RGx00U&RM500U Series

TCP/IP Application Note

5G Module Series

Version: 1.0

Date: 2023-07-20

Status: Released

RGx00U&RM500U 系列 TCP/IP 应用说明

5G模块系列

版本：1.0

日期：2023年7月20日

状态：已发布

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About the Document

Revision History

Version	Date	Author	Description
-	2023-03-24	Wayen XU	Creation of the document
1.0	2023-07-20	Wayen XU	First official release

关于文档

修订历史

版本	日期	作者	描述
-	2023-03-24	徐伟恩	文件的创建
1.0	2023-07-20	徐伟恩	首次正式发布

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1 Introduction

Quectel RG200U series, RG500U series and RM500U series modules feature an embedded TCP/IP stack, which enables the host to access the Internet directly through AT commands. This greatly reduces the dependence on external PPP and TCP/IP protocol stacks and thus minimizes the cost.

RG200U series, RG500U series and RM500U series modules provide the following socket services: TCP client, UDP client, TCP server and UDP server.

This document introduces how to use the TCP/IP function of Quectel RG200U series, RG500U series and RM500U series modules through AT commands.

1.1. The Process of Using TCP/IP AT Commands

Through TCP/IP AT commands, the host can configure PDP context, activate/deactivate PDP context, start/close socket service and send/receive data via socket service. The following figure illustrates the process of using TCP/IP AT commands.

1 引言

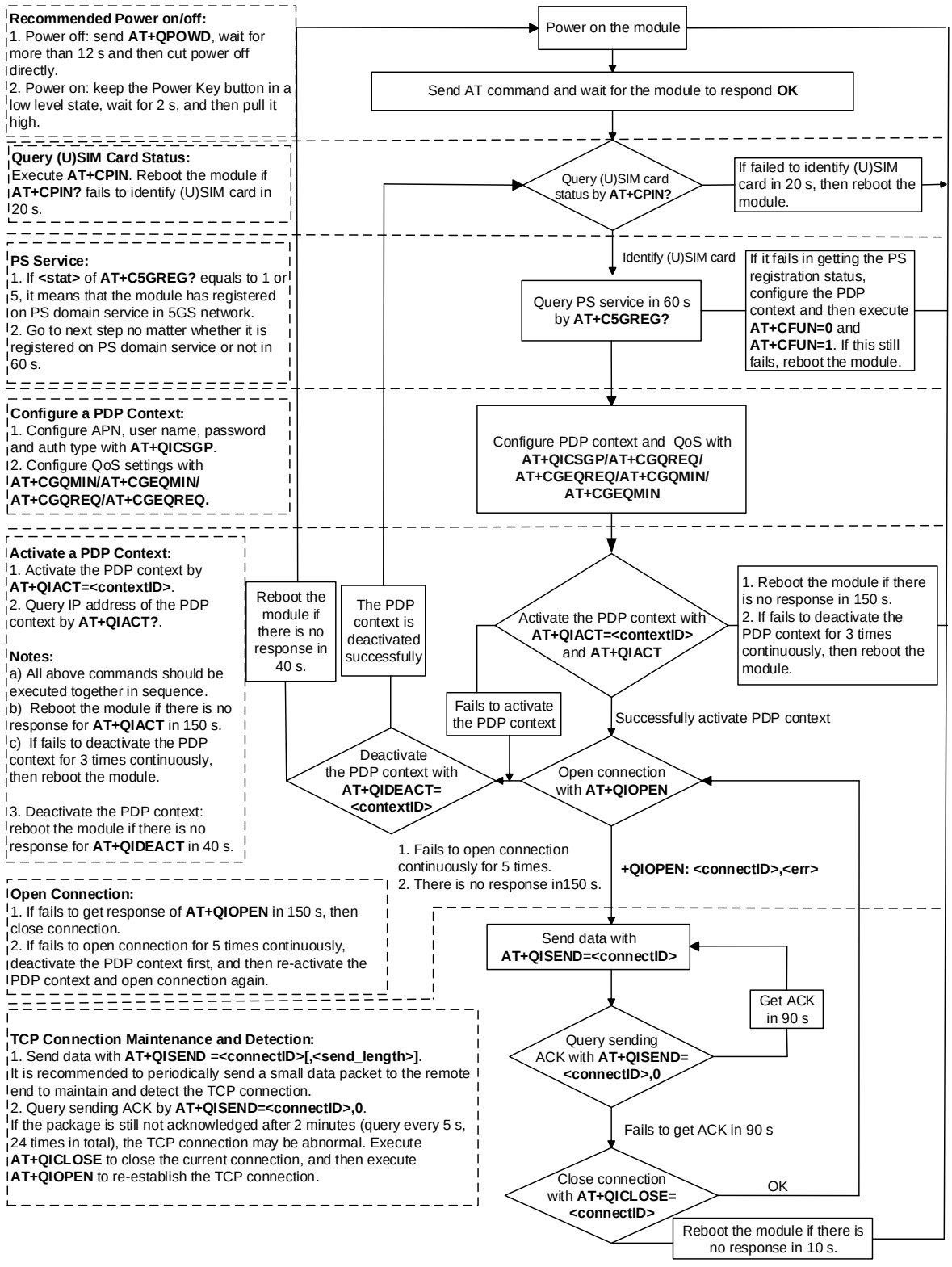
Quectel RG200U系列、RG500U系列和RM500U系列模块均内置TCP/IP协议栈，主机可通过AT命令直接访问互联网。这显著降低了对外部PPP和TCP/IP协议栈的依赖，从而有效控制成本。

RG200U系列、RG500U系列和RM500U系列模块提供以下套接字服务：TCP客户端、UDP客户端、TCP服务器和UDP服务器。

本文介绍了如何通过AT命令使用Quectel RG200U系列、RG500U系列和RM500U系列模块的TCP/IP功能。

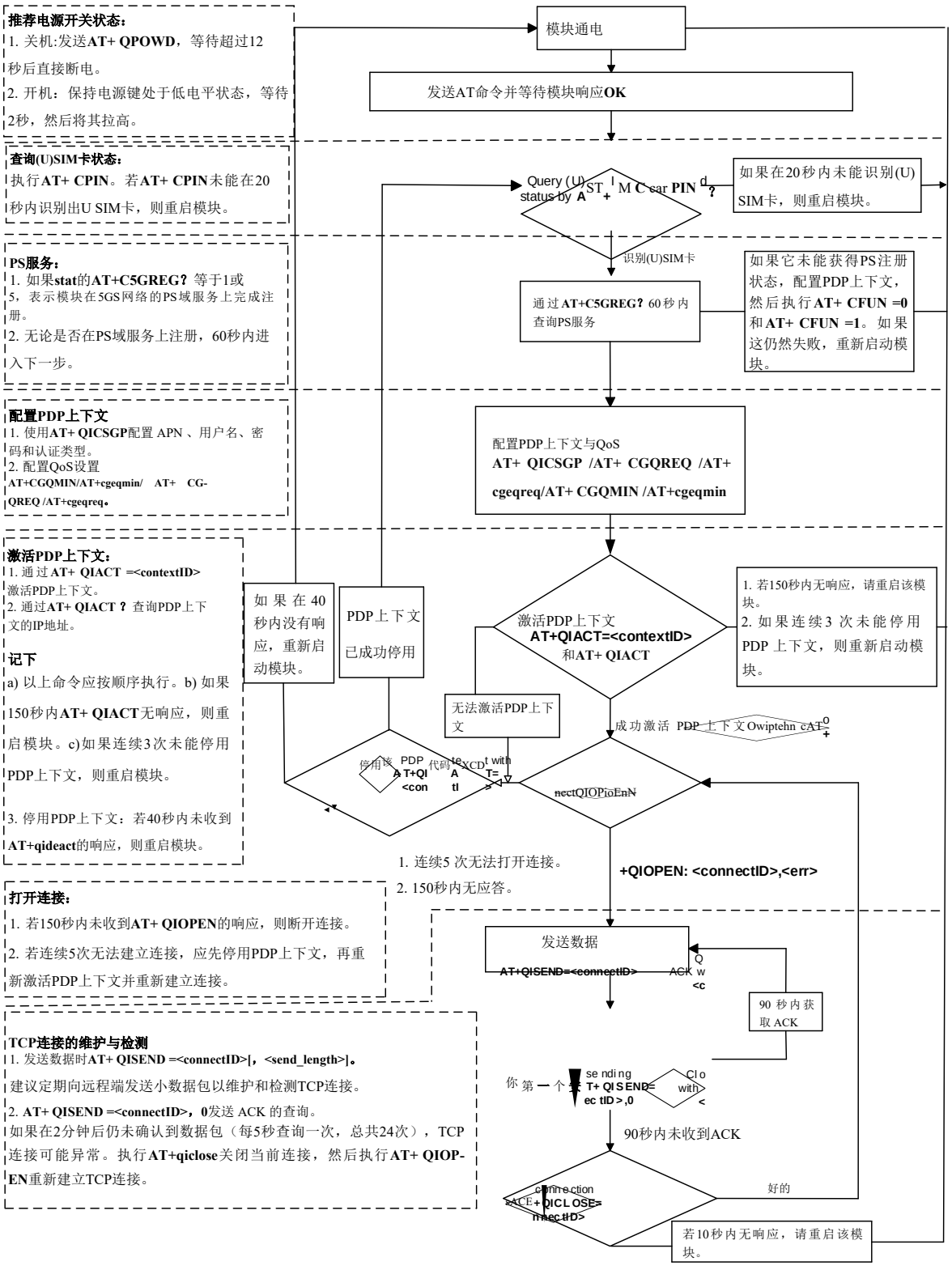
1.1. TCP/IPAT命令的使用过程

通过TCP/IPAT命令，主机可以配置PDP上下文，激活/停用PDP上下文，启动/关闭套接字服务，通过套接字服务发送/接收数据。



Notes:
1. Please note that users need to wait for the final response (for example "**OK**", "**CME ERROR**", "**CMS ERROR**") of the last AT command you entered before you enter the next AT command. You can reboot the module if the module fails to get response in 60 s.
2. Reboot the module if the module has not got response of **AT+QIACT** in 150 s or response of **AT+QICLOSE** in 10s or response of **AT+QIDEACT** in 40 s.
3. It is NOT recommended to frequently reboot the module. When the module failed to reboot for 3 times continuously for AT command execution, it can be rebooted immediately for the first time. If it still fails, reboot the module after 10 minutes for the second time, and reboot after 30 minutes for the third time if it still fails for the second time. By analogy, gradually increase the reboot interval.

Figure 1: Flow Chart of Using TCP/IP AT Commands



记下

1. 请注意，用户需要等待最后输入的AT命令的最终响应（例如“OK”、“CME错误”、“CMS错误”）后，才能输入下一个AT命令。如果模块在60秒内未收到响应，可重启模块。
2. 若模块在150秒内未收到AT+ QIACT响应，或在10秒内未收到AT+qiclose响应，或在40秒内未收到AT+qideact响应，则重启该模块。
3. 不建议频繁重启该模块。当该模块连续3次执行AT命令时未能重启，可首次立即重启。若仍失败，第二次重启模块10分钟后，若第二次重启仍失败则第三次重启30分钟后。同理，逐步增加重启间隔。

图1：TCP/IP AT命令使用流程图

1.2. Description of Data Access Modes

RG200U series, RG500U series and RM500U series modules support the following three data access modes:

- Buffer access mode
- Direct push mode
- Transparent transmission mode

When opening a socket service by **AT+QIOPEN**, the data access mode can be specified by **<access_mode>**. After a socket service is successfully opened, the data access mode can be switched by **AT+QISWTMD**.

1. In buffer access mode: data can be sent by **AT+QISEND**. If the module has received the data from the Internet, it will buffer the data and report the URC **+QIURC: "recv",<connectID>**. Data can be read by **AT+QIRD**.

2. In direct push mode: data can be sent by **AT+QISEND**. If the module has received the data from the Internet, the data will be outputted to COM port directly in the format of **+QIURC: "recv",<connectID>,<currect_recvlength><CR><LF><data>** or **+QIURC: "recv",<connectID>,<current_recvlength>,<remoteIP>,<remote_port><CR><LF><data>**.

3. In transparent transmission mode: the corresponding port (such as UART, USB modem port, etc.) enters the exclusive mode. The data received from COM port will be sent to the Internet directly. The data received from the Internet will be outputted via COM port directly.

   - **Exit from transparent transmission mode**

     To exit from the transparent transmission mode, **+++** or DTR (**AT&D1** should be set first) can be used. To prevent the **+++** from being misinterpreted as data, the following operations should be followed:

     1) Do not input any character within 1 s or longer before inputting **+++**.
     2) Input only **+++** within 1 s with no other character during this period.
     3) Do not input any character within 1 s after **+++** has been inputted.
     4) Use **+++** or DTR (**AT&D1** should be set first) to make the module exit from transparent transmission mode, and wait until **OK** is returned.

   - **Return to transparent transmission mode**

     1) By executing **AT+QISWTMD**: specify **<access_mode>**=2 and it will return **CONNECT** when the connection enters transparent transmission mode successfully.
     2) By executing **ATO**. After exiting from transparent transmission mode, execute **ATO** will switch back to transparent transmission mode again. It will return **CONNECT** when the

1.2. 数据访问模式说明

RG200U系列、RG500U系列和RM500U系列模块支持以下三种数据访问模式：

- 缓冲存取方式
- 直接推送模式
- 透明传输模式

通过**AT+ QIOPEN**打开一个套接字服务时，数据访问模式可以通过**access_mode**指定。套接字服务成功打开后，数据访问模式可以通过**AT+qiswtmd**切换。

1. 在缓冲区访问模式下:数据可以通过**AT+ QISEND**发送。如果模块从互联网接收了数据，它将缓冲数据并报告URC+**QIURC：“recv”，<connectID>**。数据可以通过**AT+ QIRD**读取。

2. 在直接推送模式下：数据可通过**AT+ QISEND**发送。若模块已从互联网接收数据，数据将以+**QIURC：“recv”，<connectID>，<currect_recvlength><CR><LF><data>** 或 +**QIURC ：“recv”，<connectID>，<current_recvlength>，<remoteIP>，<remote_port><CR><LF><data>**的格式直接输出至COM端口。

3. 在透明传输模式下，对应端口（如UART、USB调制解调器端口等）进入专用模式。从COM端口接收的数据将直接发送至互联网，而从互联网接收的数据则直接通过COM端口输出。

   - **退出透明传输模式**

     要退出透明传输模式，可先设置+++或 DTR（**AT&T1**）。为避免+++被误判为数据，需遵循以下操作步骤：

     1) 在输入++前1秒或更长时间内不得输入任何字符。
     2) 在此期间仅输入+++且无其他字符，且输入时间需在1秒内完成。
     3) 输入+++后1秒内不得输入任何字符。
     4) 使用+++或 DTR（**AT&T1**应优先设置）使模块退出透明传输模式，并等待返回**OK**。

   - **恢复透明透射模式**

     1) 通过执行**AT+qiswtmd**：指定**access_mode**=2，当连接成功进入透明传输模式时将返回**connect**。
     2) 执行**ATO**。退出透明传输模式后，执行**ATO**将再次切换回透明传输模式。当返回**connect**时

connection enters transparent transmission mode successfully. If no connection has entered transparent transmission mode before, it will return **NO CARRIER** after executing **ATO**.

NOTE

1. In buffer access mode, if the buffer is not empty, the module will not report any new URC until all the received data has been read from the buffer by **AT+QIRD**.
2. In transparent transmission mode, AT commands cannot be executed. If the socket connection is closed because of network error or other errors, the module will report **NO CARRIER** and exit from the transparent transmission mode. In this case, **AT+QICLOSE** should be executed to close the socket service.

连接成功进入透明传输模式。若连接此前未进入透明传输模式，则执行**ATO**后返回**NO carrier**。

注释

1. 在缓冲区访问模式下，如果缓冲区不为空，模块将不会报告任何新的URC，直到所有接收到的数据都从缓冲区读取完成**AT+ QIRD**。
2. 在透明传输模式下，无法执行AT命令。如果由于网络错误或其他错误导致套接字连接关闭，模块将报告**NO carrier**并退出透明传输模式。在这种情况下，应执行**AT+qiclose**以关闭套接字服务。

2 Description of TCP/IP AT Commands

This chapter introduces AT command related to TCP/IP.

