EC21&EC25&EC20 R2.1 Socket Forwarding AT Commands Manual

LTE Standard Module Series

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About the Document

History

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Contents

About the Document ... 3
Contents ... 4

1 Introduction ... 5

2 Description of AT Commands ... 6
2.1. AT+QFWDSERVER Establish TCP/UDP Server on AP Side ... 6
2.2. AT+QFWDCLIENT Establish TCP/UDP Client on AP Side ... 7
2.3. AT+QFWDSEND Send Data by AP Side Socket ... 8
2.4. AT+QFWDRECV Receive Data by AP Side Socket ... 9
2.5. AT+ QFWDACK Query Data Buffer Queue Information by AP Side Socket ... 10
2.6. AT+QFWDSSTATE Query Load State of the Specified Server ... 11
2.7. AT+QFWDCLOSE Close the Socket on AP Side ... 11
2.8. AT+QFWDCFG Configure the Socket on AP Side ... 12

3 Description of URCs ... 13
3.1. URC Indicating Server Setup ... 13
3.2. URC Indicating Active Client Setup ... 13
3.3. URC Indicating Client and Local Server Connection ... 14
3.4. URC Indicating Readable Data of the Connection ... 14
3.5. URC Indicating Closed Client ... 15

4 Examples ... 16

5 Terms and Abbreviations ... 18

1 Introduction

The interaction between the network data and the physical data can be realized through socket forwarding. This document mainly introduces the AT commands related to socket forwarding.

The applicable modules of this document are as below:

- EC2x: EC25, EC21 and EC20 R2.1

2 Description of AT Commands

2.1. AT+QFWDSERVER Establish TCP/UDP Server on AP Side

This command is used to establish a TCP/UDP server on the AP side. A URC will be reported in format “**+QFWDURC: "server/open",<socket_id>,<result>**” indicating whether the server establishment is successful. The module automatically accepts the connection requested by the TCP server by default. After the server is established successfully, the URC port could be re-configured by **AT+QFWDCFG="urc"**.

AT+QFWDSERVER Establish TCP/UDP Server on AP Side	
Test Command **AT+QFWDSERVER=?**	Response **+QFWDSERVER: (0-16),(1-65535),("IP","IPV6"),("tcp","udp"),(1-65535),(1-10),(1-65535),("uart1","usbat","usbmodem")** **OK**
Write Command **AT+QFWDSERVER=<pdp_cid>,<socket_id>,<ip_vsn>,<protocol_type>,<listen_port>,<listen_backlog>,<idle_timeout>,<urc_port>**	Response **OK** Or **ERROR**
Read Command **AT+QFWDSERVER?**	Response List of **(+QFWDSERVER: <socket_id>,<protocol_type>,<listen_port>,<urc_port>)** **OK** Or **ERROR**

Parameter

<pdp_cid>	Integer type. Serial number of PDP context. Range: 0-16 0 indicates binding any address.
<ip_vsn>	String type. IP version. IP IPv4

	IPV6 IPv6
<protocol_type>	String type. Protocol type. TCP TCP socket UDP UDP socket
<listen_port>	Integer type. Listening port. Range: 1-65535.
<listen_backlog>	Integer type. Listening backlog. Range: 1-10.
<idle_timeout>	Integer type. The duration of the idle timeout between the server and the client. If there is no data interaction, the module server will close connection proactively. Range: 1~65535. Unit: s. Default value: 60s.
<urc_port>	Integer type. The configured URC port. The default port is AT performance port. Uart1 Main UART port Usbat AT performance port Usbmodem Modem port
<socket_id>	Integer type. The corresponding socket ID of the server.

2.2. AT+QFWDCLIENT Establish TCP/UDP Client on AP Side

This command is used to establish a TCP/UDP client on AP side. A URC will be reported in format "**+QFWDURC: "client/open",<socket_id>,<result>**" indicating whether the client establishment is successful. After that, the URC port could be re-configured by **AT+QFWDCFG="urc"**.

AT+QFWDCLIENT Establish TCP/UDP Client on AP Side	
Test Command **AT+QFWDCLIENT=?**	Response **+QFWDCLIENT: (0-16),(1-65535),("IP","IPV6"),("tcp","udp"),<remote_addr>,<1-65535>,("uart1","usbat","usbmodem")** **OK**
Write Command **AT+QFWDCLIENT=<pdp_cid>,<socket_id>,<ip_vsn>,<protocol_type>,<remote_addr>,<remote_port>,<urc_port>**	Response **OK** Or **ERROR**
Read Command **AT+QFWDCLIENT?**	Response List of **(+QFWDCLIENT: <socket_id>,<direction>,<protocol_type>,<remote_addr>,<remote_port>,<local_addr>,<local_port>,<urc_port>)** **OK** Or **ERROR**

Parameter

<pdp_cid> Integer type. Serial number of PDP context. Range: 0-16.
0 indicates binding any address.

