FIBOCOM L610 AT Commands_TCP&UDP

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Applicability type

No.	Product model	Description
1	L610	NA

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Versions

Version	Author	Assessor	Approver	Update Date	Description
V1.0.0	Robin	Long Zhongyou	Long Zhongyou	2019-11-29	Initial version

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Contents

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1 TCP/IP

1.1 Basic Mode

1.1.1+MIPCALL, Create a Wireless Link

1.1.1.1 Description

This command sets up a PPP (Point to Point Protocol) connection with the GGSN (Gateway GPRS Support Node), and returns a valid dynamic IP for the module.

1.1.1.2 Syntax

Command	Response/Action
+MIPCALL=<operation>[,<cid>/<APN>[,<User name>,<Password>,[<auth>]]]	OK +MIPCALL: <Local IP address>[,<Local IPV6 address>] or OK +MIPCALL: 0 or ERROR
+MIPCALL?	+MIPCALL: <status>[,<Local IP address>[,<Local IPV6 address>]] OK
+MIPCALL=?	+MIPCALL: (list of supported <operation>s) OK

⚠️ **Notes:**

- The +MIPCALL command does not have a general ABORT mechanism, therefore a command cannot be issued until the previous command ends.
- Activating a context can take up to 30 seconds. Deactivating a context can take up to 30 seconds.
- If use AT+MIPCALL=1to activate PDP. The APN must be set by AT+CGDCONT command.
- The "User name" and the "Password" parameters can be up to 64 characters each. The "APN" parameter can be up to 99 characters each.

1.1.1.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	No	Yes	< 1s

1.1.1.4 Defined Values

<operation>: integer type and range 0-3

   0   disconnect a link

   1   establish GPRS link of IPV4

   2   establish GPRS link of IPV6(can only used for actived by APN)

   3   establish GPRS link of IPV4 and IPV6(can only used for actived by APN)

<status>: integer type and range 0-2

   0   Disconnected

   1   Connected

   2   Busy(disconnecting or connecting)

<cid>: Digit string which specifies a particular PDP context definition (See "+CGDCONT, Define PDP Context").

<APN>:APN of service provider (in quotation marks). Contact your service provider for details.

<User name>:User name in provider server (in quotation marks). Contact your service provider for details.

<Password>:Password for provider server (in quotation marks). Contact your service provider for details.

<auth>: integer type and range 0-2,Set type of authentication

   0   Don't need authentic

   1   PAP

   2   CHAP

<Local IP address>: IP address given by server after PPP negotiation (string without double quotes).

<Local IPV6 address>: IP address given by server (string without double quotes).

1.1.2+MIPOPEN, Open a Socket (UDP or TCP)

1.1.2.1 Description

This command causes the Module to initialize a new socket that waits for a connection from a remote machine or opens a common connection with a remote side (according to received parameters).

⚠ **Note:**

MIPxxx is a complete set of GPRS commands. This set should not be used with other GPRS commands, such as CGATT, CGACT, and so on.The +MIPOPEN command returns a +MIPSTAT unsolicited event if it fails, for example, if it was rejected by the remote side. This command will return in 60 sec when DNS is error.

1.1.2.2 Syntax

Command	Response/Action
+MIPOPEN=<Socket_ID>,[<Source_Port>],<Remote_IP>,<Remote_Port>,<Protocol>	OK +MIPOPEN: <Socket_ID>,<State>[,<Remote_IP>,<Remote_Port>] or OK +MIPSTAT: <Socket_ID>,<Status> or ERROR
+MIPOPEN?	+MIPOPEN: [list of free <Socket_ID>s] OK For each socket that can be opened or +MIPOPEN: 0 OK If there are no free sockets.
+MIPOPEN=?	+MIPOPEN: (list of supported <Socket_ID>s),(list of supported <Source_Port>s),(<IP/URL>), (list of <Remote_Port>s),(list of supported <Protocol>s) OK

1.1.2.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	No	Yes	< 1s

1.1.2.4 Defined Values

<Socket_ID>: A unique number that identifies a connection. Valid socket numbers 1- 6.

<Source_Port>: Port of source site.Port range: 0-65535 (decimal digits).

<Remote_IP>: String Type.

> IP: IP of the remote site in the format "AAA.BBB.CCC.DDD". The range of each octet is 0-255. Value can be written in 1, 2, or 3 digits.

> Host name of remote site: The host-name convention should meet the rules as describe in RFC-1035 section: 2.3 Conventions. Syntax is not validated, except the maximum length (255 characters). In set mode,<Remote_IP> only return in listen mode.

> IPV6:The IPV6 address format is "X:X:X:X:X:X:X:X", where each X represents 16b in the address, expressed in hexadecimal, for example:"ABCD: EF01: 2345: 6789: ABCD: EF01: 2345: 6789".

<Remote_Port>: Port of remote site.

> Port range: 1-65535 (decimal digits) for outgoing connection.

> Port 0 for incoming connection.

> In set mode,<Remote_IP> only return in listen mode.

<Protocol>: integer type and range 0-2 and 60-62, Type of protocol stack.

- 0   TCP of IPV4
- 1   UDP of IPV4
- 2   SSL of IPV4
- 60 TCP of IPV6
- 61 UDP of IPV6
- 62 SSL of IPV6

<State>: integer type and range 0-1

- 0   inactive
- 1   active

<Status>: integer type and range 0-2

- 0   ACK indication
- 1   Broken protocol stack
- 2   Connection closed automatically due to non – fatal alert

> ⚠️ **Note:**
>
> Does not recommend using port numbers below 1024. These numbers are defined to be reserved for operating systems.

1.1.3 +MIPCLOSE, Close a Socket

1.1.3.1 Description

This command causes the module to free the socket accumulating buffer and to close the socket.

⚠️ **Note:**

All data stored in the accumulating buffer will be lost.

1.1.3.2 Syntax

Command	Response/Action
+MIPCLOSE=<Socket_ID>[,<Mode>]	OK +MIPCLOSE: <Socket_ID>[,<number_of_acknowledged_bytes>],<close_type> or ERROR
+MIPCLOSE?	+MIPCLOSE: [list of active <Socket_ID>s] OK For all ACTIVE sockets. or +MIPCLOSE: 0 OK For no ACTIVE socket.
+MIPCLOSE=?	+MIPCLOSE: (list of supported <Socket_ID>s),(list of supported < close_type>s) OK

1.1.3.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	No	Yes	< 1s

1.1.3.4 Defined Values

<Socket_ID>: Unique number that identifies a connection.Valid socket numbers 1- 6.