2.1. AT Command Introduction

2.1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on the command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on the command line. When an optional parameter is not given in a command, the new value equals to its previous value or the default settings, unless otherwise specified.
- **Underline** Default setting of a parameter.

2.1.2. AT Command Syntax

All command lines must start with **AT** or **at** and end with **<CR>**. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. In tables presenting commands and responses throughout this document, only the commands and responses are presented, and **<CR>** and **<LF>** are deliberately omitted.

Table 1: Types of AT Commands

Command Type	Syntax	Description
Test Command	**AT+<cmd>=?**	Test the existence of corresponding command and return information about the type, value, or range of its parameter.
Read Command	**AT+<cmd>?**	Check the current parameter value of corresponding command.
Write Command	**AT+<cmd>=<p1>[,<p2>[,<p3>[...]]]**	Set user-definable parameter value.

2 TCP/IPAT命令说明

本章介绍与TCP/IP有关的AT命令。

2.1. AT命令介绍

2.1.1. 定义

- **<CR>** 回车字符。
- **<LF>** 行进给字符
- **<...>** 参数名称。命令行中不会显示角括号。
- **[...]** 命令的可选参数或TA信息响应的可选部分。命令行中不显示方括号。若命令未指定可选参数，则新值将等于其先前值或默认设置，除非另有说明。
- 下划线参数的默认设置。

2.1.2. AT命令语法

所有命令行必须以**AT**或**at**开头，并以**CR**结尾。信息响应和结果代码始终以回车字符和换行字符开头和结尾：**CR><LF><response><CR><LF>**。在本文档中呈现命令和响应的表格中，仅展示命令和响应，而**CR**和**LF**被刻意省略。

表1：AT命令类型

命令类型	语法	描述
测试命令	**AT+<cmd>=?**	检测对应命令的存在，并返回其参数的类型、值或范围信息。
读命令	**AT+<cmd>?**	检查对应命令的当前参数值。
写入命令	**AT+<cmd>=<p1>[，<p2>[，<p3>[...]]]**设置用户可定义参数值。	

Execution Command	**AT+<cmd>**	Return a specific information parameter or perform a specific action.

2.2. Declaration of AT Command Examples

The AT command examples in this document are provided to help you learn about the use of the AT commands introduced herein. The examples, however, should not be taken as Quectel's recommendations or suggestions about how to design a program flow or what status to set the module into. Sometimes multiple examples may be provided for one AT command. However, this does not mean that there is a correlation among these examples, or that they should be executed in a given sequence.

2.3. Description of AT Commands

2.3.1. AT+QICFG Configure Optional Parameters

This command configures optional parameters.

AT+QICFG Configure Optional Parameters	
Test Command **AT+QICFG=?**	Response: **+QICFG: "transpktsize",(**range of supported **<transpktsize>**s**)** **+QICFG: "transwaittm",(**range of supported **<transwaittm>** s**)** **+QICFG: "dataformat",(**list of supported **<send_data_format>**s**),(**list of supported **<recv_data_format>**s**)** **+QICFG: "viewmode",(**list of supported **<view_mode>**s**)** **+QICFG: "tcp/retranscfg",(**range of supported **<max_backoffs>** s**),(**range of supported **<max_rto>**s**)** **+QICFG: "dns/cache",(**list of supported **<DNS_cache>**s**)** **+QICFG: "qisend/timeout",(**list of supported **<time>**s**)** **+QICFG: "passiveclosed",(**list of supported **<closed>**s**)** **+QICFG: "tcp/accept",(**list of supported **<state>**s**)** **+QICFG: "tcp/keepalive",(**list of supported **<enable>**s**),(**range of supported **<idle_time>**s**),(**range of supported **<interval_time>**s**),(**range of supported **<probe_cnt>**s**)** **+QICFG: "recvind",(**list of supported **<enable>**s**)** **+QICFG: "close/mode",(**range of supported **<close_mode>**s**)** **+QICFG: "sendinfo",(**list of supported **<send_view_mode>**s**)** **+QICFG: "formatcfg",(**range of supported **<format>**s**)** **OK**

执行命令**AT+<cmd>**	返回特定信息参数或执行特定操作。

2.2. AT命令示例声明

本文档提供的AT命令示例旨在帮助您掌握文中介绍的AT命令使用方法。但需注意，这些示例并非Quectel公司对程序流程设计或模块状态设置的建议。同一AT命令可能包含多个示例，但这并不意味着这些示例之间存在关联性，也不代表必须按特定顺序执行。

2.3. AT命令说明

2.3.1. AT+ QICFG 配置可选参数

该命令用于配置可选参数。

AT+ QICFG 配置可选参数	
测试命令 **AT+QICFG=?**	应答： **+ QICFG：“transpktsize”，(**支持的**<transpktsize>范围s)+ QICFG：“transwaittm”，(**支持的**<transwaittm>范围s)+ QICFG：“dataformat”，(**支持的**<send_data_format>s列表)，(**支持的**<recv_data_format>s列表)** **+ QICFG：“viewmode”，(**支持的**<view_mode>选项列表)+ QICFG：“tcp/retranscfg”，(**支持的**<max_backoffs>范围)，(**支持的**<max_rto>范围)** **+ QICFG：“dns/cache”，(**支持的**<DNS_cache>缓存)** **+ QICFG：“qisend/timeout”，(**支持的**<time>s)** **+ QICFG：“passiveclosed”，(**支持的**<closed>s)** **+ QICFG：“tcp/accept”，(**支持的**<state>s)** **+QICFG：“tcp/keepalive”，**（支持的**启用**选项列表），（支持的**空闲时间**范围），（支持的**间隔时间**范围），（支持的**探测次数**范围）** **+ QICFG：“recvind”，(**支持的**<enable>s)** **+ QICFG：“close/mode”，(**支持的**<close_mode>选项)+ QICFG：“sendinfo”，(**支持的**<send_view_mode>选项)+ QICFG：“formatcfg”，(**支持的**<format>选项)** **好的**

Write Command Set the maximum length of data to be sent **AT+QICFG="transpktsize"[,<transpktsize>]**	Response: If the optional parameter is omitted, query the current setting: **+QICFG: "transpktsize",<transpktsize>** **OK** If the optional parameter is specified, set the maximum length of data to be sent: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure the waiting time before sending data automatically in transparent transmission mode **AT+QICFG="transwaittm"[,<transwaittm>]**	Response: If the optional parameter is omitted, query the current setting: **+QICFG: "transwaittm",<transwaittm>** **OK** If the optional parameter is specified, configure the waiting time before sending data automatically in transparent transmission mode: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure the format of the data to be sent or received (only for non-transparent transmission mode) **AT+QICFG="dataformat"[,<send_data_format>,<recv_data_format>]**	Response: If the optional parameters are omitted, query the current setting: **+QICFG: "dataformat",<send_data_format>,<recv_data_format>** **OK** If the optional parameters are specified, configure the format of the data to be sent or received: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**

写入命令 设置待发送数据的最大长度 **AT+ QICFG =“传输数据包大小”[<传输数据包大小>]**	应答： 若省略该可选参数，请查询当前设置： **+QICFG: "transpktsize",<transpktsize>** **好的** 若指定该可选参数，请设置待发送数据的最大长度： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 设置等待时间在...之前发送数据自动透明传输方式 **AT+ QICFG =“transwaittm”[，<transwaittm>]**	应答： 若省略该可选参数，请查询当前设置： **+QICFG: "transwaittm",<transwaittm>** **好的** 若指定该可选参数，则在透明传输模式下自动配置数据发送前的等待时间： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 配置待发送或接收的数据格式 （仅适用于非透明传输模式） **AT+ QICFG =“数据格式”[<发送数据格式>，<接收数据格式>]**	应答： 若省略可选参数，请查询当前设置： **+QICFG: "dataformat",<send_data_format>,<recv_data_format>** **好的** 若指定可选参数，请配置待发送或接收数据的格式： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**

Write Command Configure the output format of received data (only for non-transparent transmission mode) **AT+QICFG="viewmode"[,<view_mode>]**	Response: If the optional parameter is omitted, query the current setting: **+QICFG: "viewmode",<view_mode>** **OK** If the optional parameter is specified, configure the output format of the received data: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure the maximum interval time and maximum times for TCP retransmission **AT+QICFG="tcp/retranscfg"[,<max_backoffs>,<max_rto>]**	Response: If the optional parameters are omitted, query the current setting: **+QICFG: "tcp/retranscfg",<max_backoffs>,<max_rto>** **OK** If the optional parameters are specified, configure the maximum interval time and maximum times for TCP retransmission: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Enable or disable the DNS cache **AT+QICFG="dns/cache"[,<DNS_cache>]**	Response: If the optional parameter is omitted, query the current setting: **+QICFG: "dns/cache",<DNS_cache>** **OK** If the optional parameter is specified, enable or disable the DNS cache: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure the timeout value for	Response: If the optional parameter is omitted, query the current setting:

写入命令 配置接收数据的输出格式（仅适用于非透明传输模式） **AT+ QICFG =“viewmode”[，<view_mode>]**	应答： 若省略该可选参数，请查询当前设置： **+ QICFG：“viewmode”，<view_mode>** **好的** 若指定该可选参数，请配置接收数据的输出格式： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 配置TCP重传的最大间隔时间和最大次数 **AT+QICFG="tcp/retranscfg"[,<max_backoffs>,<max_rto>]**	应答： 若省略可选参数，请查询当前设置： **+QICFG: "tcp/retranscfg",<max_backoffs>,<max_rto>** **好的** 若指定可选参数，请配置TCP重传的最大间隔时间和最大次数： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 启用或禁用DNS缓存 **AT+ QICFG =“dns/cache”[，<DNS_cache>]**	应答： 若省略该可选参数，请查询当前设置： **+ QICFG：“dns/cache”，<DNS_cache>** **好的** 若指定该可选参数，可启用或禁用DNS缓存： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 配置超时值	应答： 若省略该可选参数，请查询当前设置：

input data **AT+QICFG="qisend/timeout"[,<time>]**	**+QICFG: "qisend/timeout",<time>** **OK** If the parameter is specified, configure the input data timeout: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Enable or disable the passive close of TCP connection when the server is closed **AT+QICFG="passiveclosed"[,<closed>]**	Response If the optional parameter is omitted, query the current setting: **+QICFG: "passiveclosed",<closed>** **OK** If the parameter is specified, enable or disable the passive close of TCP connection when the server is closed: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Enable or disable the automatic reception of the TCP connection from the client **AT+QICFG="tcp/accept"[,<state>]**	Response: If the optional parameter is omitted, query the current setting: **+QICFG: "tcp/accept",<state>** **OK** If the optional parameter is specified, enable or disable the automatic reception of the TCP connection from the client: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure whether to send TCP keep-alive information. **AT+QICFG="tcp/keepalive"[,<enable>[,<idle_time>,<interval**	Response If the optional parameters are omitted, query the current setting: **+QICFG: "tcp/keepalive",<enable>,<idle_time>,<interval_time>,<probe_cnt>**

输入数据 **AT+ QICFG =“qisend/timeout”[,<时间>]**	**+ QICFG：“qisend/timeout”，<time>** **好的** 若已指定参数，请配置输入数据超时时间： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 当服务器关闭时，启用或禁用TCP连接的被动关闭功能 **AT+ QICFG =“被动闭合”[，<闭合>]**	应答 若省略该可选参数，请查询当前设置： **+ QICFG：“passiveclosed”，<closed>** **好的** 若指定该参数，可在关闭服务器时启用或禁用TCP连接的被动关闭功能： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 启用或禁用客户端TCP连接的自动接收功能 **AT+ QICFG =“tcp/accept”[<状态>]**	应答： 若省略该可选参数，请查询当前设置： **+ QICFG：“tcp/accept”，<state>** **好的** 若指定该可选参数，可启用或禁用从客户端自动接收TCP连接的功能： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 配置是否发送TCP保持连接信息。 **AT+ QICFG =“tcp/keepalive”[<启用>[<空闲时间>，<间隔**	应答 若省略可选参数，请查询当前设置： **+QICFG: "tcp/keepalive",<enable>,<idle_time>,<interval_time>,<probe_cnt>**

_time>,<probe_cnt>]]	**OK** If the optional parameters are specified, configure whether to send TCP keep-alive information: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure whether to display the data length in the URC reported by the module after receiving the data in buffer mode **AT+QICFG="recvind"[,<enable>]**	Response If the parameter is omitted, query the current setting: **+QICFG: "recvind",<enable>** **OK** If the parameter is specified, configure whether to display the data length in the URC reported by the module after receiving the data: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Enable or disable to return response information of **AT+QICLOSE** in URC format **AT+QICFG="close/mode"[,<close_mode>]**	Response If the parameter is omitted, query the current setting: **+QICFG: "close/mode",<close_mode>** **OK** If the parameter is specified, enable or disable to return response information of **AT+QICLOSE** in URC format: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Enable or disable to return response information of **AT+QISEND** in URC format (only when **<service_type>**="TCP"、"UDP"	Response If the parameter is omitted, query the current setting: **+QICFG: "sendinfo",<send_view_mode>** **OK**

时间>，<探测计数>]]	**好的** 若已指定可选参数，需配置是否发送TCP保持连接信息。 **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 配置是否在缓冲模式下接收数据 后显示模块上报的URC数据长度 **AT+ QICFG =“接收指示”[<启用>]**	应答 若省略该参数，请查询当前设置： **+ QICFG：“recvind”，<enable>** **好的** 若指定该参数，则配置是否在模块接收数据后显示其上报的URC数据长度： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 启用或禁用以返回**AT+qiclose**的响应信息，格式为 URC **AT+ QICFG =“close/mode”[，<close_mode>]**	应答 若省略该参数，请查询当前设置： **+ QICFG：“关闭/模式”，<close_mode>** **好的** 如果指定参数，则启用或禁用以返回**AT+qiclose**的响应信息，格式为 URC： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 启用或禁用以返回**AT+ QISEND**的响应信息（仅当**<service type>=**“TCP”、“UDP”	应答 若省略该参数，请查询当前设置： **+ QICFG：“发送信息”，<send_view_mode>** **好的**

or "TCP INCOMING") **AT+QICFG="sendinfo"[,<send_view_mode>]**	If the parameter is specified, enable or disable to return response information of **AT+QISEND** in URC format: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Configure response information format after executing **AT+QISEND** **AT+QICFG="formatcfg"[,<format>]**	Response If the parameter is omitted, query the current setting: **+QICFG: "formatcfg",<format>** **OK** If the parameter is specified, configure response information format after executing **AT+QISEND**: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristic	The commands take effect immediately. The configurations are not saved.

