

# **BC35-G&BC28 MQTT**

## **Application Note**

**NB-IoT Module Series**

Rev. BC35-G&BC28\_MQTT\_Application\_Note\_V1.0

Date: 2018-09-06

Status: Released



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# About the Document

## History

Revision	Date	Author	Description
1.0	2018-09-06	Louis GU/ Benjamin LU	Initial

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# 1 Introduction

MQTT (Message Queuing Telemetry Transport) is a broker-based publish/subscribe messaging protocol designed to be open, simple, lightweight and easy to implement. It is designed for connections with remote locations where a "small code footprint" is required or the network bandwidth is limited.

This document mainly introduces how to use the MQTT function of Quectel BC35-G and BC28 modules through AT commands.

# 2 MQTT Data Interaction

This chapter gives the data interaction mechanism of MQTT function.

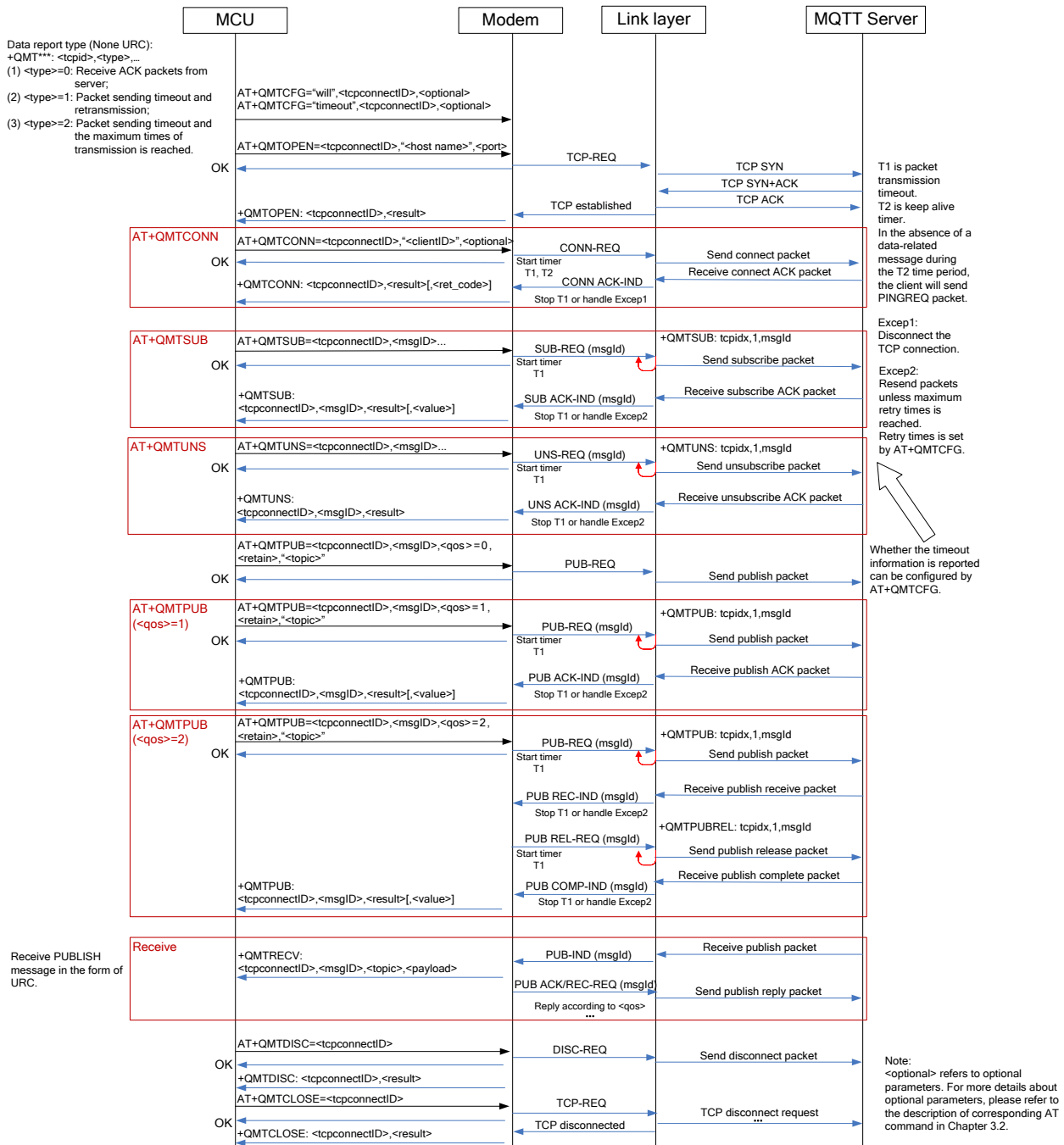


Figure 1: MQTT Data Interaction Diagram

# 3 MQTT Related AT Commands

This chapter presents the AT commands for operating MQTT function.