<Mode>: integer type and range 0-2. This value only used for TCP connection.

    0   Wait FIN ack from Server (default)

    1   Do not wait FIN response from server

    2   Wait 2MSL

<number_of_acknowledged_bytes>: Total number of bytes that were acknowledged.

<close_type>: Connection close type:

> 0   Connection was closed correctly.
>
> 1   The remote side didn't reply, so connection closed by close timeout.
>
> 2   Other (The remote side replied with RST,Re-transmission timeout occurred, etc.).

1.1.4 +MIPSETS, Set Size and Timeout for Automatic Push

1.1.4.1 Description

This command causes the Module to set a watermark in the accumulating buffer and set timeout. When the watermark is reached, data is pushed from the accumulating buffer into the protocol stack.

Timeout is used to define interval of time between MIPSEND command and time when data will be automatically pushed from the accumulating buffer into the protocol stack.

Data chunks between the terminal and the Module are limited to be smaller than 1024 characters (2048 characters in coded form). In order to reduce the overhead of sending small amounts of data over the air, the Module uses an accumulating buffer. The terminal can specify a watermark within the accumulating buffer size limits to indicate how much data should be accumulated. When the data in the accumulating buffer exceeds the watermark, all data in buffer will be sent.

Arriving data to accumulating buffer triggers a start of time (defined in timeout) countdown. When counter reaches zero, data is moved into the protocol stack. If new data arrived before time is reached zero, it is re-initialized. If data in accumulating buffer reached watermark it is pushed to the accumulating buffer as usual, but if after automatic push there is some remaining data, time countdown is started.

⚠️ **Note:**

If there is data in the accumulating buffer, the +MIPSETS command will be rejected.

1.1.4.2 Syntax

Command	Response/Action
+MIPSETS=<Socket_ID>,<Size>[,<Timeout>]	+MIPSETS: <Status> OK or ERROR
+MIPSETS?	+MIPSETS: <Socket_ID>,<Size>,<Timeout> OK

Command	Response/Action
	For all ACTIVE sockets.
	Or
	+MIPSETS: 0
	OK
	For no ACTIVE socket.
+MIPSETS=?	+MIPSETS: (list of supported <Socket_ID>s),(list of supported <Size>s),(list of supported <Timeout>s)
	OK

1.1.4.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.4.4 Defined Values

<Socket_ID>: Unique number that identifies a connection.Valid socket numbers 1- 6.

<Size>: Size of the buffer, size range 1- 2048.

The default value is 2048.

<Timeout>: integer type and range 0-1000ms

0   means no timeout is used (default).

<Status>: integer type

0   Success

3   Operation not allowed

1.1.5 +MIPDSETS, Set Size and Timeout for Output Data

1.1.5.1 Description

This command causes the module to set a max length and time span when send received data to TE. The max length means the data which module send to TE must less than this length. Time span is used to define interval of time between two package when send data to TE

1.1.5.2 Syntax

Command	Response/Action
AT+MIPDSETS=<Socket_ID>, <Size>[,<Time span>]	+MIPDSETS: 0 OK or ERROR
AT+MIPDSETS?	+MIPDSETS: <Socket_ID>,<Size>,<Time span> OK For all ACTIVE sockets. or +MIPDSETS: 0 OK For no ACTIVE socket.
AT+MIPDSETS=?	+MIPDSETS: (list of supported <Socket_ID>s),(list of supported <Size>s),(list of supported <Time span>s) OK

1.1.5.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.5.4 Defined Values

<Socket_ID>: Unique number that identifies a connection.Valid socket numbers 1- 6.

<Size>: Size of the buffer,size range1-2048.

The default value is 2048.

<Time span>: integer type and range 0-1000ms.

The default value is 0.

1.1.6 +MIPSEND, Send Data

1.1.6.1 Description

This command causes the module to store the data that the terminal provides in the accumulating buffer, and then send this data using an existing protocol stack when the amount of data reaches the predefined amount (see "+MIPSETS, Set Size and Timeout for Automatic Push" on. Before sending data, a valid connection must be created using the +MIPCALL and +MIPOPEN commands.

Recommends that the terminal sets the watermark in the accumulating buffer prior to this command, using the +MIPSETS command. By default, the watermark is set to 2048 bytes of data.

1.1.6.2 Syntax

Command	Response/Action
+MIPSEND=<Socket_ID>,<Data>	ERROR or +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK
+MIPSEND?	+MIPSEND: <Socket_ID>,<FreeSize> OK For all ACTIVE sockets. or +MIPSEND: 0 OK For no ACTIVE socket.

1.1.6.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.6.4 Defined Values

<Socket_ID>: 1,2,3,4,5,6 Number of valid socket.

<Data>: String type. User data encoded with 0-F hexadecimal digits.

<Status>: integer type and range 0-1

  0 Send data to socket buffer OK

  1 MIPXOFF received before, send failed

<FreeSize>: Free space in current buffer. Free size is calculated from the 2048.

   Free Size range 0-2048.

1.1.7 +MIPPUSH, Push Data into Protocol Stack

1.1.7.1 Description

This command causes the Module to push the data accumulated in its accumulating buffers into the protocol stack. It is assumed that before using this command, some data should exist due to previous +MIPSEND commands.

1.1.7.2 Syntax

Command	Response/Action
+MIPPUSH=<Socket_ID>[,<Destination_IP>, <Destination_Port>]	+MIPPUSH: <Socket_ID>,<Status>[,<accumulated_sent_length>] OK or ERROR
+MIPPUSH?	+MIPPUSH: [list of active <Socket_ID>s] OK For all ACTIVE sockets or +MIPPUSH: 0 OK For no ACTIVE socket.
+MIPPUSH=?	+MIPPUSH: (list of supported <Socket_ID>s),(<IP>),(list of supported <

Command	Response/Action
	Destination_Port>s) OK

1.1.7.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.7.4 Defined Values

<Socket_ID>: 1,2,3,4,5,6 Number of valid socket.