Parameter

<transpktsize>	Integer type. The maximum length of the data packet to be sent in transparent transmission mode. Range: 1–1460; Default value: 1024; Unit: byte.
<transwaittm>	Integer type. The waiting time before sending the data automatically if the length of data to be sent is less than the value of **<transpktsize>** in transparent transmission mode. Range: 0–20; Default value: 2; Unit: 100 ms.
<send_data_format>	Integer type. The format of the data to be sent. The suffix “0x” is not needed when the mode is set as hex mode, and the module will automatically form two bytes to one ASCII code. 0 Text mode 1 Hex mode
<recv_data_format>	Integer type. The format of the data to be received. The suffix “0x” is not needed when the mode is set as hex mode, and the module will automatically form two bytes to one ASCII code. 0 Text mode

或“TCP传入” **AT+ QICFG =“发送信息”[，<发送视图模式>]**	若指定该参数，启用或禁用以返回**AT+ QISEND**的响应信息（URC格式）： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 执行后配置响应信息格式 **AT+QISEND** **AT+ QICFG =“格式配置”[<format>]**	应答 若省略该参数，请查询当前设置： **+ QICFG：“formatcfg”，<format>** **好的** 如果指定该参数，则在执行**AT+ QISEND**后配置响应信息格式： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征性的	这些指令立即生效。 配置未保存。

参数

<传输数据包大小>	整数类型。透明传输模式下待发送数据包的最大长度。范围：1–1460；默认值：1024；单位：字节。
<transwaittm>	整数类型。在透明传输模式下，若待发送数据长度小于**transpktsize**值时，自动发送数据前的等待时间。范围：0–20；默认值：2；单位：100毫秒。整数类型。待发送数据的格式。当模式设置为十六进制模式时，无需使用后缀“0x”，模块将自动将两个字节组合成一个ASCII码。 0 文本模式 1 十六进制模式
<发送数据格式>	
<接收数据格式>	整数类型。待接收数据的格式。当模式设置为十六进制模式时，无需使用后缀“0x”，模块将自动将两个字节组合为一个ASCII码。 0 文本模式

	1 Hex mode
<view_mode>	Integer type. The output format of the received data in non-transparent transmission mode. 0 data header\r\ndata. 1 data header,data.
<max_backoffs>	Integer type. The maximum times of TCP retransmission. Range: 3–20; Default value: 8.
<max_rto>	Integer type. The maximum interval time of TCP retransmission. Range: 5–1000; Default value: 600; Unit: 100 ms.
<DNS_cache>	Integer type. Enable or disable the DNS cache. 0 Enable 1 Disable
<time>	Integer type. The timeout value of **AT+QISEND**. After **>** is responded, if no data is inputted within the timeout period, **AT+QISEND** will be exited. Range: 0–3600; Default value: 0; Unit: ms.
<closed>	Integer type. Enable or disable the passive close of TCP connection when the server is closed. 0 Disable 1 Enable
<state>	Integer type. Enable or disable the automatic reception of the TCP connection from the client. 0 Disable 1 Enable
<enable>	Integer type. In **AT+QICFG="tcp/keepalive"**, it means whether to send TCP keepalive information. In **AT+QICFG="recvind"**, it configures whether to display the data length in the URC reported by the module after receiving the data in buffer mode. 0 Not send/Not display 1 Send/Display
<idle_time>	Integer type. The triggered keepalive cycle time. Range: 1–1800; Default value: 60; Unit: s.
<interval_time>	Integer type. The interval of sending packets in a cycle time. Range: 25–100; Default value: 25; Unit: s.
<probe_cnt>	Integer type. The times of sending packets in a cycle time. Range: 3–10; Default value: 3.
<close_mode>	Integer type. Enable or disable to report response information of **AT+QICLOSE** in URC format. 0 Disable 1 Enable
<send_view_mode>	Integer type. Enable or disable to report response information of **AT+QISEND** in URC format. 0 Disable 1 Enable
<format>	Integer type. The response information format after executing **AT+QISEND**.

	1 十六进制模式
<视图模式>	整数类型。非透明传输模式下接收数据的输出格式。 0数据头\r\ndata。 1个数据头，数据。
<max_backoffs>	整数类型。TCP重传的最大次数。范围：3-20； 默认值：8。
<max_rto>	整数类型。TCP重传的最大间隔时间。范围：5-1000；默认值：600；单位：100毫秒。
<DNS_缓存>	整数类型。启用或禁用DNS缓存。 0 启用 1 禁用
时间	整数类型。**AT+ QISEND**的超时值。在>响应后，若超时时间内未输入数据，则**AT+ QISEND**将退出。范围：0-3600；默认值：0；单位：ms。
封闭	整数类型。启用或禁用服务器关闭时TCP连接的被动关闭。 0 禁用 1 启用
陈述	整数类型。启用或禁用从客户端自动接收TCP连接。 0 禁用 1 启用
使能够	整数类型。在**AT+ QICFG =″tcp/keepalive″**中，表示是否发送TCP keepalive信息。在**AT+ QICFG =″recvind″**中，配置在缓冲模式下接收数据后，是否显示模块报告的URC数据长度。 0 未发送/未显示 1 发送/显示
<idle_time>	整数类型。触发的存活周期时间。范围：1-1800；默认值 值：60；单位：秒。
<间隔时间>	整数类型。周期时间内发送数据包的间隔。范围：25-100； 默认值：25；单位：秒。
<探测器计数>	整数类型。每个周期内发送数据包的次数。范围：3-10； 默认值：3。
<关闭模式>	整数类型。启用或禁用以报告**AT+qiclose**的响应信息，格式为 URC。 0 禁用 1 启用
<发送查看模式>	整数类型。启用或禁用以报告**AT+ QISEND**的响应信息，格式为 URC。 0 禁用 1 启用
版式	整数类型。执行**AT+ QISEND**后的响应信息格式。

	S3 is **ATS3** and S4 is **ATS4**. 0 "S3S4>" 1 "S3S4>S3S4"
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

NOTE

The setting of **AT+QICFG="tcp/retranscfg"[,<max_backoffs>,<max_rto>]** will take effect to all TCP Socket connections and will not be saved to NV.

2.3.2. AT+QICSGP Configure Parameter of TCP/IP Context

This command configures **<APN>**, **<username>**, **<password>** and other parameters of TCP/IP context. The QoS settings can be configured by **AT+CGQMIN**, **AT+CGEQMIN**, **AT+CGQREQ** and **AT+CGQREQ**. For more details about the AT commands, see ***document [1]***.

AT+QICSGP Configure Parameters of TCP/IP Context	
Test Command **AT+QICSGP=?**	Response: **+QICSGP: (**range of supported **<conntextID>**s**),(**range of supported **<context_type>**s**),<APN>,<username>,<password>,(**range of supported **<authentication>**s**)** **OK**
Write Command Configure the specified context **AT+QICSGP=<contextID>[,<context_type>,<APN>[,<username>,<password>,<authentication>]]**	Response: If the optional parameters are omitted, query the configuration of specified context: **+QICSGP: <context_type>,<APN>,<username>,<password>,<authentication>** **OK** If the optional parameters are specified, configure the specified context: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristics	The command takes effect immediately.

	S3是**ATS3**，S4是**ATS4**。 0 "S3S4>" 1 "S3S4>S3S4"
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

注释

AT+QICFG=“tcp/retranscfg”[，<max_backoffs>，<max_rto>]的设置将对所有TCP套接字连接生效，且不会保存至NV。

2.3.2. TCP/IP上下文的AT+ QICSGP 配置参数

此命令配置 <**APN** >、**<username>**、**<password>**及 TCP/IP 环境的其他参数。QoS 设置可通过**AT+ CGQMIN**、**AT+cgeqmin**、**AT+ CGQREQ**和**AT+ CGQREQ**进行配置。有关 AT 命令的更多详细信息，请参阅***文档[1]***。

AT+ QICSGP 配置TCP/IP上下文参数	
测试命令 **AT+QICSGP=?**	应答： **+ QICSGP : (**支持的范围**<conntextID>**s)，**(**支持的范围**<context_type>**s)， **< APN >，<username>，<passw ord>，(**支持的范围**<authentication>**s) **好的**
写入命令 配置指定上下文 **AT+ QICSGP =<contextID>[<context_ type>，< APN >[<username>，<passwo rd>，<authent-ication>]]**	应答： 若省略可选参数，则查询指定上下文的配置： **+ QICSGP : <context_type>，< APN >，<username>，<passwo rd>，<authentication>** **好的** 若指定可选参数，请配置指定上下文： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征	该命令立即生效。

	The configurations are not saved.

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<context_type>	Integer type. The protocol type. 1 IPv4 2 IPv6 3 IPv4v6
<APN>	String type. Access point name.
<username>	String type. Username. Maximum length: 127; Unit: byte.
<password>	String type. Password. Maximum length: 127; Unit: byte.
<authentication>	Integer type. APN authentication methods. 0 None 1 PAP 2 CHAP 3 PAP or CHAP
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

Example

```
AT+QICSGP=1                          //Query the configuration of context 1.
+QICSGP: 1,"","","",0

OK
AT+QICSGP=1,1,"UNINET","","",0       //Configure context 1. APN is configured as "UNINET"
                                       (China Unicom).
OK
```

2.3.3. AT+QIACT Activate PDP Context

Before activating PDP context by **AT+QIACT**, the context should be configured by **AT+QICSGP**. After activation, the IP address can be queried by **AT+QIACT?**.

The range of **<contextID>** is 1–5. Module supports up to 5 PDP contexts activated simultaneously. Depending on the network, it may take at most 150 s to return **OK** or **ERROR** after **AT+QIACT** is executed. Before the response is returned, other AT commands cannot be executed.

AT+QIACT Activate PDP Context	
Test Command **AT+QIACT=?**	Response: **+QIACT: (**range of supported **<contextID>**s**)**

	配置未保存。

参数

情境ID	整数类型。PDP上下文ID。范围：1-5。
类型>	整数类型。协议类型。 1 IPv4 2 IPv6 3 IPv4v6
<APN>	字符串类型。接入点名称。
<用户名>	字符串类型。用户名。最大长度：127；单位：字节。
<密码>	字符串类型。密码。最大长度：127；单位：字节。
证明	整数类型。 APN 认证方法。 0 没有一个 1 PAP 2 CHAP 3 PAP或CHAP
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

样例

```
AT+QICSGP=1                              //查询上下文1的配置
+QICSGP: 1，“”，“”，“”，0

好的
AT+QICSGP=1,1，“联通”，“”，0            //配置上下文 1. APN 已配置为“UNINET”
                                           中国联通
好的
```

2.3.3. AT+ QIACT 激活PDP上下文

在通过**AT+ QIACT**激活PDP上下文之前，上下文应通过**AT+ QICSGP**进行配置。激活后，可通过**AT+ QIACT**查询IP地址。

contextID的范围是 1-5。模块最多支持同时激活 5 个 PDP 上下文。根据网络情况，执行**AT+ QIACT**后返回**OK**或**error**的时间最多为 150 秒。在返回响应之前，不能执行其他 AT 命令。

AT+ QIACT 激活PDP上下文	
测试命令 **AT+QIACT=?**	应答： **+QIACT : (**支持的 **<contextID>**范围)

	OK
Read command **AT+QIACT?**	Response: Return the list of all activated PDP contexts and corresponding IP addresses: If **<context_type>**=1 **+QIACT: 1,<context_state>,1,<IPv4_address>** **[...** **+QIACT: 5,<context_state>,1,<IPv4_address>]** **OK** Or **<context_type>**=2 **+QIACT: 1,<context_state>,2,<IPv6_address>** **[...** **+QIACT: 5,<context_state>,2,<IPv6_address>]** **OK** Or **<context_type>**=3 **+QIACT: 1,<context_state>,3,<IPv4_address>,<IPv6_address>** **[...** **+QIACT: 5,<context_state>,3,<IPv4_address>,<IPv6_address>]** **OK**
Write Command Activate specified PDP context **AT+QIACT=<contextID>**	Response: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	150 seconds, determined by the network.
Characteristics	-

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<context_state>	Integer type. The PDP context state. 0 Deactivated 1 Activated
<context_type>	Integer type. The protocol type.

	好的
读命令 **AT+QIACT?**	应答： 返回所有已激活PDP上下文及其对应IP地址的列表： 如果**<context_type>**=1 **+ QIACT : 1，<context_state>，1，< IPv4_address >** **[...** **[+ QIACT : 5，<context_state>，1，< IPv4_address >]** **好的** 或**<context_type>**=2 **+ QIACT : 1，<context_state>，2，< IPv6_address >** **[...** **+ QIACT : 5，<context_state>，2，< IPv6_address >]** **好的** 或**<context_type>**=3 **+QIACT: 1,<context_state>,3,<IPv4_address>,<IPv6_address>** **[...** **+QIACT: 5,<context_state>,3,<IPv4_address>,<IPv6_address>]** **好的**
写入命令 激活指定的PDP上下文 **AT+QIACT=<contextID>**	应答： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	150秒，由网络确定。
特征	-

参数

情境ID	整数类型。	PDP上下文ID。范围：1-5。
状态_	整数类型。0 未激活 1 已激活	PDP上下文状态。
类型>	整数类型。	协议类型

	1 IPv4 2 IPv6 3 IPv4v6
<IPv4_address>	String type. Local IPv4 address after the context is activated.
<IPv6_address>	String type. Local IPv6 address after the context is activated.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.4. AT+QIDEACT Deactivate PDP Context

This command deactivates specified context and closes all TCP/IP connections set up in this context. Depending on the network, it may take at most 40 s to return **OK** or **ERROR** after executing **AT+QIDEACT**. Before the response is returned, other AT commands cannot be executed.

AT+QIDEACT Deactivate PDP Context	
Test Command **AT+QIDEACT=?**	Response: **+QIDEACT: (**range of supported **<contextID>**s**)** **OK**
Write Command **AT+QIDEACT=<contextID>**	Response: **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	40 seconds, determined by network.
Characteristics	-

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<err>	Integer type. Error codes. See ***Chapter 4***.

2.3.5. AT+QIACTEX Activate PDP Context Asynchronously

This command activates specified PDP context asynchronously. Before activating specified PDP context by **AT+QIACTEX**, the context should be configured by **AT+QICSGP**. After activation, the IP address can be queried by **AT+QIACTEX?**.

The range of **<contextID>** is 1–5. Module supports up to 5 PDP contexts activated simultaneously. The

	1 IPv4 2 IPv6 3 IPv4v6
<IPv4_address>	字符串类型。启用上下文后显示的本地IPv4地址。
<IPv6_address>	字符串类型。启用上下文后显示的本地IPv6地址。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.4. AT+qideact PDP上下文的去激活

此命令将停用指定上下文并关闭在此上下文中建立的所有TCP/IP连接。根据网络情况，执行**AT+qideact**后最多需要40秒返回**OK**或**error**。在返回响应之前，无法执行其他AT命令。

AT+qideact PDP上下文的去激活	
测试命令 **AT+QIDEACT=?**	应答： **+qideact: (**支持的 **<contextID>**范围**)** **好的**
写入命令 **AT+qideact=<contextID>**	应答： **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	40秒，由网络决定。
特征	-

参数

<contextID>整数类型。PDP上下文ID。范围：1-5。	
<err>	整数类型。错误代码。请参阅***第4***章。

2.3.5. AT+qiactex异步激活PDP上下文

此命令异步激活指定的PDP上下文。在通过**AT+qiactex**激活指定的PDP上下文之前，应通过**AT+ QICSGP**配置上下文。激活后，可通过**AT+qiactex?**查询IP地址。

contextID的取值范围为1-5。该模块最多可同时激活5个PDP上下文。

number of PDP context activated simultaneously actually depends on (U)SIM card. The module returns **OK** or **ERROR** after executing **AT+QIACTEX**. After that, the result is reported by URC **+QIACTEX**.