## 3.1. AT Command Syntax

Table 1: Types of AT Commands and Responses

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

## 3.2. Description of MQTT Related AT Commands

### 3.2.1. AT+QMTCFG Configure Optional Parameters of MQTT

The command is used to configure optional parameters of MQTT.

#### AT+QMTCFG Configure Optional Parameters of MQTT

Test Command AT+QMTCFG=?	Response +QMTCFG: "version",(0),(3,4) +QMTCFG: "keepalive",(0),(0-3600) +QMTCFG: "session",(0),(0,1) +QMTCFG: "timeout",(0),(1-60),(1-10),(0,1) +QMTCFG: "will",(0),(0,1),(0-2),(0,1),"will_topic","will_msg" +QMTCFG: "aliauth",(0),"productkey","devicename","devicsecret"  OK
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<p>Write Command Configure the MQTT protocol version <b>AT+QMTCFG="version",&lt;tcpconnectl D&gt;[,&lt;vsn&gt;]</b></p>	<p>Response If &lt;vsn&gt; is not omitted, configure the MQTT protocol version: <b>OK</b></p> <p>If &lt;vsn&gt; is omitted, query the MQTT protocol version: <b>+QMTCFG: "version",&lt;vsn&gt;</b></p> <p><b>OK</b></p> <p>If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command Configure the keep-alive time <b>AT+QMTCFG="keepalive",&lt;tcpconne ctID&gt;[,&lt;keep-alive time&gt;]</b></p>	<p>Response If &lt;keep-alive time&gt; is not omitted, configure the keep-alive time: <b>OK</b></p> <p>If &lt;keep-alive time&gt; is omitted, query the keep-alive time: <b>+QMTCFG: "keepalive",&lt;keep-alive time&gt;</b></p> <p><b>OK</b></p> <p>If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command Configure the session type <b>AT+QMTCFG="session",&lt;tcpconnectl D&gt;[,&lt;clean_session&gt;]</b></p>	<p>Response If &lt;clean_session&gt; is not omitted, configure the session type: <b>OK</b></p> <p>If &lt;clean_session&gt; is omitted, query the session type: <b>+QMTCFG: "session",&lt;clean_session&gt;</b></p> <p><b>OK</b></p> <p>If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command Configure timeout of message delivery <b>AT+QMTCFG="timeout",&lt;tcpconnectl</b></p>	<p>Response If &lt;pkt_timeout&gt;, &lt;retry_times&gt; and &lt;timeout_notice&gt; are not omitted, configure timeout of message delivery:</p>

<p>D&gt;[,&lt;pkt_timeout&gt;[,&lt;retry_times&gt;][,&lt;timeout_notice&gt;]]</p>	<p>OK</p> <p>If &lt;pkt_timeout&gt;, &lt;retry_times&gt; and &lt;timeout_notice&gt; are omitted, query the timeout of message delivery.  <b>+QMTCFG: "timeout",&lt;pkt_timeout&gt;,&lt;retry_times&gt;,&lt;timeout_notice&gt;</b></p> <p>OK</p> <p>If there is any error:  <b>ERROR</b>  Or  <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command Configure Will Information  <b>AT+QMTCFG="will",&lt;tcpconnectID&gt;[,&lt;will_fg&gt;[,&lt;will_qos&gt;,&lt;will_retain&gt;,"&lt;will_topic&gt;","&lt;will_msg&gt;"]]</b></p>	<p>Response</p> <p>If &lt;will_fg&gt;, &lt;will_qos&gt;, &lt;will_retain&gt;, "&lt;will_topic&gt;" and "&lt;will_msg&gt;" are not omitted, configure the Will Information:  <b>OK</b></p> <p>If &lt;will_fg&gt;, &lt;will_qos&gt;, &lt;will_retain&gt;, "&lt;will_topic&gt;" and "&lt;will_msg&gt;" are omitted, query the Will Information:  <b>+QMTCFG: "will",&lt;will_fg&gt;[,&lt;will_qos&gt;,&lt;will_retain&gt;,"&lt;will_topic&gt;","&lt;will_msg&gt;"]</b></p> <p>OK</p> <p>If there is any error:  <b>ERROR</b>  Or  <b>+CME ERROR: &lt;err&gt;</b></p>
<p>Write Command Configure Alibaba device information for Alibaba Cloud  <b>AT+QMTCFG="aliauth",&lt;tcpconnectID&gt;["&lt;product_key&gt;","&lt;device_name&gt;","&lt;device_secret&gt;"]</b></p>	<p>Response</p> <p>If "&lt;product_key&gt;","&lt;device_name&gt;","&lt;device_secret&gt;" are not omitted, configure the device information:  <b>OK</b></p> <p>If "&lt;product_key&gt;","&lt;device_name&gt;","&lt;device_secret&gt;" are omitted, query the device information:  <b>[+QMTCFG:"aliauth","&lt;product_key&gt;","&lt;device_name&gt;","&lt;device_secret&gt;"]</b></p> <p>OK</p> <p>If there is any error:  <b>ERROR</b>  Or</p>