<Destination_IP>: String type.

> IP of destination site in the format "AAA.BBB.CCC.DDD". The value can be written in1, 2 or
>
> 3 digits.
>
> The IPV6 address format is "X:X:X:X:X:X:X:X", where each X represents 16b in the address,
>
> expressed in hexadecimal, for example: "ABCD: EF01: 2345: 6789: ABCD: EF01: 2345: 6789".

<Destination_Port>: 0-65535Port of destination site. Written in decimal digits.

⚠️ **Notes:**

<Destination_IP> and <Destination_Port> are used only for UDP connections. If <Destination_IP> and

<Destination_Port>are not provided by the user, a datagram is sent to the last target (or the default target provided

by the +MIPOPEN command).

<accumulated_sent_length>: accumulatedsentlength

<Status>: integer type and range 0-2

> 0   Success
>
> 1   socket is flowed off
>
> 2   there is no data in socket to send

1.1.8 +MIPFLUSH, Flush Data from Buffers

1.1.8.1 Description

This command causes the Module to flush (delete) data accumulated in its accumulating buffers.

1.1.8.2 Syntax

Command	Response/Action
+MIPFLUSH=<Socket_ID>	+MIPFLUSH: <Socket_ID>

Command	Response/Action
	OK or ERROR
+MIPFLUSH?	+MIPFLUSH: [list of active <Socket_ID>s] OK For all ACTIVE sockets or +MIPFLUSH: 0 OK For no ACTIVE socket.
+MIPFLUSH=?	+MIPFLUSH: (list of supported <Socket_ID>s) OK

1.1.8.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.8.4 Defined Values

<Socket_ID>: 1,2,3,4,5,6 - Number of valid sockets.

1.1.9 +MIPRUDP, Receive Data from UDP Protocol Stack

1.1.9.1 Description

This unsolicited event is sent by the Module to the terminal when data is received from the UDP protocol stack.

1.1.9.2 Syntax

Command	Response/Action
Unsolicited Response	+MIPRUDP: <Source_IP>,<Source_Port>,<Socket_ID>,<Left/Data_len>,<Data>

1.1.9.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.9.4 Defined Values

<Source_IP>: IP of the source(string without double quotes).

<Source_Port>: Port of the source.

<Socket_ID>: 1,2,3,4,5,6 - Number of valid sockets.

<Left>: Size of received Data still left in protocol stack, when IPRFMT set 0 by +GTSET command.

<Data_len>:Size of output data, when IPRFMT set 2 by +GTSET command.

<Data>: Data received with 0-F hexadecimal digits. (string without double quotes and ends with a <CR>).

1.1.10 +MIPRTCP, Receive Data from TCP Protocol Stack

1.1.10.1 Description

This unsolicited event is sent by the Module to the terminal when data is received from the TCP protocol stack.

1.1.10.2 Syntax

Command	Response/Action
Unsolicited Response	+MIPRTCP: <Socket_ID>,<Left/Data_len>,<Data>

1.1.10.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.10.4 Defined Values

<Socket_ID>: 1,2,3,4,5,6 - Number of valid sockets.

<Left>: Size of received Data still left in protocol stack, when IPRFMT set 0 by +GTSET command.

<Data_len>:Size of output data, when IPRFMT set 2 by +GTSET command.

<Data>: Data string received with 0-F hexadecimal digits. (string without double quotes and ends with a <CR>).

1.1.11+MIPSTAT, Status Report

1.1.11.1 Description

This unsolicited event is sent to the terminal indicating a change in status. Currently there are two

possible sources of failure, a broken logical connection or a broken physical connection.

1.1.11.2 Syntax

Command	Response/Action
Unsolicited Response	+MIPSTAT: <Socket_ID>,<Status>[,<number_of_acknowld_bytes>]

1.1.12.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.11.4 Defined Values

<Socket_ID>: A unique number that identifies a connection.Valid socket numbers 1- 6.

<Status>: integer type and range 0-2

    0   ACK indication

    1   Broken protocol stack

    2   Connection closed automatically due to non – fatal alert

<number_of_acknowld_bytes>: Total number of bytes that were acknowledged.

1.1.12+MIPCONF, Configure Internal TCP/IP Stack

1.1.12.1 Description

This command allows configuring TCP stack parameters, such as re-transmissions number, upper and

bottoming limits of re-transmission timeout, close delay. It can be used to configure TCP socket

parameters before socket activation. Configuration values will be stored in Module until power circle.

1.1.12.2 Syntax

This command must used under MIPCALL is enabled.

Command	Response/Action
+MIPCONF=<Socket_ID>[[,<retr_num	OK

Command	Response/Action
>][,<min_TO>][,<max_TO>][,<max_clo se_delay>][,<is_nack_ind_req>]]	or ERROR
+MIPCONF?	+MIPCONF: 1,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<i s_nack_ind_req> +MIPCONF: 2,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<i s_nack_ind_req> +MIPCONF: 3,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<i s_nack_ind_req> +MIPCONF: 4,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<i s_nack_ind_req> [+MIPCONF: 5,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<i s_nack_ind_req> +MIPCONF: 6,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<i s_nack_ind_req>] OK
+MIPCONF=?	+MIPCONF: (list of supported <Socket_ID>s),(list of supported <retr_num>s),(list of supported <min_TO>s),(list of supported <max_TO>s),(list of supported <max_close_delay>s),(list of supported <is_nack_ind_req>s) OK

1.1.12.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.12.4 Defined Values

<Socket_ID>: Number of configured TCP socket (1 to 6).

<retr_num>: Number of re-transmissions (1 to 12), Default: 5.

<min_TO>: Bottom limit to re-transmit timeout (100 ms to 1 sec.), Default: 5*100ms.

<max_TO>: Upper limit to re-transmit timeout (1 sec. to 60 sec.), Default: 600*100ms

<max_close_delay>: Closing delay required by RFC 793 (100 ms to 7500 ms), Default: 75*100mS.

<is_nack_ind_req>: integer type and range 0-2

NACK/ACK TCP indication feature.

Activating this parameter enables Module to report the user, in case of losing a TCP connection, what data was received by the remote TCP layer.