<ip_vsn> String type. IP version.
IP IPv4
IPV6 IPv6

<protocol_type> String type. Protocol type.
TCP TCP socket
UDP UDP socket

<remote_addr> String type. Remote address of the socket. It can be an IP address or domain name.

<remote_port> Integer type. Remote port of the socket. Range: 1-65535.

<local_addr> String type. Local address of the socket.

<local_port> Integer type. Local port of the socket. Range: 1-65535.

<idle_timeout> Integer type. The duration of the idle timeout between the server and the client. If there is no data interaction, the module server will close connection proactively. Range: 1~65535. Unit: s. Default value: 60s.

<urc_port> Integer type. The configured URC port. The default port is AT performance port.
Uart1 Main UART
Usbat AT performance port
Usbmodem Modem port

<socket_id> Integer type. The corresponding socket ID of the server.

<direction> String type. It indicates who initiated the connection request.
Active The module that serves as a client
Income The client that is accessed by an external request when module serves as a server

2.3. AT+QFWDSEND Send Data by AP Side Socket

This command is used to send the data inputted via the UART port to the network by AP side socket. The maximum data length supported by this command is 1024 bytes, and both fixed-length data sending and variable-length data sending are supported (the data sending can be ended by tapping “CTRL+Z”).

AT+QFWDSEND Send Data by AP Side Socket	
Test Command **AT+QFWDSEND=?**	Response **+QFWDSEND: <socket_id>,<data_format>,<send_length>** **OK**
Write Command **AT+QFWDSEND=<socket_id>,<da**	Response If parameter verification failed:

ta_format>,[<send_len>]	**ERROR** Or **>** After the response ">", input the data to be sent. Tap "CTRL+Z" to end the data sending. If parameter verification succeed: **+QFWDSEND: <socket_id>,<actual_send_len>** **OK** If the data sending is canceled: **OK** If the length of the data sent is more than 1024 bytes: **ERROR**

Parameter

<socket_id>	Integer type. Socket ID.
<data_format>	Integer type. Data format. 0 ASCII 1 HEX
<send_len>	Integer type. The length of the data to be sent. Range: 1-1024.
<actual_send_len>	Integer type. The actual length of the data to be sent. Range: 0-1024.

2.4. AT+QFWDRECV Receive Data by AP Side Socket

This command is used to receive data by AP side Socket and then receive the data in the socket.

AT+QFWDRECV Receive Data by AP Side Socket	
Test Command **AT+QFWDRECV=?**	Response **+QFWDPRECV: <socket_id>,<read_len>** **OK**
Write Command fixed-length data sending **AT+QFWDRECV=<socket_id>,<read_length>**	Response **+QFWDRECV: <socket_id>,<actual_read_len>,<0D>,<0A>,<read_data>** **OK**

	Or **ERROR**

Parameter

<socket_id>	Integer type. Socket ID.
<read_len>	Integer type. The length of the data to be received. Range: 1-1024.
<actual_read_len>	Integer type. The actual length of the data to be received. Range: 0-1024.

2.5. AT+ QFWDACK Query Data Buffer Queue Information by AP Side Socket

This command is used to query the information of the data buffer queue to be sent/received in the specified socket.

AT+ QFWDACK Query Data Buffer Queue Information by AP Side Socket	
Test Command **AT+QFWDACK=?**	Response **+QFWDACK: <socket_id>** **OK**
Write Command **AT+QFWDACK=<socket_id>**	Response **+QFWDACK: <socket_id>,<sendused>,<sendunused>,<sendmax>,<recvused>,<recvunused>,<recvmax>** **OK** Or **ERROR**

Parameter

<socket_id>	Integer type. Socket ID.
<sendused>	Integer type. The used length of the data queue to be sent. 0 All data has been sent.
<sendunused>	Integer type. The unused length of the data queue to be sent.
<sendmax>	Integer type. The maximum length of the data queue to be sent.
<recvused>	Integer type. The used length of the data queue to be received.
<recvunused>	Integer type. The unused length of the data queue to be received.
<recvmax>	Integer type. The maximum length of the data queue to be received.

2.6. AT+QFWDSSTATE Query Load State of the Specified Server

This command is used to query the load state of the specified server, i.e. the number of the client that accesses the server.

AT+QFWDSSTATE Query Load State of the Specified Server	
Test Command **AT+QFWDSSTATE=?**	Response **OK**
Write Command **AT+QFWDSSTATE=<server_socketid>**	Response List of **(+QFWDSSTATE: <index>,<accept_socketid>,<remote_addr>,<remote_port>,<local_addr>,<local_port>)** **OK** Or **ERROR**

Parameter

<server_socketid>	Integer type. The corresponding socket ID of the server.
<accept_socketid>	Integer type. The corresponding socket ID of the client that is accessed by external request.
<remote_addr>	String type. Remote address of the socket. It can be an IP address or domain name.
<remote_port>	Integer type. Remote port of the socket. Range: 1-65535.
<local_addr>	String type. Local address of the socket.
<local_port>	Integer type. Local port of the socket. Range: 1-65535.
<index>	Integer type. The number of the income client. Range: 1-65535.