	<b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	300ms

## Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;vsn&gt;</b>	MQTT protocol version 3 MQTT protocol v3.1 4 MQTT protocol v3.1.1
<b>&lt;will_fg&gt;</b>	Configure the Will flag 0 Ignore the Will flag configuration 1 Require the Will flag configuration
<b>&lt;will_qos&gt;</b>	Quality of service for message delivery 0 At most once 1 At least once 2 Exactly once
<b>&lt;will_retain&gt;</b>	The Will retain flag is only used on PUBLISH messages. 0 When a client sends a PUBLISH message to a server, the server will not hold on to the message after it has been delivered to the current subscribers 1 When a client sends a PUBLISH message to a server, the server should hold on to the message after it has been delivered to the current subscribers
<b>&lt;will_topic&gt;</b>	Will topic string
<b>&lt;will_msg&gt;</b>	The Will message defines the content of the message that is published to the will topic if the client is unexpectedly disconnected. It can be a zero-length message.
<b>&lt;pkt_timeout&gt;</b>	Timeout of the packet delivery. The range is 1-60. The default value is 10. Unit: second.
<b>&lt;retry_times&gt;</b>	Retry times when packet delivery times out. The range is 0-10. The default value is 3.
<b>&lt;timeout_notice&gt;</b>	0 Not report timeout message when transmitting packet 1 Report timeout message when transmitting packet
<b>&lt;clean_session&gt;</b>	Configure the session type 0 The server must store the subscriptions of the client after it disconnects. 1 The server must discard any previously maintained information about the client and treat the connection as “clean”.
<b>&lt;keep-alive time&gt;</b>	Keep-alive time. The range is 0-3600. The default value is 120. Unit: second. It defines the maximum time interval between messages received from a client. If the server does not receive a message from the client within 1.5 times of the keep-alive time period, it disconnects the client as if the client has sent a DISCONNECT message. 0 The client is not disconnected
<b>&lt;product_key&gt;</b>	Product key issued by Alibaba Cloud

<device_name>	Device name issued by Alibaba Cloud
<device_secret>	Device secret key issued by Alibaba Cloud

#### NOTES

1. If <will\_flag>=1, then <will\_qos>, <will\_retain>, <will\_topic> and <will\_msg> must be present. Otherwise they will be omitted.
2. <clean\_session>=0 is only effective when the server supports the operation.
3. Care must be taken to ensure message delivery does not time out while it is still being sent.  
**AT+QMTCFG="aliauth"** command is only used for Alibaba Cloud. If it is configured, the parameters <username> and <password> in command **AT+QMTCONN** can be omitted.

### 3.2.2. AT+QMTENAUTH Get a Token from Tencent Cloud

The command is used to get a token from Tencent Cloud.

#### AT+QMTENAUTH Get a Token from Tencent Cloud

Test Command <b>AT+QMTENAUTH=?</b>	Response <b>+QMTTENAUTH:"&lt;product_id&gt;","&lt;device_name&gt;","&lt;client_id&gt;","&lt;device_secret&gt;"[,&lt;expire&gt;[",&lt;url&gt;"]]</b>  <b>OK</b>
Read Command <b>AT+QMTENAUTH?</b>	Response <b>[+QMTTENAUTH:"&lt;password&gt;"]</b>  <b>OK</b>
Write Command <b>AT+QMTTENAUTH="&lt;product_id&gt;","&lt;device_name&gt;","&lt;client_id&gt;","&lt;device_secret&gt;"[,&lt;expire&gt;[",&lt;url&gt;"]]</b>	Response <b>OK</b>  <b>+QMTTENAUTH : &lt;result_code&gt;[,&lt;password&gt;]</b>  If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	195s, determined by network

