 1 Add IP header, the format is:</p> <p>1) For single IP connection (+CIPMUX=0) <b>+IPD,&lt;data length&gt;:</b> 2) For multi IP connection (+CIPMUX=1) <b>+RECEIVE,&lt;n&gt;,&lt;data length&gt;:</b></p>
---------------------	---

## Example

```
AT+CIPHEAD=?
+CIPHEAD: (0-NO HEADER,1-ADD HEADER)

OK
```

### 7.2.16 AT+CIPHEXS Show Data in Hex Mode of a Package Received

#### AT+CIPHEXS Show Data in Hex Mode of a Package Received

Read Command <b>AT+CIPHEXS?</b>	Response <b>+CIPHEXS: &lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CIPHEXS=&lt;mode&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<mode>	<p>A numeric parameter which indicates whether show data in hex mode or not.</p> <p>0-1 Not show data in hex mode.</p> <p>2 Show data in hex mode.</p> <p>While AT+CIPHEAD=1, if&lt;mode&gt;=1 or 2: add 0d0a at the end of data.</p>
--------	---

## Example

**AT+CIPHEXS?**

**+CIPHEXS: 0**

**OK**

### NOTE

- The command is effective only if AT+CIPRXGET=0.

## 7.2.17 AT+CIFSREX Get Local IP Address

### AT+CIFSREX Get Local IP Address

Test Command <b>AT+CIFSREX=?</b>	Response <b>OK</b>
Execution Command <b>AT+CIFSREX</b>	Response <b>+CIFSREX: &lt;IP address&gt;</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<IP address>	A string parameter which indicates the IP address assigned from GPRS or CSD.
--------------	--

### Example

```
AT+CIFSREX=?
OK
```

#### NOTE

- The command is effective only if AT+CIPRXGET=0.
- Only after PDP context is activated, local IP address can be obtained by AT+CIFSREX, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be: IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in single-connection mode (see <state> parameter); IP STATUS, IP PROCESSING in multi-connection mode (see <state> parameter).

## 7.2.18 AT+CIPATS Set Auto Sending Time

### AT+CIPATS Set Auto Sending Time

Test Command <b>AT+CIPATS=?</b>	Response <b>+CIPATS:</b> (list of supported <mode>s),(list of supported <time>)  <b>OK</b>
Read Command <b>AT+CIPATS?</b>	Response <b>+CIPATS:</b> <mode>,<time>  <b>OK</b>
Write Command <b>AT+CIPATS=&lt;mode&gt;[,&lt;time&gt;]</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	



## Defined Values

<IP address>	A numeric parameter which indicates whether set timer when module is sending data <u>0</u> Not set timer when module is sending data 1 Set timer when module is sending data
<time>	A numeric parameter which indicates the seconds after which the data will be sent. If <mode> is 1, <time> is 1-100. otherwise <time> is 0.

## Example

**AT+CIPATS=?**

**+CIPATS: (0-NOT AUTO SEND,1-AUTO SEND),(1-100)**

**OK**

**AT+CIPATS=?**

**+CIPATS: 0,0**

**OK**

### 7.2.19 AT+CIPSPRT Set Prompt of '>' When Module Sends Data

#### AT+CIPSPRT Set Prompt of '>' When Module Sends Data

Test Command <b>AT+CIPSPRT=?</b>	Response <b>+CIPSPRT: (list of supported &lt;send prompt&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CIPSPRT?</b>	Response <b>+CIPSPRT: &lt;send prompt&gt;</b>  <b>OK</b>
Write Command <b>AT+CIPSPRT=&lt;send prompt&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;send prompt&gt;</b>	<p>A numeric parameter which indicates whether to echo prompt '&gt;' after module issues AT+CIPSEND command.</p> <p>0 It shows "send ok" but does not prompt echo '&gt;' when sending is successful.</p> <p>1 It prompts echo '&gt;' and shows "send ok" when sending is successful.</p> <p>2 It neither prompts echo '&gt;' nor shows "send ok" when sending is successful.</p>
----------------------------	--

### Example

```
AT+CIPSPRT=?
+CIPSPRT: (0,1,2)
```

OK

```
AT+CIPSPRT?
+CIPSPRT: 1
```

OK

### 7.2.20 AT+CIPCSGP Set CSD or GPRS for Connection Mode

#### AT+CIPCSGP Set CSD or GPRS for Connection Mode

<p>Test Command</p> <pre>AT+CIPCSGP=?</pre>	<p>Response</p> <pre>+CIPCSGP: 0-CSD,DIALNUMBER,USER NAME,PASSWORD, RATE(0-3) +CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD</pre> <p>OK</p>
<p>Read Command</p> <pre>AT+CIPCSGP?</pre>	<p>Response</p> <pre>+CIPCSGP: &lt;mode&gt;,&lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;[,&lt;rate&gt;]</pre> <p>OK</p>
<p>Write Command</p> <pre>AT+CIPCSGP=&lt;mode&gt;[,&lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;],(&lt;dial number&gt;,&lt;user name&gt;,&lt;password&gt;,&lt;rate&gt;]</pre>	<p>Response</p> <p>OK or ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>

Max Response Time	-
Reference	

### Defined Values

<mode>	A numeric parameter which indicates the wireless connection mode 0 Set CSD as wireless connection mode <u>1</u> Set GPRS as wireless connection mode
<apn>	A string parameter which indicates the access point name
<use name>	A string parameter which indicates the user name
<password>	A string parameter which indicates the password CSD parameters.
<dial number>	A string parameter which indicates the CSD dial numbers
<user name>	A string parameter which indicates the CSD user name
<password>	A string parameter which indicates the CSD password
<rate>	A numeric parameter which indicates the CSD connection rate 0 2400 1 4800 <u>2</u> 9600 3 14400

### Example

```
AT+CIPSPRT=?
+CIPSPRT: (0,1,2)
```

OK

```
AT+CIPSPRT?
+CIPSPRT: 1
```

OK

### 7.2.21 AT+CIPSRIP Show Remote IP Address and Port When Received Data

#### AT+CIPSRIP Show Remote IP Address and Port When Received Data

Test Command	Response
<b>AT+CIPSRIP=?</b>	<b>+CIPSRIP: (list of supported &lt;mode&gt;s)</b>
	<b>OK</b>
Read Command	Response

<b>AT+CIPSRIP?</b>	<b>+CIPSRIP: &lt;mode&gt;</b>
	<b>OK</b>
Write Command <b>AT+CIPSRIP=&lt;mode&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	A numeric parameter which shows remote IP address and port. <u>0</u> Do not show the prompt 1 Show the prompt, the format is as follows: 1) For single IP connection (+CIPMUX=0) <b>+RECV FROM: &lt;IP ADDRESS&gt;:&lt;PORT&gt;</b> 2) For multi IP connection (+CIPMUX=1) <b>+RECEIVE,&lt;n&gt;,&lt;data length&gt;,&lt;IP ADDRESS&gt;:&lt;PORT&gt;</b>
---------------------	--

### Example

```

AT+CIPSRIP=?
+CIPSRIP: (0,1)

OK

AT+CIPSRIP?
+CIPSRIP: 0

OK

```

### 7.2.22 AT+CIPSHOWTP Display Transfer Protocol in IP Head When Received Data

<b>AT+CIPSHOWTP Display Transfer Protocol in IP Head When Received Data</b>	
Test Command <b>AT+CIPSHOWTP=?</b>	Response <b>+CIPSHOWTP: (list of supported &lt;mode&gt;s)</b>
	<b>OK</b>

Read Command <b>AT+CIPSHOWTP?</b>	Response <b>+CIPSHOWTP: &lt;mode&gt;</b>  <b>OK</b>
Write Command <b>AT+CIPSHOWTP=&lt;mode&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<mode>	A numeric parameter which indicates whether to display transfer protocol in IP header to received data or not <u>0</u> Not display transfer protocol 1 Display transfer protocol, the format is "+IPD,<data size>,<TCP/UDP>:<data>"
--------	---

### Example

**AT+CIPSHOWTP=?**

**+CIPSHOWTP: (0,1)**

**OK**

**AT+CIPSHOWTP?**

**+CIPSHOWTP: 0**

**OK**

#### NOTE

- This command will be effective only in single connection mode (+CIPMUX=0).
- Only when +CIPHEAD is set to 1, the setting of this command will work.

## 7.2.23 AT+CIPUDPMODE UDP Extended Mode

AT+CIPUDPMODE UDP Extended Mode	
Test Command <b>AT+CIPUDPMODE=?</b>	Response 1) For single IP connection (+CIPMUX=0) <b>+CIPUDPMODE: (0-2),("0-255).(0-255).(0-255).(0-255)",(0-65535)</b>  <b>OK</b> 2) For multi IP connection (+CIPMUX=1) <b>+CIPUDPMODE:(0-5),(0-2),("0-255).(0-255).(0-255).(0-255)",(0-65535)</b>  <b>OK</b>
Read Command <b>AT+CIPUDPMODE?</b>	Response 1) For single IP connection (+CIPMUX=0) <b>+CIPUDPMODE: &lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b>  <b>OK</b> 2) For multi IP connection (+CIPMUX=1) <b>+CIPUDPMODE: 0,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b> <b>+CIPUDPMODE: 1,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b> <b>+CIPUDPMODE: 2,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b> <b>+CIPUDPMODE: 3,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b> <b>+CIPUDPMODE: 4,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b> <b>+CIPUDPMODE: 5,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b>  <b>OK</b>
Write Command 1) For single IP connection (+CIPMUX=0) <b>AT+CIPUDPMODE=&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b> 2) For multi IP connection (+CIPMUX=1) <b>AT+CIPUDPMODE=&lt;n&gt;,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<n>	A numeric parameter which indicates the connection number.
-----	--

	0-5
<mode>	Mode type 0 UDP Normal Mode 1 UDP Extended Mode 2 Set UDP address to be sent
<IP address>	A string parameter which indicates remote IP address
<port>	Remote port. Default value is 0, if users want to set a port; the value is 1-65535.

### Example

**AT+CIPUDPMODE=?**

**+CIPUDPMODE: (0-2),("0-255).(0-255).(0-255).(0-255)","(0-65535)**

OK

**AT+CIPUDPMODE?**

**+CIPUDPMODE: 0**

OK

### 7.2.24 AT+CIPRXGET Get Data from Network Manually

#### AT+CIPRXGET Get Data from Network Manually

Test Command <b>AT+CIPRXGET=?</b>	Response If single IP connection (+CIPMUX=0) <b>+CIPRXGET: (list of supported &lt;mode&gt;s),(list of supported &lt;reqlength&gt;)</b>  OK If multi IP connection (+CIPMUX=1) <b>+CIPRXGET: (list of supported &lt;mode&gt;s),(list of supported &lt;id&gt;s),(list of supported &lt;reqlength&gt;)</b>  OK
Read Command <b>AT+CIPRXGET?</b>	Response <b>+CIPRXGET: &lt;mode&gt;</b>  OK
Write Command 1) If single IP connection (+CIPMUX=0)	Response OK or

**AT+CIPRXGET=<mode>[,<reqlength>]**

2) If multi IP connection (+CIPMUX=1)

**AT+CIPRXGET=<mode>[,<id>[,<reqlength>]]**

**ERROR**

1)For single IP connection

If "AT+CIPSRIP=1" is set, IP address and port are contained.

if <mode>=1

**+CIPRXGET: 1[,<IP ADDRESS>:<PORT>]**

if <mode>=2

**+CIPRXGET: 2,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]**

1234567890...

**OK**

if <mode>=3

**+CIPRXGET: 3,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]**

5151...

**OK**

if <mode>=4

**+CIPRXGET: 4,<cnflength>**

**OK**

2)For multi IP connection

If "AT+CIPSRIP=1" is set, IP address and port is contained.

if <mode>=1

**+CIPRXGET: 1,<id>[,<IP ADDRESS>:<PORT>]**

if <mode>=2

**+CIPRXGET: 2,<id>,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]**

1234567890...

**OK**

if <mode>=3

**+CIPRXGET: 3,<id>,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]**

5151...

**OK**

if <mode>=4

**+CIPRXGET: 4,<id>,<cnflength>**

**OK**

If error is related to ME functionality:

**+CME ERROR: <err>**

Parameter Saving Mode NO\_SAVE

Max Response Time -



Reference

**Defined Values**

<b>&lt;mode&gt;</b>	<p><u>0</u> Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly.</p> <p>1 Enable getting data from network manually.</p> <p>2 The module can get data, but the length of output data can not exceed 1460 bytes at a time.</p> <p>3 Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time.</p> <p>4 Query how many data are not read with a given ID.</p>
<b>&lt;id&gt;</b>	A numeric parameter which indicates the connection number
<b>&lt;reqlength&gt;</b>	Requested number of data bytes (1-1460 bytes) to be read
<b>&lt;cnflength&gt;</b>	Confirmed number of data bytes to be read, which may be less than <length>. 0 indicates that no data can be read.

**Example**

```
AT+CIPRXGET=?
+CIPRXGET: (0-4),(1-1460)
```

OK

```
AT+CIPRXGET?
+CIPRXGET: 0
```

OK

**NOTE**

- To enable this function, parameter <mode> must be set to 1 before connection.

**7.2.25 AT+CIPTKA Set TCP Keepalive Parameters**

**AT+CIPTKA Set TCP Keepalive Parameters**

Test Command	Response
<b>AT+CIPTKA=?</b>	If single IP connection (+CIPMUX=0)

	<p><b>+CIPTKA:</b> (list of supported <b>&lt;mode&gt;s</b>),(list of supported <b>&lt;keepIdle&gt;s</b>),(list of supported <b>&lt;keepInterval&gt;</b>),(list of supported <b>&lt;keepCount&gt;s</b>)</p> <p>If multi IP connection (+CIPMUX=1)</p> <p><b>+CIPTKA:</b> (list of supported <b>&lt;id&gt;s</b>),(list of supported <b>&lt;mode&gt;s</b>),(list of supported <b>&lt;keepIdle&gt;s</b>),(list of supported <b>&lt;keepInterval&gt;</b>),(list of supported <b>&lt;keepCount&gt;s</b>)</p> <p><b>OK</b></p>
Read Command <b>AT+CIPTKA?</b>	<p>Response</p> <p>If single IP connection (+CIPMUX=0)</p> <p><b>+CIPTKA: &lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p>If multi IP connection (+CIPMUX=1)</p> <p><b>+CIPTKA: 0,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p><b>+CIPTKA: 1,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p><b>+CIPTKA: 2,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p><b>+CIPTKA: 3,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p><b>+CIPTKA: 4,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p><b>+CIPTKA: 5,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b></p> <p><b>OK</b></p>
Write Command 1)If single IP connection (+CIPMUX=0) <b>AT+CIPTKA=&lt;mode&gt;[,&lt;keepIdle&gt;[,&lt;keepInterval&gt;[,&lt;keepCount&gt;]]]</b> 2) If multi IP connection (+CIPMUX=1) <b>AT+CIPTKA=&lt;n&gt;,&lt;mode&gt;[,&lt;keepIdle&gt;[,&lt;keepInterval&gt;[,&lt;keepCount&gt;]]]</b>	<p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>ERROR</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;n&gt;</b>	A numeric parameter which indicates the connection 0-5
<b>&lt;mode&gt;</b>	Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism
<b>&lt;keepIdle&gt;</b>	Integer type; Idle time (in second) before TCP send the initial

	keepalive probe. 30-7200 Default: 7200
<keepInterval>	Interval time (in second) between keepalive probes retransmission. 30-600 Default: 75
<keepCount>	Integer type; Max number of keepalive probes to be sent. 1-9 Default: 9

### Example

**AT+CIPTKA=?**

+CIPTKA: (0-1),(30-7200),(30-600),(1-9)

OK

**AT+CIPTKA?**

+CIPTKA: 0

OK

#### NOTE

- If <keepIdle>,<keepInterval> and <keepCount> is not set, module will use the default values when <mode>=1.

### 7.2.26 AT+CIPMODE Open Transparent Mode

#### AT+CIPMODE Open Transparent Mode

Test Command <b>AT+CIPMODE=?</b>	Response <b>+CIPMODE: (0-NORMAL MODE,1-TRANSPARENT MODE)</b>  <b>OK</b>
Read Command <b>AT+CIPMODE?</b>	Response <b>+CIPMODE: &lt;mode&gt;</b>  <b>OK</b>
Execution Command <b>AT+CIPMODE=&lt;mode&gt;</b>	Response <b>OK</b> If set fail <b>ERROR</b>

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<mode>	Transparent mode
	0 Disable transparent mode
	1 Enable transparent mode

## Example

```
AT+CIPMODE=?
+CIPMODE: (0-NORMAL MODE,1-TRANSPARENT MODE)
```

OK

```
AT+CIPMODE?
+CIPMODE: 0
```

OK

### NOTE

- The execution command of this command is valid only activates moving scene at the status of IP\_INITIAL or IP\_CLOSED
- The execution command of this command is valid only for single connection

## 7.2.27 AT+CIPCHAN Enter Transparent Mode

### AT+CIPCHAN Enter Transparent Mode

Test Command	Response
<b>AT+CIPCHAN=?</b>	<b>OK</b>
Execution Command	Response
<b>AT+CIPCHAN</b>	<b>CONNECT</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	

## Defined Values

<mode>	Transparent mode
	0 Disable transparent mode
	1 Enable transparent mode

## Example

```
AT+CIPCHAN=?  
OK
```

### NOTE

- This command is executed in single-connection mode.
- Before execute this command, "AT+CIPMODE=1" must be executed and the connection must be established successfully.
- When module is in transparent mode, if user tapped "+++", module would exit transparent mode.
- When user tapped "+++" to exit transparent mode, user can execute the command of "ATO" to return transparent mode.