AT+QIACTEX Activate PDP Context Asynchronously	
Test Command **AT+QIACTEX=?**	Response: **+QIACTEX: (**range of supported **<contextID>**s**), (**list of supported **<view_mode>**s**)** **OK**
Read Command **AT+QIACTEX?**	Response: Return the list of all activated PDP contexts and corresponding IP addresses: If **<context_type>**=1 **+QIACTEX: 1,<context_state>,1,<IPv4_address>** **[...** **+QIACTEX: 5,<context_state>,1,<IPv4_address>]** Or **<context_type>**=2 **+QIACTEX: 1,<context_state>,2,<IPv6_address>** **[...** **+QIACTEX: 5,<context_state>,2,<IPv6_address>]** Or **<context_type>**=3 **+QIACTEX: 1,<context_state>,3,<IPv4_address>,<IPv6_address>** **[...** **+QIACTEX: 5,<context_state>,3,<IPv4_address>,<IPv6_address>]** **OK**
Write Command **AT+QIACTEX=<contextID>[,<view_mode>]**	Response: If **<view_mode>**=0： **OK** **+QIACTEX: <contextID>,<err>** If **<view_mode>**=1： **OK** **+QIACTEX: <contextID>,<err>[,1,<IPv4_address>]** Or **+QIACTEX: <contextID>,<err>[,2,<IPv6_address>]** Or

实际同时激活的PDP上下文数量取决于(U)SIM卡。该模块在执行**AT+qiactex**后返回**OK**或**error**。之后，结果由URC+**qiactex**报告。

AT+qiactex异步激活PDP上下文	
测试命令 **AT+QIACTEX=?**	应答： +**qiactex: (**支持的 <**contextID**>范围)，(列表 支持 <**view_mode**> **好的**
读命令 **AT+QIACTEX®**	应答： 返回所有已激活PDP上下文及其对应IP地址的列表： 如果**<context_type>**=1 **+qiactex: 1，<context_state>，1，< IPv4_address >[...** **+qiactex: 5，<context_state>，1，< IPv4_address >]** 或**<context_type>**=2 **+qiactex: 1，<context_state>，2，< IPv6_address >[...** **+qiactex: 5，<context_state>，2，< IPv6_address >]** 或**<context_type>**=3 **+QIACTEX：** **1,<context_state>,3,<IPv4_address>,<IPv6_address>** **[...** **+qiactex: 5，<context_state>，3，< IPv4_address >，< IPv6_a dd-ress>]** **好的**
写入命令 **AT+qiactex=<contextID>[，<view_m ode>]**	应答： 如果**<view_mode>**=0: **好的** **+QIACTEX: <contextID>,<err>** 如果**<view_mode>**=1: **好的** **+qiactex: <contextID>，<err>[，1，< IPv4_address >]** 或 **+qiactex: <contextID>，<err>[，2，< IPv6_address >]** 或

	+QIACTEX: <contextID>,<err>[,3,<IPv4_address>,<IPv6_address>] If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	150 seconds, determined by network.
Characteristics	-

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<view_mode>	Integer type. Whether to display IP address and type. 0 Not display 1 Display
<context_state>	Integer type. The PDP context state. 0 Deactivated 1 Activated
<context_type>	Integer type. Protocol type. 1 IPv4 2 IPv6 3 IPv4v6
<IPv4_address>	String type. Local IPv4 address of the activated context.
<IPv6_address>	String type. Local IPv6 address of the activated context.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.6. AT+QIDEACTEX Deactivate PDP Context Asynchronously

This command deactivates PDP context asynchronously. After executing **AT+QIDEACTEX**, the module returns **OK** or **ERROR**. After that, the result of PDP context is reported by URC **+QIDEACTEX**.

AT+QIDEACTEX Deactivate PDP Context Asynchronously	
Test Command **AT+QIDEACTEX=?**	Response: **+QIDEACTEX: (**range of supported **<contextID>**s**)** **OK**
Write Command **AT+QIDEACTEX=<contextID>**	Response: **OK**

	+qiactex: <contextID>，<err>[，3，< IPv4_address >，< IPv6_address>] 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	150秒，由网络决定。
特征	-

参数

情境ID	整数类型。PDP上下文ID。范围：1-5。
<视图模式>	整数类型。是否显示IP地址及类型。 0 不显示 1 显示
状态_	整数类型。PDP上下文状态。 0 失活 1 已激活
类型>	整数类型。协议类型。 1 IPv4 2 IPv6 3 IPv4v6
<IPv4_address>	字符串类型。激活上下文的本地IPv4地址。
<IPv6_address>	字符串类型。激活上下文的本地IPv6地址。整数类型。错误代码。有关
<err>	详细信息，请参阅***第4***章。

2.3.6. AT+qideactex异步停用PDP上下文

该命令异步停用PDP上下文。执行**AT+qideactex**后，模块返回**OK**或**error**。之后，PDP上下文的结果由URC+**qideactex**报告。

AT+QIDEACTEX **停用PDP**	**上下文异步**
测试命令 **AT+QIDEACTEX=?**	应答： **+qideactex: (**支持的范围**<contextID>s)** **好的**
写入命令 **AT+qideactex=<contextID>** **好的**	应答：

	+QIDEACTEX: <contextID>,<err> If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	40 seconds, determined by network.
Characteristics	-

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.7. AT+QIOPEN Open Socket Service

This command opens socket service. The service type can be specified by **<service_type>**. The data access mode (buffer access mode, direct push mode and transparent transmission mode) can be specified by **<access_mode>**. The URC **+QIOPEN** indicates whether the socket service has been opened successfully.

1. If **<service_type>**="TCP LISTENER", the module works as TCP server. After accepting a new TCP connection, the module automatically specifies a **<connectID>** and reports a URC **+QIURC: "incoming",<connectID>,<serverID>,<remoteIP>,<remote_port>**. The range of **<connectID>** is 0–11. The type of this new TCP connection is "TCP INCOMING" and the value of **<access_mode>** is the same with that of **<access_mode>** of "TCP LISTENER".

2. If **<service_type>**="UDP SERVICE", UDP data can be sent to or received from the remote IP through **<local_port>**.
   - Send data: execute **AT+QISEND=<connectID>,<send_length>,<remoteIP>,<remote_port>**.
   - Receive data in direct push mode: the module reports the URC **+QIURC: "recv",<connectID>,<currentrecvlength>,<remoteIP>,<remote_port><CR><LF><data>**.
   - Receive data in buffer access mode: the module reports the URC **+QIURC: "recv",<connectID>**, and then data can be read by user by **AT+QIRD=<connectID>**.

It is suggested to wait for 150 seconds for the URC **+QIOPEN: <connectID>,<err>** to be outputted after the command is executed. If the URC cannot be received in 150 seconds, **AT+QICLOSE** should be used to close the socket.

	+QIDEACTEX: <contextID>,<err> 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	40秒，由网络决定。
特征	-

参数

<contextID>整数类型。PDP上下文ID。范围：1-5。	
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.7. AT+ QIOPEN 开放套接字服务

该命令打开套接字服务。服务类型可通过**<service_type>**指定。数据访问模式（缓冲区访问模式、直接推送模式和透明传输模式）可通过**<access_mode>**指定。URC **+QIOPEN**表示套接字服务是否已成功打开。

1. 如果 **<service_type>**= “TCP listener”，该模块作为TCP服务器运行。在接收新TCP连接后，模块会自动指定一个 **<connectID>**并报告一个URC **+QIURC:“incoming”，<connectID>，<serverID>，<remoteIP>，<remote_port>**。 **<connectID>**的取值范围为0-11。此新TCP连接的类型为“TCP incoming”，且 **<access_mode>**的值与 **<access_mode>**“TCP listener” 的值相同。

2. 如果**<service_type>**= “UDP服务”，则UDP数据可以通过**<local_port>**发送或接收来自远程IP的数据。

   - 发送数据：执行**AT+QISEND=<connectID>，<send_length>，<remoteIP>，<remote_port>.**
   - 以直接推送模式接收数据：该模块报告URC**+QIURC:“recv”，<connectID>，<currentrecvlength>，<remoteIP>，<remote_port><CR><LF><data>.**
   - 以缓冲区访问模式接收数据：模块报告URC **+QIURC :“recv”，<connectID>**，然后用户可以通过**AT+QIRD =<connectID>**读取数据。

建议在执行命令后等待150秒，以输出URC **+QIOPEN : <connectID>，<err>**。如果在150秒内无法收到URC，则应使用**AT+qiclose**关闭套接字。

AT+QIOPEN Open Socket Service	
Test Command **AT+QIOPEN=?**	Response **+QIOPEN: (**range of supported **<contextID>**s**),(**range of supported **<connectID>**s**),(**list of supported **<service_type>**s**),<address_string>,(**range of supported **<remote_port>**s**),(**range of supported **<local_port>**s**),(**range of supported **<access_mode>**s**),(**range of supported **<TCP_client_maxnum>**s**),(**range of supported **<connect_timeout>**s**)** **OK**
Write Command **AT+QIOPEN=<contextID>,<connectID>,<service_type>,<address_string>,<remote_port>[,<local_port>[,<access_mode>[,<TCP_client_maxnum>[,<connect_timeout>]]]]**	Response: If the service is in transparent transmission mode (**<access_mode>**=2) and is opened successfully: **CONNECT** If there is any error: **ERROR** Error description can be queried by **AT+QIGETERROR**. If the service is in buffer access mode (**<access_mode>**=0) or direct push mode (**<access_mode>**=1): **OK** **+QIOPEN: <connectID>,<err>** **<err>** is 0 when the service is opened successfully. In other cases, **<err>** is not 0.
Maximum Response Time	150 seconds, depending on the network.
Characteristics	-

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<connectID>	Integer type. Socket ID. Range: 0–11.
<service_type>	String type. Socket service type. "TCP" Start a TCP connection as a client "UDP" Start a UDP connection as a client "TCP LISTENER" Start a TCP server to listen to TCP connection "UDP SERVICE" Start a UDP service
<address_string>	String type. The IP address or domain name of the remote server. It can be

AT+ QIOPEN 开放套接字服务	
测试命令 **AT+QIOPEN=?**	应答 **+QIOPEN : (**支持的 **<contextID>**范围)，(范围 支持 **连接ID** s)，(列表 的 支持 **服务类型**、**地址字符串**、支持的**远程端口**范围、支持的**本地端口**范围、支持的**访问模式**范围、支持的**TCP客户端最大数量**范围、支持的 的 支持 **<connect_timeout>**秒**)** **好的**
写入命令 **AT+ QIOPEN =<contextID>，<connectID >，<service_type>，<address_string>，<remote_port>[<local_port>[<access_mode>[<TCP_client_maxnum>[<connect_timeout>]]]]**	应答： 若服务处于透明传输模式（**access_mode**=2）且成功开启： **连接/接通** 如存在任何错误： **错误** 错误描述可通过**AT+qigeterror**进行查询。 如果服务处于缓冲区访问模式（**<access_mode>**=0）或直接推送模式（**<access_mode>**=1）： **好的** **+QIOPEN: <connectID>,<err>** 当服务成功打开时，**<err>**为0。否则，**<err>**不为0。
最大响应时间	150秒，视网络情况而定。
特征	-

参数

情境ID	整数类型。PDP上下文ID。范围：1-5。
<connectID>< 服 务 类型>	整数类型。套接字ID。范围：0-11。 字符串类型。套接字服务类型。 行车调度台 以客户端身份建立TCP连接 UDP 以客户端身份建立UDP连接 TCP监听器：启动TCP服务器监听TCP连接；UDP服务：启动UDP服务
<地址字符串>	字符串类型。远程服务器的IP地址或域名。可以是

	set as **<IP_address>** or **<domain_name>**. **<IP_address>** String type. If **<service_type>**="TCP" or "UDP", it indicates the IP address of the remote server, such as "220.180.239.212". If **<service_type>**="TCP LISTENER" or "UDP SERVICE", input "127.0.0.1". **<domain_name>** String type. The domain name address of the remote server. Maximum length: 256; Unit: byte.
<remote_port>	Integer type. The port of the remote server. Range: 0–65535. If **<service_type>**="TCP" or "UDP", the port must be specified. If **<service_type>**="TCP LISTENER" or "UDP SERVICE", set it as 0.
<local_port>	Integer type. Local port. Range: 0–65535. If **<service_type>**="TCP" or "UDP", the local port will be assigned automatically if it is set as 0. Otherwise, the local port will be specified. If **<service_type>**="TCP LISTENER" or "UDP SERVICE", the port number must be specified.
<access_mode>	Integer type. The data access mode of the socket service. 0 Buffer access mode 1 Direct push mode 2 Transparent transmission mode
<TCP_client_maxnum>	Integer type. **<TCP_client_maxnum>** is valid only when **<service_type>**="TCP LISTENER" and it can control the maximum number of client connection. Range: 0–11; Default value: 11.
<connect_timeout>	Integer type. Reconnection timeout value. Range: 10–150; Default value: 0; Unit: s. The reconnection is not enabled by default.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

NOTE

1. It is suggested to wait for 150 seconds for the URC **+QIOPEN: <connectID>,<err>** to be outputted.
2. You need to close socket service by executing **AT+QICLOSE=<connectID>** if the connection failed.
3. If the module works as the server, you need to configure the call mode as the router mode or the bridge mode by executing **AT+QCFG="nat",1** or **AT+QCFG="nat",2**. For more details about the command, see ***document [1]***.

2.3.8. AT+QICLOSE Close Socket Service

This command closes specified socket service. Depending on the network, it will take at most 10 seconds (default value, it can be modified by **<timeout>**) to return **OK** or **ERROR** after **AT+QICLOSE** is executed. Before the response is returned, other AT commands cannot be executed.

	设置为<**IP_address**>或<**domain_name**>。 **IP地址** 字符串类型。 如果<**service_type**>= “TCP” 或 “UDP”，则表示远程服务器的IP地址，例如 "220.180.239.212". 如果**service_type**>是 “TCP监听器” 或 “UDP服务”，则输入 “127.0.0.1” 。 **domain_name**>字符串类型。远程的域名地址 服务器。最大长度：256；单位：字节。整数
<远程端口>	类型。远程服务器的端口。范围：0-65535。 如果<**service_type**>= “TCP” 或 “UDP”，则必须指定端口。 如果 <**service_type**>是 “TCP listener” 或 “UDP service”，则将其设置为 0。
<本地端口>	整数类型。本地端口。范围：0-65535。 如果 <**service_type**>= “TCP” 或 “UDP”，则如果本地端口设置为0，将自动分配本地端口。否则，将指定本地端口。如果 <**service_type**>= “TCP监听程序” 或 “UDP服务”，则必须指定端口号。
<访问模式>	整数类型。套接字服务的数据访问模式。 0 缓冲存取方式 1 直接推送模式 2 透明传输模式
<TCP客户端最大数>	整数类型。<**TCP_client_maxnum**>仅当 <**service_type**>为 “TCP listener” 时有效，用于控制客户端连接的最大数量。范围：0-11；默认值：11。
<连接超时>	整数类型。重连超时值。范围：10-150；默认值：0； 单位：秒。默认情况下未启用重新连接功能。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

注释

1. 建议等待150秒，直到URC +**QIOPEN : <connectID>，<err>**输出完毕。
2. 如果连接失败，您需要通过执行**AT+qiclose=<connectID>**来关闭套接字服务。
3. 如果模块作为服务器工作，则需要通过执行**AT+ QCFG = “nat” ，1**或**AT+ QCFG = “nat” ，2**将呼叫模式配置为路由器模式或桥接模式。有关此命令的更多详细信息，请参阅***文档[1]***。

2.3.8. AT+QIClose关闭套接字服务

此命令关闭指定的套接字服务。根据网络情况，执行**AT+qiclose**后最多需要10秒（默认值，可通过**timeout**修改）返回**OK**或**error**。在返回响应之前，无法执行其他AT命令。

AT+QICLOSE Close Socket Service	
Test Command **AT+QICLOSE=?**	Response: **+QICLOSE: (**range of supported **<connectID>**s**),(**range of supported **<timeout>**s**)** **OK**
Write Command **AT+QICLOSE=<connectID>[,<timeout>]**	Response: If **<close_mode>**=0 (**AT+QICFG="close/mode"**): Close successfully: **OK** Fail to close: **ERROR** If **<close_mode>**=1 (**AT+QICFG="close/mode"**): Close successfully: **OK** **+QIURC: "closed",<connectID>** Fail to close: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	Default value: 10 s, determined by **<timeout>**.
Characteristics	-

Parameter

<contextID>	Integer type. The Socket ID. Range: 0–11.
<timeout>	Integer type. Timeout value for the response to be outputted. If the FIN ACK of other clients is not received within **<timeout>**, the module will be forced to close the socket. Range: 0–65535; Default value: 10; Unit: second.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.9. AT+QISTATE Query Socket Service Status

This command queries the socket service status. If **<query_type>**=0, it will return the status of all existing socket services in the specified context. If **<query_type>**=1, it will return the status of a specified socket service.