#### Parameter

<product_id>	Product ID issued by Tencent Cloud
<device_name>	Device name issued by Tencent Cloud
<client_id>	Client ID. Format: <product_id>@<device_name>

<b>&lt;device_secret&gt;</b>	Device secret key issued by Tencent Cloud
<b>&lt;expire&gt;</b>	Set password expiration data
<b>&lt;url&gt;</b>	Set the URL to get the password
<b>&lt;password&gt;</b>	Password get from Tencent Cloud
<b>&lt;result_code&gt;</b>	Result of the command execution
	0 Get password successfully
	1 DNS resolution failed
	2 Socket initializing error
	3 HTTP packet error
	4 Socket send error
	5 HTTP packet parsing error
	6 Timeout

### 3.2.3. AT+QMTOPEN Open a Network for MQTT Client

The command is used to open a network for MQTT client.

#### AT+QMTOPEN Open a Network for MQTT Client

Test Command <b>AT+QMTOPEN=?</b>	Response <b>+QMTOPEN:</b> (list of supported <b>&lt;tcpconnectID&gt;</b> s),"<host_name>",(list of supported <b>&lt;port&gt;</b> s)  OK
Read Command <b>AT+QMTOPEN?</b>	Response <b>[+QMTOPEN: &lt;tcpconnectID&gt;,"&lt;host_name&gt;",&lt;port&gt;]</b>  OK
Write Command <b>AT+QMTOPEN=&lt;tcpconnectID&gt;,"&lt;host_name&gt;",&lt;port&gt;</b>	Response OK  <b>+QMTOPEN: &lt;tcpconnectID&gt;,&lt;result&gt;</b>  If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	75s, determined by network

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
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<b>&lt;host_name&gt;</b>	The address of the server. It could be an IP address or a domain name. The maximum size is 100 bytes.
<b>&lt;port&gt;</b>	The port of the server. The range is 1-65535.
<b>&lt;result&gt;</b>	Result of the command execution
	-1 Failed to open network
	0 Network opened successfully
	1 Wrong parameter
	2 MQTT identifier is occupied
	3 Failed to activate PDP
	4 Failed to parse domain name
	5 Network disconnection error

### 3.2.4. AT+QMTCLOSE Close a Network for MQTT Client

The command is used to close a network for MQTT client.

#### AT+QMTCLOSE Close a Network for MQTT Client

Test Command <b>AT+QMTCLOSE=?</b>	Response <b>+QMTCLOSE:</b> (list of supported <tcpconnectID>s)  <b>OK</b>
Write Command <b>AT+QMTCLOSE=&lt;tcpconnectID&gt;</b>	Response <b>OK</b>  <b>+QMTCLOSE:</b> <tcpconnectID>,<result>  If there is any error: <b>ERROR</b> Or <b>+CME ERROR:</b> <err>
Maximum Response Time	300ms

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;result&gt;</b>	Result of the command execution
	-1 Failed to close network
	0 Network closed successfully

### 3.2.5. AT+QMTCONN Connect a Client to MQTT Server

The command is used when a client requests a connection to MQTT server. When a TCP/IP socket connection is established from a client to a server, a protocol level session must be created using a CONNECT flow.

#### AT+QMTCONN Connect a Client to MQTT Server

Test Command <b>AT+QMTCONN=?</b>	Response <b>+QMTCONN:</b> (list of supported <tcpconnectID>s),"<clientID>"["<username>"["<password>"]]  <b>OK</b>
Read Command <b>AT+QMTCONN?</b>	Response <b>[+QMTCONN: &lt;tcpconnectID&gt;,&lt;state&gt;]</b>  <b>OK</b>
Write Command <b>AT+QMTCONN=&lt;tcpconnectID&gt;,"&lt;clientID&gt;"["&lt;username&gt;"["&lt;password&gt;"]]</b>	Response <b>OK</b>  <b>+QMTCONN: &lt;tcpconnectID&gt;,&lt;result&gt;[,&lt;ret_code&gt;]</b>  If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	<b>&lt;pkt_timeout&gt;</b> (default 10s), determined by network

