Application

SIM7000 Series_MQTT_Application Note

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About Document

Document Information

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1.00	April10, 2018	Xiaobao.qu	First Release.

Related Documents

[1] SIM7000 Series AT Command Manual V1.03.pdf

This document applies to the following products:

Name	Type	Size (mm)	Comments
SIM7000E/C/A/G	Cat-M1(/NB1/ GSM)	24*24	N/A
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Contents

1 Purpose of this document

Based on module AT command manual, this document will introduce MQTT application process.

Developers could understand and develop application quickly and efficiently based on this document.

2 AT Commands for MQTT

2.1 Overview

Command	Description
AT+SMCONF	Set MQTT Parameter
AT+CSSLCFG	SSL Configure
AT+SMSSL	Select SSL Configure
AT+SMCONN	MQTT Connection
AT+SMPUB	Send Packet
AT+SMSUB	Subscribe Packet
AT+SMUNSUB	Unsubscribe Packet
AT+SMSTATE	Inquire MQTT Connection Status
AT+SMPUBHEX	Set SMPUB Data Format to Hex
AT+SMDISC	Disconnection MQTT

2.2 Detailed Descriptions of Commands

2.2.1 AT+SMCONF Set MQTT Parameter

AT+SMCONF Set MQTT Parameter	
Test Command **AT+SMCONF=?**	Response **+SMCONF: "MQTTParamTag","MQTTParamValue range"** **OK**

Read Command **AT+SMCONF?**	Response **+SMCONF: <MQTTParamTag>,<MQTTParamValue>** **OK**
Write Command **AT+SMCONF=<MQTTParamTag>,<MQTTParamValue>**	Response **OK** or **ERROR**
	Parameters < **MQTTParaTag** > "**CLIENTID**" Client conection id "**URL**" (indispensable parameter) server URL address "server domain",["tcpPort"] "server": Host or IP "tcpPort": Port default is 1883 "**KEEPTIME**" Hold connect time. default is 60s "**CLEANSS**" Session cleanin. Default is 0. Range of values:(0-1). "**USERNAME**" User name. default null "**PASSWORD**" Password. default null "**QOS**" Send packet qos level. range of values（0~2） "**TOPIC**" Publish topic name "**MESSAGE**" Publish message details "**RETAIN**" Retain identification. Default is 0. Range of values:(0-1) <**MQTTParamValue**> MQTT Parameter value.Type and supported content depend on related < MQTTParaTag>.
Example	AT+SMCONF="CLIENTID","id" OK AT+SMCONF="KEEPTIME",60 OK AT+SMCONF="URL","test.mosquitto.org","1883" OK AT+SMCONF="CLEANSS",1 OK AT+SMCONF="QOS",1 OK AT+SMCONF="TOPIC","will topic" OK AT+SMCONF="MESSAGE","will message" OK AT+SMCONF="RETAIN",1 OK

2.2.2 AT+CSSLCFG SSL Configure

AT+CSSLCFG Analysis SSL Configure	
Write command **AT+CSSLCFG="convert",<ssltype>,<cname>,[<keyname>[,<passkey>]]**	Response **OK** If failed: **+CME ERROR: <err>**
	Parameters **<ssltype>** 1 QAPI_NET_SSL_CERTIFICATE_E 2 QAPI_NET_SSL_CA_LIST_E 3 QAPI_NET_SSL_PSK_TABLE_E **<cname>** String type (string should be included in quotation marks): name of cert file **<keyname>** String type (string should be included in quotation marks):name of key file **<passkey>** String type (string should be included in quotation marks):value of passkey
Parameter Saving Mode	-
Max Response Time	-
Reference	-

2.2.3 AT+SMSSL Select SSL Configure

AT+SMSSL Select SSL Configure	
Read Command **AT+SMSSL?**	Response **+SMSSL:index,ca list,cert name**
Write Command **AT+SMSSL=<index>,<calist>,<cert name>**	Response **OK** or **ERROR**
	Parameters **<index>** SSL status, range: 0-6 **<ca list>** CA_LIST file name, length 20 byte **<cert name>** CERT_NAME file name, length 20 byte
Example	AT+SMSSL=1,calist,certname OK

2.2.4 AT+SMCONN MQTT Connection

AT+SMCONN MQTT Connection	
Executive Command **AT+SMCONN**	Response **OK** or **ERROR**
Example	AT+SMCONN OK

2.2.5 AT+SMPUB Send Packet

AT+SMPUB Send Packet	
Test Command **AT+SMPUB=?**	Response **+SMPUB: <topic>,< content length>,(0-2),(0-1)**
Write Command **AT+SMPUB=<topic>,<content length>,<qos>,<retain>**	Response **OK** or **ERROR**
	Parameters **<topic>** Subscribe packet **<qos>** Send packet QOS level, range: 0~2 **<content length>** Message length, range: 0~512 **<retain>** Server hold message range: 0~1
Example	AT+SMPUB="001",10,1, 1 OK

2.2.6 AT+SMSUB Subscribe Packet

AT+SMSUB Subscribe Packet	
Read Command **AT+SMSUB=?**	Response **+SMSUB: "topic",qos** **OK**
Write Command **AT+SMSUB=<topic>,<qos>**	Response **OK** or **ERROR**

	Parameters **<topic>** Subscribe packet **<qos>** Send packet qos level, range: 0~2
Example	AT+SMSUB="001",1 OK