0 feature inactive.

1 NACK indication active.

2 ACK indication active.

• Default value is 0

This parameter resets after power cycle.

1.1.13 +MIPKEEPCONF, Set TCP Keep Alive Time

1.1.13.1 Description

This command is used to set the TCP live mechanism of related parameters, including whether to open the mechanism, and how long a failure detection shake hands, shake hands how long resend and resend.(when power supply drop, setting parameter will be saved.)

1.1.13.2 Syntax

Command	Response/Action
+MIPKEEPCONF=<mode>[,<keepidle>,<keepintvl>,<keepcnt>]	OK or ERROR
+MIPKEEPCONF?	+MIPKEEPCONF: <mode>[,<keepidle>,<keepintvl>,<keepcnt>] OK

Command	Response/Action
+MIPKEEPCONF=?	+MIPKEEPCONF: (list of supported <mode>s),(list of supported <keepidle>s),(list of supported <keepintvl>s),(list of supported <keepcnt>s), OK

1.1.13.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.13.4 Defined Values

<mode>: integer type and range 0-1

> 0 – switch off (default)

> 1 – switch on. Only mode = 1,need <keepidle>,<keepintvl>,<keepcnt > Parameter.

> Used to set whether open living mechanism

<keepidle>: Used to set send TCP handshake detection time(1 sec to 36000 sec).

> Default value 7200 sec

> ps：As a result of protocol stack processing, real time interval and the set value will have small deviation, the actual effect shall prevail.

<keepintvl>: Used to set the TCP handshake failed, handshake messages again(1 sec to 750 sec).

> Default value 65 sec

<keepcnt>: Used to set the TCP handshake failed, handshake messages retry count(1 to 50).

> Default value 9

1.1.14+MPING, Start Ping Execution (ICMP Protocol)

1.1.14.1 Description

This command allows verifying IP connectivity to another remote machine (computer) by sending one or more Internet Control Message Protocol (ICMP) Echo Request messages.

The receipt of corresponding Echo Reply messages are displayed, along with round trip times.

Valid IP address must be obtained using AT+MIPCALL command prior to starting ping execution.

Only one ping request execution will be allowed at any given moment.

The set command shall send a <count> Internet Control Message Protocol (ICMP) Echo Request

messages to a target node defined by <"Destination IP/hostname"> parameter. If <mode> is equal 0, no parameters trailing <mode> parameter are allowed, otherwise ERROR message will be reported to DTE. If <mode> is equal 0, MS will abort sending Echo Request messages if ping request is in process, otherwise ERROR message will be reported to DTE.

1.1.14.2 Syntax

Command	Response/Action
+MPING=<mode>[,<Destination_IP/hostname>[,<count>[,<size>[,<TTL>[,<TOS>[,<TimeOut>]]]]]]	OK or ERROR
Unsolicited Response	+MPING: <Destination_IP>,<type>,<code> [,<RTT>]
+MPING?	+MPING: <count>,<size>,<TTL>,<TOS>,<TimeOut> OK
+MPING=?	+MPING: <count>,<size>,<TTL>,<TOS>,<TimeOut> OK

1.1.14.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	No	Yes	< 1s

1.1.14.4 Defined Values

These contents shows the +MPING command parameters.

<mode>: integer type and range 0-2

> 0   Abort current ping request execution.
>
> 1   Launch new IPV4 ping request.
>
> 2   Launch new IPV6 ping request.

<Destination_IP/hostname>: String type. Specifies the target machine (computer), which is identified either by IP address 4 octets long in dotted decimal notation or by host name of maximum 255 (not including double quotes) characters long in dotted notation. Each octet of IP address has valid value range of 0 to 255. Host names are not case sensitive and can contain alphabetic or numeric letters or the hyphen. There is no default value - appropriate ERROR will be displayed if parameter is not supplied. If it is an IPV6 host, the address

format is "X:X:X:X:X:X:X:X", where each X represents 16b in the address, expressed in hexadecimal, for example: "ABCD:EF01:2345:6789:ABCD:EF01:2345:6789"

<count>:Specifies a number of Internet Control Message Protocol (ICMP) Echo Request messages to send. Valid value range is from 1 to 255.The default value is 4.

<size>:Specifies the length, in bytes, of the Data field in the Echo Request messages sent. The minimum size is 0.The maximum size is 1372.The default value is 32.

<TTL>:Time To Live (TTL). Specifies number of hops (hop is one step, from one router to the next, on the path of a datagram on an IP network), which the Echo Request message may be routed over. The value is set by using TTL field in IP header. Valid value range is from 1 to 255.The default value is 64.

<TOS>:The Type Of Service (TO S) is for internet service quality selection. The type of service is specified along the abstract parameters precedence, delay, throughput, and reliability. These abstract parameters are to be mapped into the actual service parameters of the particular networks the datagram traverses. Minimum and maximum values for TOS are 0 and 255 respectively. Refer to RFC 791 and RFC 2474 which obsoletes RFC 791 for TOS defined values.The default value is 0.

<TimeOUT>:Specifies the amount of time, in milliseconds, to wait for the Echo Reply message that corresponds to a sent Echo Request message, measured after Echo Request message was sent. If the Echo Reply message is not received within the time-out, +MPINGSTAT. The default value is 4000 ms.

These contents shows the +MPING unsolicited response parameters.

<Destination_IP>: String type. Specifies the message sender machine (computer), which is identified by IP address 4 octets long in dotted decimal notation. Each octet of IP address has valid value range of 0 to 255. The message sender machine (computer) may be either the target of Echo Request message (if a response was an Echo Reply message) or a gateway (router) in a path of Echo Request message passage for any other ICMP response message.

<type>:The first octet of the ICMP header is an ICMP type field, which specifies the format of the ICMP message. Referto IETF RFC 792 for <type> valid values.

<code>:The reasons for the non-delivery of a packet are described by code field value of ICMP header. Every <type> has its own defined <code> values. Refer to IETF RFC 792 for <code> valid values.

<RTT>:Specifies Round Trip Time (RTT) measured in milliseconds. This parameter will be reported in command response only if Echo Reply message was received.