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;clientID&gt;</b>	The client identifier string.
<b>&lt;username&gt;</b>	User name of the client. It can be used for authentication.
<b>&lt;password&gt;</b>	Password corresponding to the user name of the client. It can be used for authentication.
<b>&lt;result&gt;</b>	Result of the command execution 0 Packet sent successfully and ACK received from server 1 Packet retransmission 2 Failed to send packet
<b>&lt;state&gt;</b>	MQTT connection state 1 MQTT is initializing 2 MQTT is being connected 3 MQTT is connected

<b>&lt;ret_code&gt;</b>	4 MQTT is being disconnected Connection status return code
	0 Connection Accepted
	1 Connection Refused: Unacceptable Protocol Version
	2 Connection Refused: Identifier Rejected
	3 Connection Refused: Server Unavailable
	4 Connection Refused: Bad User Name or Password
	5 Connection Refused: Not Authorized
<b>&lt;pkt_timeout&gt;</b>	Timeout of the packet delivery. The range is 1-60. The default value is 10. Unit: second.

**NOTE**

If a client with the same Client ID is already connected to the server, the "older" client must be disconnected by the server before completing the CONNECT flow of the new client.

### 3.2.6. AT+QMTDISC Disconnect a Client from MQTT Server

The command is used when a client requests a disconnection from MQTT server. A DISCONNECT message is sent from the client to the server to indicate that it is about to close its TCP/IP connection.

#### AT+QMTDISC Disconnect a Client from MQTT Server

Test Command <b>AT+QMTDISC=?</b>	Response <b>+QMTDISC:</b> (list of supported <b>&lt;tcpconnectID&gt;s</b> )  <b>OK</b>
Write Command <b>AT+QMTDISC=&lt;tcpconnectID&gt;</b>	Response <b>OK</b>  <b>+QMTDISC: &lt;tcpconnectID&gt;,&lt;result&gt;</b>  If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	300ms

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
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<b>&lt;result&gt;</b>	Result of the command execution
-1	Failed to close connection
0	Connection closed successfully

### 3.2.7. AT+QMTSUB Subscribe to Topics

The command is used to subscribe to one or more topics. A SUBSCRIBE message is sent by a client to register an interest in one or more topic names with the server. Messages published to these topics are delivered from the server to the client as PUBLISH messages.

#### AT+QMTSUB Subscribe to Topics

Test Command <b>AT+QMTSUB=?</b>	Response <b>+QMTSUB:</b> (list of supported <b>&lt;tcpconnectID&gt;s</b> ),(list of supported <b>&lt;msgID&gt;s</b> )," <b>&lt;topic&gt;</b> ",(list of supported <b>&lt;qos&gt;s</b> )  <b>OK</b>
Write Command <b>AT+QMTSUB=&lt;tcpconnectID&gt;,&lt;msgID&gt;,"&lt;topic1&gt;",&lt;qos1&gt;[,"&lt;topic2&gt;",&lt;qos2&gt;...]</b>	Response <b>OK</b>  <b>+QMTSUB: &lt;tcpconnectID&gt;,&lt;msgID&gt;,&lt;result&gt;[,&lt;value&gt;]</b>  If there is any error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	<b>&lt;pkt_timeout&gt; * &lt;retry_times&gt;</b> (default 15s), determined by network

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;msgID&gt;</b>	Message identifier of packet. The range is 1-65535.
<b>&lt;topic&gt;</b>	Topic that the client wants to subscribe to or unsubscribe from
<b>&lt;qos&gt;</b>	The QoS level at which the client wants to publish the messages. 0 At most once 1 At least once 2 Exactly once
<b>&lt;result&gt;</b>	Result of the command execution 0 Sent packet successfully and received ACK from server 1 Packet retransmission 2 Failed to send packet
<b>&lt;value&gt;</b>	If <b>&lt;result&gt;</b> is 0, it is a vector of granted QoS levels. At the same time, if the

	value is 128, indicating that the subscription was rejected by the server. If <b>&lt;result&gt;</b> is 1, it means the times of packet retransmission. If <b>&lt;result&gt;</b> is 2, it will not be presented.
<b>&lt;pkt_timeout&gt;</b>	Timeout of the packet delivery. The range is 1-60. The default value is 10. Unit: second.
<b>&lt;retry_times&gt;</b>	Retry times when packet delivery times out. The range is 0-10. The default value is 3.

**NOTE**

The **<msgID>** is only present in messages where the QoS bits in the fixed header indicate QoS levels 1 or 2. It must be unique amongst the set of "inflight" messages in a particular direction of communication. It typically increases by exactly one from one message to the next, but is not required to do so.