AT+QIClose关闭套接字服务	
测试命令 **AT+QICLOSE=?**	应答： **+qiclose: (**支持的 <**connectID**>范围)，(支持的 <**timeout**>范围) **好的**
写入命令 **AT+qiclose=<连接ID>[，超时时间]**	应答： 如果**<close_mode>=0 (AT+ QICFG =“close/mode”):**关闭成功: **好的** 未能关闭： **错误** 如果**<close_mode>=1 (AT+ QICFG =“close/mode”):**关闭成功： **好的** **+ QIURC：“已关闭”，<connectID>** 未能关闭： **错误** 或 **“CME”错误：<err>**
最大响应时间	默认值：10 秒，由 <**timeout**>确定。
特征	-

参数

情境ID<超时>	整数类型。套接字ID。范围：0-11。 整数类型。用于输出响应的超时值。若在<**timeout**>内未收到其他客户端的FIN ACK，模块将强制关闭套接字。范围：0-65535；默认值：10；单位：秒。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.9. AT+Q状态查询套接字服务状态

此命令查询套接字服务状态。如果 <**query_type**>=0，它将返回指定上下文中所有现有套接字服务的状态。如果 <**query_type**>=1，它将返回指定套接字服务的状态。

AT+QISTATE Query Socket Service Status	
Test Command **AT+QISTATE=?**	Response: **+QISTATE: (**list of supported **<query_type>**s**),(**range of supported **<contextID>**s**),(**range of supported **<connectID>**s**)** **OK**
Read Command/Execution Command **AT+QISTATE?** Or **AT+QISTATE**	Response: Return the status of all existing socket services: **+QISTATE: <connectID>,<service_type>,<IP_address>,<remote_port>,<local_port>,<socket_state>,<contextID>,<serverID>,<access_mode>,<AT_port>** **[…]** **OK**
Write Command If **<query_type>**=0, query the status of all socket services in a specified context **AT+QISTATE=<query_type>,<contextID>**	Response: Return the status of all existing socket service in a specified context **+QISTATE: <connectID>,<service_type>,<IP_address>,<remote_port>,<local_port>,<socket_state>,<contextID>,<serverID>,<access_mode>,<AT_port>** **[…]** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command If **<query_type>**=1, query the status of specified socket service **AT+QISTATE=<query_type>,<connectID>**	Response: Return the status of specified socket service: **+QISTATE: <connectID>,<service_type>,<IP_address>,<remote_port>,<local_port>,<socket_state>,<contextID>,<serverID>,<access_mode>,<AT_port>** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300 ms

AT+Q状态查询套接字服务状态	
测试命令 **AT+Q状态=?**	应答： **+qistate: (**支持的 <**query_type**>类型列表)，(支持的 <**contex-tID**>范围)，(支持的 <**connectID**>范围) **好的**
读指令/执行指令 **AT+Q状态?** 或 **AT+Q状态**	应答： 返回所有现有套接字服务的状态： **+qistate: <连接ID>，<服务类型>，<IP地址>，< remote_port>，<local_port>，<socket_state>，<contextID>，< 服务器ID>，<访问模式>，<AT端口>** **[…]** **好的**
写入命令 如果 <**query_type**>=0，查询指定上下文 **AT+qistate=<query_type>，<context ID>**中所有套接字服务的状态	应答： 返回指定上下文中所有现有套接字服务的状态 **+qistate: <连接ID>，<服务类型>，<IP地址>，< remote_port>，<local_port>，<socket_state>，<contextID>，< 服务器ID>，<访问模式>，<AT端口>** **[…]** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 如果 <**query_type**>=1，查询指定套接字服务的状态**AT+qistate=<query_type>，<connec tID>**	应答： 返回指定套接字服务的状态： **+qistate: <连接ID>，<服务类型>，<IP地址>，< remote_port>，<local_port>，<socket_state>，<contextID>，< 服务器ID>，<访问模式>，<AT端口>** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	300毫秒

Characteristics	-

Parameter

<query_type>	Integer type. The query type. 0 Query connection status of all existing socket services in a specified context 1 Query connection status of a specified socket service
<contextID>	Integer type. The PDP context ID. Range: 1–5.
<connectID>	Integer type. Socket ID. Range: 0–11.
<service_type>	String type. The socket service type. "TCP" Start a TCP connection as a client "UDP" Start a UDP connection as a client "TCP LISTENER" Start a TCP server to listen to TCP connection "TCP INCOMING" Start a TCP connection accepted by a TCP server "UDP SERVICE" Start a UDP service
<IP_address>	String type. IP address. If **<service_type>**="TCP" or "UDP", it is the IP address of remote server. If **<service_type>**="TCP LISTENER" or "UDP SERVICE", it is the local IP address. If **<service_type>**="TCP INCOMING", it is the IP address of remote client.
<remote_port>	Integer type. Remote port number. Range: 1–65535. If **<service_type>**="TCP" or "UDP", it is the port of remote server. If **<service_type>**="TCP LISTENER" or "UDP SERVICE", **<remote_port>** is 0 and the port is invalid. If **<service_type>**="TCP INCOMING", it is the port of remote client.
<local_port>	Integer type. Local port number. Range: 0–65535. If **<local_port>** is 0, the local port is assigned automatically.
<socket_state>	Integer type. The socket service status. 0 "Initial": connection has not been established 1 "Opening": client is connecting or server is trying to listen 2 "Connected": client connection has been established 3 "Listening": server is listening 4 "Closing": connection is closed
<serverID>	Integer type. It is valid only when **<service_type>**="TCP INCOMING". **<serverID>** indicates the server that accepts this TCP connection, and the value is the same as that of **<connectID>** of this server's "TCP LISTENER".
<access_mode>	Integer type. Data access mode. 0 Buffer access mode 1 Direct push mode 2 Transparent transmission mode
<AT_port>	String type. COM port of socket service. "usbmodem" USB modem port "usbat" USB AT port "uart1" UART port 1

特征	-

参数

<**query_type**>整数类型。查询类型。

0 查询指定上下文中所有现有套接字服务的连接状态

1 查询指定套接字服务的连接状态 <**contextID**>整数类型。PDP上下文ID。范围：1–5。

<**connectID**>整数类型。Socket ID。范围：0–11。

<**service_type**>字符串类型。套接字服务类型。

行车调度台 以客户端身份建立TCP连接

UDP 以客户端身份建立UDP连接

TCP监听程序 启动TCP服务器监听TCP连接

“TCP incoming” 指TCP服务器已接受的TCP连接

UDP服务启动

IP_address字符串类型。IP地址。

如果<**service_type**>= “TCP”或“UDP”，则为远程服务器的IP地址。

若**服务类型**为“TCP监听器”或“UDP服务”，则为本地IP地址。

如果 <**service_type**>= “TCP incoming”，则为远程客户端的 IP 地址。<**remote_port**>整数类型。远程端口号。范围：1–65535。

如果<**service_type**>= “TCP”或“UDP”，则为远程服务器的端口。

如果 <**service_type**>= “TCP listener” 或 “UDP service”，则 <**remote_port**>为 0，且端口无效。

如果<**service_type**>= “TCP incoming”，则为远程客户端的端口。

local_port整数类型。本地端口号。范围：0–65535。

如果 <**local_port**>为 0，则自动分配本地端口。

<**socket_state**>整数类型。套接字服务状态。

0 “初始”：连接尚未建立

1 “开启”：客户端正在连接或服务器正在监听

2 “已连接”：客户端连接已建立

3 “监听”：服务器正在监听

4 “关闭”：连接已关闭

<**serverID**>整数类型。仅当 <**service_type**>= “TCP incoming” 时有效。 <**serverID**>

表示接受此TCP连接的服务器，其值与该服务器“TCP监听器”的<**connectID**>相同。

access_mode整数类型。数据访问模式。

0 缓冲存取方式

1 直接推送模式

2 透明传输模式 <**AT_port**> 字符串类型。套接字服务的COM端口。

USB调制解调器	USB调制解调器端口
“usbat”	USB AT端口
“uart1”	UART端口1

<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.10. AT+QISEND Send Data

This command sends Socket data in string type through the specified connection. If the data access mode of a specified socket service is buffer access mode (**<access_mode>**=0) or direct push mode (**<access_mode>**=1), the data can be sent by **AT+QISEND**. When the data is sent successfully, **SEND OK** will be returned. Otherwise, **SEND FAIL** or **ERROR** is returned.

- **SEND FAIL** indicates the sending buffer is full and resending of the data can be tried.
- **ERROR** indicates an error arises in the process of sending data. You should resend the data after a certain period of time. The maximum length is 1460 bytes.
- **SEND OK** does not mean the data has been sent to the server successfully. You can query whether the data has reached the server by executing **AT+QISEND=<connectID>,0**.

AT+QISEND Send Data	
Test Command **AT+QISEND=?**	Response: **+QISEND: (**range of supported **<connectID>**s**),(**range of supported **<send_length>**s**),<remoteIP>,(**range of supported **<remote_port>**s**)** **OK**
Write Command Send variable-length data when **<service_type>**="TCP", "UDP" or "TCP INCOMING" **AT+QISEND=<connectID>**	Response: **>** After the response **>**, input the data to be sent. Tap **Ctrl + Z** to send and tap **Esc** to cancel the operation If **<send_view_mode>**=0 (**AT+QICFG="sendinfo"**): If the connection has been established and the data is sent to the module successfully: **SEND OK** If the connection has been established but the sending buffer is full: **SEND FAIL** If there is any error: **ERROR** Or **+CME ERROR: <err>** If **<send_view_mode>**=1 (**AT+QICFG="sendinfo"**):

<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.10. AT+ QISEND 发送数据

该命令通过指定连接发送字符串类型的Socket数据。若指定Socket服务的数据访问模式为缓冲区访问模式（**access_mode**=0）或直接推送模式（**access_mode**=1），则可通过**AT+ QISEND**发送数据。当数据成功发送时，将返回**SEND OK**；否则返回**SEND FAIL**或**error**。

- **SEND FAIL**表示发送缓冲区已满，可尝试重新发送数据。
- **error**表示在发送数据的过程中出现错误。应在一段时间后重新发送数据。最大长度为 1460 字节。
- **SEND OK**不表示数据已成功发送到服务器。可通过执行**AT+ QISEND =<connectID>，0**查询数据是否已到达服务器。

AT+ QISEND 发送数据	
测试命令 **AT+QISEND=?**	应答： **+QISEND：(**支持的 **<connectID>**范围)，(支持的 **<send_length>**范围)，**<remoteIP>，(**范围 支持 **<remote_port>** **好的**
写入命令 当 **service_type>** 为 “TCP”、“UDP”或 “TCP incoming” 时发送可变长度数据**AT+ QISEND =<connectID>**	应答： **>** 响应>后，输入要发送的数据。按**Ctrl + Z**发送，按**Esc**取消操作 如果**<send_view_mode>**=0 **(AT+ QICFG = “sendinfo”):** 若连接已建立且数据成功发送至模块： **发送** 若连接已建立但发送缓冲区已满： **发送失败** 如存在任何错误： **错误** 或 **“CME” 错误：<err>** 如果**<send_view_mode>**=1 **(AT+ QICFG = “sendinfo”):**

	If the connection has been established and the data is sent to the module successfully: **+QISEND: <connectID>,<status>,<free_size>** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command Send fixed-length data when **<service_type>**="TCP", "UDP" or "TCP INCOMING" **AT+QISEND=<connectID>,<send_length>**	Response: **>** After the response **>,** input the data with the length equal to **<send_length>**. If **<send_view_mode>**=0 (**AT+QICFG="sendinfo"**): If the connection has been established and the data is sent to the module successfully: **SEND OK** If the connection has been established but the sending buffer is full: **SEND FAIL** If there is any error: **ERROR** Or **+CME ERROR: <err>** If **<send_view_mode>**=1 (**AT+QICFG="sendinfo"**): If the connection has been established and the data is sent to the module successfully: **+QISEND: <connectID>,<status>,<free_size>** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command If **<service_type>**="UDP SERVICE" **AT+QISEND=<connectID>,<send_length>,<remoteIP>,<remote_port>**	Response: This command sends fixed-length data to a specified remote IP address and remote port. The **<service_type>** must be "UDP SERVICE".

	若连接已建立且数据成功发送至模块： **+ QISEND : <connectID>，<status>，<free_size>** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 当**服务类型**为“TCP”、“UDP”或“TCP incoming”时发送固定长度数据 **AT+ QISEND =<连接ID>，<发送长度> gth**	应答： **>** 响应>后，输入长度等于**send_length**的数据。 如果**<send_view_mode>**=0 (**AT+ QICFG =“sendinfo”**): 若连接已建立且数据成功发送至模块： **发送** 若连接已建立但发送缓冲区已满： **发送失败** 如存在任何错误： **错误** 或 **“CME”错误：<err>** 如果**<send_view_mode>**=1 (**AT+ QICFG =“sendinfo”**): 若连接已建立且数据成功发送至模块： **+ QISEND : <connectID>，<status>，<free_size>** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 如果**<service_type>=“UDP服务”AT+ QISEND =<connectID>，<send_len gth>，<remoteIP>，<remote port>**	应答： 此命令将固定长度的数据发送到指定的远程IP地址和远程端口。**<service_type>**必须为“UDP服务”。

	> After the response **>,** input the data with a length equal to **<send_length>** If the connection has been established and the data is sent successfully: **SEND OK** If the connection has been established but the sending buffer is full: **SEND FAIL** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command When **<send_length>**=0, query the sent data **AT+QISEND=<connectID>,0**	Response: If the specified connection exists: **+QISEND: <total_send_length>,<ackedbytes>,<unacked bytes>** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristics	-

Parameter

<connectID>	Integer type. Socket ID. Range: 0–11.
<send_length>	Integer type. The length of data to be sent. Range: 0–1460; Unit: byte.
<remoteIP>	String type. The remote IP address (must be in dotted decimal format). It is valid only when **<service_type>**="UDP SERVICE".
<remote_port>	Integer type. Remote port. Range: 1–65535. It is valid only when **<service_type>**="UDP SERVICE".
<total_send_length>	Integer type. The total length of sent data. Unit: byte.
<ackedbytes>	Integer type. The total length of received data. Unit: byte.
<unackedbytes>	Integer type. The total length of data that are not received. Unit: byte.
<status>	Integer type.

	> 响应>后，输入长度等于<**send_length**>的数据 若连接已建立且数据传输成功： **发送** 若连接已建立但发送缓冲区已满： **发送失败** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 当 <**send_length**>=0时，发送查询数据 那 **AT+ QISEND =<连接ID>，0**	应答： 若指定连接存在： **+ QISEND ：<total_send_length>，<ackedbytes>，<unacked bytes>** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征	-

参数

<连接ID>	整数类型。套接字ID。范围：0-11。
<发送长度>	整数类型。待发送数据的长度。范围：0-1460；单位：字节。
<remoteIP>	字符串类型。远程IP地址（必须采用点分十进制格式）。仅当**service_type**=“UDP服务”时有效。
<远程端口>	整数类型。远程端口。范围：1-65535。仅当 <**service_type**>= “UDP服务” 时有效。
<发送总长度>	整数类型。发送数据的总长度。单位：字节。
<ack>	整数类型。接收数据的总长度。单位：字节。
未确认字节	整数类型。未接收数据的总长度。单位：字节。
社会地位	整数类型。

	0 The data is sent to socket buffer successfully 1 The received buffer is full and fail to send
<free_size>	Integer type. The remaining space of the current buffer area. Range: 0–10240; Unit: byte.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.11. AT+QIRD Read Received TCP/IP Data

In buffer access mode, module buffers data after receiving it and reports **+QIURC: "recv",<connectID>**, and then the data can be read by **AT+QIRD**.

Please note that if the buffer is not empty, when the module receives data again, it will not report a new URC until all the received data has been read.