⚠️ **Note:**

Ping request is being executed from the moment the valid AT+MPING set command was received by Module until +MPINGSTAT unsolicited report with <status> equal either to 0 or 2 is sent to DTE or ping request execution was aborted with AT+MPING=0 command. Refer to description of +MPINGSTAT unsolicited response for details.

In some cases, the reply message for an Echo Request message might be not an Echo Reply messages but rather some other ICMP message, which is reporting an error in datagram processing. For purpose of reporting an exact type of response for sent Echo Request message, unsolicited response includes <type> and <code> fields. The first octet of the data portion of the IP datagram is an ICMP <type> field. The value of this field determines the format of the remaining data. The <type> and <code> fields jointly define ICMP message type.

For example, a case when an Echo Request message encapsulated in IP datagram to be forwarded by a gateway has exceeded TTL (equal zero). In this case the gateway must discard the datagram and may return an ICMP Time Exceeded message.

1.1.15+MPINGSTAT, Status Update for +MPING Execution

1.1.15.1 Description

This is the unsolicited response that the Module sends to the terminal to inform of ping execution status update and provides summary statistics of ping request when ping request execution is completed.

1.1.15.2 Syntax

Command	Response/Action
Unsolicited Response	+MPINGSTAT: <status>[,<Destination_IP>,<SentMessages>,<ReceivedMessages>[,<AverageRTT>]]

1.1.15.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.15.4 Defined Values

<status>: integer type and range 0-4.Specifies a status of ping request execution.

0 - The unsolicited response with this <status> will be sent to DTE upon completion of ping request. If PING request was aborted or socket connection was terminated for any reason, this unsolicited response will not be reported to DTE.

1 - The unsolicited response with this <status> will be sent to DTE if no ICMP reply message was received within timeout.

2 - The unsolicited response with this <status> will be sent to DTE if socket connection was terminated for any reason. This status essentially means that ping request execution was aborted.

3 - Flow Control OFF. The unsolicited response with this <status> will be sent to DTE if phone doesn't have enough memory to process sending an Echo Request message.

4 - Flow Control ON. The unsolicited response with this <status> will be sent to DTE if phone has enough memory to send an Echo Request message after flow control was OFF.

<Destination_IP>: String type. Specifies the target machine (computer) for ping request.The IPV4 address is identified by IP address 4 octets long in dotted decimal notation. Each octet of IP address has valid value range of 0 to 255.The IPV6 address format is "X:X:X:X:X:X:X:X", where each X represents 16b in the address, expressed in hexadecimal, for example: "ABCD: EF01: 2345: 6789: ABCD: EF01: 2345: 6789".

<SentMessages>:Specifies a total number of sent Echo Request messages.

<ReceivedMessages>:Specifies a total number of received Echo Reply messages corresponding to Echo Request messages.

<AverageRTT>:Specifies average Round Trip Time (RTT) for this ping request. This value will be reported if and only if <ReceivedMessages> value is greater than zero. Calculation of this value comprises of accumulating all RTT values and dividing total accumulated RTT by <ReceivedMessages> value. Only an integral part of a result will be reported and any digits of a fraction part will be truncated.

1.1.16+MSDNS, Set DNS IP Address

1.1.16.1 Description

This command set/read DNS (Domain Name Server) IP address (primary/secondary) for each socket. If the user doesn't specify DNS servers by AT+MSDNS, Module will use default DNS from NW. The defined value(s) will be saved during disconnect PDP context (can be used in next PDP context), but will reset after power cycle.

1.1.16.2 Syntax

Command	Response/Action
+MSDNS=<Socket_ID>[,<Primary_DNS_server_IP>[,<Secondary_DNS_server_IP>]]	OK or ERROR
+MSDNS?	+MSDNS: 1,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSDNS: 2,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSDNS: 3,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP>

Command	Response/Action
	+MSDNS:
	4,\<Primary_DNS_server_IP\>,\<Secondary_DNS_server_IP\>
	+MSDNS:
	5,\<Primary_DNS_server_IP\>,\<Secondary_DNS_server_IP\>
	+MSDNS:
	6,\<Primary_DNS_server_IP\>,\<Secondary_DNS_server_IP\>
	+MSDNS:
	7,\<Primary_DNS_server_IP\>,\<Secondary_DNS_server_IP\>
	OK
+MSDNS=?	+MSDNS: (List of supported \<Socket_ID\>s),(\<IP\>),(\<IP\>)
	OK

1.1.16.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.16.4 Defined Values

\<Socket_ID\>:A unique number that identifies a connection (provided by the terminal application).

1,2,3,4,5,6 - Valid socket number

7 - Valid socket number dedicated to +MPING, +MIPDNS, +MIPNTP.

If set Socket_ID parameter only, clear the DNS server IP, but when set two parameters, another DNS server IP don't clear.

\<Primary_DNS_server_IP\>,\<Secondary_DNS_server_IP\>: String type. IP of the destination site in the format "AAA.BBB.CCC.DDD". The range of each octant is 0-255. The value can be written in 1, 2, or 3 digits.

1.1.17+MSV6DNS, Set DNS IPV6 Address

1.1.17.1 Description

This command set/read DNS (Domain Name Server) IPV6 address (primary/secondary) for each socket. If the user doesn't specify DNS servers by AT+MSV6DNS, Module will use default DNS from NW. The defined value(s) will be saved during disconnect PDP context (can be used in next PDP context), but will

reset after power cycle.

1.1.17.2 Syntax

Command	Response/Action
+MSV6DNS=<Socket_ID>[,<Primary_DNS_server_IP>[,<Secondary_DNS_server_IP>]]	OK or ERROR
+MSV6DNS?	+MSV6DNS: 1,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSV6DNS: 2,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSV6DNS: 3,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSV6DNS: 4,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSV6DNS: 5,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSV6DNS: 6,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> +MSV6DNS: 7,<Primary_DNS_server_IP>,<Secondary_DNS_server_IP> OK
+MSV6DNS=?	+MSV6DNS: (List of supported <Socket_id>s),(<IP>),(<IP>) OK

1.1.17.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.17.4 Defined Values

<Socket_ID>: A unique number that identifies a connection (provided by the terminal application).

1,2,3,4,5,6 - Valid socket number

7 - Valid socket number dedicated to +MPING, +MIPDNS, +MIPNTP.