# 8 AT Commands for HTTP(S) Application

## 8.1 Overview of AT Commands for HTTP(S) Application

Command	Description
<b>AT+CHTTPCREATE</b>	Create a HTTP client instance
<b>AT+CHTTPCREATEEXT</b>	Create a HTTPS client instance by multi packages for a long size command
<b>AT+CHTTPCON</b>	Establish the HTTP(S) connection
<b>AT+CHTTPDISCON</b>	Close the HTTP(S) connection
<b>AT+CHTTPDESTROY</b>	Destroy the HTTP(S) client instance
<b>AT+CHTTPSEND</b>	Send HTTP(S) package
<b>AT+CHTTPSENDEXT</b>	Send HTTP(S) package by multi packages for a long size command
<b>AT+CHTTPPARA</b>	Set parameter for AT command of AT+CHTTPSEND
<b>AT+CHTTPTOFS</b>	Download File to Module System
<b>AT+CHTTPCLRMULCRTBUF</b>	Clear multi create buffer of AT+CHTTPCREATEEXT
<b>AT+CHTTPCLRMULSNDBUF</b>	Clear multi send buffer of AT+CHTTPSENDEXT
<b>AT+CHTTPRESUMESSEND</b>	Set resume send package or not when HTTP(S) disconnected
<b>+CHTTPNMIH</b>	Header of the response from host
<b>+CHTTPNMIC</b>	Content of the response from host
<b>+CHTTPERR</b>	HTTP(S) client connection error indicator
<b>+CHTTPTOFS</b>	HTTP(S) download indicate from host
<b>+CHTTPTOFSOK</b>	HTTP(S) download finished indicate

## 8.2 Detailed Descriptions of AT Commands for HTTP(S) Application

### 8.2.1 AT+CHTTPCREATE Create a HTTP Client Instance

#### AT+CHTTPCREATE Create a HTTP Client Instance

Read Command <b>AT+CHTTPCREATE?</b>	Response <b>+CHTTPCREATE: &lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;[&lt;CR&gt;&lt;LF&gt;</b> <b>+CHTTPCREATE: &lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;</b> <b>[...]]</b>  <b>OK</b>
Write Command <b>AT+CHTTPCREATE=&lt;host&gt;[</b> <b>,&lt;auth_user&gt;,&lt;auth_passw</b> <b>ord&gt;</b>	Response Create an HTTP or HTTPS client instance and set configuration. If the <host> is start with "https://", our device will create an HTTPS client. <b>+CHTTPCREATE: &lt;httpclient_id&gt;</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<host>	HTTP server host
<auth_user>	Authorization name [option]
<auth_password>	Authorization password [option]
<httpclient_id>	An indicator of HTTP client instance created by the command.
<state>	The create state of the httpclient_id 1 Successfully 0 Failed

### Example

#### **AT+CHTTPCREATE?**

```
+CHTTPCREATE: 0,0,(null)
+CHTTPCREATE: 1,0,(null)
+CHTTPCREATE: 2,0,(null)
+CHTTPCREATE: 3,0,(null)
+CHTTPCREATE: 4,0,(null)
```

**OK**

#### NOTE

- All optional parameter should be exist or not exist in one command.

## 8.2.2 AT+CHTTPCREATEEXT Create a HTTPS Client Instance by Multi Packages for a Long Size Command

### AT+CHTTPCREATEEXT Create a HTTPS Client Instance by Multi Packages for a Long Size Command

Read Command <b>AT+CHTTPCREATEEXT?</b>	Response <b>+CHTTPCREATEEXT: &lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;[&lt;CR&gt;&lt;LF&gt; +CHTTPCREATEEXT: &lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt; [...]]</b>  <b>OK</b>
Write Command <b>AT+CHTTPCREATEEXT=&lt;flag&gt;,&lt;total_len&gt;,&lt;len&gt;,&lt;host&gt;[&lt;auth_user&gt;,&lt;auth_password&gt;,&lt;server_cert_len&gt;,&lt;server_cert&gt;,&lt;client_cert_len&gt;,&lt;client_cert&gt;,&lt;client_pk_len&gt;,&lt;client_pk&gt;]</b>	Response Create an HTTP or HTTPS client instance and set configuration. If the <host> is start with "https://", our device will create an HTTPS client. <b>+CHTTPCREATEEXT: &lt;httpclient_id&gt;</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<flag>	1 Means there are more packages, 0 Means this package is the last one
<total_len>	The total length of the command
<len>	The length of current package
<host>	HTTP server host
<auth_user>	Authorization name [option]
<auth_password>	Authorization password [option]
<server_cert_len>	Server certification length, for https [option]
<server_cert>	Server certification, for https [option]
<client_cert_len>	Client certification length, for https [option]
<client_cert>	Client certification, for https [option]
<client_pk_len>	Client private key length, for https [option]
<client_pk>	Client private key, for https [option]



<httpclient_id>	An indicator of HTTP client instance created by the command.
<state>	The create state of the httpclient_id 1 Successfully 0 Failed

### Example

#### AT+CHTTPCREATEEXT?

```
+CHTTPCREATEEXT: 0,0,(null)
+CHTTPCREATEEXT: 1,0,(null)
+CHTTPCREATEEXT: 2,0,(null)
+CHTTPCREATEEXT: 3,0,(null)
+CHTTPCREATEEXT: 4,0,(null)
```

OK

#### NOTE

- All optional parameter should be exist or not exist in one command.

### 8.2.3 AT+CHTTPCON Establish the HTTP(S) Connection

#### AT+CHTTPCON Establish the HTTP(S) Connection

Test Command <b>AT+CHTTPCON=?</b>	Response <b>+CHTTPCON: (0-4)</b>  <b>OK</b>
Read Command <b>AT+CHTTPCON?</b>	Response <b>+CHTTPCON: &lt;httpclient_id&gt;,&lt;con_state&gt;,&lt;host&gt;[&lt;CR&gt;&lt;LF&gt;</b> <b>+CHTTPCON: &lt;httpclient_id&gt;,&lt;con_state&gt;,&lt;host&gt;</b> <b>[...]]</b>  <b>OK</b>
Write Command <b>AT+CHTTPCON=&lt;httpclient_id&gt;</b>	Response Use the created HTTP instance to connect to target host. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<httpclient_id>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command.
<con_state>	The connected state of the httpclient_id 1 OK 0 FAIL
<host>	HTTP server host

## Example

```
AT+CHTTPCON=?
+CHTTPCON: (0-4)
```

OK

```
AT+CHTTPCON?
+CHTTPCON: 0,0,(null)
+CHTTPCON: 1,0,(null)
+CHTTPCON: 2,0,(null)
+CHTTPCON: 3,0,(null)
+CHTTPCON: 4,0,(null)
```

OK

### NOTE

- AT+CHTTPCREATE should be set before this command.

## 8.2.4 AT+CHTTPDISCON Close the HTTP(S) Connection

### AT+CHTTPDISCON Close the HTTP(S) Connection

Test Command <b>AT+CHTTPDISCON=?</b>	Response <b>+CHTTPDISCON: (0-4)</b>  <b>OK</b>
Write Command	Response

<b>AT+CHTTPDISCON=&lt;httpcli ent_id&gt;</b>	Use the created HTTP instance to disconnect the connection with host. After disconnected and before destroy the HTTP instance, you can use AT+CHTTPCON to connect it again. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<httpclient_id>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command.
-----------------	--

### Example

```
AT+CHTTPDISCON=?
+CHTTPDISCON: (0-4)
```

```
OK
```

#### NOTE

- AT+CHTTPCON should be set before this command.

## 8.2.5 AT+CHTTPDESTROY Destroy the HTTP(S) Client Instance

### AT+CHTTPDESTROY Destroy the HTTP(S) Client Instance

Test Command <b>AT+CHTTPDESTROY=?</b>	Response <b>+CHTTPDESTROY: (0-4)</b>  <b>OK</b>
Read Command <b>AT+CHTTPDESTROY?</b>	Response <b>+CHTTPDESTROY:</b> <b>&lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;[&lt;CR&gt;&lt;LF&gt;+CHTTPDESTROY:</b> <b>&lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;</b>

	[...]]
	<b>OK</b>
Write Command <b>AT+CHTTPDESTROY=&lt;http client_id&gt;</b>	Response Use the created HTTP instance to disconnect the connection with host. <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<httpclient_id>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command.
<state>	The create state of the httpclient_id 1 Successfully 0 Failed
<host>	HTTP server host

### Example

```
AT+CHTTPDESTROY=?
+CHTTPDESTROY: (0-4)

OK
```

#### NOTE

- AT+CHTTPCREATE should be set before this command

## 8.2.6 AT+CHTTPSEND Send HTTP(S) Package

### AT+CHTTPSEND Send HTTP(S) Package

Test Command	Response
--------------	----------

<b>AT+CHTTPSEND=?</b>	<b>+CHTTPSEND:</b> <b>(0-4),(0-3),"path","http header","http content type","http content"</b>
	<b>OK</b>
Write Command <b>AT+CHTTPSEND=&lt;httpclient_id&gt;,&lt;method&gt;,&lt;path&gt;,&lt;customer_header&gt;,&lt;content_type&gt;,&lt;content_string&gt;]</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;httpclient_id&gt;</b>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command.
<b>&lt;method&gt;</b>	HTTP method 0 HTTPCLIENT_GET 1 HTTPCLIENT_POST 2 HTTPCLIENT_PUT 3 HTTPCLIENT_DELETE
<b>&lt;path&gt;</b>	The resource path on server, ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html".
<b>&lt;customer_header&gt;</b>	The string converted from customer header hex data.
<b>&lt;content_type&gt;</b>	A string indicates the content type of the content, if the method is not POST and PUT, it must be empty.
<b>&lt;content_string&gt;</b>	The string converted from content hex data.

### Example

```
AT+CHTTPSEND=?
+CHTTPSEND: (0-4),(0-3),"path","http header","http content type","http content"
OK
```

#### NOTE

- AT+CHTTPCON should be set before this command

## 8.2.7 AT+CHTTPSENDEXT Send HTTP(S) Package by Multi Packages for a Long Size Command

### AT+CHTTPSENDEXT Send HTTP(S) Package by Multi Packages for a Long Size Command

Test Command <b>AT+CHTTPSENDEXT=?</b>	Response <b>+CHTTPSENDEXT:</b> (0-1),"total_len","current_len",(0-4),(0-3),"path_len","path", "header_len","header","content_type_len","content_type","content_string_len","content_string"  OK
Write Command <b>AT+CHTTPSENDEXT=&lt;flag&gt;,&lt;total_len&gt;,&lt;len&gt;,&lt;httpclient_id&gt;,&lt;method&gt;,&lt;path_len&gt;,&lt;path&gt;,&lt;customer_header_len&gt;,&lt;customer_header&gt;,&lt;content_type_len&gt;,&lt;content_type_len&gt;,&lt;content_string_len&gt;,&lt;content_string&gt;</b>	Response OK or ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<flag>	1 Means there are more packages 0 Means this package is the last one
<total_len>	The total length of the command
<len>	The length of current package
<httpclient_id>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command.
<method>	HTTP method 0 HTTPCLIENT_GET 1 HTTPCLIENT_POST 2 HTTPCLIENT_PUT 3 HTTPCLIENT_DELETE
<path_len>	length of path
<path>	The resource path on server, ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html".

<customer_header_len>	Length of customer_header
<customer_header>	The string converted from customer header hex data.
<content_type_len>	The length of Content_type
<content_type>	A string indicate the content type of the content, if the method is not POST and PUT, it must be empty.
<content_string_len>	The length of Content_string
<content_string>	The string converted from content hex data.

## Example

**AT+CHTTPSENDEXT=?**

**+CHTTPSENDEXT:**

(0-1),"total\_len","current\_len",(0-4),(0-3),"path\_len","path","header\_len","header","content\_type\_len","content\_type","content\_string\_len","content\_string"

OK

### NOTE

- AT+CHTTPCON should be set before this command

## 8.2.8 AT+CHTTPPARA Set Parameter for AT Command of AT+CHTTPSEND

### AT+CHTTPPARA Set Parmeter for AT Command of AT+CHTTPSEND

Test Command <b>AT+CHTTPPARA=?</b>	Response <b>+CHTTPPARA: (0-1)</b>  <b>OK</b>
Read Command <b>AT+CHTTPPARA?</b>	Response <b>+CHTTPPARA: &lt;value&gt;</b>  <b>OK</b>
Write Command <b>AT+CHTTPPARA=&lt;value&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

## Defined Values

<value>	<p>The parameter for sending</p> <p>1 Can send AT+CHTTPSEND continuously</p> <p>0 Can not send AT+CHTTPSEND continuously, until the server response</p>
---------	---

## Example

**AT+CHTTPPARA=?**

**+CHTTPPARA: (0-1)**

**OK**

**AT+CHTTPPARA?**

**+CHTTPPARA: 0**

**OK**

### NOTE

- Use this command for setting send parameter, so that you can send "AT+CHTTPSEND" continuously, and no care of the response.

## 8.2.9 AT+CHTTPTOFS Download File to Module System

### AT+CHTTPTOFS Download File to Module System

<p>Test Command</p> <p><b>AT+CHTTPTOFS=?</b></p>	<p>Response</p> <p><b>+CHTTPTOFS: (0-4),"path"</b></p> <p><b>OK</b></p>
<p>Write Command</p> <p><b>AT+CHTTPTOFS=&lt;httpclient_id&gt;,&lt;path&gt;</b></p>	<p>Response</p> <p>Use the created HTTP instance to connect to target host.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>
<p>Parameter Saving Mode</p>	<p><b>NO_SAVE</b></p>



Max Response Time	-
Reference	

### Defined Values

<httpclient_id>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command
<path>	The resource path on server, it should begin with "/". ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html".

### Example

```
AT+CHTTPTOFS=?
+CHTTPTOFS: (0-4),"path"
OK
```

#### NOTE

- AT+CHTTPCON should be set before this command.

### 8.2.10 AT+CHTTPCLRMULCRTBUF Clear Multi Create Buffer of AT+CHTTPCREATEEXT

#### AT+CHTTPCLRMULCRTBUF Clear Multi Create Buffer of AT+CHTTPCREATEEXT

Execution Command	Response
<b>AT+CHTTPCLRMULCRTBU F</b>	<b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### NOTE

- Clear multi create buffer of AT+CHTTPCREATEEXT. When you do not AT+CHTTPCREATEEXT

the last package, but you want to AT+CHTTPCREATEEXT the new command, you can AT+CHTTPCLRMULCRTBUF.

### 8.2.11 AT+CHTTPCLRMULSNDBUF Clear Multi Send Buffer of AT+CHTTPSENDEXT

#### AT+CHTTPCLRMULSNDBUF Clear Multi Send Buffer of AT+CHTTPSENDEXT

Execution Command <b>AT+CHTTPCLRMULSNDBUF</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### NOTE

- Clear multi send buffer of AT+CHTTPSENDEXT. When you do not AT+CHTTPSENDEXT the last package, but you want to AT+CHTTPSENDEXT the new command, you can AT+CHTTPCLRMULSNDBUF.

### 8.2.12 AT+CHTTPRESUMESSEND Set Resume Send Package or not when HTTP(S) Disconnected

#### AT+CHTTPRESUMESSEND Set Resume Send Package or not when HTTP(S) Disconnected

Test Command <b>AT+CHTTPRESUMESSEND=?</b>	Response <b>+CHTTPRESUMESSEND: (0-1)</b>  <b>OK</b>
Read Command <b>AT+CHTTPRESUMESSEND?</b>	Response <b>+CHTTPRESUMESSEND: &lt;value&gt;</b>  <b>OK</b>
Write Command <b>AT+CHTTPRESUMESSEND=&lt;value&gt;</b>	Response <b>OK</b> or

	<b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;value&gt;</b>	<p>Resume send package or not when HTTP disconnected.</p> <p>1 Can resume send packages by AT+CHTTPSENDEXT when HTTP disconnected</p> <p>0 Cannot resume send packages by AT+CHTTPSENDEXT when HTTP disconnected. Once HTTP disconnected, multi send buffer of AT+CHTTPSENDEXT is cleared automatically, you should always AT+CHTTPSENDEXT the first package</p>
----------------------	--

## Example

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

```
OK
```

### 8.2.13 +CHTTPNMIH Header of the Response from Host

#### +CHTTPNMIH Header of the Response from Host

	<p>Response</p> <p>The response from host has 2 parts. This is the header part and content part will follow this URC.</p> <p><b>+CHTTPNMIH:</b></p> <p><b>&lt;httpclient_id&gt;,&lt;response_code&gt;,&lt;header_length&gt;,&lt;header&gt;</b></p>
--	--

## Defined Values

<b>&lt;httpclient_id&gt;</b>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command
<b>&lt;response_code&gt;</b>	<p>The HTTP response code</p> <p>100 Continue</p> <p>101 Switching Protocols</p> <p>200 OK</p>

	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 Time-out
	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 Time-out
	505 HTTP Version not supported
<b>&lt;header_length&gt;</b>	The length (buffer size) of the header string
<b>&lt;header&gt;</b>	Header data of response

### 8.2.14 +CHTTPNMIC Content of The Response from Host

## +CHTTPNMIC Content of The Response from Host

Response

The response from host has 2 parts. This is the content part and follows by the header part URC. And there are multi content URC follow one header URC.

**+CHTTPNMIC:**

**<httpclient\_id>,<flag>,<total\_length><content\_package\_len>,<content\_package\_string>**

### Defined Values

<b>&lt;httpclient_id&gt;</b>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command
<b>&lt;flag&gt;</b>	The flag to indicate if there are more data of the HTTP content. 1 Means there are more packages 0 Means this package is the last one
<b>&lt;total_length&gt;</b>	The total length of the content. It is get from header "Content-Length: xxx", so if the response is not 200 OK, maybe the value is -1.
<b>&lt;content_package_len&gt;</b>	Content data length of current URC.
<b>&lt;content_package_string&gt;</b>	Content data string which is converted from content hex data. The length must be original content hex data size/2.

### 8.2.15 +CHTTPERR HTTP(S) Client Connection Error Indicator

#### +CHTTPERR HTTP Client Connection Error Indicator

Response

When the URC send, there is some error happen on the HTTP client. Normally is TCP connection is disconnected.

**+CHTTPERR: <httpclient\_id>[,<error\_code>]**

### Defined Values

<b>&lt;httpclient_id&gt;</b>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command
<b>&lt;error_code&gt;</b>	-1 Means disconnected -2 Connection was closed by a remote host. -3 An unknown error occurred. -4 A protocol error occurred. -5 Could not resolve the hostname. -6 A URL parse error occurred.

If the URC send out, the HTTP client will be disconnected automatically. If user want to send HTTP message to server, he must use AT+CHTTPCON command to connect.