### 3.2.8. AT+QMTUNS Unsubscribe from Topics

The command is used to unsubscribe from one or more topics. An UNSUBSCRIBE message is sent by the client to the server to unsubscribe from named topics.

AT+QMTUNS Unsubscribe from Topics	
Test Command <b>AT+QMTUNS=?</b>	Response <b>+QMTUNS:</b> (list of supported <b>&lt;tcpconnectID&gt;</b> s),(list of supported <b>&lt;msgID&gt;</b> s)," <b>&lt;topic&gt;</b> "  <b>OK</b>
Write Command <b>AT+QMTUNS=&lt;tcpconnectID&gt;,&lt;msgID&gt;,"&lt;topic1&gt;"["&lt;topic2&gt;"...]</b>	Response <b>OK</b>  <b>+QMTUNS:</b> <b>&lt;tcpconnectID&gt;,&lt;msgID&gt;,&lt;result&gt;</b>  If there is an error related to ME functionality: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	<b>&lt;pkt_timeout&gt;</b> * <b>&lt;retry_times&gt;</b> (default 15s), determined by network

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;msgID&gt;</b>	Message identifier of packet. The range is 1-65535.

<b>&lt;topic&gt;</b>	Topic that the client wants to subscribe to or unsubscribe from
<b>&lt;result&gt;</b>	Result of the command execution 0 Sent packet successfully and received ACK from server 1 Packet retransmission 2 Failed to send packet
<b>&lt;pkt_timeout&gt;</b>	Timeout of the packet delivery. The range is 1-60. The default value is 10. Unit: second.
<b>&lt;retry_times&gt;</b>	Retry times when packet delivery times out. The range is 0-10. The default value is 3.

### 3.2.9. AT+QMTPUB Publish Messages

The command is used to publish messages by a client to a server for distribution to interested subscribers. Each PUBLISH message is associated with a topic name. If a client subscribes to one or more topics, any message published to those topics are sent by the server to the client as a PUBLISH message.

#### AT+QMTPUB Publish Messages

Test Command <b>AT+QMTPUB=?</b>	Response <b>+QMTPUB:</b> (list of supported <b>&lt;tcpconnectID&gt;</b> s),(list of supported <b>&lt;msgID&gt;</b> s),(list of supported <b>&lt;qos&gt;</b> s),(list of supported <b>&lt;retain&gt;</b> s)," <b>&lt;topic&gt;</b> "," <b>&lt;msg&gt;</b> "  <b>OK</b>
Write Command <b>AT+QMTPUB=&lt;tcpconnectID&gt;,&lt;msgID&gt;,&lt;qos&gt;,&lt;retain&gt;,"&lt;topic&gt;"</b> After ">" is responded, input the data to be sent. Tap "CTRL+Z" to send, and tap "ESC" to cancel the operation.	Response <b>OK</b>  <b>+QMTPUB: &lt;tcpconnectID&gt;,&lt;msgID&gt;,&lt;result&gt;[,&lt;value&gt;]</b>  If there is an error: <b>ERROR</b> Or <b>+CME ERROR: &lt;err&gt;</b>
Maximum Response Time	<b>&lt;pkt_timeout&gt; * &lt;retry_times&gt;</b> (default 15s), determined by network

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;msgID&gt;</b>	Message identifier of packet. The range is 0-65535. It will be 0 only when <b>&lt;qos&gt;=0</b> .
<b>&lt;qos&gt;</b>	The QoS level at which the client wants to publish the messages. <u>0</u> At most once

---

	1 At least once
	2 Exactly once
<b>&lt;retain&gt;</b>	Whether or not the server will retain the message after it has been delivered to the current subscribers.
	<u>0</u> The server will not retain the message after it has been delivered to the current subscribers
	1 The server will retain the message after it has been delivered to the current subscribers
<b>&lt;topic&gt;</b>	Topic that needs to be published
<b>&lt;msg&gt;</b>	Message to be published
<b>&lt;result&gt;</b>	Result of the command execution
	0 Packet sent successfully and ACK received from server (message that published when <b>&lt;qos&gt;</b> =0 does not require ACK)
	1 Packet retransmission
	2 Failed to send packet
<b>&lt;value&gt;</b>	If <b>&lt;result&gt;</b> is 1, it means the times of packet retransmission. If <b>&lt;result&gt;</b> is 0 or 2, it will not be presented.
<b>&lt;pkt_timeout&gt;</b>	Timeout of the packet delivery. The range is 1-60. The default value is 10. Unit: second.
<b>&lt;retry_times&gt;</b>	Retry times when packet delivery times out. The range is 0-10. The default value is 3. Unit: second.