If set Socket_ID parameter only, clear the DNS server IP, but when set two parameters, another DNS server IP don't clear.

<Primary_DNS_server_IP>, <Secondary_DNS_server_IP>: String type. The IPV6 address format is

"X:X:X:X:X:X:X:X", where each X represents 16b in the address, expressed in hexadecimal, for example:

"ABCD:EF01:2345:6789:ABCD:EF01:2345:6789"

1.1.18 +MIPODM, Open a Socket (UDP or TCP) in Online Data Mode

1.1.18.1 Description

This command causes the Module to initialize a new socket that waits for a connection from a remote machine or opens a common or TCP connection with a remote side (according to received parameters) and switch it to Online (raw data transfer) Data Mode and open a connection with a remote side.

⚠️ **Notes:**

MIPxxx is a complete set of GPRS commands. This set should not be used with other GPRS commands, such as CGATT, CGACT, and so on. Online Data Mode allows the user to transfer raw data from terminal to Network and vice versa over a GPRS channel. Currently, only RS232 connection to terminal with hardware flow control is supported.

Each socket allocates an accumulating buffer whose size is 1372 bytes(1372 byte is for 2G module, 8192 byte is for 3G/4G module). When the user sends amount of data, less then buffer size, the data is being sent to Network after a spooling timeout (200 ms is for 2G module, and 50ms is for 3G/4G module), otherwise the data is being sent to Network immediately. Only one socket is allowed at the same time in Online Data Mode.

1.1.18.2 Syntax

The +MIPODM command returns a +MIPSTAT <Socket_ID><Status> unsolicited event if it fails. For example, if it was rejected by the remote side.

Command	Response/Action
+MIPODM=<Socket_ID>,[<Source Port>],<Remote IP>,<Remote Port>,<Protocol>[,<Pseudo-Command Mode On/Off>]	OK +MIPODM: <Socket_ID>,<State>[,<Remote IP>,<Remote Port>] or

Command	Response/Action
	OK
	+MIPSTAT: <Socket_ID>,<Status>
	or
	ERROR
+MIPODM?	+MIPODM: [list of free <Socket_ID>s]
	OK
	for each socket that can be opened
	or
	+MIPODM: 0
	OK
	if there are no free sockets.
+MIPODM=?	+MIPODM: (list of supported <Socket_ID>s),(list of supported <source port>s),(<IP/URL>),(list of supported <Remote Port>s),(list of supported <protocol>s), (list of supported <Pseudo-Command Mode state>s)
	OK

1.1.18.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	No	Yes	< 1s

1.1.18.4 Defined Values

<Socket_ID>:A unique number that identifies a connection.Valid socket numbers - 1,2,3,4,5 and 6.

<Source Port>:Port of source site.Port range: 0-65535 (decimal digits).

<Remote IP>: String type. The address of IPV4 or IPV6.

IP: IP of the remote site in the format "AAA.BBB.CCC.DDD". The range of each octet is 0-255. The value can be written in 1, 2, or 3 digits.

Host-name of remote site: The host-name convention should meet the rules as describe in RFC-1035 section: 2.3 Conventions. Syntax is not validated, except the maximum length (255 characters).

IPV6:   The IPV6 address format is "X:X:X:X:X:X:X:X", where each X represents 16b in the address, expressed in hexadecimal, for example: "ABCD: EF01: 2345: 6789: ABCD: EF01: 2345: 6789"

<Remote Port>:Port of remote site.

Port range: 1-65535 (decimal digits) for outgoing connection.

⚠️ Notes:

The Set command returns <Remote IP> and <Remote Port> parameters only for sockets opened in Listen mode.

It does not recommend using port numbers below 1024. These numbers are defined to be reserved for operating systems.

<Protocol>: integer type and range 0-2 and 60-62.

Type of protocol stack.

0   TCP of IPV4

1   UDP of IPV4

2   SSL of IPV4

60 TCP of IPV6

61 UDP of IPV6

62 SSL of IPV6

<State>: integer type and range 0-1

0   inactive

1   active

<Pseudo-Command Mode On/Off>: integer type and range 0-1.

Optional parameter enables / disables Pseudo Command Mode when ODM executed and Module is in PREMUX state.

0   Enable (default value, when Module is in PREMUX state)

1   Disable

<Status>: integer type and range 0-2

0   ACK indication

1   Broken protocol stack

2   Connection closed automatically due to non – fatal alert

1.1.19+MIPXOFF, Flow Control - Xoff

1.1.19.1 Description

This command is the unsolicited response that the Module sends to the terminal to stop sending data until it receives the +MIPXON command, when it does not have enough memory to process new +MIPSEND requests. The Module uses the accumulating buffer prior to pushing data into the protocol stack. This memory resource is protected by a Xoff_upper watermark.

1.1.19.2 Syntax

Command	Response/Action
Unsolicited Response	+MIPXOFF: <Socket_ID>

1.1.19.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.19.4 Defined Values

<Socket_ID>:A unique number that identifies a connection.Valid socket numbers - 1,2,3,4,5 and 6.

1.1.20+MIPXON, Flow Control - Xon

1.1.20.1 Description

This command is the unsolicited event that the Module sends to the terminal when it detects that it has free memory in the accumulating buffer and can process new +MIPSEND requests, after the +MIPXOFF event.

1.1.20.2 Syntax

Command	Response/Action
Unsolicited Response	+MIPXON: <Socket_ID>

1.1.20.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.20.4 Defined Values

<Socket_ID>:A unique number that identifies a connection.Valid socket numbers - 1,2,3,4,5 and 6.

1.1.21+MIPDNS, Resolve Domain name

1.1.21.1 Description

This command is used to resolve the domain name.

1.1.21.2 Syntax

Command	Response/Action
+MIPDNS=<domain name>[,<address type>]	+MIPDNS: <domain name>,<IP> OK or ERROR

1.1.21.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.21.4 Defined Values

<domain name>: String type. domain name to resolve.

<address type>:The type of the domain name.The default value is 0.

- 0: IPV4 address
- 1: IPV6 address
- 2 IPV4/IPV6 address

<IP>: resolved IPV4 or IPV6 address (string without double quotes).