### 8.2.16 +CHTTPTOFS HTTP(S) Download Indicate from Host

#### +CHTTPTOFS HTTP(S) Download Indicate from Host

Response  
 HTTP download progress indicate  
**+CHTTPTOFS: <httpclient\_id>,<flag>,<content\_len>,<len>**

#### Defined Values

<httpclient_id>	The indicator of HTTP(S) client instance created by the AT+CHTTPCREATE command
<flag>	The flag to indicate if there are more data of the HTTP content 1 Means there are more packages 0 Means this package is the last one
<content_len>	Total length of content data
<len>	The length of all downloaded content data

### 8.2.17 +CHTTPTOFSOK HTTP(S) Download Finished Indicate

#### +CHTTPTOFSOK HTTP Download Finished Indicate

Response  
**+CHTTPTOFSOK: <httpclient\_id>,<contend\_len>,<len>**

#### Defined Values

<httpclient_id>	The indicator of HTTP client instance created by the AT+CHTTPCREATE command
<content_len>	Total length of content data
<len>	The length of all downloaded content data

# 9 AT Commands for PING Application

## 9.1 Overview of AT Commands for PING Application

Command	Description
<b>AT+CIPPING</b>	Test IP network connectivity to a remote host

## 9.2 Detailed Descriptions of AT Commands for PING Application

### 9.2.1 AT+CIPPING Test IP Network Connectivity to A Remote Host

<b>AT+CIPPING Test IP Network Connectivity to A Remote Host</b>	
Test Command <b>AT+CIPPING=?</b>	Response <b>+CIPPING:</b> (list of supported <retryNum>s),(list of supported <dataLen>s),(list of supported <timeout>s)  OK
Read Command <b>AT+CIPPING?</b>	Response <b>+CIPPING:</b> <retryNum>,<dataLen>,<timeout>  OK
Write Command <b>AT+CIPPING=&lt;IPaddr&gt;[,&lt;retryNum&gt;[,&lt;dataLen&gt;[,&lt;timeout&gt;]]]</b>	Response OK <b>+CIPPING:</b> <replyId>,<Ip Address>,<replyTime>,<ttl>[<CR><LF>+CIPPING: <replyId>,<Ip Address>,<replyTime>,<ttl> [...]] or BUSY (When previous command unfinished, AT+CIPPING again) or ERROR

	or <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<IPAddr>	IP address of the remote host, string type.
<retryNum>	The number of Ping Echo Request to send 1-100 Default: 4
<dataLen>	The length of Ping Echo Request data 0-5120 Default: 32
<timeout>	The timeout, in units of 100ms, waiting for a single Echo Reply 1-600 Default: 100(10 seconds)
<replyId>	Echo Reply number
<IP Address>	IP Address of the remote host
<replyTime>	Time, in units of 100ms, required to receive the response
<tTl>	Time to live

## Example

**AT+CIPPING=?**

**+CIPPING: (1-100),(0-5120),(1-600)**

OK

**AT+CIPPING?**

**+CIPPING: 4,32,100**

OK

### NOTE

- Before sending PING Request the PDP context must be activated.
- When the Echo Request timeout expires (no reply received on time), the response will contains **<replyTime>** setting to 100(default timeout)



# 10 AT Commands for LwM2M Application

## 10.1 Overview of AT Commands for LwM2M Application

Command	Description
<b>AT+CLMCONF</b>	Configure LwM2M instance and create the connection
<b>AT+CLMADDOBJ</b>	Add LwM2M object
<b>AT+CLMDELOBJ</b>	Delete LwM2M object
<b>AT+CLMREAD</b>	Read notification and command
<b>AT+CLMWRITE</b>	Write notification and command
<b>AT+CLMEXECUTE</b>	Execute notification and command
<b>AT+CLMNOTIFY</b>	Notify data change
<b>AT+CLMDEL</b>	Delete LwM2M instance
<b>+CLMOBSERVE</b>	Indicated an observe command
<b>+CLMPARAMETER</b>	Indicated an observer's parameter
<b>+CLMERR</b>	Indicated there are some errors

## 10.2 Detailed Descriptions of AT Commands for LwM2M Application

### 10.2.1 AT+CLMCONF Configure LwM2M Instance and Create the Connection

<b>AT+CLMCONF Configure LwM2M Instance and Create the Connection</b>	
Write Command <b>AT+CLMCONF=&lt;ip_addr&gt;,&lt;port&gt;,&lt;local_port&gt;,&lt;name&gt;,&lt;domain&gt;,&lt;lifetime&gt;[,&lt;pskid&gt;,&lt;psk&gt;][,&lt;binding_mode&gt;]</b>	Response <b>+CLMCONF: &lt;lwm2m_id&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference

**Defined Values**

<ip_addr>	String, LwM2M server IP address.
<port>	Integer, LwM2M server port.
<local_port>	Integer, local port.
<name>	String, Username for show in server.
<domain>	String, specifies the type of packet data protocol: IPv4 Internet Protocol (IETF STD 5) IPv6 Internet Protocol, version 6 (IETF RFC 2460).
<lifetime>	Integer, lifetime to register LwM2M server. The unit is second.
<pskid>	String, Mandatory for DTLS register.
<psk>	String, Mandatory for DTLS register.
<binding_mode>	Integer, binding mode supported by LwM2M client/server. 1 UDP mode 2 UDP queue mode

**10.2.2 AT+CLMADDOBJ Add LwM2M Object**

**AT+CLMADDOBJ Add LwM2M Object**

Write Command	Response
<b>AT+CLMADDOBJ=&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_count&gt;,&lt;resource_id&gt;,&lt;resource_id&gt;,...</b>	<b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

**Defined Values**

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response. Range is 0-32.
<object_id>	Integer, object id. range is 0-65535.
<instance_id>	Integer, instance id. Range is 0-32.
<resource_count>	Integer, resource count. Range is 0-32.
<resource_id>	Integer, resource id. Range is 0-32.

**NOTE**

- AT+CLMCONF should be set before this command.

### 10.2.3 AT+CLMDELOBJ Delete LwM2M Object

#### AT+CLMDELOBJ Delete LwM2M Object

Write Command <b>AT+CLMDELOBJ=&lt;lwm2m_id&gt;,&lt;object_id&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;lwm2m_id&gt;</b>	Integer, LwM2M id, AT+CLMCONF's response.
<b>&lt;object_id&gt;</b>	Integer, object id.

**NOTE**

- AT+CLMADDOBJ should be set before this command.

### 10.2.4 AT+CLMREAD Read Notification and Command

#### AT+CLMREAD Read Notification and Command

Write Command <b>AT+CLMREAD=&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_cnt&gt;,&lt;resource_id&gt;,&lt;value_type&gt;,&lt;len&gt;,&lt;value&gt;,&lt;resource_id&gt;,&lt;value_type&gt;,&lt;len&gt;,&lt;resource_id&gt;,&lt;value_type&gt;,&lt;len&gt;</b>	Response This command used to indicated there is received a read operation. And then using this command to send the read operation result. <b>OK</b> <b>+CLMREAD:</b> <b>&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;count&gt;,&lt;resource_id&gt;,&lt;resource_id&gt;,&lt;resource_id&gt;</b>
---	---

<value>,...	
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response.
<object_id>	Integer, object id.
<instance_id>	Integer, instance id.
<resource_cnt>	Integer, if it is 0, means all readable resources of the instance.
<resource_id>	Integer, if count is 0, the resource id is not exist.
<value_type>	Char, value type. I Integer F Float B Boolean D UINT8 array data S String
<len>	Integer, value length.
<value>	Value type, value context.

### 10.2.5 AT+CLMWRITE Write Notification and Command

#### AT+CLMWRITE Write Notification and Command

Write Command <b>AT+CLMWRITE=&lt;lwm2m_id&gt;,&lt;result&gt;</b>	Response This command used to indicated there is received a write operation. And then using this command to send the write operation result. <b>OK</b>  <b>+CLMWRITE:</b> <b>&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_cnt&gt;,&lt;resource_id&gt;,&lt;value_type&gt;,&lt;len&gt;,&lt;value&gt;,&lt;resource_id&gt;,&lt;value_type&gt;,&lt;len&gt;,&lt;value&gt;,&lt;resource_id&gt;,&lt;value_type&gt;,&lt;len&gt;,&lt;value&gt;,...</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response.
<result>	I Integer, write result, result of write command, error code. 0 Success Other value is error code in Spec.
<object_id>	Integer, object id.
<instance_id>	Integer, instance id.
<resource cnt>	Integer, if resource_id==-1, there will be set count.
<resource_id>	Integer, resource id. -1 All of resource about the instance.
<value_type>	Char, value type. I Integer F Float B Boolean D UINT8 array data S String
<len>	Integer, value length.
<value>	Value type, value context.

## 10.2.6 AT+CLMEXECUTE Execute Notification and Command

### AT+CLMEXECUTE Execute Notification and Command

Write Command <b>AT+CLMEXECUTE=&lt;lwm2m_id&gt;,&lt;result&gt;</b>	Response This command used to indicated there is received a execute operation. And then using this command to send the execute operation result. <b>OK</b>  <b>+CLMEXECUTE:</b> <b>&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_id&gt;,&lt;len&gt;,&lt;buffer&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response.
<result>	Integer, result of write command, error code. 0 Success Other value is error code in Spec.

<object_id>	Integer, object id.
<instance_id>	Integer, instance id.
<resource_id>	Integer, resource id. -1 All of resource about the instance.
<len>	Integer, data size.
<buffer>	Raw data in hex value but char format, execute command.

### 10.2.7 AT+CLMNOTIFY Notify Data Change

AT+CLMNOTIFY Notify Data Change	
Write Command <b>AT+CLMNOTIFY=&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_id&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response
<object_id>	Integer, object id
<instance_id>	Integer, instance id
<resource_id>	Integer, resource id

### 10.2.8 AT+CLMDEL Delete LwM2M Instance

AT+CLMDEL Delete LwM2M Instance	
Write Command <b>AT+CLMDEL=&lt;lwm2m_id&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response
------------	--

### 10.2.9 +CLMOBSERVE Indicated an observe command

#### +CLMOBSERVE Indicated an observe command

	<p>Response</p> <p>This command used to indicated there is received an observe command.</p> <p><b>+CLMOBSERVE:</b></p> <p>&lt;lwm2m_id&gt;,&lt;code&gt;,&lt;object_id&gt;[,&lt;instance_id&gt;],&lt;resource_id&gt;</p>
--	---

#### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response.
<code>	Integer, 0 Add observe 1 Cancel observe
<object_id>	Integer, object id.
<instance_id>	Integer, instance id. -1 All of instances of the object.
<resource_id>	Integer, resource id. -1 All of resource about the instance.

### 10.2.10 +CLMPARAMETER Indicated an observer's parameter

#### +CLMPARAMETER Indicated an observer's parameter

	<p>Response</p> <p>This command used to indicated there is received an observer's parameter command.</p> <p><b>+CLMPARAMETER:</b></p> <p>&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_id&gt;,&lt;toSet&gt;,&lt;toClear&gt;,&lt;minPeriod&gt;,&lt;maxPeriod&gt;,&lt;greaterThan&gt;,&lt;lessThan&gt;,&lt;step&gt;</p>
--	---

#### Defined Values

<lwm2m_id>	AT+CLMCONF result
------------	-------------------

<object_id>	Object id.
<instance_id>	Instance id -1 All of instances and resources
<resource_id>	Resource id -1 All of resource about the instance
<toSet>	Integer, to Set value
<toClear>	Integer, to Clear value
<minPeriod>	Integer, min Period
<maxPeriod>	Integer, max Period
<greaterThan>	Float, greater than
<lessThan>	Float, less than
<step>	Float, step

### 10.2.11 +CLMERR Indicated there are Some Errors

#### +CLMERR Indicated there are Some Errors

	Response This command Indicated there are some errors. <b>+CLMERR: &lt;lwm2m_id&gt;,&lt;error_code&gt;</b>
--	--

#### Defined Values

<lwm2m_id>	Integer, LwM2M id, AT+CLMCONF's response.
<error_code>	Integer, error code. 1 Reset by peer point 2 Network disconnect



# 11 AT Commands for MQTT Application

## 11.1 Overview of AT Commands for MQTT Application

Command	Description
AT+CMQNEW	New MQTT
AT+CMQCON	Send MQTT Connection Packet
AT+CMQDISCON	Disconnect MQTT
AT+CMQSUB	Send MQTT Subscribe Packet
AT+CMQUNSUB	Send MQTT Unsubscribe Packet
AT+CMQPUB	Send MQTT Publish Packet
+CMQDISCON	MQTT Disconnect Indication
AT+CMQALICFG	Configure Alibaba Cloud Parameters
AT+CMQALICON	Send MQTT Connection Packet to Alibaba Cloud
AT+CMQTTSNEW	New MQTTS
AT+CMQTTSNEWEXT	New a MQTTS Instance by Multi Packages for a Long Size Command
AT+CMQAZURECFG	Configure Microsoft Azure IoT Parameters
AT+CMQAZURECON	Send MQTT Connection Packet to Azure IoT
AT+CMQTSYNC	Configure MQTT Synchronization Mode

## 11.2 Detailed Descriptions of AT Commands for MQTT Application

### 11.2.1 AT+CMQNEW New MQTT

AT+CMQNEW New MQTT	
Test Command AT+CMQNEW=?	Response +CMQNEW: "server","port",(list of supported <command_timeout_ms>s),(list of supported <bufsize>s)  OK

Read Command <b>AT+CMQNEW?</b>	Response <b>+CMQNEW: &lt;mqtt_id&gt;,&lt;used_state&gt;,&lt;server&gt;</b>  <b>OK</b>
Write Command <b>AT+CMQNEW=&lt;server&gt;,&lt;port&gt;,&lt;command_timeout_ms&gt;,&lt;bufsize&gt;[,&lt;cid&gt;]</b>	Response <b>+CMQNEW: &lt;mqtt_id&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<mqtt_id>	Integer, MQTT id
<used_state>	The used result of mqtt_id 0 Not used 1 Used
<server>	String, null or server IP address(or MQTT server name). Max length is 50.
<port>	String, MQTT server port, can be from 0 to 65535.
<command_timeout_ms>	Integer, AT command timeout (ms), can be from 0 to 60000.
<bufsize>	Integer, buffer size, can be from 20 to 1132.
<cid>	Integer, PDP context ID, AT+CGACT response. [option]

### Example

```
AT+CMQNEW=?
+CMQNEW: "Server name or IP address",(0-65535),(0-60000),(20-1132)

OK
```

## 11.2.2 AT+CMQCON Send MQTT Connection Packet

### AT+CMQCON Send MQTT Connection Packet

Test Command <b>AT+CMQCON=?</b>	Response <b>+CMQCON:</b> <b>&lt;mqtt_id&gt;,&lt;version&gt;,&lt;client_id&gt;,&lt;keepalive_interval&gt;,&lt;cleanses sion&gt;,&lt;will_flag&gt;</b>
------------------------------------	--

	OK
Read Command <b>AT+CMQCON?</b>	Response <b>+CMQCON: &lt;mqtt_id&gt;,&lt;connected_state&gt;,&lt;server&gt;</b>
	OK
Write Command <b>AT+CMQCON=&lt;mqtt_id&gt;,&lt;version&gt;,&lt;client_id&gt;,&lt;keepalive_interval&gt;,&lt;cleansession&gt;,&lt;will_flag&gt;[,&lt;will_options&gt;][,&lt;username&gt;,&lt;password&gt;]</b>	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;mqtt_id&gt;</b>	Integer, MQTT id, AT+CMQNEW's response
<b>&lt;connected_state&gt;</b>	The connected result of mqtt_id, 0 Not connected 1 Connected
<b>&lt;server&gt;</b>	String, null(not connect) or MQTT server IP address
<b>&lt;version&gt;</b>	Integer, MQTT version. 3 MQTT 3.1 4 MQTT 3.1.1
<b>&lt;client_id&gt;</b>	String, client ID, should be unique. Max length is 120.
<b>&lt;keepalive_interval&gt;</b>	Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800. Unit is second.
<b>&lt;cleansession&gt;</b>	Integer, clean session, can be 0 or 1.
<b>&lt;will_flag&gt;</b>	Integer, will flag, can be 0 or 1.
<b>&lt;will_option&gt;</b>	String, will options, mandatory if <will_flag> is 1, the format is as follows: topic=xxx,QoS=xxx,retained=xxx,message_len=xxx,message=xxx
<b>&lt;username&gt;</b>	String, user name (option). Max length is 100
<b>&lt;password&gt;</b>	String, password (option). Max length is 100

## Example

```
AT+CMQCON=?
+CMQCON: (0-0),(3,4),"client ID",(0-64800),(0,1),(0,1)
```

OK

**AT+CMQCON?**

+CMQCON: 0,0,null

OK

**NOTE**

- AT+CMQNEW should be set before this command.
- If <will\_flag> is 0, then we don't need input <will\_options>.

### 11.2.3 AT+CMQDISCON Disconnect MQTT

#### AT+CMQDISCON Disconnect MQTT

Test Command <b>AT+CMQDISCON=?</b>	Response <b>+CMQDISCON: &lt;mqtt_id&gt;</b>  <b>OK</b>
Write Command <b>AT+CMQDISCON=&lt;mqtt_id&gt;</b> <b>&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<mqtt_id>	Integer type, MQTT id, AT+CMQNEW's response.
-----------	--

#### Example

**AT+CMQDISCON=?**

+CMQDISCON: (0-0)

OK

**NOTE**

- AT+CMQCON should be set before this command.

### 11.2.4 AT+CMQSUB Send MQTT Subscribe Packet

#### AT+CMQSUB Send MQTT Subscribe Packet

Test Command <b>AT+CMQSUB=?</b>	Response <b>+CMQSUB: &lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;</b>  <b>OK</b>
Write Command <b>AT+CMQSUB=&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mqtt_id&gt;</b>	Integer, MQTT id, AT+CMQNEW's response.
<b>&lt;topic&gt;</b>	String, topic of subscribe message. Max length is 128.
<b>&lt;QoS&gt;</b>	Integer, message QoS, can be 0, 1 or 2.

#### Example

```
AT+CMQSUB=?
+CMQSUB: (0-0),"topic",(0-2)
```

```
OK
```

### 11.2.5 AT+CMQUNSUB Send MQTT Unsubscribe Packet

#### AT+CMQUNSUB Send MQTT Unsubscribe Packet

Test Command	Response
--------------	----------

<b>AT+CMQUNSUB=?</b>	<b>+CMQUNSUB: &lt;mqtt_id&gt;,&lt;topic&gt;</b>
	<b>OK</b>
Write Command <b>AT+CMQUNSUB=&lt;mqtt_id&gt;,&lt;topic&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mqtt_id&gt;</b>	Integer, MQTT id, AT+CMQNEW's response.
<b>&lt;topic&gt;</b>	String, topic of subscribe message. Max length is 128

### Example

```
AT+CMQUNSUB=?
+CMQUNSUB: (0-0),"topic"

OK
```

### 11.2.6 AT+CMQPUB Send MQTT Publish Packet

#### AT+CMQPUB Send MQTT Publish Packet

Test Command <b>AT+CMQPUB=?</b>	Response <b>+CMQPUB:</b> <b>&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;,&lt;retained&gt;,&lt;dup&gt;,&lt;message_len&gt;,&lt;message&gt;</b>
	<b>OK</b>
Write Command <b>AT+CMQPUB=&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;,&lt;retained&gt;,&lt;dup&gt;,&lt;message_len&gt;,&lt;message&gt;</b>	Response <b>OK</b> Unsolicited result code: If the topic has been subscribed, then return: <b>+CMQPUB:</b> <b>&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;,&lt;retained&gt;,&lt;dup&gt;,&lt;message_len&gt;,&lt;message&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference

**Defined Values**

<mqtt_id>	Integer, MQTT id, AT+CMQNEW's response.
<topic>	String, topic of publish message. Max length is 128
<Qos>	Integer, message QoS, can be 0, 1 or 2.
<retained>	Integer, retained flag, can be 0 or 1.
<dup>	Integer, duplicate flag, can be 0 or 1.
<message_len>	Integer, length of publish message, can be from 2 to 1000.If message is HEX data streaming, then <message_len> should be even.
<message>	Default should be a hex data streaming, but if we set AT+CREVHEX=0 then we can send a RAW data message. And if we want to send a HEX data streaming again, we can set AT+CREVHEX=1.