AT+QIRD Read Received TCP/IP Data	
Test Command **AT+QIRD=?**	Response: **+QIRD: (**range of supported **<connectID>**s**),(**range of supported **<read_length>**s**)** **OK**
Write Command When **<service_type>**="TCP"、"UDP" or "TCP INCOMING" **AT+QIRD=<connectID>[,<read_length>]**	Response: If the specified connection has received the data: **+QIRD: <read_actual_length><CR><LF><data>** **OK** If there is no data: **+QIRD: 0** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command When **<service_type>**="UDP SERVICE" **AT+QIRD=<connectID>**	Response: If data exists: **+QIRD: <read_actual_length>,<remoteIP>,<remote_port><CR><LF><data>** **OK** If there is no data:

	0 数据已成功发送至套接字缓冲区 1 接收缓冲区已满，发送失败
<自由尺寸>	整数类型。当前缓冲区剩余空间。范围：0-10240； 单位：字节。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.11. AT+ QIRD 读取接收的TCP/IP数据

在缓冲区访问模式下，模块在接收数据后进行缓冲，并报告**QIURC：“recv”，<connectID>**，然后数据可以被**AT+ QIRD**读取。

请注意，若缓冲区未清空，当模块再次接收数据时，需待所有接收数据读取完毕后，才会报告新的URC。

AT+ QIRD读取接收的 TCP/IP 数据	
测试命令 **AT+QIRD=?**	应答： **+QIRD : (**支持的 <**connectID**>范围)，(支持的 <**read_length**>范围) **好的**
写入命令 当 **<service_type>=**“TCP”、“UDP”或“TCP incoming”**AT+ QIRD =<connectID>[，<read_len gth>]**	应答： 若指定连接已接收数据： **+QIRD: <read_actual_length><CR><LF><data>** **好的** 若无数据： **+QIRD: 0** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 当 **<service_type>=**“UDP服务” **AT+ QIRD =<连接ID>**	应答： 若存在数据： **+ QIRD : <read_actual_length>，<remoteIP>，<remote_port>< CR><LF><data>** **好的** 若无数据：

	+QIRD: 0 **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Write Command When **<read_length>**=0, query the data that has been read **AT+QIRD=<connectID>,0**	Response: If the specified connection exists: **+QIRD: <total_receive_length>,<have_read_length>,<unread_length>** **OK** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristics	-

Parameter

<connectID>	Integer type. Socket ID. Range: 0–11.
<read_length>	Integer type. The maximum length of data to be read. Range: 0–1500; Unit: byte.
<read_actual_length>	Integer type. The length of data that has been actually read. Unit: byte.
<remoteIP>	String type. The remote IP address. It is valid only when **<service_type>**="UDP SERVICE".
<remote_port>	Integer type. Remote port. Range: 0–65535. It is valid only when **<service_type>**="UDP SERVICE".
<data>	The data that has been read.
<total_receive_length>	Integer type. The total length of the received data. Unit: byte.
<have_read_length>	Integer type. The length of data that has been read. Unit: byte.
<unread_length>	Integer type. The length of data that has not been read. Unit: byte.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

	+QIRD: 0 **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
写入命令 当 **<read_length>**=0 时，查询已读取的数据**AT+ QIRD =<connectID>，0**	应答： 若指定连接存在： **+ QIRD ：<total_receive_length>，<have_read_length>，<unrea d_leng-th>** **好的** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征	-

参数

<连接ID>	整数类型。套接字ID。范围：0-11。
<阅读长度>	整数类型。可读取数据的最大长度。范围：0-1500；单位：字节。
<read_actual_length>	整数类型。实际读取的数据长度。单位：字节。
<remoteIP>	字符串类型。远程IP地址。仅当**<service_type>**= “UDP服务”时有效。
<远程端口>	整数类型。远程端口。范围：0-65535。仅当 **<service_type>**= “UDP服务” 时有效。
数据	已读取的数据。
<总接收长度>	整数类型。接收数据的总长度。单位：字节。
<have_read_length>	整数类型。已读取数据的长度。单位：字节。
<未读长度>	整数类型。未读取数据的长度。单位：字节。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.12. AT+QISWTMD Switch Data Access Mode

This command switches the data access mode, including buffer access mode, direct push mode and transparent transmission mode. When a socket service is established, the data access mode can be specified by **<access_mode>** in **AT+QIOPEN**. After a socket service has been opened, the data access mode can be switched by **AT+QISWTMD**.

AT+QISWTMD Switch Data Access Mode	
Test Command **AT+QISWTMD=?**	Response **+QISWTMD: (**range of supported **<connectID>**s**),(**range of supported **<access_mode>**s**)** **OK**
Write Command **AT+QISWTMD=<connectID>,<access_mode>**	Response If **<access_mode>**=0 or 1 and data access mode is switched successfully: **OK** If **<access_mode>**=2 and data access mode is switched successfully, the module will enter transparent transmission mode: **CONNECT** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristic	This command takes effect immediately. The configurations are not saved.

Parameter

<connectID>	Integer type. Socket ID. Range: 0–11.
<access_mode>	Integer type. Data access mode. 0 Buffer access mode 1 Direct push mode 2 Transparent transmisson mode
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.12. AT+qiswtmd交换机数据访问方式

该命令切换数据访问模式，包括缓冲区访问模式、直接推送模式和透明传输模式。建立一个套接字服务时，可通过**AT+ QIOPEN**中的**access_mode**指定数据访问模式。套接字服务开启后，可通过**AT+qiswtmd**切换数据访问模式。

AT+qiswtmd交换机数据访问方式	
测试命令 **AT+QISWTMD=?**	应答 **+qiswtmd: (**支持的 <**connectID**>范围)，(支持的 <**access_mode**>范围) **好的**
写入命令 **AT+qiswtmd=<连接ID>，<访问模式>**	应答 如果<**access_mode**>=0或1且数据访问模式已成功切换： **好的** 如果<**access_mode**>=2且数据访问模式切换成功，模块将进入透明传输模式： **连接/接通** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征性的	该命令立即生效。 配置未保存。

参数

<connectID><访问模式>	整数类型。套接字ID。范围：0-11。 整数类型。数据访问模式。 0 缓冲存取方式 1 直接推送模式 2 透明透射模式
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.13. AT+QPING Ping Remote Server

This command tests the Internet protocol reachability of a host. Before conducting Ping operations, the host should activate the context corresponding to **<contextID>** by **AT+QIACT**. It will return the result within **<timeout>** and the default value of **<timeout>** is 4 seconds.

AT+QPING Ping Remote Server	
Test Command **AT+QPING=?**	Response: **+QPING: (**range of supported **<contextID>**s**),<host>,(**range of supported **<timeout>**s**),(**range of supported **<pingnum>**s**),(**range of supported **<ping_size>**s**)** **OK**
Write Command **AT+QPING=<contextID>,<host>[,<timeout>[,<pingnum>[,<ping_size>]]]**	Response If a remote server is Pinged successfully: **OK** **+QPING: <result>[,<IP_address>,<bytes>,<time>,<ttl>]** **[…]** **+QPING: <finresult>[,<sent>,<rcvd>,<lost>,<min>,<max>,<avg>]** If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristic	This command takes effect immediately. The configurations are not saved.

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<host>	String type. The host address. The format is a domain name or a dotted decimal IP address.
<timeout>	Integer type. Sets the maximum time to wait for the response of each Ping request. Range: 1–255; Default value: 4; Unit: s.
<pingnum>	Integer type. Sets the maximum number of times for sending Ping request. Range: 1–10; Default value: 4.
<ping_size>	Integer type. Sets the maximum byte length of each Ping request Range: 32–1500;

2.3.13. AT+ QPING Ping远程服务器

该命令测试主机的Internet协议可达性。在执行Ping操作之前，主机应通过**AT+ QIACT**激活与**contextID**对应的上下文。它将在**timeout**内返回结果，且**timeout**的默认值为4秒。

AT+ QPING Ping远程服务器	
测试命令 **AT+QPING=?**	应答： **+QPING : (**支持的 <**contextID**>范围)，<**host**>，(支持的 <**timeout**> 范围)，(支持的 <**pingnum**>范围)，(支持的 <**ping_size**>范围) **好的**
写入命令 **AT+ QPING =<contextID>，<host>[<ti meo-ut>[<pingnum>[<ping_size>]]]**	应答 若远程服务器成功收到Ping请求： **好的** **+ QPING : <result>[<IP_address>，<bytes>，<time>，<ttl>]** **[…]** **+ QPING : <finresult>[<sent>，<rcvd>，<lost>，<min>，<ma x>，<avg>]** 如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征性的	该命令立即生效。 配置未保存。

参数

情境ID	整数类型。PDP上下文ID。范围：1-5。
主人	字符串类型。主机地址。格式为域名或带点十进制IP地址。
暂时休息	整数类型。设置每个Ping请求响应的最大等待时间。范围：1-255；默认值：4；单位：秒。
Pingingnum>	整数类型。设置发送Ping请求的最大次数。范围：1-10；默认值：4。
<ping_size>	整数类型。设置每次Ping请求的最大字节长度范围：32-1500；

	Default value: 32; Unit: byte.
<result>	Integer type. The result of each Ping request. 0 Received the Ping response from the server. In this case, detailed information is contained in **<IP_address>,<bytes>,<time>,<ttl>**. Other values Error codes. Please refer to ***Chapter 4***.
<IP_address>	String type. The IP address of the remote server in dotted decimal format.
<bytes>	Integer type. The actual length of each sent Ping request. Unit: byte.
<time>	Integer type. The time wait for the response of the Ping request. Unit: ms.
<ttl>	Integer type. Time-to-live (TTL) value of the response packet of the Ping request.
<finresult>	Integer type. The final result of the command. 0 It is finished normally. It is successful to activate the context and find the host. In this case, detailed information is contained in **<sent>,<rcvd>,<lost>,<min>,<max>,<avg>** Other values Error codes. Please refer to ***Chapter 4***.
<sent>	Integer type. Number of times the Ping requests that have been sent.
<rcvd>	Integer type. Number of the Ping requests that have received the response.
<lost>	Integer type. Number of the Ping requests that are timed out.
<min>	Integer type. The minimum response time. Unit: ms.
<max>	Integer type. The maximum response time. Unit: ms.
<avg>	Integer type. The average response time. Unit: ms.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.14. AT+QIDNSCFG Configure Address of DNS Server

This command configures address of DNS server. Before the DNS address is set, the host must activate the context corresponding to **<contextID>** by **AT+QIACT** first.

AT+QIDNSCFG Configure Address of DNS Server	
Test command **AT+QIDNSCFG=?**	Response **+QIDNSCFG: (**range of supported **<contextID>**s**),<pridnsaddr>,<secdnsaddr>** **OK**
Write Command **AT+QIDNSCFG=<contextID>[,<pridnsaddr>[,<secdnsaddr>]]**	Response If the optional parameters are omitted, query the current DNS server address of a specified PDP context: **+QIDNSCFG: <contextID>,<pridnsaddr>,<secdnsaddr>** **OK** If the optional parameters are specified, configure the primary and secondary DNS server addresses of a specified PDP context: **OK**

	默认值：32；单位：字节。
结果	整数类型。每次Ping请求的结果。 0 已从服务器收到Ping响应。此情况下，详细信息包含在**<IP_address>，<bytes>，<time>，<ttl>**中。 其他值 错误代码。请参阅***第4章***。
<IP地址>	字符串类型。远程服务器的IP地址，采用点分十进制格式。
字节	整数类型。每个发送的Ping请求的实际长度。单位：字节。
时间	整数类型。Ping请求响应的等待时间。单位：毫秒。
<ttl>	整数类型。Ping请求响应数据包的生存时间（TTL）值。
<finresult>	整数类型。命令的最终结果。 0 操作正常完成。已成功激活上下文并定位主机。此情况下包含详细信息。 **<发送>，<接收>，<丢失>，<最小>，<最大>，<平均>** 其他值 错误代码。请参阅***第4章***。
送	整数类型。已发送的Ping请求次数。
被接受	整数类型。已收到响应的Ping请求数量。
失去的	整数类型。超时的Ping请求次数。
分	整数类型。最小响应时间。单位：毫秒（ms）。
<最大值>	整数类型。最大响应时间。单位：毫秒（ms）。
<平均值>	整数类型。平均响应时间。单位：毫秒（ms）。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4章***。

2.3.14. AT+qidnscfg配置DNS服务器地址

该命令配置DNS服务器地址。在设置DNS地址之前，主机必须先通过**AT+ QIACT**激活与**contextID**对应的上下文。

AT+qidnscfg配置DNS服务器地址	
测试命令 **AT+QIDNSCFG=?**	应答 **+qidnscfg: (**支持的范围**<contextID>s)，<pridnsadd r>，<secdnsaddr>** **好的**
写入命令 **AT+qidnscfg=<contextID>[<p ridnsa-ddr>[<secdnsaddr>]]**	应答 若省略可选参数，则查询指定PDP上下文的当前DNS服务器地址： **+QIDNSCFG: <contextID>,<pridnsaddr>,<secdnsaddr>** **好的** 若已指定可选参数，请配置指定PDP上下文的主DNS和备用DNS服务器地址。 **好的**

	If there is any error: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	-
Characteristics	This command takes effect immediately. The configurations are not saved.

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.
<pridnsaddr>	String type. The primary DNS server address.
<secdnsaddr>	String type. The secondary DNS server address.
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

NOTE

1. Only IPv4 DNS address can be set in IPv4.
2. Only IPv6 DNS address can be set in IPv6.

2.3.15. AT+QISDE Control Whether to Echo the Data to be Sent by AT+QISEND

This command controls whether to echo the data to be sent by **AT+QISEND**, that is, whether to echo the input data to be sent.

AT+QISDE Control Whether to Echo the Data to be Sent by AT+QISEND	
Test Command **AT+QISDE=?**	Response **+QISDE: (**list of supported **<echo>**s**)** **OK**
Read Command **AT+QISDE?**	Response **+QISDE: <echo>** **OK**
Write Command **AT+QISDE=<echo>**	Response **OK** If there is any error: **ERROR** Or

	如存在任何错误： **错误** 或 **“CME”错误：<err>**
最大响应时间	-
特征	该命令立即生效。 配置未保存。

参数

情境ID	整数类型。PDP上下文ID。范围：1-5。
<pridnsaddr>	字符串类型。主DNS服务器地址。
<secdnsaddr>	字符串类型。二级DNS服务器地址。
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

注释

1. IPv4环境下仅支持设置IPv4 DNS地址。
2. IPv6中只能设置IPv6 DNS地址。

2.3.15. AT+ QISDE 控制是否回传AT+ QISEND 发送的数据

该命令控制是否回显**AT+ QISEND**发送的数据，即是否回显待发送的输入数据。

AT+ QISDE 控制是否回传AT+ QISEND 发送的数据	
测试命令 **AT+QISDE=?**	应答 **+QISDE : (**支持的 **<echo>**列表) **好的**
读命令 **AT+QISDE?**	应答 **+QISDE: <echo>** **好的**
写入命令 **AT+QISDE=<echo>**	应答 **好的** 如存在任何错误： **错误** 或

	+CME ERROR: <err>
Maximum Response Time	-
Characteristic	This command takes effect immediately. The configurations are not saved.

Parameter

<echo>	Integer type. Whether to echo the data to be sent by **AT+QISEND**. 0 Not echo the data 1 Echo the data
<err>	Integer type. Error codes. For more details, see ***chapter 4***.

2.3.16. AT+QIGETERROR Query Error Code of the Last AT Command

If **ERROR** is returned after TCP/IP related commands are executed, the details of error can be queried by **AT+QIGETERROR**. Please note that **AT+QIGETERROR** only returns the error code of the last TCP/IP related AT command.

AT+QIGETERROR Query Error Code of the Last AT Command	
Test Command **AT+QIGETERROR=?**	Response **OK**
Execution Command **AT+QIGETERROR**	Response **+QIGETERROR: <err>,<errcode_description>** **OK**
Maximum Response Time	-
Characteristic	-

Parameter

<err>	Integer type. Error codes. For more details, see ***chapter 4***.
<errcode_description>	String type. Indicates the details of error. Please refer to ***Chapter 4*** for details.

	“CME”错误：<err>
最大响应时间	-
特征性的	该命令立即生效。 配置未保存。

参数

回声	整数类型。是否回显**AT+ QISEND**发送的数据。0 不回显数据 1 回声数据
<err>	整数类型。错误代码。有关详细信息，请参阅***第4***章。

2.3.16. AT+qigeterror最后一条AT命令的查询错误码

如果执行了与TCP/IP相关的命令后返回了**错误**，则可以通过**AT+qigeterror**查询错误的详细信息。请注意，**AT+qigeterror**仅返回了最后一条与TCP/IP相关的AT命令的错误代码。

AT+qigeterror最后一条AT命令的查询错误码	
测试命令 **AT+QIGETERROR=?**	应答 **好的**
执行命令 **AT+QI错误**	应答 **+qigeterror: <err>，<errcode_description>** **好的**
最大响应时间	-
特征性的	-

参数

<err> **<errcode_description>**	整数类型。错误代码。有关详细信息，请参阅***第4***章。字符串类型。指示错误的详细信息。请参阅详细信息。	***第4章***关于

2.4. URC Description

+QIURC: is used at the beginning of URCs of TCP/IP related AT commands to be reported to the host. The URC contains the reports about incoming data, closed connection, incoming connection and so on. Actually, **<CR><LF>** occurs at both the beginning and end of URCs, but **<CR><LF>** is not presented intentionally in this document.