2.2.7 AT+SMUNSUB Unsubscribe Packet

AT+SMUNSUB Unsubscribe Packet	
Read Command **AT+SMUNSUB=?**	Response **+SMUNSUB: "topic"** **OK**
Write Command **AT+SMUNSUB=<topic>**	Response **OK** or **ERROR**
	Parameters **<topic>** Subscribe subject
Example	AT+SMUNSUB="001" OK

2.2.8 AT+SMSTATE Inquire MQTT Connection Status

AT+SMSTATE Inquire MQTT Connection Status	
Read Command **AT+SMSTATE?**	Response **+SMSTATE: <status>** **OK**
	Parameters **<status>** 0 Expression MQTT disconnect state 1 Expression MQTT on-line state
Example	AT+SMSTATE? +SMSTATE: 1 OK

2.2.9 AT+SMPUBHEX Set SMPUB Data Format to Hex

AT+SMPUBHEX Set SMPUB Data Format to Hex	
Test Command **AT+SMPUBHEX=?**	Response **+SMSSL: (0-1)**
Read Command **AT+ SMPUBHEX?**	Response **+SMSSL: <status>**
	PARAMETERS **<status>** 0 SMPUB data format is normal 1 SMPUB data format is hex
Write Command **AT+SMPUBHEX=<status>**	Response **OK** or **ERROR**
	Parameters **<status>** SMPUB format status, range: 0~1
Example	AT+SMPUBHEX=1 OK

2.2.10 AT+SMDISC Disconnect MQTT

AT+SMDISC Disconnect MQTT	
Read Command **AT+SMDISC?**	Response **OK** or **ERROR**
Example	AT+SMDISC OK

3 Bearer Configuration

Usually module will register PS service automatically.

3.1 PDN Auto-activation

AT Command	Response	Description
AT+CPIN?	+CPIN:READY OK	Check SIM card status
AT+CSQ	+CSQ: 20,0 OK	Check RF signal
AT+CGREG?	+CGREG: 0,1 OK	Check PS service
AT+CGACT?	+CGACT: 1,1 OK	Activated automatically
AT+COPS?	+COPS: 0,0,"CHN-UNICOM",9 OK	Check operator info CHN-UNICOM is operator's name 9 is NB-IOT network
AT+CGCONTRDP	+CGCONTRDP: 1,5,"shnbiot","10.250.0.213.255.255.255.0" OK	Get APN and IP address from network

3.2 APN Manual configuration

If not attached, could configure correct APN setting.

AT Command	Response	Description
AT+CFUN=0	+CPIN: NOT READY OK	Disable RF
AT*MCGDEFCONT="IP","3GNET"	OK	Configure new APN
AT+CFUN=1	OK +CPIN: READY	Enable RF
AT+CGREG?	+CGREG: 0,1 OK	Inquiry PS service
AT+CGCONTRDP	+CGCONTRDP:	Attached PS domain and

	1,5,"3GNET","10.250.0.253.255.255.255.0"	got IP address automatically
	OK	

3.3 MQTT Function

AT Command	Response	Description
AT+CNACT=1,"cmnet"	OK +APP PDP: ACTIVE	Open wireless connection parameter cmnet is APN,this parameter needs to set different APN values according to different cards
AT+CNACT?	+CNACT: 1,"10.181.182.177" OK	Get local IP
AT+SMCONF="URL","test.mosquitto.org","1883"	OK	Set up server URL
AT+SMCONF="KEEPTIME",60	OK	Set MQTT time to connect server
AT+SMCONN	OK	
AT+SMSUB="update",1	OK	Subscription packet
AT+SMPUB="update","5",1,1 >hello	OK +SMSUB: "update","hello"	Send packet Get data on server
		Get data
AT+SMUNSUB="update"	OK	Unsubscription packet
AT+SMDISC	OK	Disconnect MQTT
AT+CNACT=0	OK +APP PDP: DEACTIVE	Disconnect wireless
	OK	
	OK	

3.4 MQTTS Function

AT Command	Response	Description
AT+CNACT=1,"cmnet"	OK	Open wireless

	+APP PDP: ACTIVE	connection parameter cmnet is APN,this parameter needs to set different APN values according to different cards
AT+CNACT?	+CNACT: 1,"10.181.182.177" OK	Get local IP
AT+SMCONF="URL","test.mosquitto.org","1883"	OK	Set up server URL
AT+SMCONF="KEEPTIME",60	OK	Set MQTT time to connect server
AT+CSSLCFG="CONVERT",2,"rootCA.pem"	OK	rootCA.pem is ca certificate
AT+CSSLCFG="CONVERT",1,"cert.pem" , "key.pem"	OK	cert.pem is certificate,key.pem is key of cert.pem
AT+SMSSL=1,rootCA.pem,cert.pem	OK	Set ca certificate and cert certificate name
AT+SMCONN	OK	
AT+SMSUB="update",1	OK	Subscription packet
AT+SMPUB="update","5",1,1 >hello	OK +SMSUB: "update","hello"	Send packet Get data on server
		Get data
AT+SMUNSUB="update"	OK	Unsubscription packet
AT+SMDISC	OK	Disconnect MQTT
AT+CNACT=0	OK +APP PDP: DEACTIVE	Disconnect wireless
	OK	
	OK	

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