**Example**

```
AT+CMQPUB=?
+CMQPUB: (0-0),"topic",(0-2),(0,1),(0,1),(2-1000),"message"
```

```
OK
```

**11.2.7 +CMQDISCON MQTT Disconnect Indication**

**+CMQDISCON MQTT Disconnect Indication**

Response  
When the URC send, there is some error happen on the MQTT connection. This is probably because the MQTT server has disconnected the device for some reasons.  
**+CMQDISCON: <mqtt\_id>**

**11.2.8 AT+CMQALICFG Configure Alibaba Cloud Parameters**

**AT+CMQALICFG Configure Alibaba Cloud Parameters**

Test Command <b>AT+CMQALICFG=?</b>	Response <b>+CMQALICFG:</b>
---------------------------------------	--------------------------------

	<mqtt_id>,<productKey>,<deviceName>,<deviceSecret>
	OK
Write Command <b>AT+CMQALICFG=&lt;mqtt_id&gt; ,&lt;productKey&gt;,&lt;deviceName&gt; &lt;deviceSecret&gt;</b>	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<mqtt_id>	Integer, MQTT id, AT+CMQNEW's response
<productKey>	Product Key, get it from Alibaba Cloud. Length from 1 to 20.
<deviceName>	Device Name, get it from Alibaba Cloud. Length from 1 to 32.
<deviceSecret>	Device Secret, get it from Alibaba Cloud. Length from 1 to 40.

#### NOTE

- AT+CMQNEW should be set before this command.
- This command is a special command to connect to Alibaba Cloud.

### 11.2.9 AT+CMQALICON Send MQTT Connection Packet to Alibaba Cloud

#### AT+CMQALICON Send MQTT Connection Packet to Alibaba Cloud

Test Command <b>AT+CMQALICON=?</b>	Response <b>+CMQALICON: &lt;mqtt_id&gt;,&lt;keepalive_interval&gt;,&lt;cleansession&gt;</b>
	OK
Write Command <b>AT+CMQALICON=&lt;mqtt_id&gt; ,&lt;keepalive_interval&gt;,&lt;cleansession&gt;</b>	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	



## Defined Values

<mqtt_id>	Integer, MQTT id, AT+CMQNEW's response
<keepalive_interval>	Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800.
<cleansession>	Integer, clean session, can be 0 or 1

## Example

```
AT+CMQALICON=?
+CMQALICON: (0-0),(0-64800),(0,1)
```

OK

### NOTE

- AT+CMQNEW and AT+CMQALICFG should be set before this command.
- This command is a special command to connect to Alibaba Cloud.

## 11.2.10 AT+CMQTTSNEW New MQTTS

### AT+CMQTTSNEW New MQTTS

Test Command <b>AT+CMQTTSNEW=?</b>	Response <b>+CMQTTSNEW: "server", "port", (list of supported &lt;command_timeout_ms&gt;s), (list of supported &lt;bufsize&gt;s)</b>  <b>OK</b>
Read Command <b>AT+CMQTTSNEW?</b>	Response <b>+CMQTTSNEW: &lt;mqtt_id&gt;, &lt;used_state&gt;, &lt;server&gt;</b>  <b>OK</b>
Write Command <b>AT+CMQTTSNEW=&lt;server&gt;,&lt;port&gt;,&lt;command_timeout_ms&gt;,&lt;bufsize&gt;</b>	Response <b>+CMQTTSNEW: &lt;mqtt_id&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference

**Defined Values**

<mqtt_id>	Integer, MQTT id
<used_state>	The used result of mqtt_id 0 Not used 1 Used
<server>	String, null or server IP address(or MQTT server name). Max length is 50.
<port>	String, MQTT server port, can be from 0 to 65535.
<command_timeout_ms>	Integer, AT command timeout (ms), can be from 0 to 60000.
<bufsize>	Integer, buffer size, can be from 20 to 1132.

**Example**

**AT+CMQTTSNEW=?**

**+CMQTTSNEW: "Server name or IP address",(0-65535),(0-60000),(20-1132)**

OK

**AT+CMQTTSNEW?**

**+CMQTTSNEW: 0,0,null**

OK

**NOTE**

- AT+CSETCA should be set before this command, we need to set the certificates first!

**11.2.11 AT+CMQTTSNEWEXT NEW a MQTTS Instance by Multi Packages for a Long Size Command**

**AT+CMQTTSNEWEXT New a MQTTS Instance by Multi Packages for a Long Size Command**

Read Command

**AT+CMQTTSNEWEXT?**

Response

**+CMQTTSNEWEXT: <mqtt\_id>,<used\_state>,<server>**

	<b>OK</b>
Write Command <b>AT+CMQTTSNEWEXT=&lt;flag&gt;,&lt;total_len&gt;,&lt;len&gt;,&lt;server&gt;,&lt;port&gt;,&lt;command_timeout_ms&gt;,&lt;bufsize&gt;,&lt;server_cert_len&gt;,&lt;server_cert&gt;,&lt;client_cert_len&gt;,&lt;client_cert&gt;,&lt;client_pk_len&gt;,&lt;client_pk&gt;</b>	Response <b>+CMQTTSNEWEXT: &lt;mqtt_id&gt;</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;flag&gt;</b>	1 Means there are more packages 0 Means this package is the last one
<b>&lt;total_len&gt;</b>	The total length of the command
<b>&lt;len&gt;</b>	The length of current package
<b>&lt;server&gt;</b>	String, null or server IP address(or MQTT server name). Max length is 50.
<b>&lt;port&gt;</b>	String, MQTT server port, can be from 0 to 65535.
<b>&lt;command_timeout_ms&gt;</b>	Integer, AT command timeout (ms), can be from 0 to 60000.
<b>&lt;bufsize&gt;</b>	Integer, buffer size, can be from 20 to 1132.
<b>&lt;server_cert_len&gt;</b>	Server certification length, for mqttts.
<b>&lt;server_cert&gt;</b>	Server certification, for mqttts, should be HEX format.
<b>&lt;client_cert_len&gt;</b>	Client certification length, for mqttts.
<b>&lt;client_cert&gt;</b>	Client certification, for mqttts, should be HEX format.
<b>&lt;client_pk_len&gt;</b>	Client private key length, for mqttts.
<b>&lt;client_pk&gt;</b>	Client private key, for mqttts, should be HEX format.
<b>&lt;mqtt_id&gt;</b>	Integer, MQTT id.
<b>&lt;used_state&gt;</b>	The used result of mqtt_id 0 Not used 1 Used

## Example

```
AT+CMQTTSNEWEXT?  
+CMQTTSNEWEXT: 0,0,null
```

**OK**

## 11.2.12 AT+CMQAZURECFG Configure Microsoft Azure IoT Parameters

### AT+CMQAZURECFG Configure MicroSoft Azure IoT Parameters

Test Command <b>AT+CMQAZURECFG=?</b>	Response <b>+CMQAZURECFG:</b> <b>&lt;mqtt_id&gt;,&lt;hostName&gt;,&lt;deviceId&gt;,&lt;deviceKey&gt;,&lt;expiry_time&gt;</b>  <b>OK</b>
Write Command <b>AT+CMQAZURECFG=&lt;mqtt_id&gt;,&lt;hostName&gt;,&lt;deviceId&gt;,&lt;deviceKey&gt;,&lt;expiry_time&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mqtt_id&gt;</b>	Integer, MQTT id, AT+CMQTTTSNEW 's response
<b>&lt;hostName&gt;</b>	Host Name, get it from Azure IoT Connection String.
<b>&lt;deviceId&gt;</b>	Device Id, get it from Azure IoT.
<b>&lt;deviceKey&gt;</b>	Device Primary Key, get it from Azure IoT.
<b>&lt;expiry_time&gt;</b>	Expiration Time, from 0 to 31536000.

#### Example

```
AT+CMQAZURECFG=?
+CMQAZURECFG: (0-0),"hostName","deviceId","deviceKey",(0-31536000)
OK
```

#### NOTE

- AT+CMQTTTSNEW should be set before this command.
- This command is a special command to connect to Azure IoT.

### 11.2.13 AT+CMQAZURECON Send MQTT Connection Packet to Azure IoT

AT+CMQAZURECON Send MQTT Connection Packet to Azure IoT	
Test Command <b>AT+CMQAZURECON=?</b>	Response <b>+CMQAZURECON:</b> <b>&lt;mqtt_id&gt;,&lt;keepalive_interval&gt;,&lt;cleansession&gt;</b>  <b>OK</b>
Write Command <b>AT+CMQAZURECON=&lt;mqtt_id&gt;,&lt;keepalive_interval&gt;,&lt;cleansession&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mqtt_id&gt;</b>	Integer, MQTT id, AT+CMQTTSNEW 's response
<b>&lt;keepalive_interval&gt;</b>	Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800.
<b>&lt;cleansession&gt;</b>	Integer, clean session, can be 0 or 1

#### Example

```
AT+CMQAZURECON=?
+CMQAZURECON: (0-0),(0-64800),(0,1)

OK
```

#### NOTE

- AT+CMQTTSNEW and AT+CMQAZURECFG should be set before this command.
- This command is a special command to connect to Azure IoT.

## 11.2.14 AT+CMQTSYNC Configure MQTT Synchronization Mode

### AT+CMQTSYNC Configure MQTT Synchronization Mode

Test Command <b>AT+CMQTSYNC=?</b>	Response <b>+CMQTSYNC:</b> (list of supported <n>s)  <b>OK</b>
Read Command <b>AT+CMQTSYNC?</b>	Response <b>+CMQTSYNC:</b> <n>  <b>OK</b>
Write Command <b>AT+CMQTSYNC=&lt;n&gt;</b>	Response <b>OK</b> If error is related to wrong AT syntax or incorrect parameters. <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<n>	<u>0</u> Disable MQTT synchronization mode
	1 Enable MQTT synchronization mode

#### Example

```
AT+CMQTSYNC=?
+CMQTSYNC: (0,1)
```

OK

```
AT+CMQTSYNC?
+CMQTSYNC: 0
```

OK

# 12 AT Commands for CoAP Application

## 12.1 Overview of AT Commands for CoAP Application

Command	Description
<b>AT+CCOAPNEW</b>	Create a CoAP client instance
<b>AT+CCOAPSEND</b>	Send CoAP data
<b>AT+CCOAPCSEND</b>	Send CoAP data
<b>AT+CCOAPDEL</b>	Destroy the CoAP client instance
<b>+CCOAPNMI</b>	Content from CoAP server

## 12.2 Detailed Descriptions of AT Commands for CoAP Application

### 12.2.1 AT+CCOAPNEW Create a CoAP Client Instance

<b>AT+CCOAPNEW Create a CoAP Client Instance</b>	
Test Command <b>AT+CCOAPNEW=?</b>	Response <b>+CCOAPNEW: (0-255).(0-255).(0-255).(0-255),(0-65535),(0-10)</b>  <b>OK</b>
Write Command <b>AT+CCOAPNEW=&lt;ip_addr&gt; ,&lt;port&gt;,&lt;cid&gt;</b>	Response <b>+CCOAPNEW: &lt;coap_id&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<ip_addr>	String, CoAP server IP address.
<port>	Integer, CoAP server port(spec default 5683).
<cid>	Integer, PDP context ID, AT+CGACT response.
<coap_id>	Integer, CoAP client instance id created by the command.

### Example

```
AT+CCOAPNEW=?
+CCOAPNEW: (0-255).(0-255).(0-255).(0-255),(0-65535),(0-10)

OK
```

### 12.2.2 AT+CCOAPSEND Send CoAP Data

AT+CCOAPSEND Send CoAP Data	
Test Command <b>AT+CCOAPSEND=?</b>	Response <b>+CCOAPSEND: (1-2),(4-512),"data"</b>  <b>OK</b>
Write Command <b>AT+CCOAPSEND=&lt;coap_id &gt;,&lt;data_len&gt;,&lt;data&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<coap_id>	Integer, CoAP client instance id created by the AT+CCOAPNEW command.
<data_len>	Integer, Send data length (by byte).
<data>	String, the hex data streaming.

### Example

```
AT+CCOAPSEND=?
+CCOAPSEND: (1-2),(4-512),"data"
```



OK

**NOTE**

- AT+CCOAPNEW should be set before this command.

### 12.2.3 AT+CCOAPCSEND Send CoAP Data

#### AT+CCOAPCSEND Send CoAP Data

Test Command <b>AT+CCOAPCSEND=?</b>	Response <b>+CCOAPCSEND:</b> <b>(1-2),(1),(0-3),(0-7),(0-31),"token","option",(0-512),"data"</b>  <b>OK</b>
Write Command <b>AT+CCOAPCSEND=&lt;coap_id&gt;,&lt;version&gt;,&lt;type&gt;,&lt;h_code&gt;,&lt;l_code&gt;,&lt;token&gt;,&lt;option&gt;,&lt;data_len&gt;,&lt;data&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;coap_id&gt;</b>	Integer, CoAP client instance id created by the AT+CCOAPNEW command.
<b>&lt;version&gt;</b>	Integer, version information, the current value is 1.
<b>&lt;type&gt;</b>	Integer, the message type. 0 CON, confirmable message (requires ACK/RST). 1 NON, non-confirmable message (one-shot message). ACK, used to acknowledge confirmable messages. 3 RST, indicates error in received messages.
<b>&lt;h_code&gt;</b>	Integer, the first three bits of the <code> value. 0 Empty message or request 1 Reserved 2-5 Response 6-7 Reserved
<b>&lt;l_code&gt;</b>	Integer, the last five bits of the <code> value (0-31).

<code> Function code or response code. Code takes different forms in CoAP request message and response message. Code takes one byte and is divided into two parts, the first three bits <h\_code> and the last five bits <l\_code> In order to describe it conveniently, it is written into c.dd structure(such as 0.01,2.01,4.02 and so on).

For example, if <h\_code> is 4 and <l\_code> is 12, so <code> is 4.12.

**Request:**

- [0.01]GET method, get resource
- [0.02]POST method, create resource
- [0.03]PUT method, update resource
- [0.04]DELETE method, delete resource

**Response:**

- [2.01]Created
- [2.02]Deleted
- [2.03]Valid
- [2.04]Changed
- [2.05]Content.
- [4.00]Bad Request.
- [4.01]Unauthorized.
- [4.02]Bad Option.
- [4.03]Forbidden.
- [4.04]Not Found.
- [4.05]Method Not Allowed.
- [4.06]Not Acceptable.
- [4.12]Precondition Failed.
- [4.15]Unsupported Content-Type.
- [5.00]Internal Server Error.
- [5.01]Not Implemented.
- [5.02]Bad Gateway.
- [5.03]Service Unavailable.
- [5.04]Gateway Timeout.
- [5.05]Proxying Not Supported.

<token>	String, the hex data streaming, request id, relate the response to the request (option).
<option>	String, the hex data streaming, zero or more options (option).
<data_len>	Integer, Send data length (by byte).
<data>	String, the hex data streaming (payload).

**Example**

**AT+CCOAPCSEND=?**

**+CCOAPCSEND: (1-2),(1),(0-3),(0-7),(0-31),"token","option",(0-512),"data"**

OK

**NOTE**

- AT+CCOAPNEW should be set before this command.

### 12.2.4 AT+CCOAPDEL Destroy the CoAP Client Instance

#### AT+CCOAPDEL Destroy the CoAP Client Instance

Test Command <b>AT+CCOAPDEL=?</b>	Response <b>+CCOAPDEL: (1-2)</b>  <b>OK</b>
Write Command <b>AT+CCOAPDEL=&lt;coap_id&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;coap_id&gt;</b>	Integer, CoAP client instance id created by the AT+CCOAPNEW command.
------------------------	--

#### Example

```
AT+CCOAPDEL=?
+CCOAPDEL: (1-2)

OK
```

**NOTE**

- AT+CCOAPNEW should be set before this command.

## 12.2.5 +CCOAPNMI Content from CoAP server

### +CCOAPNMI Content from CoAP server

Response

+CCOAPNMI: <coap\_id>,<data\_len>,<data>

#### Defined Values

<coap_id>	Integer, CoAP client instance id created by the AT+CCOAPNEW command.
<data_len>	Integer, data length (by byte).
<data>	String, the hex data streaming.

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# 13 AT Commands for SNTP Application

## 13.1 Overview of AT Commands for SNTP Application

Command	Description
AT+CSNTPSTART	Start to query network time
AT+CSNTPSTOP	Stop to query network time
+CSNTP	Received network time

## 13.2 Detailed Descriptions of AT Commands for SNTP Application

### 13.2.1 AT+CSNTPSTART Start to Query Network Time

AT+CSNTPSTART Start to Query Network Time	
Write Command	Response
AT+CSNTPSTART=<url>[,zone]	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<url>	A string of SNTP server name or IP address.
<zone>	String type value; On behalf of the time zone, range -47...+48.The eastern region is denoted as "+32".

### 13.2.2 +CSNTP Received Network Time

#### +CSNTP Received Network Time

Response

Indicated there is received some data from network.

**+CSNTP: <time>[,zone]**

#### Defined Values

<b>&lt;time&gt;</b>	String type value; format is yy/MM/dd, hh:mm:ss:ms, where characters indicate year (two last digits),month, day, hour, minutes, seconds and millisecond . E.g 10/05/06,00:01:52:62
<b>&lt;zone&gt;</b>	String type value; On behalf of the time zone, range -47...+48.The eastern region is denoted as "+32".