2.4.1. +QIURC: "closed" URC Indicating Closed Connection

When TCP socket service is closed by remote client or due to network error, the URC will be reported, and the status of socket service will be "closing" (**<socket_state>**=4). **AT+QICLOSE=<connectID>** can be used to restore the **<socket_state>** to "initial" state.

+QIURC: "closed" URC Indicating Closed Connection	
+QIURC: "closed",<connectID>	Socket service connection is closed.

Parameter

<connectID>	Integer type. Socket ID. Range: 0–11.

2.4.2. +QIURC: "recv" URC Indicating Incoming Data

In buffer access mode or direct push mode, the module will report the URC to the host after receiving data.

- In buffer access mode: the URC format is **+QIURC: "recv",<connectID>**. The host can read data by **AT+QIRD** after URC is reported. Please note that if the buffer is not empty, when the module receives data again, it will not report a new URC until all the received data has been read from the buffer by **AT+QIRD**.
- In direct push mode: the received data will be outputted via COM port directly.

+QIURC: "recv" URC Indicating Incoming Data	
+QIURC: "recv",<connectID>	It will be reported when the module receives the incoming data in buffer access mode. The host can receive data by **AT+QIRD**.
+QIURC: "recv",<connectID>,<current_recvlength><CR><LF><data>	It will be reported when the module receives the incoming data and the **<service_type>**="TCP", "UDP", or "TCP INCOMING" in direct push mode.
+QIURC: "recv",<connectID>,<curre	It will be reported when the module receives the incoming data

2.4. URC描述

+QIURC：用于TCP/IP相关AT命令的URC开头，用于向主机报告。URC包含关于传入数据、关闭连接、传入连接等的报告。实际上，<**CR**<LF>既出现在URC的开头也出现在URC的结尾，但<**CR**<LF>在本文档中并非有意呈现。

2.4.1. + QIURC：“closed” URC 表示连接已关闭

当TCP套接字服务被远程客户端关闭或由于网络错误时，将报告URC，且套接字服务的状态将为“关闭”（**socket_state**=4）。**AT+qiclose=<connectID>**可用于将**socket_state**恢复至“初始”状态。

+ QIURC：“closed” URC 表示连接已关闭
+QIURC：“closed”，<connectID>套接字服务连接已关闭。

参数

<connectID>	整数类型。套接字ID。范围：0–11。

2.4.2. + QIURC：“recv” URC（统一资源控制）表示接收数据

在缓冲区访问模式或直接推送模式下，模块将在接收到数据后向主机报告URC。

- 在缓冲区访问模式下:URC格式为**+QIURC：“recv”，<connectID>**。主机可以在URC报告后通过**AT+ QIRD**读取数据。请注意，如果缓冲区不为空，当模块再次接收数据时，它将不会报告新的URC，直到所有接收到的数据都已通过**AT+ QIRD**从缓冲区读取。
- 在直接推送模式下：接收到的数据将通过COM端口直接输出。

+ QIURC：“recv” URC（统一资源控制）表示接收数据	
+QIURC: "recv",<connectID>	当模块以缓冲区访问模式接收传入数据时，系统将发出通知。 主机可通过**AT+ QIRD**接收数据。
+ QIURC：“接收”，<连接ID>，<当前nt接收长度<CR><LF><数据>	当模块接收到传入数据时将进行上报 以及 <**service_type**>= “TCP”、“UDP”或直接推送模式下的“TCP incoming”。
+ QIURC：“接收”，<连接ID>，<当前	当模块接收到传入数据时将进行上报

nt_recvlength>,<remoteIP>,<remote_port><CR><LF><data>	and **<service_type>**="UDP SERVICE" in direct push mode.

Parameter

<connectID>	Integer type. Socket ID. Range: 0–11.
<currentrecvlength>	Integer type. The length of actually received data.
<remoteIP>	String type. Remote IP address (It must be dotted decimal format).
<remote_port>	Integer type. Remote port. Range: 1–65535.
<data>	The received data.

2.4.3. +QIURC: "incoming full" URC Indicating Incoming Connection Reaches Limit

If the incoming connection reaches limit, or no socket system resources can be allocated, the module will report the URC **+QIURC: "incoming full",<serverID>** when there is new incoming connection request.

+QIURC: "incoming full" URC Indicating Incoming Connection Reaches Limit	
+QIURC: "incoming full"	The URC indicates the incoming connection reaches limit.

2.4.4. +QIURC: "incoming" URC Indicating Incoming Client Connection

If the **<service_type>**="TCP LISTENER", when a remote client connects to this server, the host will automatically assign an available **<connectID>** for the new connection. The range of **<connectID>** is 0–11. In such case, the module will report the URC. The **<service_type>** of the new connection will be "TCP INCOMING", and the **<access_mode>** will be buffer access mode.

+QIURC: "incoming" URC Indicating Incoming Client Connection	
+QIURC: "incoming",<connectID>,<serverID>,<remoteIP>,<remote_port>	When the new incoming connection is accepted by **<serverID>**, the allocated **<connectID>**, **<remoteIP>** and **<remote_port>** will be reported by this URC.

Parameter

<connectID>	Integer type. Socket ID that is automatically specified by the module for the incoming client connection. Range: 0–11.
<serverID>	Integer type. Server of accepting the incoming **<connectID>**. **<service_type>** is "TCP LISTENER" and listening socket ID is **<serverID>** of the server.
<remoteIP>	String type. Remote IP address of the incoming **<connectID>**. Range: 1–65535.
<remote_port>	Integer type. Remote port of the incoming **<connectID>**. Range: 1–65535.

网络接收长度、远程IP地址、远程端口<CR><LF><数据>	并且**服务类型**=“UDP服务”采用直接推送模式。

参数

<连接ID>	整数类型。套接字ID。范围：0-11。
<currentrecvlength>	整数类型。实际接收数据的长度。
<remoteIP>	字符串类型。远程IP地址（必须采用点分十进制格式）。
<远程端口>	整数类型。远程端口。范围：1-65535。
数据	接收数据

2.4.3. + QIURC：“incoming full” URC（用户资源控制）表示传入连接已达上限

如果传入连接达到限制，或者无法分配任何套接字系统资源，当有新的传入连接请求时，该模块将报告URC +**QIURC**：“传入满”，<serverID>。

+ QIURC：“传入全”	URC指示传入连接达到限制
+ QIURC：“传入全”	URC表示传入连接已达上限。

2.4.4. + QIURC：“incoming” URC（统一资源控制）表示客户端连接即将建立

如果<**service_type**>=“TCP监听器”，当远程客户端连接到该服务器时，主机将自动为新连接分配可用的<**connectID**>。<**connectID**>的范围为0-11。在此情况下，模块将报告URC。新连接的<**service_type**>将为“TCP传入”，且<**access_mode**>将采用缓冲区访问模式。

+ QIURC：“incoming” URC（统一资源控制）表示客户端连接即将建立	
+ QIURC：“incoming”，<connectID>，<s 服务器ID、远程IP地址、远程端口	当新连接被接受时 **服务器ID**、分配的**连接ID**、<**remoteIP**>和**remote_port**将由该URC报告。

参数

<连接ID>	整数类型。由模块自动指定的用于接收客户端连接的套接字ID。范围：0-11。
<服务器ID>	整数类型。服务器接受传入的<**connectID**>。<**service_type**>为“TCP监听器”，监听套接字ID为服务器的<**serverID**>。
<remoteIP>	字符串类型。传入的 <**connectID**>的远程 IP 地址。范围：1-65535。
<远程端口>	整数类型。传入的 <**connectID**>的远程端口。范围：1-65535。

2.4.5. +QIURC: "pdpdeact" URC Indicating PDP Deactivation

PDP context may be deactivated by the network. The module will report the URC to the host about PDP deactivation. In such case, the host must execute **AT+QIDEACT** to deactivate the context and reset all connections.

+QIURC: "pdpdeact" URC Indicating PDP Deactivation	
+QIURC: "pdpdeact",<contextID>	The context corresponding to **<contextID>** is deactivated.

Parameter

<contextID>	Integer type. The PDP context ID. Range: 1–5.

2.4.5. + QIURC：“pdpdeact” URC 指示PDP失活

网络可能会停用PDP上下文。该模块将向主机报告URC以停用PDP上下文。在此情况下，主机必须执行**AT+qideact**以停用上下文并重置所有连接。

+ QIURC：“pdpdeact” URC 指示PDP失活
+QIURC：“pdpdeact”，<contextID>对应 <contextID>的上下文已停用。

参数

<contextID>整数类型。PDP上下文ID。范围：1-5。

3 Example

3.1. Configure and Activate a Context

3.1.1. Configure a Context

```
AT+QICSGP=1,1,"UNINET","","",0          //Configure context 1. APN is "UNINET" for China Unicom.
OK
```

3.1.2. Activate a Context

```
AT+QIACT=1                              //Activate context 1. Depending on the network, the maximum
                                          response time is 150 s.
OK                                      //Activated the context successfully.
AT+QIACT?                               //Query the context state.
+QIACT: 1,1,1,"10.7.157.1"

OK
```

3.1.3. Deactivate a Context

```
AT+QIDEACT=1                            //Deactivate context 1.
OK                                      //Deactivated the context successfully. Depending on the
                                          network, the maximum response time is 40 s.
```

3.2. TCP Client Works in Buffer Access Mode

3.2.1. Set up a TCP Client Connection and Enter Buffer Access Mode

```
AT+QIOPEN=1,0,"TCP","220.180.239.212",8009,0,0   //Context is 1 and <connectID> is 0. Before
                                                   using AT+QIOPEN, the host should activate
                                                   the context by AT+QIACT.
OK
```

3 样例

3.1. 配置和激活上下文

3.1.1. 配置上下文

```
AT+QICSGP=1,1，“联通”，“”，0          //配置上下文 1. APN 为中国联通的 UNINET 。
好的
```

3.1.2. 激活上下文

```
AT+QIACT=1                              //激活上下文1。根据网络情况，最大
                                          反应时间为150秒。
好的                                     //上下文已成功激活。
AT+QIACT?                               //查询上下文状态。
+QIACT: 1,1,1,"10.7.157.1"

好的
```

3.1.3. 使上下文失效

```
AT+QIDEACT=1                            //停用上下文1。
好的                                     //已成功停用上下文。具体取决于
                                          网络中，最大响应时间为40秒。
```

3.2. TCP客户端在缓冲区访问模式下的工作

3.2.1. 建立TCP客户端连接并进入缓冲区访问模式

```
AT+ QIOPEN =1,0，“TCP”，“220.180.239.212”，8009,0,0//上下文为1且connectID>为0。在使用
                                          AT+ QIOPEN前，主机应通过AT+ QIACT激
                                          活上下文。
好的
```

```
+QIOPEN: 0,0                                    //TCP client is connected successfully. It is
                                                 recommended to wait for the URC for 150 s.
                                                 If it cannot be received in 150 s, the host
                                                 could use AT+QICLOSE to close the socket.
AT+QISTATE=1,0                                   //Check whether the connection status of
                                                  <connectID> is 0.
+QISTATE: 0,"TCP","220.180.239.201",8009,65514,2,1,0,0,"usbmodem"

OK
```

3.2.2. Send Data in Buffer Access Mode

```
AT+QISEND=0                     //Send variable-length data.
> test1<ctrl+Z>
SEND OK                         //SEND OK does not mean the data has been sent to the server
                                 successfully. The host can query whether the data has reached
                                 the server by AT+QISEND=0,0.
AT+QISEND=0,4                   //Send fixed-length data and the data length is 4 bytes.
> test
SEND OK
AT+QISEND=0,0                   //Query the length of sent data.
+QISEND: 9,9,0

OK
```

3.2.3. Receive Data from Remote Server in Buffer Access Mode

```
+QIURC: "recv",0                //Data received when <connectID>=0.
AT+QIRD=0,1500                  //Read data and the length of data is 1500 bytes.
+QIRD: 5                        //The length of actually received data is 5 bytes.
test1

OK
AT+QICFG="recvind",1
OK
+QIURC: "recv",0,5              //5-byte data received when <connectID>=0
AT+QIRD=0,1500                  //Read data and the length of data is 1500 bytes.
+QIRD: 5                        //The length of actually received data is 5 bytes.
test1

OK
```

```
+QIOPEN:  0,0                                    //TCP客户端已成功连接。
                                                 建议等待URC 150秒。如果150秒内无法接收，
                                                 主机可以使用AT+qiclose来关闭套接字。
AT+Q状态=1.0                                     //检查连接状态是否正常
                                                 <connectID>为 0。
+QISTATE: 0,"TCP","220.180.239.201",8009,65514,2,1,0,0,"usbmodem"

好的
```

3.2.2. 缓冲存取方式的数据发送

```
AT+QISEND=0                    //发送可变长度数据。
> test1<Ctrl+Z>
发送                           //SEND OK并不表示数据已发送至服务器
                               成功。主机可以通过AT+ QISEND =0,0查询数据是否已到达服务器。
AT+QISEND=0.4                  //发送固定长度数据，数据长度为4字节。
试验
发送
AT+QISEND=0.0                  //查询已发送数据的长度。
+QISEND: 9,9,0

好的
```

3.2.3. 缓冲访问模式下从远程服务器接收数据

```
+QIURC: "recv",0               //接收到的数据<connectID>=0.
AT+QIRD=0,1500                 //读取数据，数据长度为1500字节。
+QIRD: 5                       //实际接收数据长度为5字节。
测试1

好的
AT+ QICFG =“接收中”，1
好的
+QIURC: "recv",0,5             //接收到5字节数据，当<connectID>=0时
AT+QIRD=0,1500                 //读取数据，数据长度为1500字节。
+QIRD：5                       //实际接收数据长度为5字节。
测试1

好的
```

```
AT+QIRD=0,1500
+QIRD: 0                    //No data in buffer.

OK
AT+QIRD=0,0                 //Query the total length of received data, including read and unread data.
+QIRD: 10,10,0

OK
```

3.2.4. Close a Connection

```
AT+QICLOSE=0                //Close a connection whose <connectID> is 0. Depending on the network, the maximum response time is 10 s.

OK
```

3.3. TCP Client Works in Transparent Transmission Mode

3.3.1. Set up a TCP Client Connection and Enter Transparent Transmission Mode

```
AT+QIOPEN=1,0,"TCP","220.180.239.212",8009,0,2  //Context is 1 and <connectID> is 0. Before using AT+QIOPEN, the host should activate the context with AT+QIACT.

CONNECT                     //TCP client is connected successfully. It is recommended to wait for the URC CONNECT for 150 s. If it cannot be received in 150 s, the host could use AT+QICLOSE to close the socket.
```

3.3.2. Send Data in Transparent Transmission Mode

```
<All data got from COM port will be sent to internet directly>
```

3.3.3. Receive Data from Remote Server in Transparent Transmission Mode

```
Test 1                      //All data received from Internet will be outputted via COM port directly.
```

```
AT+QIRD=0,1500
+QIRD: 0                    //缓冲区中无数据。

好的
AT+QIRD=0.0                 //查询已接收数据的总长度，包括已读取和未读取的数据。
+QIRD: 10,10,0

好的
```

3.2.4. 关闭连接

```
AT+QICLOSE=0                //关闭 <连接ID为0的连接。根据具体情况
                                网络中，最大响应时间为10秒。
好的
```

3.3. 透明传输模式下的TCP客户端

3.3.1. 建立TCP客户端连接并进入透明传输模式

```
AT+ QIOPEN =1,0，“TCP”，“220.180.239.212”，8009,0,2//上下文为1且connectID>为0。在使用
                                AT+ QIOPEN前，主机应通过AT+ QIACT激活
                                上下文。
连接/接通                                   //TCP客户端已成功连接。
                                建议等待URC连接150秒。如果150秒内无法接
                                收，主机可以使用AT+qiclose来关闭套接字。
```

3.3.2. 透明传输模式下的数据发送

```
所有从COM端口获取的数据将直接发送至互联网
```

3.3.3. 透明传输模式下从远程服务器接收数据

```
试验1                                       //所有从互联网接收的数据将通过
                                直接连接COM端口。
```