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## NOTES

1. If this command is executed successfully and gets **OK** back, users can continue to publish new packet. The maximum quantity of transmitting packet should not be greater than that of inflight windows (5).
2. After executing this command, the client will be ready to send data, which will be sent as payload. The maximum length of the input data is 1548 bytes at a time and tap "Ctrl+Z" to send the data.
3. PUBLISH messages can be sent either from a publisher to the server, or from the server to a subscriber. When a server publishes messages to a subscriber, the following URC will be returned to notify the host to read the received data that is reported from MQTT server:

**+QMTRECV: <tcpconnectID>,<msgID>,<topic>,<payload>**

For more details about the URC description, please refer to **Chapter 5.2**.

## 4 Summary of Error Codes

Final result code **+CME ERROR: <err>** indicates an error related to mobile equipment or network. The following table lists some of the general error codes.

**Table 1: General Errors (27.007)**

Code of <err>	Meaning
3	Operation not allowed
4	Operation not supported
23	Memory failure
30	No network service
50	Incorrect parameters
51	Command implemented but currently disabled
52	Command aborted by user
159	Uplink busy/flow control

**Table 2: General Errors (27.005)**

Code of <err>	Meaning
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter

310	USIM not inserted
311	USIM PIN required
312	PH-USIM PIN required
313	USIM failure
314	USIM busy
315	USIM wrong
316	USIM PUK required
317	USIM PIN2 required
318	USIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network service
332	Network timeout
340	No +CNMA acknowledgement expected
500	Unknown error

**NOTE**

**AT+CME=<n>** command disables (<n>=0) or enables (<n>=1) the use of final result code “**+CME ERROR:<err>**”: If <n> keeps the default value “0”, the error response will be **ERROR**; if <n> is set to 1, the error response will be **+CME ERROR: <err>**. Please refer to *document [3]* for details.

# 5 MQTT Related URCs

This chapter gives MQTT related URCs and their descriptions.

**Table 3: MQTT Related URCs**

SN	URC Format	Description
[1]	<b>+QMTSTAT: &lt;tcpconnectID&gt;,&lt;err_code&gt;</b>	When the state of MQTT link layer is changed, the client will close the MQTT connection and report the URC.
[2]	<b>+QMTRECV: &lt;tcpconnectID&gt;,&lt;msgID&gt;,&lt;topic&gt;,&lt;payload&gt;</b>	Reported when the client has received the packet data from MQTT server.

## 5.1. “+QMTSTAT” URC to Indicate State Change in MQTT Link Layer

The URC begins with “+QMTSTAT:”. It will be reported when there is a change in the state of MQTT link layer.

### “+QMTSTAT” URC to Indicate State Change in MQTT Link Layer

<b>+QMTSTAT: &lt;tcpconnectID&gt;,&lt;err_code&gt;</b>	When the state of MQTT link layer is changed, the client will close the MQTT connection and report the URC.
Reference	

#### Parameter

<b>&lt;tcpconnectID&gt;</b>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<b>&lt;err_code&gt;</b>	An error code. Please refer to the table below for details.

**Table 4: Error Codes of the URC**

<err_code>	Description	How to do
1	Connection is closed or reset by peer.	Execute <b>AT+QMTOPEN</b> command and reopen MQTT connection.
2	Sending PINGREQ packet timed out or failed.	Deactivate PDP first, and then active PDP and reopen MQTT connection.
3	Sending CONNECT packet timed out or failed.	<ol style="list-style-type: none"> <li>1. Check whether the inputted user name and password are correct.</li> <li>2. Make sure the client ID is not used.</li> <li>3. Reopen MQTT connection and try to send CONNECT packet to server again.</li> </ol>
4	Receiving CONNECK packet timed out or failed.	<ol style="list-style-type: none"> <li>1. Check whether the inputted user name and password are correct.</li> <li>2. Make sure the client ID is not used.</li> <li>3. Reopen MQTT connection and try to send CONNECT packet to server again.</li> </ol>
5	The client sends DISCONNECT packet to sever and the server is initiative to close MQTT connection.	This is a normal process.
6	The client is initiative to close MQTT connection due to packet sending failure all the time.	<ol style="list-style-type: none"> <li>1. Make sure the data is correct.</li> <li>2. Try to reopen MQTT connection since there may be network congestion or an error.</li> </ol>
7	The link is not alive or the server is unavailable.	Make sure the link is alive or the server is available currently.
8-255	Reserved for future use.	