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# 14 AT Commands for TLS Application

## 14.1 Overview of AT Commands for TLS Application

Command	Description
<b>AT+CTLSCFG</b>	Configure TLS parameters
<b>AT+CTLSCONN</b>	Create a TLS connection
<b>AT+CTLSCLOSE</b>	Close a TLS connection
<b>AT+CTLSEND</b>	Send data
<b>AT+CTLSRECV</b>	Receive data
<b>AT+CSETCA</b>	Set the certificate parameters
<b>AT+CSETCIPHER</b>	Set the encryption suite used by the TLS handshake

## 14.2 Detailed Descriptions of AT Commands for TLS Application

### 14.2.1 AT+CTLSCFG Configure TLS Parameters

<b>AT+CTLSCFG Configure TLS Parameters</b>	
Write Command <b>AT+CTLSCFG=&lt;tid&gt;,&lt;type&gt;,&lt;value&gt;[,&lt;type&gt;,&lt;value&gt;[,&lt;type&gt;,&lt;value&gt;[...]]]</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<tid>	Integer type. It is the identifier of the TLS connection to be created.
-------	---

	The values(1-6).
<b>&lt;type&gt;</b>	<p>Integer type. It is the type of the parameter to be configured.</p> <ol style="list-style-type: none"> <li>1 Server name (string)</li> <li>2 Port (int, default value is 443)</li> <li>3 Socket type (0-tcp, tcp supported only, default value is 0)</li> <li>4 Auth_mode (int, 0-none, 1-optional, 2-required, default value is 2)</li> <li>5 Debug level (int, 0~4, 0-no log, 4-all log enabled, default value is 0)</li> <li>6 Server CA (&lt;size&gt;&lt;more&gt;&lt;certificate&gt;, size (int)-total size of the certificate without the terminate null; more(int)-is there more certificate content needed to be sent, 1-yes, 0-no; certificate (string)-the total or partial of the certificate content. default value for type 6 is null)</li> <li>7 Client certificate (same as 6-server CA, default value for type 7 is null)</li> <li>8 Client private key (&lt;size&gt;&lt;more&gt;&lt;private-key&gt;, size and more is the same as 6-server CA, private-key (string)-the total or partial of the private-key, default value for type 8 is null)</li> </ol>
<b>&lt;value&gt;</b>	Integer type. It is the value of the parameter to be configured.

### 14.2.2 AT+CTLSCONN Create a TLS Connection

AT+CTLSCONN Create a TLS Connection	
Write Command <b>AT+CTLSCONN=&lt;tid&gt;,&lt;cid&gt;</b>	Response <b>OK</b> <b>+CTLSCONN: &lt;tid&gt;,&lt;ret&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;tid&gt;</b>	Integer type. It is the identifier of the TLS connection to be created. It should be the same as the one in CTLSCFG.
<b>&lt;ret&gt;</b>	Integer type. It tells the result of the TLS connection. If the connection succeeds, it is 1. Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details.



### 14.2.3 AT+CTLSCLOSE Close a TLS Connection

#### AT+CTLSCLOSE Close a TLS Connection

Write Command <b>AT+CTLSCLOSE=&lt;tid&gt;</b>	Response <b>OK</b>  <b>+CTLSCLOSE: &lt;tid&gt;,&lt;ret&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;tid&gt;</b>	Integer type. It is the identifier of the TLS connection to be created. It should be the same as the one in CTLSCFG.
<b>&lt;cid&gt;</b>	Integer type. It is a numeric parameter specifying a particular PDP context returned by CGACT.
<b>&lt;ret&gt;</b>	Integer type. It tells the result of the TLS connection closure. If the closure succeeds, it is 1. Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details.

### 14.2.4 AT+CTLSEND Send Data

#### AT+CTLSEND Send Data

Write Command <b>AT+CTLSEND=&lt;tid&gt;,&lt;data_len&gt;,&lt;data&gt;[,&lt;encod_method&gt;]</b>	Response <b>OK</b>  <b>+CTLSEND: &lt;tid&gt;,&lt;ret&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;tid&gt;</b>	Integer type. It is the identifier of the TLS connection to be created. It should be the same as the one in CTLSCFG.
<b>&lt;data_len&gt;</b>	Integer type. It is the length of the <data>. Max length of a single transmission 1024.
<b>&lt;data&gt;</b>	It is the data sent.

<b>&lt;encod_method&gt;</b>	Integer type. It is the encode method used for <data>. 801 String encoding and it is the default value which can be omitted. 802 Hex encoding 803 Base64 encoding
<b>&lt;ret&gt;</b>	Integer type. It tells the result of the data sending. If it is greater than 0, it is the actual number of data send. Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details.

### 14.2.5 AT+CTLSRECV Receive Data

AT+CTLSRECV Receive Data	
Write Command <b>AT+CTLSRECV=&lt;tid&gt;,&lt;max_num&gt;[,&lt;encod_method&gt;]</b>	Response <b>OK</b> <b>+CTLSRECV: &lt;tid&gt;,&lt;ret&gt;[,&lt;data&gt;[,&lt;encode_method&gt;]]</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;tid&gt;</b>	Integer type. It is the identifier of the TLS connection to be created. It should be the same as the one in CTLSCFG.
<b>&lt;max_num&gt;</b>	Integer type. It is the maximum number of plain data without encoding that could be received. When encod_method=801,the maximum receiving length of a single time is 1024, Otherwise the maximum receiving length of a single time is 512.
<b>&lt;encod_method&gt;</b>	Integer type. It is the encode method used for <data>. 801 String encoding and it is the default value which can be omitted. 802 Hex encoding. 803 Base64 encoding.
<b>&lt;ret&gt;</b>	Integer type. If it is greater than 0, it is the length of data received after encoding .Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details.
<b>&lt;data&gt;</b>	It is the data received with encoding.

### 14.2.6 AT+CSETCA Set the Certificate Parameters

## AT+CSETCA Set the Certificate Parameters

Read Command <b>AT+CSETCA?</b>	Response <b>&lt;type&gt;: &lt;total_len&gt;</b>  <b>OK</b>
Write Command <b>AT+CSETCA=&lt;type&gt;,&lt;total_len&gt;,&lt;is_end&gt;,&lt;encod_method&gt;,&lt;ca_data&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;type&gt;</b>	String type. 0 Root CA, root certificate. 1 Client CA, client certificate. 2 Client Private Key. 3 PSKID 4 PSK
<b>&lt;total_len&gt;</b>	Integer type. The total length of the certificate.
<b>&lt;is_end&gt;</b>	Is there more certificate content needed to be sent. 0 No 1 Yes
<b>&lt;encod_method&gt;</b>	Integer type. It is the encode method used for <ca_data>. 0 String encoding 1 Hex encoding
<b>&lt;ca_data&gt;</b>	String type. Content of the certificate.

### Example

```
AT+CSETCA?  
OK
```

## 14.2.7 AT+CSETCIPHER Set the Encryption Suite Used by the TLS Handshake

### AT+CSETCIPHER Set the Encryption Suite Used by the TLS Handshake

Read Command <b>AT+CSETCIPHER?</b>	Response <b>&lt;type&gt;: &lt;num&gt;</b>
---------------------------------------	--

	<b>OK</b>
Execution Command <b>AT+CSETCIPHER</b>	Response List of all currently supported encryption suites <b>OK</b>
Write Command <b>AT+CSETCIPHER=&lt;enable&gt; ,&lt;num&gt;</b>	Response <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;enable&gt;</b>	Whether to enable the set encryption suite function 0 Close 1 Open
<b>&lt;num&gt;</b>	Encryption package number selected.

### Example

**AT+CSETCIPHER?**

**+CETCIPHER: 0,0**

**OK**

# 15 AT Commands for OneNet Application

## 15.1 Overview of AT Commands for OneNet Application

Command	Description
AT+MIPLCREATE	Create a OneNet instance
AT+MIPLCREATEEXT	Another method to Create a OneNet instance
AT+MIPLDELETE	Delete a OneNet instance
AT+MIPLOPEN	Register to OneNet.
AT+MIPLCLOSE	Deregister to OneNet
AT+MIPLADDOBJ	Add an object
AT+MIPLDELOBJ	Delete an object
AT+MIPLUPDATE	Update registration
AT+MIPLREADRSP	Read response from user
AT+MIPLWRITERSP	Write response from user
AT+MIPLEXECUTERSP	Execute response from user
AT+MIPLOBSERVERSP	Observe response from user
AT+MIPLDISCOVERRSP	Discover response from user
AT+MIPLPARAMETERRSP	Set parameter from user
AT+MIPLNOTIFY	Notify data value change from user
AT+MIPLVER	Read version
+MIPLREAD	Read request to user
+MIPLWRITE	Write request to user
+MIPLEXECUTE	Execute request to user
+MIPLOBSERVE	Observe request to user
+MIPLDISCOVER	Discover request to user
+MIPLPARAMETER	Set parameter request to user
+MIPLEVENT	Event indication to user

## 15.2 Detailed Descriptions of AT Commands OneNet Application

## 15.2.1 AT+MIPLCREATE Create a OneNet Instance

AT+MIPLCREATE Create a OneNet Instance	
Test Command <b>AT+MIPLCREATE=?</b>	Response <b>+MIPLCREATE:</b> (list of supported <totalsize>),(list of supported <config>),(list of supported <index>),(list of supported <currentsize>),(list of supported <flag>  <b>OK</b>
Read Command <b>AT+MIPLCREATE?</b>	Response <b>+MIPLCREATE:</b> <id>,<used_state>  <b>OK</b>
Write Command <b>AT+MIPLCREATE=&lt;totalsize&gt;,&lt;config&gt;,&lt;index&gt;,&lt;currentsize&gt;,&lt;flag&gt;</b>	Response <b>OK</b> --message received correctly if index not equals to 0 <b>+MIPLCREATE:</b> <id>  <b>OK</b> --message received correctly and return OneNet instance or <b>+CIS ERROR:</b> <err>
Execution Command <b>AT+MIPLCREATE</b>	Response <b>+MIPLCREATE:</b> <id>  <b>OK</b> or <b>+CIS ERROR:</b> <err> Create OneNet default configuration as host of "183.230.40.39" with bootstrap.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<totalsize>	Integer, configuration file total size(it is byte size)
<config>	Hex string, configuration file, ex: 130033f1.....
<index>	Integer, configuration file index, from 0 to 1024
<currentsize>	Integer, configuration file size in current AT command(it is byte size)
<flag>	Integer, message flag 1 First message 2 Middle message

	0 Last message
<id>	Integer, create OneNet id
<used_state>	Integer, the used result of AT+MIPLCREATE 0 Not used 1 Used

### Example

**AT+MIPLCREATE=?**

+MIPLCREATE: (0-1024),"config",(0-1024),(0-512),(0-2)

OK

**AT+MIPLCREATE=?**

+MIPLCREATE: 0,0

OK

### 15.2.2 AT+MIPLCREATEEXT Another Method to Create a OneNet Instance

#### AT+MIPLCREATEEXT Another Method to Create a OneNet Instance

Test Command <b>AT+MIPLCREATEEXT=?</b>	Response <b>+MIPLCREATEEXT: (0-255).(0-255).(0-255).(0-255),(0,1)</b>  <b>OK</b>
Read Command <b>AT+MIPLCREATEEXT?</b>	Response <b>+MIPLCREATEEXT: &lt;id&gt;,&lt;used_state&gt;</b>  <b>OK</b>
Write Command <b>AT+MIPLCREATEEXT=&lt;addr&gt;,&lt;bs&gt;</b>	Response <b>+MIPLCREATEEXT: &lt;id&gt;</b>  <b>OK</b> --message received correctly and return OneNet instance or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;addr&gt;</b>	String. OneNet host IP address
<b>&lt;bs&gt;</b>	Integer. OneNet host bootstrap value 0 Bootstrap disabled 1 Bootstrap enabled Such as: 183.230.40.39, bs value is set to 1 183.230.40.40, bs value is set to 0
<b>&lt;id&gt;</b>	Integer, Create OneNet id
<b>&lt;used_state&gt;</b>	Integer. The used result of AT+MIPLCREATE 0 Not used 1 Used

## Example

**AT+MIPLCREATEEXT=?**

**+MIPLCREATEEXT: (0-255).(0-255).(0-255).(0-255),(0-1)**

OK

**AT+MIPLCREATEEXT?**

**+MIPLCREATEEXT: 0,0**

OK

### NOTE

- The parameter of "BS" is necessary from OneNet Version 2.2.0, but it is needless before OneNet Ver2.2.0.

## 15.2.3 AT+MIPLDELETE Delete a OneNet Instance

### AT+MIPLDELETE Delete a OneNet Instance

Test Command <b>AT+MIPLDELETE=?</b>	Response <b>+MIPLDELETE: (list of supported &lt;id&gt;)</b>  <b>OK</b>
Write Command <b>AT+MIPLDELETE=&lt;id&gt;</b>	Response <b>OK</b>



	or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
------	--

## Example

**AT+MIPLDELETE=?**

**+MIPLDELETE: (0)**

**OK**

## 15.2.4 AT+MIPLOPEN Register to OneNet

### AT+MIPLOPEN Register to OneNet

Test Command <b>AT+MIPLOPEN=?</b>	Response <b>+MIPLOPEN:</b> (list of supported <id>),(list of supported <lifetime>),(list of supported <param>)  <b>OK</b>
Read Command <b>AT+MIPLOPEN?</b>	Response <b>+MIPLOPEN:</b> <id>,<connected_state>  <b>OK</b>
Write Command <b>AT+MIPLOPEN=&lt;id&gt;,&lt;lifetime&gt;,&lt;param&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<lifetime>	Integer, lifetime to register ONENET server. The unit is second.
<param>	Reserved
<connected_state>	The connected result of AT+MIPLOPEN 0 Not connected 1 Connected

### Example

```
AT+MIPLOPEN=?
+MIPLOPEN: (0),(15-268435455),(0-1024)

OK

AT+MIPLOPEN?
+MIPLOPEN: 0,0

OK
```

## 15.2.5 AT+MIPLCLOSE Deregister to OneNet

### AT+MIPLCLOSE Deregister to OneNet

Test Command <b>AT+MIPLCLOSE=?</b>	Response <b>+MIPLCLOSE:</b> (list of supported <id>)  <b>OK</b>
Write Command <b>AT+MIPLCLOSE=&lt;id&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
------	--

### Example

**AT+MIPLCLOSE=?**

**+MIPLCLOSE: (0)**

OK

## 15.2.6 AT+MIPLADDOBJ Add an Object

### AT+MIPLADDOBJ Add an Object

Test Command <b>AT+MIPLADDOBJ=?</b>	Response <b>+MIPLADDOBJ:</b> (list of supported <id>),(list of supported <objectid>),(list of supported <instancecount>),(list of supported <instancebitmap>),(list of supported <attributecount>),(list of supported <actioncount>)  OK
Read Command <b>AT+MIPLADDOBJ?</b>	Response <b>+MIPLADDOBJ:</b> <object_num>  OK
Write Command <b>AT+MIPLADDOBJ=&lt;id&gt;,&lt;objectid&gt;,&lt;instancecount&gt;,&lt;instancebitmap&gt;,&lt;attributecount&gt;,&lt;actioncount&gt;</b>	Response OK or <b>+CIS ERROR:</b> <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<objectid>	Integer, object id
<instancecount>	Integer, instance count
<instancebitmap>	Binary string, instance bitmap, ex: "00101" (5 instances, only instance 1 & 3 are available)
<attributecount>	Integer, attribute count(The Object that has read or write operation, has the attribute)
<actioncount>	Integer, action count(The Object that has execute operation, has the action)
<object_num>	Current OneNet object number

## Example

**AT+MIPLADDOBJ=?**

+MIPLADDOBJ: (0),(0-4294967295),(1-64),"instancebitmap",(0-1024),(0-1024)

OK

**AT+MIPLADDOBJ?**

+MIPLADDOBJ: 0

OK

## 15.2.7 AT+MIPLDELOBJ Delete an Object

### AT+MIPLDELOBJ Delete an Object

Test Command

**AT+MIPLDELOBJ=?**

Response

+MIPLDELOBJ: (list of supported <id>),(list of supported <objectid>)

OK

Write Command

**AT+MIPLDELOBJ=<id>,<objectid>**

Response

OK

or

+CIS ERROR: <err>

Parameter Saving Mode

NO\_SAVE

Max Response Time

-

Reference

## Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<objectid>	Integer, object id

## Example

**AT+MIPLDELOBJ=?**

+MIPLDELOBJ: (0),(0-4294967295)

OK

## 15.2.8 AT+MIPLUPDATE Update Registration

AT+MIPLUPDATE Update Registration	
Test Command <b>AT+MIPLUPDATE=?</b>	Response <b>+MIPLUPDATE:</b> (list of supported <id>),(list of supported <lifetime>),(list of supported <withObjectFlag>  <b>OK</b>
Write Command <b>AT+MIPLUPDATE=&lt;id&gt;,&lt;lifetime&gt;,&lt;withObjectFlag&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE.
<lifetime>	Integer, lifetime to update registration. The unit is second.
<withObjectFlag>	Integer, whether to update objects 0 Not update objects 1 Update objects

### Example

```
AT+MIPLUPDATE=?
+MIPLUPDATE: (0),(15-268435455),(0-1)

OK
```

## 15.2.9 AT+MIPLREADRSP Read Response from User

AT+MIPLREADRSP Read Response from User	
Test Command <b>AT+MIPLREADRSP=?</b>	Response <b>+MIPLREADRSP:</b> (list of supported <id>),(list of supported

	<p><b>&lt;msgid&gt;</b>),(list of supported <b>&lt;result&gt;</b>),(list of supported <b>&lt;objectid&gt;</b>),(list of supported <b>&lt;instanceid&gt;</b>),(list of supported <b>&lt;resourceid&gt;</b>),(list of supported <b>&lt;valuetype&gt;</b>),(list of supported <b>&lt;len&gt;</b>),(list of supported <b>&lt;value&gt;</b>),(list of supported <b>&lt;index&gt;</b>),(list of supported <b>&lt;flag&gt;</b>)</p> <p><b>OK</b></p>
Write Command <b>AT+MIPLREADRSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;index&gt;,&lt;flag&gt;</b>	<p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>+CIS ERROR: &lt;err&gt;</b></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;id&gt;</b>	Integer, OneNet instance returned by AT+MIPLCREATE
<b>&lt;msgid&gt;</b>	Integer, message id, the same to +MIPLREAD
<b>&lt;result&gt;</b>	<p>Integer, read result, 1 indicates read success, should provide read content in the same time</p> <ul style="list-style-type: none"> <li>1 Read/Observe/Discover OK</li> <li>2 Write/Execute/ Set parameter OK</li> <li>11 400 Bad request</li> <li>12 401 Unauthorized</li> <li>13 404 Not Found</li> <li>14 405 Method Not Allowed</li> <li>15 406 Not Acceptable</li> </ul>
<b>&lt;objectid&gt;</b>	Integer, object id
<b>&lt;instanceid&gt;</b>	Integer, instance id
<b>&lt;resourceid&gt;</b>	Integer, resource id
<b>&lt;valuetype&gt;</b>	<p>Integer, read data value type</p> <ul style="list-style-type: none"> <li>1 String</li> <li>2 Opaque</li> <li>3 Integer</li> <li>4 Float</li> <li>5 Bool</li> </ul>
<b>&lt;len&gt;</b>	Integer, read data length. It can be omitted, if valuetype is Integer or Float, or Bool
<b>&lt;value&gt;</b>	Integer, read data value
<b>&lt;index&gt;</b>	Integer, message index, from 0 to 1024