3.3.4. Close a TCP Client

```
AT+QICLOSE=0                                    //After using +++ to exit from the transparent transmission mode, the host could use AT+QICLOSE to close the TCP connection. Depending on the network, the maximum response time is 10 s.
OK
```

3.4. TCP Client Works in Direct Push Mode

3.4.1. Set up a TCP Client Connection and Enter Direct Push Mode

```
AT+QIOPEN=1,0,"TCP","220.180.239.212",8009,0,1  //Context is 1 and <connectID> is 0. Before executing AT+QIOPEN, the host should activate the context with AT+QIACT.
OK

+QIOPEN: 0,0                                    //TCP client is connected successfully. It is suggested to wait for the URC for 150 s. If it cannot be received in 150 s, the host could use AT+QICLOSE to close Socket.
AT+QISTATE=1,0                                  //Query whether the connection status of <connectID> is 0.
+QISTATE: 0,"TCP","220.180.239.201",8009,65344,2,1,0,1,"usbmodem"

OK
```

3.4.2. Send Data in Direct Push Mode

```
AT+QISEND=0                                     //Send variable-length data.
> test1<ctrl+Z>
SEND OK                                         //SEND OK does not mean the data has been sent to the server successfully. Host can query whether the data has reached the server via AT+QISEND=0,0.
AT+QISEND=0,5                                   //Send fixed-length data and the data length is 5 bytes.
> test2
SEND OK
AT+QISEND=0,0                                   //Query the length of sent data, acknowledged data and unacknowledged data.
```

3.3.4. 关闭TCP客户端

```
AT+QICLOSE=0                                    //使用+++退出透明界面后
                                                传输模式下，主机可使用AT+qiclose关闭TCP连
                                                接。根据网络情况，最大响应时间为10秒。
好的
```

3.4. TCP客户端直接推送工作模式

3.4.1. 建立TCP客户端连接并进入直接推送模式

```
AT+ QIOPEN =1,0，“TCP”，“220.180.239.212”，8009,0,1//上下文为1且connectID>为0。在执行
AT+ QIOPEN之前，主机应通过AT+ QIACT激活上下文。
好的

+QIOPEN: 0,0                                    //TCP客户端已成功连接。
                                                建议等待URC 150秒。若150秒内未收到URC，
                                                主机可使用AT+qiclose关闭Socket。
AT+Q状态=1.0                                    //查询连接状态是否
                                                <connectID>为 0。
+QISTATE: 0,"TCP","220.180.239.201",8009,65344,2,1,0,1,"usbmodem"

好的
```

3.4.2. 直接推送模式下的数据发送

```
AT+QISEND=0                                     //Send variable-length data.
> test1<Ctrl+Z>
发送
                                                //SEND OK不表示数据已成功发送到服务器。主机可
                                                通过AT+ QISEND =0,0查询数据是否已到达服务器。
AT+QISEND=0.5                                   //发送固定长度数据，数据长度为5字节。
> 测试2
发送
AT+QISEND=0.0
                                                //查询已发送数据、已确认数据及未确认数据的长度。
```

```
+QISEND: 10,10,0

OK
```

3.4.3. Receive Data from Remote Server in Direct Push Mode

```
+QIURC: "recv",0,4                    //Receive data from remote server.
test
```

3.4.4. Close a TCP Client

```
AT+QICLOSE=0                          //Close the connection whose <connectID> is 0. Depending on the network, the maximum response time is 10 s.
OK
```

3.5. TCP Server Works in Buffer Access Mode

3.5.1. Start a TCP Server

```
AT+QIOPEN=1,1,"TCP LISTENER","127.0.0.1",0,2020,0 //Context is 1 and <connectID> is 1. Before using AT+QIOPEN, the host should activate the context with AT+QIACT.
OK

+QIOPEN: 1,0                          //TCP server is opened successfully.
AT+QISTATE=0,1                        //Query whether the connection state of <contextID> is 1.
+QISTATE: 1,"TCP LISTENER","127.0.0.1",0,2020,3,1,1,0,"usbmodem"

OK
```

3.5.2. Accept TCP Incoming Connection from Client

```
+QIURC: "incoming",11,1,"172.31.242.222",54091  //Accept a TCP connection. The <service_type> is "TCP incoming", and <connectID> is 11.
```

```
+QISEND: 10,10,0

好的
```

3.4.3. 直接推送模式下从远程服务器接收数据

```
+QIURC: "recv",0,4                    //从远程服务器接收数据。
试验
```

3.4.4. 关闭TCP客户端

```
AT+QICLOSE=0                          //关闭 <connectID>为 0 的连接。
                                      根据网络情况，最大响应时间为10秒。
好的
```

3.5. TCP服务器在缓冲区访问模式下的工作

3.5.1. 启动TCP服务器

```
AT+ QIOPEN =1,1，“TCP listener”，“127.0.0.1”，0,2020,0//上下文为1且<connectID>为1。在使用
                                      AT+ QIOPEN 之 前， 主 机 应 通 过 AT+
                                      QIACT激活上下文。
好的

+QIOPEN: 1,0                          //TCP服务器已成功建立连接。
AT+Q状态=0,1                          //查询连接状态是否
                                      <covidID>是 1。
+qistate: 1，“TCP监听器”，“127.0.0.1”，0,2020,3,1,1,0，“USB调制解调器”

好的
```

3.5.2. 接受客户端的TCP传入连接

```
+QIURC：“incoming”，11,1，“172.31.242.222”，54091//接受TCP连接。服务类型为“TCP incom-
                                      ing”，连接ID为11。
```

3.5.3. Receive Data from Client

```
+QIURC: "recv",11                       //Received data from remote incoming connection.

AT+QIRD=11,1500                         //Read data received from incoming connection.
+QIRD: 4                                //Actual data length is 4 bytes.
test

OK
AT+QIRD=11,1500
+QIRD: 0                                //No data in buffer.

OK
AT+QIRD=11,0                            //Query the total length of received data, including read and unread data.

+QIRD: 4,4,0

OK
```

3.5.4. Close a TCP Server Connection

```
AT+QICLOSE=11                           //Close the incoming connection. Depending on the network, the maximum response time is 10 s.

OK
AT+QICLOSE=1                            //Close TCP server listening.
OK
```

3.6. Example of UDP Service

3.6.1. Start a UDP Service

```
AT+QIOPEN=1,2,"UDP SERVICE","127.0.0.1",0,3030,0 //Start a UDP service. The <connectID> is 2 and <contextID> is 1. Before using AT+QIOPEN, the host should activate the context with AT+QIACT first.

OK

+QIOPEN: 2,0                            //UDP service is started successfully.
AT+QISTATE=0,1                          //Query whether the connection status of <connectID> is 1.
```

3.5.3. 从客户机接收数据

```
+QIURC: "recv",11                    //接收来自远程传入的数据
                                     关系
AT+QIRD=11,1500                      //从入站连接读取数据。
+QIRD: 4                             //实际数据长度为4字节。
试验

好的
AT+QIRD=11,1500
+QIRD: 0                             //缓冲区中无数据。

好的
AT+QIRD=11.0                         //查询已接收数据的总长度，包括
                                     已读取与未读取数据
+QIRD：4,4,0

好的
```

3.5.4. 关闭TCP服务器连接

```
AT+QICLOSE=11                        //关闭接收连接。根据
                                     该网络的最大响应时间为10秒。
好的
AT+QICLOSE=1                         关闭TCP服务器监听。
好的
```

3.6. UDP服务实例

3.6.1. 启动UDP服务

```
                AT+ QIOPEN =1,2，“UDP服务”，“127.0.0.1”，0,3030,0//启动UDP服务。connectID>为2，contex-
                tID>为1。使用AT+ QIOPEN前，主机需先
                通过AT+ QIACT激活上下文。
好的

+QIOPEN: 2,0                         //UDP服务已成功启动。
AT+Q状态=0,1                         //查询连接状态是否
                                     <connectID>是 1。
```

```
+QISTATE: 2,"UDP SERVICE","127.0.0.1",0,3030,2,1,2,0,"usbmodem"

OK
```

3.6.2. Send UDP Data to Remote Server

```
AT+QISEND=2,10,"10.7.89.10",6969        //Send 10-byte data to remote server whose IP is 10.7.89.10 and the remote port is 6969.

>1234567890
SEND OK
```

3.6.3. Receive Data from Remote Side

```
+QIURC: “recv”,2                        //Receive data from remote side.
AT+QIRD=2                               //Read UDP data. One whole UDP packet will be outputted. There is no need to specify the read length.

+QIRD: 4,"10.7.76.34",7687              //Data length is 4 bytes. The remote IP address is 10.7.76.34 and remote port is 7687.

AAAA

OK
AT+QIRD=2                               //Read data.
+QIRD: 0                                //No data in buffer.

OK
AT+QISEND=2,10,"10.7.76.34",7687        //Send data to the remote whose IP is 10.7.76.34 and remote port is 7687.

>1234567890
SEND OK
```

3.6.4. Close a UDP Service

```
AT+QICLOSE=2                            //Close the service.
OK
```

```
+qistate: 2，“UDP服务”，“127.0.0.1”，0,3030,2,1,2,0，“USB调制解调器”

好的
```

3.6.2. 向远程服务器发送UDP数据

```
AT+ QISEND =2,10，“10.7.89.10”，6969      //向指定IP地址的远程服务器发送10字节数据
                                                是10.7.89.10，远程端口为6969。
>1234567890
发送
```

3.6.3. 从远程接收数据

```
+QIURC: "recv",2                          //接收来自远程端的数据。
AT+QIRD=2                                 //读取UDP数据。一个完整的UDP数据包将
                                                无需指定读取长度。
+QIRD: 4,"10.7.76.34",7687                //数据长度为4字节。远程IP地址是
                                                10.7.76.34，远程端口为7687。
澳大利亚农业航空协会

好的
AT+QIRD=2                                 //读取数据。
+QIRD: 0                                  //缓冲区中无数据。

好的
AT+ QISEND =2,10，“10.7.76.34”，7687      //向IP为10.7.76.34的远程发送数据
                                                远程端口为7687。
>1234567890
发送
```

3.6.4. 关闭UDP服务

```
AT+QICLOSE=2                              //关闭服务。
好的
```

3.7. PING

```
AT+QPING=1,"www.baidu.com"                  //Ping www.baidu.com in context 1. Before Pinging the target IP address, the host should activate the context with AT+QIACT.

OK

+QPING: 0,"61.135.169.125",32,192,255

+QPING: 0,"61.135.169.125",32,240,255

+QPING: 0,"61.135.169.125",32,241,255

+QPING: 0,"61.135.169.125",32,479,255

+QPING: 0,4,4,0,192,479,288
```

3.8. Get Last Error Code

```
AT+QIOPEN=1,"TCP","220.180.239.212",8009,0,1    //Open a socket service, and <connectID> is not specified.

ERROR
AT+QIGETERROR
+QIGETERROR: 552, invalid parameters

OK
```

3.7. 冰点

```
AT+ QPING =1， "www.baidu.com"                    //Ping www.baidu.com在上下文1中。在Ping之前
                                                  目标IP地址，主机应通过AT+ QIACT激活上下文。
好的

+QPING: 0,"61.135.169.125",32,192,255

+QPING: 0,"61.135.169.125",32,240,255

+QPING: 0,"61.135.169.125",32,241,255

+QPING: 0,"61.135.169.125",32,479,255

+QPING: 0,4,4,0,192,479,288
```

3.8. 获取最后错误代码

```
AT+ QIOPEN =1，"TCP"，"220.180.239.212"，8009,0,1//打开一个套接字服务，且未指定<con-
                                                  nectID>。
错误
AT+QI错误
+qigeterror: 552，参数无效

好的
```

4 Summary of Error Codes

If **ERROR** is returned after executing TCP/IP related AT commands, the details of error type can be queried by **AT+QIGETERROR**. Please note that **AT+QIGETERROR** just returns error code of the last TCP/IP AT command.

Table 2: Summary of Error Codes

<err>	<errcode_description>	Meaning
0	Operation success	Operation success
550	Unknown error	Unknown error
551	Operation blocked	Operation blocked
552	Invalid parameters	Invalid parameters
553	Memory not enough	Memory not enough
554	Socket creation failed	Socket creation failed
555	Operation not supported	Operation not supported
556	Socket bind failed	Socket bind failed
557	Socket listen failed	Socket listen failed
558	Socket write failed	Socket write failed
559	Socket read failed	Socket read failed
560	Socket accept failed	Socket accept failed
561	PDP context opening failed	PDP context open failed
562	PDP context closure failed	PDP context close failed
563	Socket identity has been used	Socket identity has been used
564	DNS busy	DNS busy
565	DNS parse failed	DNS parse failed

4 错误代码摘要

执行TCP/IP相关AT命令后返回**错误**，可通过**AT+qigeterror**查询错误类型详情。请注意**AT+qigeterror**仅返回最后一条TCP/IPAT命令的错误代码。

表2：错误代码汇总

<err>	<errcode_description>	意义
0	操作成功	操作成功
550	未知错误	未知错误
551	操作被阻止	操作被阻止
552	无效参数	无效参数
553	记忆不足	记忆不足
554	套接字创建失败	套接字创建失败
555	操作不受支持	操作不受支持
556	套接字绑定失败	套接字绑定失败
557	套接字监听失败	套接字监听失败
558	套接字写入失败	套接字写入失败
559	读取套接字失败	读取套接字失败
560	接受套接字失败	接受套接字失败
561	PDP上下文打开失败	PDP上下文打开失败
562	PDP上下文关闭失败	PDP上下文关闭失败
563	已使用套接字身份	已使用套接字身份
564	DNS 正忙	DNS 正忙
565	DNS解析失败	DNS解析失败

566	Socket connect failed	Socket connect failed
567	Socket has been closed	Socket has been closed
568	Operation busy	Operation busy
569	Operation timeout	Operation timeout
570	PDP context broken down	PDP context broken down
571	PDP context broken down	Cancel sending
572	Operation not allowed	Operation not allowed
573	APN not configured	APN not configured
574	Port busy	Port busy

566	套接字连接失败	套接字连接失败
567	插座已关闭	插座已关闭
568	操作繁忙	操作繁忙
569	操作超时	操作超时
570	PDP上下文中断	PDP上下文中断
571	PDP上下文中断	取消发送
572	操作不允许	操作不允许
573	APN 未配置	APN 未配置
574	端口忙	端口忙

5 Appendix Reference

Table 3: Related Document

Document Name
[1] Quectel_RGx00U&RM500U_Series_AT_Commands_Manual

Table 4: Terms and Abbreviations

Abbreviation	Description
3GPP	3rd Generation Partnership Project
ACK	Acknowledgement
APN	Access Point Name
ASCII	American Standard Code for Information Interchange
CHAP	Challenge Handshake Authentication Protocol
CS	Circuit Switching
DNS	Domain Name System
FIN	Finish
ID	Identifier
IP	Internet Protocol
NTP	Network Time Protocol
NV	Non-Volatile
PAP	Password Authentication Protocol l
PDP	Packet Data Protocol
PPP	Point-to-Point Protocol
PS	Packet Switching
QoS	Quality of Service

5 附录参考文献

表3：相关文件

文档名称
[1] Quectel_RGx00U&RM500U_Series_AT_Commands_Manual

表4：术语与缩写

缩写	描述
3GPP	第三代伙伴计划
确认	致谢
APN	访问点名称
美国信息交换标准代码	美国信息交换标准代码
CHAP	挑战握手认证协议
CS	电路交换
域名系统	域名系统
鱼鳍	完成
身份证	标识符
冰点	互联网协议
NTP	网络时间协议
十亿分之一伏	非易失性的
PAP	密码验证协议
平行分布式处理	分组数据协议
PPP	点对点协议
附言	封装交换
服务质量	服务质量

TCP/IP	Transmission Control Protocol/Internet Protocol
TTL	Time to Live
UART	Universal Asynchronous Receiver& Transmitter
UDP	User Datagram Protocol
URC	Unsolicited Result Code
USB	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module
UTC	Coordinated Universal Time

TCP/IP	传输控制协议/因特网协议
通过透镜	生存时间
UART	通用异步收发信机
UDP	用户数据报协议
尿酸盐	非请求结果代码
统一的S波段	通用串行总线
(U) SIM卡	通用用户识别模块
单元类型编码	协调世界时