1.1.22+MIPNTP, Synchronize the local time via NTP

1.1.22.1 Description

This command causes the Module to synchronize the local time from the NTP time server.

1.1.22.2 Syntax

Command	Response/Action
+MIPNTP=<Remote_IP>,<Remote_Port>[, <address type>]	OK +MIPNTP: <Result> or ERROR
+MIPNTP?	+MIPNTP: <Remote_IP>,<Remote_Port> OK
+MIPNTP=?	+MIPNTP: (list of supported <Remote_IP>s),(list of supported <Remote_Port>s) OK

1.1.22.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	No	Yes	< 1s

1.1.22.4 Defined Values

<Remote_IP>: String type. The address of the NTP time server which could be a dotted decimal IP or a domain name.

<Remote_Port>:The port of the NTP time server.Port range: 1-65535 (decimal digits)

<address type>:The type of the NTP time server.The default value is 0.

　　0:　IPV4

　　1:　IPV6

<Result>:int type and range is 0-1.

　　0:　Fail to synchronize to local time.

　　1:　Successfully synchronize the local time;

1.1.23+MIPREAD, Receive data from buffer

1.1.23.1 Description

This command receives data from buffer. Before executing this command, you must run the

AT+GTSET="IPRFMT",5 command to open the receiving cache mode.

1.1.23.2 Syntax

Command	Response/Action
+MIPREAD=<Socket_ID>,<ReadDataLen>	+MIPDATA: <Socket_ID>,<ActualReadDataLen> <DATA> OK or +MIPREAD: <Socket_ID>,0 OK or ERROR
+MIPREAD?	OK or +MIPREAD: <Socket_ID>,<ActualDataLen> OK

1.1.23.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.1.23.4 Defined Values

<Socket_ID>:A unique number that identifies a connection.Valid socket numbers - 1,2,3,4,5 and 6.

<ReadDataLen>: Data length to read.

<ActualReadDataLen>: Data length actually read.

<DATA>: Data output.

<ActualDataLen>: Data length unread.

1.1.24+MIPDATA, Data Indication in Pseudo-Command Mode

1.1.24.1 Description

For ODM socket, if any data received from server and module stay in Pseudo-Command Mode (+++ switch). These data will be buffered in the module and send this unsolicited code to the terminal. When module return to ODM mode by ATO command, the data buffered in module during Pseudo-Command Mode will be send to the terminal immediately.

1.1.24.2 Syntax

Command	Response/Action
Unsolicited Response	+MIPDATA: <Socket_ID>,<length>

1.1.24.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
NA	NA	NA	NA	NA

1.1.24.4 Defined Values

<Socket_ID>: A unique number that identifies a connection.Valid socket numbers - 1,2,3,4,5 and 6.

<length>: The size of received data.

1.2 HEX Mode

Base on the basic mode, Module achieve the TCP/IP stack by AT command. In additional, Module supports another mechanism to complete the TCP/IP stack in HEX mode. The data will be sending in HEX when we use +MIPSEND command.

1.2.1 +MIPSEND (Ctrl-Z)

1.2.1.1Description

This command cause data will be sending in HEX. After command received, Module will respond "><CR><LF>". Send any data in HEX. The data buffer range is 0<=buffer<=2048 bytes.<CTRL+Z> ends the prompt HEX mode and returns to regular AT command mode.

1.2.1.2Syntax

Command	Response/Action
+MIPSEND=<Socket_ID>	OK +MIPPUSH: <Socket_ID>,<Status> +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK (Depends on TCP Protocol) or OK +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK (Depends on UDP Protocol) or ERROR

1.2.1.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.2.1.4 Defined Values

<Socket_ID>:Socket id.1< = Socket_ID <= 6.

<Status>: integer type and range 0-2

    0   Success

    1   socket is flowed off

    2   there is no data in socket to send

<FreeSize>: Free space in current buffer. Free size is calculated from the 2048.

       0<= Free Size <= 2048.

![Fibocom logo]

1.2.2 +MIPSEND (Timeout)

1.2.2.1 Description

This command cause data will be sending in HEX. After command received, Module will respond

"><CR><LF>". Send any data without encode. The data buffer range is 0<=buffer<=2048 bytes. After

timeout, the data will be push automatic and returns to regular AT command mode.

The default timeout is 12s.

1.2.2.2 Syntax

Command	Response/Action
+MIPSEND=<Socket_ID>	OK +MIPPUSH: <Socket_ID>,<Status> +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK (Depends on TCP Protocol) or OK +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK (Depends on UDP Protocol) or ERROR

1.2.2.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 12s

1.2.2.4 Defined Values

<Socket_ID>:Socket id.1<= Socket_ID <=6.

<Status>: integer type and range 0-2

    0   Success

1   socket is flowed off

2   there is no data in socket to send

<FreeSize>: Free space in current buffer. Free size is calculated from the 2048.

        0<=Free Size <=2048.

1.2.3 +MIPSEND (Data length)

1.2.3.1 Description

This command cause data will be sending in HEX. After command received, Module will respond

"><CR><LF>". Send any data in HEX. The data buffer range is 0<=data_len<=2048 bytes. When Module

receive the corresponding length data, the data will be push automatic and returns to regular AT

command mode.

Notes: The redundant data will be lost.

1.2.3.2 Syntax

Command	Response/Action
+MIPSEND=<Socket_ID>,<Data_len>	OK +MIPPUSH: <Socket_ID>,<Status> +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK (Depends on TCP Protocol) or OK +MIPSEND: <Socket_ID>,<Status>,<FreeSize> OK (Depends on UDP Protocol) or ERROR

1.2.3.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	No	Yes	Yes	< 1s

1.2.3.4 Defined Values

<Socket_ID>:Socket id.1< = Socket_ID <= 6.

<Status>: integer type and range 0-2

    0   Success

    1   socket is flowed off

    2   there is no data in socket to send

<FreeSize>: Free space in current buffer. Free size is calculated from the 2048.

    0<= Free Size <= 2048.

1.2.4 +GTSET, HEX mode configuration

1.2.4.1 Description

This command cause data will be sending in HEX.