<flag>	Integer, message flag 1 First message 2 Middle message 0 Last message
--------	--

### Example

```
AT+MIPLREADRSP=?
+MIPLREADRSP:
(0),(0-4294967295),(1-2,11-15),(0-4294967295),(0-63),(0-4294967295),(1-5),(0-1024),"value",
(0-1024),(0-2)
OK
```

### 15.2.10 AT+MIPLWRITERSP Write Response from User

#### AT+MIPLWRITERSP Write Response from User

Test Command <b>AT+MIPLWRITERSP=?</b>	Response <b>+MIPLWRITERSP:</b> (list of supported <id>),(list of supported <msgid>),(list of supported <result>)  <b>OK</b>
Write Command <b>AT+MIPLWRITERSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id, the same to +MIPLWRITE
<result>	Integer, write result, 2 indicates write success 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found

14	405 Method Not Allowed
15	406 Not Acceptable

### Example

**AT+MIPLWRITERSP=?**

**+MIPLWRITERSP: (0),(0-4294967295),(1-2,11-15)**

OK

### 15.2.11 AT+MIPLEXECUTERSP Execute Response from User

AT+MIPLEXECUTERSP Execute Response from User	
Test Command <b>AT+MIPLEXECUTERSP=?</b>	Response <b>+MIPLEXECUTERSP: (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;)</b>  OK
Write Command <b>AT+MIPLEXECUTERSP=&lt;id&gt; &gt;&lt;msgid&gt;,&lt;result&gt;</b>	Response OK or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id, the same to +MIPLEXECUTE
<result>	Integer, execute result, 2 indicates execute success 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable



## Example

```
AT+MIPLEXECUTERSP=?
+MIPLEXECUTERSP: (0),(0-4294967295),(1-2,11-15)

OK
```

## 15.2.12 AT+MIPLOBSERVERSP Observe Response from User

AT+MIPLOBSERVERSP Observe Response from User	
Test Command <b>AT+MIPLOBSERVERSP=?</b>	Response <b>+MIPLOBSERVERSP:</b> (list of supported <b>&lt;id&gt;</b> ),(list of supported <b>&lt;msgid&gt;</b> ),(list of supported <b>&lt;result&gt;</b> )  <b>OK</b>
Write Command <b>AT+MIPLOBSERVERSP=&lt;id &gt;&lt;msgid&gt;,&lt;result&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<b>&lt;id&gt;</b>	Integer, OneNet instance returned by AT+MIPLCREATE
<b>&lt;msgid&gt;</b>	Integer, message id, the same to +MIPLOBSERVE
<b>&lt;result&gt;</b>	Integer, (cancel) observe result, 1 indicates (cancel) observe success 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable

## Example

```
AT+MIPLOBSERVERSP=?
+MIPLOBSERVERSP: (0),(0-4294967295),(1-2,11-15)
```

OK

### 15.2.13 AT+MIPLDISCOVERRSP Discover Response from User

AT+MIPLDISCOVERRSP Discover Response from User	
Test Command <b>AT+MIPLDISCOVERRSP=?</b>	Response <b>+MIPLDISCOVERRSP:</b> (list of supported <b>&lt;id&gt;</b> ),(list of supported <b>&lt;msgid&gt;</b> ),(list of supported <b>&lt;result&gt;</b> ),(list of supported <b>&lt;length&gt;</b> ),(list of supported <b>&lt;valuestring&gt;</b> )  <b>OK</b>
Write Command <b>AT+MIPLDISCOVERRSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;&lt;length&gt;,&lt;valuestring&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;id&gt;</b>	Integer, OneNet instance returned by AT+MIPLCREATE
<b>&lt;msgid&gt;</b>	Integer, message id, the same to +MIPLDISCOVER
<b>&lt;result&gt;</b>	Integer, discover result, 1 indicates discover success 1 Read/Observe/Discover OK 2 Write/Execute/Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable
<b>&lt;length&gt;</b>	Integer, length of value string
<b>&lt;valuestring&gt;</b>	String, value string (resourceId; resourceId; ...; resourceId), must start with "" and end with ""

#### Example

**AT+MIPLDISCOVERRSP=?**  
**+MIPLDISCOVERRSP: (0),(0-4294967295),(1-2,11-15),(0-1024),"valuestring"**

OK

### 15.2.14 AT+MIPLPARAMETERRSP Set Parameter from User

#### AT+MIPLPARAMETERRSP Set Parameter from User

Test Command <b>AT+MIPLPARAMETERRSP=?</b>	Response <b>+MIPLPARAMETERRSP: (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;)</b>  <b>OK</b>
Write Command <b>AT+MIPLPARAMETERRSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;id&gt;</b>	Integer, OneNet instance returned by AT+MIPLCREATE
<b>&lt;msgid&gt;</b>	Integer, message id, the same to +MIPLPARAMETER
<b>&lt;result&gt;</b>	Integer, set parameter result, 2 indicates set parameter success 1 Read/Observe/Discover OK 2 Write/Execute/Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable

#### Example

```
AT+MIPLPARAMETERRSP=?
+MIPLPARAMETERRSP: (0),(0-4294967295),(1-2,11-15)
```

OK

## 15.2.15 AT+MIPLNOTIFY Notify Data Value Change from User

### AT+MIPLNOTIFY Notify Data Value Change from User

Test Command <b>AT+MIPLNOTIFY=?</b>	Response <b>+MIPLNOTIFY:</b> (list of supported <b>&lt;id&gt;</b> ),(list of supported <b>&lt;msgid&gt;</b> ),(list of supported <b>&lt;objectid&gt;</b> ),(list of supported <b>&lt;instanceid&gt;</b> ),(list of supported <b>&lt;resourceid&gt;</b> ),(list of supported <b>&lt;valuetype&gt;</b> ),(list of supported <b>&lt;len&gt;</b> ),(list of supported <b>&lt;value&gt;</b> ),(list of supported <b>&lt;index&gt;</b> ),(list of supported <b>&lt;flag&gt;</b> ),(list of supported <b>&lt;ack&gt;</b> )  <b>OK</b>
Write Command <b>AT+MIPLNOTIFY=&lt;id&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;index&gt;,&lt;flag&gt;[,&lt;ack&gt;]</b>	Response <b>OK</b> or <b>+CIS ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;id&gt;</b>	Integer, OneNet instance returned by AT+MIPLCREATE
<b>&lt;msgid&gt;</b>	Integer, message id
<b>&lt;objectid&gt;</b>	Integer, object id
<b>&lt;instanceid&gt;</b>	Integer, instance id
<b>&lt;resourceid&gt;</b>	Integer, resource id
<b>&lt;valuetype&gt;</b>	Integer, read data value type 1 String 2 Opaque 3 Integer 4 Float 5 Bool
<b>&lt;len&gt;</b>	Integer, write data length. It can be omitted, if valuetype is Integer or Float, or Bool
<b>&lt;value&gt;</b>	Integer, write data value
<b>&lt;index&gt;</b>	Integer, message index, from 0 to 1024
<b>&lt;flag&gt;</b>	Integer, message flag 1 First message 2 Middle message

	0 Last message
<ack>	Integer, ack id [option] If omit it, there is no result URC after this command

### Example

```
AT+MIPLNOTIFY=?
+MIPLNOTIFY:
(0),(0-4294967295),(0-4294967295),(0-63),(0-4294967295),(1-5),(0-1024),"value",(0-1024),(0-2),(0-4294967294)
OK
```

### 15.2.16 AT+MIPLVER Read Version

AT+MIPLVER Read Version	
Read Command <b>AT+MIPLVER?</b>	Response <b>+MIPLVER: &lt;version&gt;</b>
	<b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<version>	OneNet version, such as 2.2.0
-----------	-------------------------------

### Example

```
AT+MIPLVER?
+MIPLVER: 2.3.0
OK
```

## 15.2.17+MIPLREAD Read Request to User

### +MIPLREAD Read Request to User

Response

.MIPLREAD: <id>,<msgid>,<objectid>,<instanceid>,<resourceid>

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id
<objectid>	Integer, object id
<instanceid>	Integer, instance id, read all resources of all instances of the object if instanceid equals -1
<resourceid>	Integer, resource id, read all resources of the instance if resourceid equals -1

## 15.2.18+MIPLWRITE Write Request to User

### +MIPLWRITE Write Request to User

Response

+MIPLWRITE:

<id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<valuetype>  
,<len>,<value>,<flag>,<index>

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id
<objectid>	Integer, object id
<instanceid>	Integer, instance id
<resourceid>	Integer, resource id
<valuetype>	Integer, write data value type 1 String 2 Opaque 3 Integer 4 Float 5 Bool
<len>	Integer, write data length. It can be omitted, if valuetype is Integer or

	Float, or Bool
<value>	Integer, write data value
<flag>	Integer, message flag 1 First message 2 Middle message 0 Last message
<index>	Integer, message index, from 0 to 1024

### 15.2.19 +MIPLEXECUTE Execute Request to User

#### +MIPLEXECUTE Execute Request to User

	Response <b>+MIPLEXECUTE:</b> <id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<len>,<arguments>
--	---

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id
<objectid>	Integer, object id
<instanceid>	Integer, instance id
<resourceid>	Integer, resource id
<len>	Integer, parameter length
<arguments>	String, parameter string

### 15.2.20 +MIPLOBERVE Observe Request to User

#### +MIPLOBERVE Observe Request to User

	Response <b>+MIPLOBERVE:</b> <id>,<msgid>,<flag>,<objectid>,<instanceid>,<resourceid>
--	---

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
------	--

<msgid>	Integer, message id
<flag>	Integer, observe flag. 1 Indicates observe 0 Indicates cancel observe
<objectid>	Integer, object id
<instanceid>	Integer, instance id, observe all resources of all instances of the object if instanceid equals -1
<resourceid>	Integer, resource id, observe all resources of the instance if resourceid equals -1

### 15.2.21 +MIPLDISCOVER Discover request to User

#### +MIPLDISCOVER Discover request to User

Response

**+MIPLDISCOVER: <id>,<msgid>,<objectid>**

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id
<objectid>	Integer, object id

### 15.2.22 +MIPLPARAMETER Set Parameter Request to User

#### +MIPLPARAMETER Set Parameter Request to User

Response

**+MIPLPARAMETER:**

**<id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<len>,<parameter>**

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<msgid>	Integer, message id
<objectid>	Integer, object id
<instanceid>	Integer, instance id, observe all resources of all instances of the object if instanceid equals -1



<resoreceid>	Integer, resource id, observe all resources of the instance if resourceid equals -1
<len>	Integer, parameter length
<parameter>	String, parameter string, must start with "and end with" pmin=xxx; pmax=xxx; gt=xxx; lt=xxx; stp=xxx

### 15.2.23+MIPLEVENT Event Indication to User

#### +MIPLEVENT Event Indication to User

	Response <b>+MIPLEVENT: &lt;id&gt;,&lt;evtid&gt;[,&lt;extend&gt;]</b>
--	--

#### Defined Values

<id>	Integer, OneNet instance returned by AT+MIPLCREATE
<evtid>	Integer, event id 1 BOOTSTRAP_START 2 BOOTSTRAP_SUCCESS 3 BOOTSTRAP_FAILED 4 CONNECT_SUCCESS 5 CONNECT_FAILED 6 REG_SUCCESS 7 REG_FAILED 8 REG_TIMEOUT 9 LIFETIME_TIMEOUT 10 STATUS_HALT 11 UPDATE_SUCCESS 12 UPDATE_FAILED 13 UPDATE_TIMEOUT 14 UPDATE_NEED 15 UNREG_DONE 20 RESPONSE_FAILED 21 RESPONSE_SUCCESS 25 NOTIFY_FAILED 26 NOTIFY_SUCCESS
<extend>	Integer, extend parameter [option] The events of RESPONSE_FAILED and NOTIFY_FAILED can take msgid The events of UPDATE_NEED can take LIFETIME(unit is second) The events of RESPONSE_SUCCESS can take ack

# 16 AT Commands for NVRAM Application

## 16.1 Overview of AT Commands for NVRAM Application

Command	Description
<b>AT+CNVMR</b>	Read data from NVRAM
<b>AT+CNVMW</b>	Write data to NVRAM
<b>AT+CNMIVD</b>	Invalidate a specific data item in NVRAM
<b>AT+CNVMGET</b>	Get all Customer Data Item IDs from NVRAM

## 16.2 Detailed Descriptions of AT Commands for NVRAM Application

### 16.2.1 AT+CNVMR Read Data from NVRAM

<b>AT+CNVMR Read Data from NVRAM</b>	
Test Command <b>AT+CNVMR=?</b>	Response <b>+CNVMR: "Data item name"</b>  <b>OK</b>
Write Command <b>AT+CNVMR=&lt;data_item_name&gt;</b>	Response <b>+CNVMR:</b> <b>&lt;read_status&gt;[,&lt;data_item_name&gt;,&lt;length&gt;,&lt;nvrām_data&gt;]</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<read_status>	If the succeeds, it is 0.Otherwise, it is the error code. 0 Success -4 Means the data item wasn't found by the NVRAM. There may be other error codes.
<data_item_name>	A string parameter which indicates the NVRAM data item name, the string length can be from 1 to 20.
<length>	Integer, the length of the <data_item_name> item NVRAM Data.
<nvrām_data>	A string parameter which indicates the NVRAM data.

## Example

```
AT+CNVMR=?
+CNVMR: "Data item name"
```

```
OK
```

### 16.2.2 AT+CNVMW Write Data to NVRAM

#### AT+CNVMW Write Data to NVRAM

Test Command <b>AT+CNVMW=?</b>	Response <b>+CNVMW: "Data item name","Data item value",(1-1024)</b>  <b>OK</b>
Write Command <b>AT+CNVMW=&lt;data_item_name&gt;,&lt;nvrām_data&gt;,&lt;length&gt;</b> <b>&gt;</b>	Response <b>+CNVMR: +CNVMW: &lt;write_status&gt;</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<write_status>	If the succeeds, it is 0.Otherwise, it is the error code. 0 Success
----------------	--

	-7 Means no enough customers NVRAM space. There may be other error codes.
<data_item_name>	A string parameter which indicates the data item name you want to write, the string length can be from 1 to 20.
<nvr_data>	A string parameter which indicates the data you want to write in to NVRAM, the data length can be from 1 to 1024.
<length>	Integer, the length of the <nvr_data>,can be from 1 to 1024.

### Example

```
AT+CNVMW=?
+CNVMW: "Data item name", "Data item value", (1-1024)

OK
```

### 16.2.3 AT+CNVMIVD Invalidate a Specific Data Item in NVRAM

#### AT+CNVMIVD Invalidate a Specific Data Item in NVRAM

Test Command <b>AT+CNVMIVD=?</b>	Response <b>+CNVMIVD: "Data item name"</b>  <b>OK</b>
Write Command <b>AT+CNVMIVD=&lt;data_item_name&gt;</b>	Response <b>+CNVMIVD: &lt;status&gt;</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<status>	If the succeeds, it is 0. Otherwise, it is the error code. 0 Success -4 Means the data item wasn't found by the NVRAM. There may be other error codes.
<data_item_name>	A string parameter which indicates the data item name you want to write, the string length can be from 1 to 20.

## Example

```
AT+CNVMIVD=?
+CNVMW: "Data item name","Data item value",(1-1024)

OK
```

### 16.2.4 AT+CNVMGET Get all Customer Data Item IDs from NVRAM

#### AT+CNVMGET Get all Customer Data Item IDs from NVRAM

Execution Command <b>AT+CNVMGET</b>	Response If successful, return: <b>+CNVMGET: &lt;id&gt;,&lt;group_name&gt;,&lt;data_item_name&gt;</b>  <b>OK</b> If no customer NVRAM data item, return: <b>+CNVMGET: NULL</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;id&gt;</b>	The id of the data item.
<b>&lt;group_name&gt;</b>	A string parameter which indicates the group name you have wrote in to NVRAM.
<b>&lt;data_item_name&gt;</b>	A string parameter which indicates the data item name you have wrote in to NVRAM with AT+CNVMW.

## 17 AT Commands for CT IOT Platform

### 17.1 Overview of AT Commands for CT IOT Platform

Command	Description
<b>AT+CM2MCLINEW</b>	Register to CT IOT Platform
<b>AT+CM2MCLISEND</b>	Send data to CT IOT Platform
<b>AT+CM2MCLIDEL</b>	Deregister to CT IOT Platform
<b>AT+CM2MCLIGET</b>	Get the latest 6 received data
<b>AT+CCTUPNUM</b>	Set update registration retry times
<b>AT+CCTLASTSTAT</b>	Query the latest status of IoT
<b>+CM2MCLI</b>	CT IOT client notification
<b>+CM2MCLIRECV</b>	Receive data from CT IOT platform

### 17.2 Detailed Descriptions of AT Commands for CT IOT Platform

#### 17.2.1 AT+CM2MCLINEW Register to CT IOT Platform

<b>AT+CM2MCLINEW Register to CT IOT Platform</b>	
Write Command <b>AT+CM2MCLINEW=&lt;server&gt;,&lt;port&gt;,&lt;endpoint&gt;[,&lt;lifetime&gt;[,&lt;pskid&gt;,&lt;psk&gt;]]</b>	Response <b>OK</b>  <b>+CM2MCLI: 1</b>  <b>+CM2MCLI: 4</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<server>	String, LwM2M server IP address of CT IOT platform.
<port>	Integer, LwM2M server port of CT IOT platform.
<endpoint>	String, Endpoint name, the format should be "xxx", xxx is the IMEI of device.
<lifetime>	Integer, The time interval to send "update registration" to CT IOT platform, Don't update by default.
<pskid>	String, Mandatory for DTLS register, use device's IMEI for CT IOT platform.
<psk>	String, Mandatory for DTLS register, supply by CT IOT platform.