## 5.2. “+QMTRECV” URC to Notify the Host to Read MQTT Packet Data

The URC begins with “+QMTRECV:”. It is mainly used to notify the host to read the received MQTT packet data that is reported from MQTT server.

“+QMTRECV” URC to Notify the Host to Read MQTT Packet Data	
+QMTRECV: <tcpconnectID>,<msgID>,<topic>,<payload>	Notify the host to read the received data that is reported from MQTT server.
Reference	



## Parameter

---

<tcpconnectID>	MQTT socket identifier. Currently only one MQTT instance is supported. The value is always 0.
<msgID>	The message identifier of packet
<topic>	The topic that received from MQTT server
<payload>	The payload that relates to the topic name

---

# 6 Examples

This chapter gives the examples to explain how to use MQTT related AT commands.

## 6.1. Example of MQTT Operation

```
//Configure Alibaba device information for Alibaba Cloud.
AT+QMTCFG="aliauth",0,"oyjtmPI5a5j","MQTT_TEST","wN9Y6pZSIly7Exa5qVzcmigEGO4kAazZ"
OK

AT+QMTOPEN=?
+QMTOPEN: <tcpconnectID>,"<host_name>",<port>

OK

//Open a network for MQTT client.
AT+QMTOPEN=0,"iot-as-mqtt.cn-shanghai.aliyuncs.com",1883
OK

+QMTOPEN: 0,0 //Opened the MQTT client network successfully.

AT+QMTOPEN?
+QMTOPEN: 0,"iot-as-mqtt.cn-shanghai.aliyuncs.com",1883

OK

AT+QMTCONN=?
+QMTCONN: <tcpconnectID>,"<clientID>" [,"<username>"["<password>"]]

OK

//Connect a client to MQTT server.
//If Alibaba Cloud is connected, customers can use AT+QMTCFG="aliauth" command to configure the
device information in advance, and do not need to provide username/password here anymore.
AT+QMTCONN=0,"clientExample"
OK

+QMTCONN: 0,0,0 //Connected the client to MQTT server successfully.
```

**AT+QMTSUB=?**

**+QMTSUB : <tcpconnectID>,<msgID>,"<topic>",<qos>**

OK

//Subscribe to topics.

**AT+QMTSUB=0,1,"topic/example",2**

OK

**+QMTSUB: 0,1,0,2**

**AT+QMTSUB=0,1,"topic/pub",0**

OK

**+QMTSUB: 0,1,0,0**

//If a client subscribes to a topic and other devices publish the same topic to the server, the module will report the following information.

**+QMTRECV: 0,0, "topic/example", "This is the payload related to topic"**

//Unsubscribe from topics.

**AT+QMTUNS=0,2, "topic/example"**

OK

**+QMTUNS: 0,2,0**

**AT+QMTPUB=?**

**+QMTPUB : <tcpconnectID>,<msgID>,<qos>,<retain>,"<topic>"**

OK

//Publish messages.

**AT+QMTPUB=0,0,0,0,"topic/pub"**

**>This is test data, hello MQTT.**      //After receiving ">", input data "This is test data, hello MQTT." and then send it. The maximum length of the data is 1548 bytes and the data that beyond 1548 bytes will be omitted. After inputting data, tap "Ctrl+Z" to send.

OK

**+QMTPUB: 0,0,0**

//If a client subscribes to a topic named "topic/pub" and other devices publish the same topic to the server, the module will report the following information.

**+QMTRECV: 0,0, "topic/pub",This is test data, hello MQTT.**

```
//Disconnect a client from MQTT server.
```

```
AT+QMTDISC=0
```

```
OK
```

```
+QMTDISC: 0,0
```

```
//Disconnected successfully.
```

# 7 Appendix A References

**Table 5: Related Documents**

SN	Document Name	Remarks
[1]	MQTT V3.1 Protocol Specification	MQTT protocol specification version 3.1
[2]	MQTT V3.1.1 Protocol Specification	MQTT protocol specification version 3.1.1
[3]	Quectel_BC35-G&BC28_AT_Commands_Manual	AT Command Manual of BC35-G and BC28

**Table 6: Terms and Abbreviations**

Abbreviation	Description
ACK	Acknowledgement
MQTT	Message Queuing Telemetry Transport
QoS	Quality of Service
TCP	Transmission Control Protocol
URC	Unsolicited Result Code