2.7. AT+QFWDCLOSE Close the Socket on AP Side

This command is used to close the socket on AP side. If the socket corresponds to a TCP server, then only this TCP server will be closed, and the client associated with the socket will not be closed.

AT+QFWDSSTATE Close the Socket on AP Side	
Test Command **AT+QFWDCLOSE=?**	Response **OK**
Write Command **AT+QFWDCLOSE=<socket_id>**	Response **OK** Or

	ERROR

Parameter

<socket_id>	Integer type. Socket ID.

2.8. AT+QFWDCFG Configure the Socket on AP Side

This command is used to configure the socket on AP side.

AT+QFWDCGF Configure the Socket on AP Side	
Test Command **AT+QFWDCFG=?**	Response **+QFWDCFG: "urc",<socketfd>,<urc_port>** **OK**
Write Command Query the URC port of the specified socket. **AT+QFWDCFG="urc",<socketfd>**	Response **+QFWDCFG: "urc",<socketfd>,<urcport>** **OK** or **ERROR**
Write Command Configure the URC port of the specified socket. **AT+QFWDCFG="urc",<socketfd>, <urc_port>**	Response **OK** Or **ERROR**

Parameter

<socketfd>	Integer type. It indicates the socket corresponding to server/client.
<urc_port>	Integer type. It indicates the configured URC port. Uart1 Main UART Usbat AT performance port Usbmodem Modem port

3 Description of URCs

3.1. URC Indicating Server Setup

URC Indicating Server Setup	
+QFWDURC: "server/open",<socket_id>,<result>	This URC indicates whether the server is successfully set up.

Parameter

<socket_id>	Integer type. Socket ID.
<result>	Integer type. Server setup results. 0 Server is set up successfully. Others Server is failed to be set up.

3.2. URC Indicating Active Client Setup

URC Indicating Active Client Setup	
+QFWDURC: "client/open",<socket_id>,<result>	This URC indicates whether the setup client is successfully connected to server.

Parameter

<socket_id>	Integer type. Socket ID.
<result>	Integer type. Client connection results. 0 The setup client is successfully connected to the server. Others The setup client is failed to connect to the server.

3.3. URC Indicating Incoming Connection

URC Indicating Incoming Connection	
+QFWDURC: "client/incoming",<server_socketid>,<accept_socketid>,<remote_addr>,<remote_port>,<local_ip>,<local_port>	This URC will report related information when client is connected to the local server.

Parameter

<server_socketid>	Integer type. The socket ID corresponding to the server.
<accept_socketid>	Integer type. The socket ID corresponding to the income client.
<remote_addr>	String type. Remote address of the socket. It can be an IP address or domain name.
<remote_port>	Integer type. Remote port of the socket. Range: 1-65535.
<local_ip>	String type. Local IP.
<local_port>	Integer type. Local port of the socket. Range: 1-65535.

3.4. URC Indicating Readable Data of the Connection

URC Indicating Readable Data of the Connection	
+QFWDURC: "client/read",<socket_id>	This URC will report related information when the data of the connection between the client and the local server is readable.

Parameter

<socket_id>	Integer type. Socket ID.

3.5. URC Indicating Closed Client

URC Indicating Client Closed	
+QFWDURC: "client/close",<socket_id>	This URC will report a message of disconnection when the client is closed.

Parameter

<socket_id>	Integer type. Socket ID.

4 Examples

```
AT+QFWDSERVER= 1,"uninet","ip","tcp",2020,5      //Establish a TCP server with <socket_id>=1.
OK
+QFWDURC: "server/open",1,0


+QFWDURC: "client/incoming",1,2,"192.168.225.58",56784,"0.0.0.0",2020

+QFWDURC: "client/incoming",1,3,"192.168.225.58",56794,"0.0.0.0",2020

AT+QFWDSSTATE= 1                         //Query the load state of TCP server with <socket_id>=1.
+QFWDSSTATE: 1,2,"192.168.225.58",56784,"0.0.0.0",2020
+QFWDSSTATE: 2,3,"192.168.225.58",56794,"0.0.0.0",2020

OK

AT+QFWDSEND= 2,1                         //Send hex data to client with <socket_id>=2
> 3131<CTRL+Z>
+QFWDSEND: 2,2

OK

+QFWDURC: "client/read",3                //Receive the URC notifying client data that can be read with
                                          <socket_id>=3

AT+QFWDACK= 3,1024                       //Read the data received by client with <socket_id>=3.
+QFWDACK: 3,18
test, data forward

OK

+QFWDURC: "client/close",3
AT+QFWDSSTATE= 1
+QFWDSSTATE: 1,2,"192.168.225.58",56784,"0.0.0.0",2020

OK
AT+QFWDCLOSE=2                           //Close client with <socket_id>=2 proactively.
OK
```

```
AT+QFWDSSTATE=1
OK
```

5 Terms and Abbreviations

Table 1: Terms and Abbreviations

Abbreviation	Description
PDP	Packet Data Protocol
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
URC	Utility Radio Communication