### 17.2.2 AT+CM2MCLISEND Send Data to CT IOT Platform

AT+CM2MCLISEND Send Data to CT IOT Platform	
Write Command <b>AT+CM2MCLISEND=&lt;data&gt;</b>	Response <b>OK</b>  <b>+CM2MCLI: 5</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<data>	String, HEX format, should be even, the supported characters are 0~9, A~F, a~f.
--------	---

### 17.2.3 AT+CM2MCLIDEL Deregister to CT IOT Platform

AT+CM2MCLIDEL Deregister to CT IOT Platform	
Execute Command <b>AT+CM2MCLIDEL</b>	Response <b>OK</b>  <b>+CM2MCLI: 3</b> or

	<b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### 17.2.4 AT+CM2MCLIGET Get the Latest 6 Received Data

<b>AT+CM2MCLIGET Get the Latest 6 Received Data</b>	
Read Command <b>AT+CM2MCLIGET?</b>	Response <b>No Data!</b>  <b>OK</b> or <b>+CM2MCLIRECV: &lt;data&gt;</b> <b>[[+CM2MCLIRECV: &lt;data&gt;]</b> <b>...]</b>  <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Example

**AT+CM2MCLIGET?**

**No Data!**

**OK**

#### 17.2.5 AT+CCTUPNUM Set Update Registration Retry Times

<b>AT+CCTUPNUM Set Update Registration Retry Times</b>	
Test Command <b>AT+CCTUPNUM=?</b>	Response <b>+CCTUPNUM: (range of supported &lt;num&gt;s)</b>  <b>OK</b>



Read Command <b>AT+CCTUPNUM?</b>	Response <b>+CCTUPNUM: &lt;num&gt;</b>  <b>OK</b>
Write Command <b>AT+CCTUPNUM=&lt;num&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<num>	Integer, retry times when update registration fail. 0-100
-------	--

### Example

```
AT+CCTUPNUM=?
+CCTUPNUM: (0-100)
```

```
OK
```

```
AT+CCTUPNUM=?
+CCTUPNUM: 0
```

```
OK
```

## 17.2.6 AT+CCTLASTSTAT Query the Latest Status of IoT

### AT+CCTLASTSTAT Query the Latest Status of IoT

Read Command <b>AT+CCTLASTSTAT?</b>	Response <b>+CCTLASTSTAT: &lt;status&gt;</b>  <b>OK</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<status>	Integer, see the following IoT client notification chapter.
----------	---

## Example

```
AT+CCTLASTSTAT?
```

```
+CCTLASTSTAT: 0
```

```
OK
```

## 17.2.7 +CM2MCLI CT IOT Client Notification

### +CM2MCLI CT IOT Client Notification

Response  
+CM2MCLI: <n>

## Defined Values

<n>	<p>Integer, Notification.</p> <ul style="list-style-type: none"> <li>0 Response error</li> <li>1 Device registered to CT IOT platform successfully</li> <li>2 Device updated registration to CT IOT platform successfully</li> <li>3 Device deregistered to CT IOT platform successfully</li> <li>4 Device received object 19 observation successfully from CT IOT platform</li> <li>5 Device sent data to CT IOT platform</li> <li>6 Reserve, define later</li> <li>7 Device registered to CT IOT platform failed</li> </ul>
-----	---

## 17.2.8 +CM2MCLIRECV Receive data from CT IOT Platform

### +CM2MCLIRECV Receive data from CT IOT platform

Response  
+CM2MCLIRECV: <data>

## Defined Values

<data>	String, HEX format, should be even, the supported characters are 0~9, A~F, a~f.
--------	---

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# 18 AT Commands for DM Application

## 18.1 Overview of AT Commands for DM Application

Command	Description
<b>AT+DMCONFIGEXT</b>	Configure parameters for DM
<b>AT+DMSET</b>	Set DM state

## 18.2 Detailed Descriptions of AT Commands for DM Application

### 18.2.1 AT+DMCONFIGEXT Configure parameters for DM

AT+DMCONFIGEXT Configure parameters for DM	
Test Command <b>AT+DMCONFIGEXT=?</b>	Response <b>+DMCONFIGEXT: (0-255).(0-255).(0-255).(0-255), (0,1), "appkey", "pwd",(list of supported &lt;lifetime&gt;)</b>  <b>OK</b>
Write Command <b>AT+DMCONFIGEXT=&lt;addr&gt; ,&lt;bs&gt;,&lt;appkey&gt;,&lt;pwd&gt;,&lt;lifetime&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;addr&gt;</b>	String, DM host IP address
<b>&lt;bs&gt;</b>	Integer, DM host bootstrap value 0 Bootstrap disabled

	1 Bootstrap enabled Such as: 117.161.2.7, bs value is set to 0
<appkey>	String, appkey for register DM
<pwd>	String, secret key for register DM
<lifetime>	Integer, lifetime for register DM

### Example

```
AT+DMCONFIGEXT=?
+DMCONFIGEXT:
(0-255).(0-255).(0-255).(0-255),(0-1),"appkey","pwd",(15-268435455)

OK
```

### 18.2.2 AT+DMSET Set DM State

#### AT+DMSET Set DM State

Test Command <b>AT+DMSET=?</b>	Response <b>+DMSET: (0-1)</b>  <b>OK</b>
Read Command <b>AT+DMSET?</b>	Response <b>+DMSET: (value)</b>  <b>OK</b>
Write Command <b>AT+DMSET=&lt;value&gt;</b>	Response <b>OK</b> or <b>ERROR</b>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

### Defined Values

<value>	Integer, set DM on or off state 0 DM off 1 DM on
---------	--

## Example

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

```
OK
```

```
AT+DMSET?  
+DMSET: 0
```

```
OK
```

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# 19 AT Commands for FOTA Application

## 19.1 Overview of AT Commands for FOTA Application

Command	Description
<b>AT+CFOTA</b>	FOTA Operation
<b>AT+CFLE</b>	Flash Erase
<b>AT+CFLW</b>	Flash Write
<b>AT+CFLR</b>	Flash Read

## 19.2 Detailed Descriptions of AT Commands for FOTA Application

### 19.2.1 AT+CFOTA FOTA Operation

AT+CFOTA FOTA Operation	
Write Command <b>AT+CFOTA=&lt;mode&gt;[,version][,&lt;len&gt;,&lt;md5&gt;]</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	Operation type 1 Download and update differential package by TCP 2 Download differential package by TCP, not update 3 Update differential package after <b>&lt;mode&gt;=2</b>
---------------------	--

	4 Report update result to FOTA server 5 Update differential package after local download
<len>	The update differential package length
<md5>	The update differential package MD5 check value

**NOTE**

- When <mode>=1 or 2  
The PDP connect should be OK.  
Domain name resolution should be OK.
- <version> The new version which customer want to update, if you omit it, the module will update to the newest version in the OTA server. The <version> just support when <mode>=1 or 2.
- When <mode>=5  
need parameter <len> and <md5>.  
Local download need use AT+CFLE and AT+CFLW.

## 19.2.2 AT+CFLE Flash Erase

### AT+CFLE Flash Erase

Write Command <b>AT+CFLE=&lt;mode&gt;,&lt;addr&gt;,&lt;num&gt;</b>	Response <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<mode>	0 Erase FOTA update partition 1 Erase flash reserved partition
<addr>	Erase address 0 FOTA partition address is fixed when <mode>=0 138346496-138412032 Flash reserved partition valid address area (0x083F0000-0x08400000), the value should be decimal format, when <mode>=1.
<num>	Flash block number 1-145 Flash block number when <mode>=0 1-16 Flash block number when <mode>=1



**NOTE**

- FOTA partition 0x0830F000-0x083A5000,600KB
- FOTA update partition 0x08313000- 0x083A4000,580KB
- FLASH reserved partition 0x083F0000-0x08400000,64KB
- The size one flash block is 4KB

### 19.2.3 AT+CFLW Flash Write

#### At+CFLW Flash Write

Write Command <b>AT+CFLW=&lt;mode&gt;,&lt;addr&gt;,&lt;len&gt;,&lt;offset&gt;,&lt;timeout&gt;</b>	Response ">", Then enter data mode for inputting data until <len> is meet, and write data to flash. <b>OK</b> If <timeout> expired, cancel the operation <b>ERROR</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<mode>	0 Write FOTA update partition 1 Write Flash reserved partition
<addr>	Write address 0 FOTA partition address is fixed when <mode>=0 138346496-138412032 Flash reserved partition valid address area (0x083F0000-0x08400000), the value should be decimal format
<len>	The data-length for writing, maximum 512 bytes each time
<offset>	The offset added for writing not exceeding 580KB when <mode>=0 not exceeding 64KB when <mode>=1
<timeout>	Timeout for writing, unit: s, maximum 100s

**NOTE**

- Before write flash, should erase flash first

### 19.2.4 AT+CFLR Flash Read

#### AT+CFLR Flash Read

Write Command <b>AT+CFLR=&lt;addr&gt;,&lt;len&gt;</b>	Response <b>+CFLR: &lt;data&gt;</b>  <b>OK</b> If error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;addr&gt;</b>	138346496-138412032 Flash reserved partition valid address area (0x083F0000-0x08400000), the value should be decimal format. 137441280-138035200 FOTA update partition (0x08313000-0x083A4000), the value should be decimal format.
<b>&lt;len&gt;</b>	The data-length for reading, maximum 512 bytes each time
<b>&lt;data&gt;</b>	The data which is read will be putted out by UART port

**NOTE**

- FOTA update partition not support read.

# 20 AT Commands for SIM Toolkit Application

## 20.1 Overview of AT Commands for SIM Toolkit Application

Command	Description
<b>AT*MSTLOCK</b>	APP Registering for SIM Toolkit (And Locking To A Channel)
<b>AT*MSTPD</b>	SIM Toolkit Terminal Profile Download
<b>AT*MSTMODE</b>	Setting Format for SIM Toolkit Output
<b>AT*MSTICREC</b>	Obtaining Icon Records
<b>AT*MSTICIMG</b>	Obtaining Icon Image
<b>AT*MSTGC</b>	APP Request for Parameters Associated with a Previously Reported Proactive Command
<b>AT*MSTCR</b>	APP Informing PS of Response to Proactive Command
<b>AT*MSTMS</b>	Menu Selection by User
<b>AT*MSTEV</b>	APP Specific Monitored Event Occurrence

## 20.2 Detailed Descriptions of AT Commands for SIM Toolkit Application

### 20.2.1 AT\*MSTLOCK APP Registering for SIM Toolkit (and locking to a channel)

<b>AT*MSTLOCK APP Registering for SIM Toolkit (and locking to a channel)</b>	
Write Command <b>AT*MSTLOCK=&lt;data&gt;[,&lt;timeout&gt;]</b>	This command registers/de-registers the CI task with the SIMAT task so it receives any relevant SIM toolkit activity. The channel on which this AT command is received is used as the channel allocation for the unsolicited results and data. A further optional parameter supplies the length of time to set the modem user response timer.
	Response <b>OK</b> or

	<b>+CME ERROR: &lt;err&gt;</b> <b>+STC: 0</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;data&gt;</b>	Decimal digit 0 Applications processor de-registers for SIM Toolkit activity 1 Register applications processor for SIM toolkit activity. (The same channel used for this command will be used for all unsolicited result codes from receipt of this.)
<b>&lt;timeout&gt;</b>	User response timer – time set in seconds. Max timeout value is 3600 seconds. When enabled the timeout value remains operational until the command is re-entered with a timeout value of 0 or the ME is powered down(default 0).

## 20.2.2 AT\*MSTPD SIM Toolkit Terminal Profile Download

<b>AT*MSTPD SIM Toolkit Terminal Profile Download</b>	
Write Command <b>AT*MSTPD=&lt;length&gt;[,&lt;data&gt;]</b>	AT command to provide/modify MMI specific terminal profile parameters to the CI Task. The MMI profile is stored in NVRAM on the modem and read at start-up. The value stored in NVRAM may be changed using this command. If this is modified after SAT initialization the modified value will not be sent to the (U)SIM until after a power cycle.  Response <b>OK</b> or <b>+CME ERROR: &lt;err&gt;</b> <b>+STC: 0</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;length&gt;</b>	Integer, determines the number of bytes of <data> used for the APP
-----------------------	--

	data for the terminal profile.
<b>&lt;data&gt;</b>	Hexadecimal representation of the <length> number of bytes with bits set by APP to indicates which of the parameters in the byte definition table given above are to be enabled in the terminal profile.

### 20.2.3 AT\*MSTMODE Setting format for SIM Toolkit Output

AT*MSTMODE Setting format for SIM Toolkit Output	
Test Command <b>AT*MSTMODE=?</b>	AT Command for setting the format of SIM Application Toolkit output. The format may be set to PDU or Text Mode.  Response <b>*MSTMODE:</b> (list of supported <mode>s) or <b>+CME ERROR:</b> <err>
Read Command <b>AT*MSTMODE?</b>	Response <b>*MSTMODE:</b> <mode> or <b>+CME ERROR:</b> <err>
Write Command <b>AT*MSTMODE=&lt;mode&gt;</b>	Response <b>OK</b> or <b>+CME ERROR:</b> <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

#### Defined Values

<b>&lt;mode&gt;</b>	Integer 0 PDU Mode 1 Text Mode 2 CMGF Mode (default, will use AT+CMGF setting)
---------------------	---

#### Example

```
AT*MSTMODE=?
*MSTMODE: (0-2)
```

```
OK
```

AT\*MSTMODE?

\*MSTMODE: 2

OK

## 20.2.4 AT\*MSTICREC Obtaining Icon records

### AT\*MSTICREC Obtaining Icon records

Read Command <b>AT*MSTICREC?</b>	AT command for obtaining ICON image record information. – proactive commands may include an icon record in command data – this should be displayed as part of any user interaction for the proactive command.  Response <b>*MSTICREC: &lt;number of icon records on the SIM/UICC&gt;</b> or <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT*MSTICREC=&lt;rNum&gt;</b>	Response <b>*MSTICREC: &lt;rNum&gt;,&lt;numInstances&gt;,[&lt;CR&gt;&lt;LF&gt;*MSTICREC: &lt;width&gt;,&lt;height&gt;,&lt;cs&gt;,&lt;efld&gt;,&lt;offset&gt;,&lt;length&gt;[...]]</b> or <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;rNum&gt;</b>	Integer, the number of the icon record to be read from the SIM/UICC.
<b>&lt;numInstances&gt;</b>	Integer, the number of instance data records within this image record.
<b>&lt;width&gt;</b>	Integer, width of this image instance expressed in raster image points.
<b>&lt;height&gt;</b>	Integer, height of this image instance expressed in raster image points.
<b>&lt;cs&gt;</b>	Integer, coding scheme. 0 basic coding(default) 1 color coding
<b>&lt;efld&gt;</b>	Hexadecimal representation of the Image Instance file to be read on the SIM/UICC – two bytes of data ordered MSB LSB.
<b>&lt;offset&gt;</b>	Integer, number of bytes offset from start of the file to begin reading.
<b>&lt;length&gt;</b>	Integer, number of bytes to be read.

## 20.2.5 AT\*MSTICIMG Obtaining Icon image

AT*MSTICIMG Obtaining Icon image	
Write Command <b>AT*MSTICIMG=&lt;efID&gt;[,&lt;offset&gt;],&lt;length&gt;</b>	AT command to get ICON image instance data. This image instance data is referenced in the icon record to make up the icon to display.  Response <b>*MSTICIMG: &lt;length&gt;,&lt;data&gt;</b> or <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;efid&gt;</b>	Hexadecimal representation of the Image Instance file to be read on the SIM/UICC – two bytes of data ordered MSB LSB.
<b>&lt;offset&gt;</b>	Integer, Number of bytes offset from start of the file to begin reading from.
<b>&lt;length&gt;</b>	Integer, Number of bytes of image instance data to read/was read.
<b>&lt;data&gt;</b>	String containing a list of hex values for bytes of image instance data.

## 20.2.6 AT\*MSTGC APP request for parameters associated with a previously reported Proactive Command

AT*MSTGC APP request for parameters associated with a previously reported Proactive Command	
Write Command <b>AT*MSTGC=&lt;cmdId&gt;</b>	AT command to Get Command parameters for a proactive SIM command from the CI Task. This will be sent from the application after unsolicited result code *MSTC: <cmdId> informs it the SIM has issued a proactive SIM command which requires user interaction.  Response <b>*MSTGC: &lt;cmdId&gt;,&lt;data&gt;</b> or <b>+CME ERROR: &lt;err&gt;</b>

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<cmdId>	Decimal notation, Command Type value.
<data>	Proactive command specific data, dependent on <cmdId>.

## 20.2.7 AT\*MSTCR APP Informing PS of Response to Proactive Command

AT*MSTCR APP Informing PS of Response to Proactive Command	
Write Command <b>AT*MSTCR=&lt;cmdId&gt;,&lt;result&gt;[,&lt;data&gt;]</b>	AT command to provide Command Response parameters for a previously fetched proactive SIM command. Its purpose is to relay response data to the lower layers of the protocol stack to allow the Terminal Response SIM command to be returned to the SIM for the current proactive command.  Response <b>OK</b> or <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<cmdId>	Decimal notation, Command Type value.
<result>	Decimal notation, dependent on the command type – see following sections for each proactive command supported.
<data>	Additional data provided for certain commands, as required for the Terminal Response returned to the SIM after processing a proactive SIM command.

## 20.2.8 AT\*MSTMS Menu Selection by User



## AT\*MSTMS Menu Selection by User

Test Command <b>AT*MSTMS=?</b>	AT Command for selecting a menu option. On power-up the SIM will send the Set-Up-Menu proactive indication. The Application Processor (M4) loads and displays the menu structure. This AT command is used when an item from this menu is selected.  Response <b>*MSTMS: &lt;first menu item id – last menu item id&gt;,&lt;0-1&gt;</b> or <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT*MSTMS=&lt;item&gt;[,&lt;help&gt;]</b>	Response <b>OK</b> or <b>+CME ERROR: &lt;err&gt;</b>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<b>&lt;mode&gt;</b>	Integer, identifying an item in the menu items list.
<b>&lt;help&gt;</b>	Integer. 0 no help requested 1 help requested

#### NOTE

- For example, AT\*MSTMS=2,1 will select item 2 from the main menu with help. (This response would result in an ENVELOPE command being passed to the SIM/UICC to indicate the item and that help is requested – as a result of this a proactive command – DISPLAY TEXT would be generated to supply the help information to the user)

## 20.2.9 AT\*MSTEV APP specific monitored event occurrence

### AT\*MSTEV APP specific monitored event occurrence

Test Command <b>AT*MSTEV=?</b>	This command is used to inform the MS that an MMI specific event has occurred.  Response
-----------------------------------	--

	*MSTEV: (supported <event> list) or +CME ERROR: <err>
Write Command AT*MSTEV=<event>[,<language>][,<charsDownDisplay>[,<sizingSupported>[,<charsAcrossDisplay>[,<variableFontSupport>[,<displayResize>[,<textWrapping>[,<textScrolling>[,<menuWidthReduction>]]]]]]]]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

## Defined Values

<event>	Hex two digits. 05 User Activity Event* 06 Idle Screen Available Event* 08 Language Selection Event 0C Display Parameters Changed
<language>	two character string representation of the language code.
<charsDownDisplay>	numeric type to indicate how many characters down are displayed (1-15)
<sizingSupported>	numeric type 0 or 1 to indicate FALSE/TRUE.
<charsAcrossDisplay>	numeric type to indicate how many characters across are displayed (1-127).
<variableFontSupport>	numeric type 0 or 1 to indicate FALSE/TRUE.
<displayResize>	numeric type 0 or 1 to indicate FALSE/TRUE.
<textWrapping>	numeric type 0 or 1 to indicate FALSE/TRUE.
<textScrolling>	numeric type 0 or 1 to indicate FALSE/TRUE.
<menuWidthReduction>	numeric type to indicate the allowed menu size reduction (0-7).

### NOTE

- The <language> parameter is applicable only to Language Selection Event. For example, AT\*MSTEV=08,"en" indicates that a language selection of English. The language code mapping is as per reference 11.
- The display parameters are only valid for the Display Parameters Changed event.
- \* These events are only monitored for once – once they have occurred and are reported they

should be removed from the Event List automatically.

## 20.2.10 \*MSTC:<cmdId> Proactive Command Indication

### \*MSTC: <cmdId> Proactive Command Indication

*MSTC: <cmdId>	The unsolicited result code *MSTC: informs the application processor (M4) that there is a proactive command that requires some APP activity awaiting retrieval.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

### Defined Values

<cmdId>	<p>Decimal format of Type of Command. Unique identifier for the current SIM Toolkit proactive command issued by the SIM.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> <li>'01' Refresh</li> <li>'05' Set Up Event List command</li> <li>'15' Launch Browser command</li> <li>'20' Play Tone command</li> <li>'21' Display Text command</li> <li>'22' Get Inkey command</li> <li>'23' Get Input command</li> <li>'24' Select Item command</li> <li>'25' Set Up Menu command</li> <li>'28' Set Up Idle Mode Text command</li> <li>'40' Open Channel</li> <li>'42' Receive Data</li> <li>'43' Send Data</li> <li>'81' End of proactive session</li> </ul>
---------	---

#### NOTE

- The special case \*MSTC: 0 is issued when there are no SIM Toolkit applications accessible on the SIM/UICC i.e. a non-proactive SIM is being used.
- Receipt of this result code by the application processor (M4) – except in the special cases of \*MSTC: 0 and \*MSTC: 81 - should result in an AT\*MSTGC=<cmdId> being sent by to request the associated proactive command information. This information is supplied in the AT command

result.

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# 21 Supported Unsolicited Result Codes and Error Codes

## 21.1 Summary of CME ERROR Codes

Final result code **+CME ERROR: <err>** indicates different meaning. 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.

<err> values used by common messaging commands:

### 21.1.1 CME Error Codes Related to mobile equipment or network

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 call 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
48	hidden key required
50	Incorrect Parameters
100	Unknown

### 21.1.2 CME Error Codes related to PSD and Packet Domain

Final result code **+CME ERROR: <err>** indicates an error related to PSD and Packet Domain. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
103	Illegal MS
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	Last PDN Disconnection not allowed

577	PSD - activation rejected by GGSN
578	PSD - unspecified activation rejection
579	PSD - bad code or protocol rejection
580	PSD - can't modify address
581	PSD - CHAP close
582	PSD - profile (cid) currently unavailable
583	PSD - a profile (cid) is currently active
584	PSD - combined services not allowed
585	PSD - conditional IE error
586	PSD - context activation rejected
587	PSD - duplicate TI received
588	PSD - feature not supported
589	PSD - service not available
590	PSD - unknown IE from network
591	PSD - implicitly detached
592	PSD - insufficient resources
593	PSD - invalid activation state (0-1)
594	PSD - invalid address length
595	PSD - invalid character in address string
596	PSD - invalid cid value
597	PSD - invalid dial string length
598	PSD - mode value not in range
599	PSD - invalid MAND information
600	PSD - SMS service preference out of range
601	PSD - invalid TI value
602	PSD - IPCP negotiation timeout
603	PSD - LCP negotiation timeout
604	PSD - LLC error
605	PSD - LLC or SMDCP failure
606	PSD - lower layer failure
607	PSD - missing or unknown APN
608	PSD - mobile not ready
609	PSD- MS identity not in network
610	PSD- MSC temporarily not reachable
611	PSD- message incompatible with state
612	PSD- message type incompatible with state
613	PSD- unknown message from network
614	PSD- NCP close
615	PSD- network failure
616	PSD- no echo reply
617	PSD- no free NSAPIs

618	PSD- processing of multiple cids not supported
619	PSD- no PDP context activated
620	PSD- normal termination
621	PSD- NSAPI already used
622	PSD- address element out of range
623	PSD- PAP close
624	PSD- PDP context w/o TFT already activated
625	PSD- pdp type not supported
626	PSD- peer refuses our ACCM
627	PSD- peer refuses our IP address
628	PSD- peer refuses our MRU
629	PSD- peer re-requested CHAP
630	PSD- profile (cid) not defined
631	PSD- unspecified protocol error
632	PSD- QOS not accepted
633	PSD- QOS validation fail
634	PSD- reactivation required
635	PSD- regular deactivation
636	PSD- semantic error in TFT operation
637	PSD- semantic errors in packet filter
638	PSD- semantically incorrect message
639	PSD- service type not yet available
640	PSD- syntactical error in TFT operation
641	GPRS - syntactical errors in packet filter
642	PSD- too many RXJs
643	PSD- unknown PDP address or type
644	PSD- unknown PDP context
645	PSD- user authorization failed
646	PSD- QOS invalid parameter
647	PSD- FDN failure
649	PSD- bad pdp context parameters
650	PSD- PDP context already active
651	PSD- LCP termination negotiation timeout
652	more than one double colon in IPv6 address
653	IPv6 address ended with part of an IPv4 address
654	IPv6 address used dotted-decimal form outside an IPv4 address
655	in an IPv6 address, a byte of an IPv4 address was too big, causing overflow
656	in an IPv6 address, a byte of an IPv4 address was missing
657	in an IPv6 address, a byte of an IPv4 address was more than 255
658	in an IPv6 address, a byte pair was more than hex ffff



659	in an IPv6 address, a byte of an IPv4 address was too short or contained invalid characters
660	an IPv6 address was too short or contained invalid characters
661	in an IPv6 address, a byte pair was too big, causing overflow
662	an IPv6 address started with a single colon
663	an IPv6 address ended with a single colon
664	an IPv6 address contained an IPv4 address other than at the end
665	an IPv6 address was too long
666	an IPv6 address was followed by invalid characters
670	PSD - operator Determined Barring
671	PSD - activation rejected by GW or PDNGW
672	PSD – PTI already in use
673	PSD – EPS Bearer Context without TFT already activated
674	PSD - PTI mismatch
675	PSD - PDN Type IPV4 only allowed
676	PSD – PDN Type IPV6 only allowed
677	PSD – single address bearers only allowed
678	PSD – ESM information not received
679	PSD – PDN connection does not exist
680	PSD – multiple PDN connection not allowed for one APN
681	PSD – collision with network initiated request
682	PSD – unsupported QCI value
683	PSD – invalid PTI value
684	PSD – incompatible APN restriction value
685	PSD – reactivation request
690	LTE - IMSI unknown in HSS
691	LTE - illegal UE
692	LTE - EPS service not allowed
693	LTE - EPS and non EPS Service not allowed
694	LTE - UE ID cannot be derived
695	LTE - EPS tracking area not allowed
696	LTE - roaming not allowed in TA
697	LTE - roaming not allowed in PLMN
698	LTE - no suitable cells in TA
699	LTE - CS domain not available
700	LTE - ESM failure
701	LTE - MAC failure
702	LTE - synch failure
703	LTE - congestion
704	LTE - UE security capability mismatch
705	LTE - security mode rejected, unspecified

706	LTE - UE not authorized in CSG cell
707	LTE – non-EPS authorization unacceptable
708	LTE - CS domain temporarily unavailable
709	LTE - no EPS bearer context activated
710	PSD – PSD Mode not possible
711	PSD – invalid connection type
712	PSD – no free PSD bearer IDs
713	PSD – no free PSD PTIs
714	PSD – unable to open data connection
715	PSD- Incorrect username/password

### 21.1.3 CME Error Codes related to select TE character set

Final result code **+CME ERROR: <err>** indicates an error related to select TE character set. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
737	+CSCS type not supported
738	+CSCS type not found

### 21.1.4 CME Error Codes related to preferred operator list

Final result code **+CME ERROR: <err>** indicates an error related to preferred operator list. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
741	must include <format> with <oper>
742	incorrect <oper> format
743	<oper> length too long
744	SIM full
745	unable to change PLMN list
746	network operator not recognized
747	access technology missing
748	access technology not supported

### 21.1.5 CME Error Codes related to Restricted/Generic SIM Access

Final result code **+CME ERROR: <err>** indicates an error related to Restricted/Generic SIM Access. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
749	invalid command length
750	invalid input string
751	command not allowed for 3G SIM
752	Invalid <pathid> parameter
753	missing required command parameter
754	invalid SIM command
755	invalid File Id
756	missing required P1/2/3 parameter
757	invalid P1/2/3 parameter
758	missing required command data
759	invalid characters in command data

### 21.1.6 CME Error Codes related to Miscellaneous Proprietary

Final result code **+CME ERROR: <err>** indicates an error related to Miscellaneous Proprietary. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
720	SIM toolkit menu has not been configured
721	SIM toolkit already in use
722	SIM toolkit not enabled
724	MMI profile not updated
725	invalid SIM toolkit proactive command ID
726	invalid SIM proactive command response data
765	invalid input value
766	unsupported value or mode
767	operation failed

768	multiplexer already active
769	unable to get control of required
770	SIM invalid - network reject
772	SIM powered down
773	SIM File not present
794	invalid input value
795	No valid GID

### 21.1.7 CME Error Codes related to report Network State

Final result code **+CME ERROR: <err>** indicates an error related to report Network State. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
840	No Service state
841	In cell search state
842	ERRC is deactivated
843	In cell reselection state
844	In L1 test mode
845	In reestablishment state
846	In PSM state
847	No data transfer in idle state

### 21.1.8 CME Errors Codes related to SIM Toolkit Operations

The following CME errors are used for reporting of SIM Toolkit specific problems:

Verbose CME Error	CME error code	Used in response to commands	Description
sim toolkit not enabled	<b>707</b>	<b>MSTGC; MSTCR; MSTEV; MSTMS;</b>	There is no current SIM Toolkit session
sim toolkit already in use	<b>706</b>	<b>MSTGC; MSTCR; MSTEV; MSTMS;</b>	A proactive SIM Toolkit session is already running for a different entity.
sim toolkit menu has not been configured	<b>705</b>	<b>MSTMS;</b>	Either there are no menu, or items in the STK menu or the menu has been removed

APP profile not updated	709	MSTPD;	The new APP profile download has failed
invalid SIM toolkit proactive command ID	710	MSTCR;	The command id entered for the MSTCR does not conform with the current proactive command
invalid SIM proactive command response data	711	MSTCR;	The input data associated with the current proactive command is not valid.
Invalid characters in text string	25	MSTEV; MSTMS;	Invalid characters in string (i.e. characters in expected numeric string)
Invalid index	21	MSTMS;	The operation failed because the menu or the help item index was not for a valid option

## 21.2 Summary of CMS ERROR Codes

Final result code **+CMS ERROR: <err>** indicates an error related to message service 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
1	Unassigned(unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information

97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
300	ME failure
301	SMS 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 necessary
312	PH SIM pin necessary
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
332	network timeout
340	No +CNMA acknowledgment expected
500	Unknown
512	SIM not ready
513	unread records on SIM
515	PS busy
516	Couldn't read SMS parameters from SIM
517	SM BL not ready
518	invalid parameter
519	ME temporary not available
528	Invalid (non-hex) chars in PDU
529	Incorrect PDU length
530	Invalid MTI
531	Invalid (non-hex) chars in address
532	Invalid address (no digits read)
533	Incorrect PDU length (UDL)

534	Incorrect SCA length
536	Invalid First Octet (should be 2 or 34)
537	Invalid Command Type
538	SRR bit not set
539	SRR bit set
540	Invalid User Data Header IE

## 21.3 Summary of CIS ERROR Codes

Final result code **+CIS ERROR: <err>** indicates an error related to OneNet. 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
651	Memory error
652	Parameter error
653	Unsupported format
654	SDK error
655	Not find

## 21.4 Summary of TLS ERROR Codes

Final result code **+TLS ERROR: <err>** indicates an error related to message service 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.

<err> values used by common messaging commands:

Code of <err>	Meaning
-66	Failed to open a socket
-67	Buffer is too small to hold the data
-68	The connection to the given server / port failed
-69	The context is invalid, e.g. because it was free
-70	Binding of the socket failed
-72	Could not listen on the socket
-74	Could not accept the incoming connection

-76	Reading information from the socket failed
-78	Sending information through the socket failed
-80	Connection was reset by peer
-82	Failed to get an IP address for the given hostname
-8320	Unavailable feature, e.g. RSA hashing/encryption combination
-8448	Requested OID is unknown
-8576	The CRT/CRL/CSR format is invalid, e.g. different type expected
-8704	The CRT/CRL/CSR version element is invalid
-8832	The serial tag or value is invalid
-8960	The algorithm tag or value is invalid
-9088	The name tag or value is invalid
-9216	The date tag or value is invalid
-9344	The signature tag or value invalid
-9472	The extension tag or value is invalid
-9600	CRT/CRL/CSR has an unsupported version number
-9728	Signature algorithm (oid) is unsupported
-9856	Signature algorithms do not match
-9984	Certificate verification failed e.g. CRL, CA or signature check failed
-10112	Format not recognized as DER or PEM
-10240	Input invalid
-10368	Allocation of memory failed
-10496	Read/write of file failed
-10624	Destination buffer is too small
-28800	The requested feature is not available
-28928	Bad input parameters to function
-29056	Verification of the message MAC failed
-29184	An invalid SSL record was received
- 29312	The connection indicated an EOF
- 29440	An unknown cipher was received
- 29568	The server has no ciphersuites in common with the client
-29696	No RNG was provided to the SSL module
- 29824	No client certification received from the client, but required by the authentication mode
- 29952	Our own certificate(s) is/are too large to send in an SSL message
- 30080	The own certificate is not set, but needed by the server.
- 30208	The own private key or pre-shared key is not set, but needed
- 30336	No CA Chain is set, but required to operate
- 30464	An unexpected message was received from our peer
- 30592	A fatal alert message was received from our peer
- 30720	Verification of our peer failed
- 30848	The peer notified us that the connection is going to be closed



- 30976	Processing of the ClientHello handshake message failed
- 31104	Processing of the ServerHello handshake message failed
- 31232	Processing of the Certificate handshake message failed
- 31360	Processing of the CertificateRequest handshake message failed
- 31488	Processing of the ServerKeyExchange handshake message failed
- 31616	Processing of the ServerHelloDone handshake message failed
- 31744	Processing of the ClientKeyExchange handshake message failed
- 31872	Processing of the ClientKeyExchange handshake message failed in DHM / ECDH Read Public
- 32000	Processing of the ClientKeyExchange handshake message failed in DHM / ECDH Calculate Secret
- 32128	Processing of the CertificateVerify handshake message failed
- 32256	Processing of the ChangeCipherSpec handshake message failed
-32384	Processing of the Finished handshake message failed
-32512	Memory allocation failed
-26624	The operation timed out
-26496	The client initiated a reconnect from the same port.
-26368	Record header looks valid but is not expected
-26240	The alert message received indicates a non-fatal error
- 26112	Couldn't set the hash for verifying CertificateVerify
-16000	Incomplete or incorrect certificate

## 21.5 Summary of Unsolicited Result Codes

URC	Description	AT Command
*MATREADY: 1		
+CREG: <stat>[,<lac>,<ci>]	There is a change in the MT network registration status or a change of the network cell.	<b>AT+CREG=&lt;n&gt;</b>
+CSMINS: <n>,<SIM inserted>	Indicates whether SIM card has been inserted.	<b>AT+CSMINS=1</b>
+CENG: <cell>,"<arfcn>,<rxl>,<rxq>,<mcc>,<mnc>,<bsic>,<cellid>,<rla>,<txp>,<lac>,<TA>"	Report of network information.	<b>AT+CENG=&lt;mode&gt;[ ,&lt;Ncell&gt;] &lt;mode&gt;=2</b>
+CPIN: <code>	Indicates whether some password is required or not.	<b>AT+CPIN</b>
+CPIN: NOT READY	SIM Card is not ready.	
+CPIN: NOT INSERTED	SIM Card is not inserted.	

<b>+CSQN: &lt;rssi&gt;,&lt;ber&gt;</b>	Displays signal strength and channel bit error rate when <rssi>,<ber>values change.	<b>AT+EXUNSOL="SQ",1</b>
<b>+CR: &lt;serv&gt;</b>	An intermediate result code is transmitted during connect negotiation when the TA has determined the speed and quality of service to be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) appears.	<b>AT+CR=1</b>
<b>NORMAL POWER DOWN</b>	SIM7020 is powered down by the PWRKEY pin or AT command "AT+CPOWD=1".	
<b>UNDER-VOLTAGE POWER DOWN</b>	Under-voltage automatic power down.	
<b>UNDER-VOLTAGE WARNING</b>	under-voltage warning	
<b>OVER-VOLTAGE POWER DOWN</b>	Over-voltage automatic power down.	
<b>OVER-VOLTAGE WARNING</b>	over-voltage warning	
<b>+CDNSGIP: 1,&lt;domain name&gt;,&lt;IP&gt;[,&lt;IP2&gt;]</b>	DNS successful	<b>AT+CDNSGIP</b>
<b>+CGREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;]</b>	Network Registration Status	<b>AT+CGREG=&lt;n&gt;</b>

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## 22 ATC Differences among SIM7020 Series

### 22.1 AT+CSCLK

SIM7020C,SIM7020E,SIM7020G,SIM7060,SIM7060R	SIM7030
AT+CSCLK=? +CSCLK: (0-2)	AT+CSCLK=? +CSCLK: (0,2)
OK	OK
Difference: SIM7030 only support the parameter <n> equal to 0 and 2.	

### 22.2 AT+CEER

SIM7020G and SIM7060G do not support this command.

### 22.3 AT+CPLS

SIM7020G and SIM7060G do not support this command.

### 22.4 AT\*MEDRXCFG

From 1752B07SIM7020C/E version supports the command.

### 22.5 OneNet

Only SIM7020C support OneNet function.