1.2.4.2 Syntax

Command	Response/Action
+GTSET=<future>,<value>	OK or ERROR

1.2.4.3 Attributes

Pin Restricted	Persistent	Sync Mode	Effect Immediately	Time of duration
Yes	Yes	Yes	Yes	< 1s

1.2.4.4 Defined Values

1) <future>: "SENDTIME": Set the auto push timeout.

   <value>: 1-30 seconds.The default value is 12.

2) <future>: "IPRFMT": The format of received data.

   <value>: integer type and range 0、1、2、5

    0   Received data with "+MIPRTCP:" or "+MIPRUDP:" and the data is encoded.

1   Received data only and the data are without encoded. In received character string, Module doesn't accede to any <CR><LF> symbol.

2   Received data with "+MIPRTCP:" or "+MIPRUDP:" and the data is without encoded. Inreceived character string, Module will accede to <CR><LF> before"+MIPRTCP:" or "+MIPRUDP:".

5   Data read mode

The default value is 0.

2 Error Code

2.1 CME Error

Parameter	Description
<Err>	0, "phone failure"
	1, "no connection to phone"
	2, "phone-adaptor link reserved"
	3, "operation not allowed"
	4, "operation not supported"
	5, "PH-SIM PIN required"
	6, "PH-FSIM PIN required"
	7, "PH-FSIM PUK required"
	10, "SIM not inserted"
	11, "SIM PIN required"
	12, "SIM PUK required"
	13, "SIM failure"
	14, "SIM busy"
	15, "SIM wrong"
	16, "incorrect password"
	17, "SIM PIN2 required"
	18, "SIM PUK2 required"
	19, "incorrect PUK1"
	20, "memory full"
	21, "invalid index"

Parameter	Description
	22, "not found"
	23, "memory failure"
	24, "text string too long"
	25, "invalid characters in text string"
	26, "dial string too long"
	27, "invalid characters in dial string"
	30, "no network service"
	31, "network timeout"
	32, "network not allowed - emergency calls only"
	40, "network personalisation PIN required"
	41, "network personalisation PUK required"
	42, "network subset personalisation PIN required"
	43, "network subset personalisation PUK required"
	44, "service provider personalisation PIN required"
	45, "service provider personalisation PUK required"
	46, "corporate personalisation PIN required"
	47, "corporate personalisation PUK required"
	48, "hidden key required" (NOTE: This key is required when accessinghidden phonebook entries.)
	49, "EAP method not supported"
	50, "Incorrect parameters"
	100, "unknown"
	103, "Illegal MS"
	106, "Illegal ME"
	107， "GPRS services not allowed"
	111， "PLMN not allowed"
	112, "location area not allowed"
	113, "roaming not allowed in this location area"
	114, "GPRS services not allowed in this PLMN"
	116, "MSC temporarily not reachable"
	117, "Network failure"
	132, "Service not supported"
	133, "Service not subscribed"

Parameter	Description
	134, "service option temporarily out of order"
	135, "NS-api already used"
	148, "Unspecified GPRS error"
	149, "PDP authentication error"
	150, "invalid mobile class"
	244, "Attach failure"
	257, "Invalid error mapping"
	258, "APN not listed in APN Control List (ACL)"
	701, "incorrect security code"
	702, "max attempts reached"
	1001, "Unassigned (unallocated) number"
	1003, "No route to destination"
	1006, "Channel unacceptable"
	1008, "Operator determined barring"
	1016, "Normal call clearing"
	1017, "User busy"
	1018, "No user responding"
	1019, "User alerting, no answer"
	1021, "Call rejected"
	1022, "Number changed"
	1026, "Non selected user clearing"
	1027, "Destination out of order"
	1028, "Invalid number format (incomplete number)"
	1029, "Facility rejected"
	1030, "Response to STATUS ENQUIRY"
	1031, "Normal, unspecified"
	1034, "No circuit/channel available"
	1038, "Network out of order"
	1041, "Temporary failure"
	1042, "Switching equipment congestion"
	1043, "Access information discarded"
	1044, "requested circuit/channel not available"
	1047, "Resources unavailable, unspecified"

Parameter	Description
	1049, "Quality of service unavailable"
	1050, "Requested facility not subscribed"
	1055, "Incoming calls barred within the CUG"
	1057, "Bearer capability not authorized"
	1058, "Bearer capability not presently available"
	1063, "Service or option not available, unspecified"
	1065, "Bearer service not implemented"
	1068, "ACM equal to or greater than ACMmax"
	1069, "Requested facility not implemented"
	1070, "Only restr. digital information bearer capability"
	1079, "Service or option not implemented, unspecified"
	1081, "Invalid transaction identifier value"
	1087, "User not member of CUG"
	1088, "Incompatible destination"
	1091, "Invalid transit network selection"
	1095, "Semantically incorrect message"
	1096, "Invalid mandatory information"
	1097, "Message type non-existent or not implemented"
	1098, "Message type not compatible with protocol state"
	1099, "Information element non-existent or not implemented"
	1100, "Conditional IE error"
	1101, "Message not compatible with protocol state"
	1102, "Recovery on timer expiry"
	1111, "Protocol error, unspecified"
	1127, "Interworking, unspecified"
	1279, "Number not allowed"
	1283, "CCBS possible"

2.2 CMS Error

Parameter	Description
<Err>	1, "Unassigned (unallocated) number"
	8, "Operator determined barring"

Parameter	Description
	10, "Call barred"
	17, "Network failure"
	21, "Short message transfer rejected"
	22, "Memory capacity exceeded"
	27, "Destination out of service"
	28, "Unidentified subscriber"
	29, "Facility rejected"
	30, "Unknown Subscriber"
	38, "Network out of order"
	41, "Temporary failure"
	42, "Congestion"
	47, "Resources unvailable, unspecified"
	50, "Requested facility not subscribed"
	69, "Requested facility not implemented"
	81, "Invalid short message reference value"
	95, "Invalid message, unspecified"
	96, "Invalid mandatory information"
	97, "Message type non-existent or not implemented"
	98, "Message not compatible with short message protocol state"
	99, "Information element non-existent or not implemented"
	111, "Protocol error, unspecified"
	127, "Interworking unspecified"
	128, "Telematic interworking not supported"
	129, "Short message type 0 not supported"
	130, "Cannot replace short message"
	143, "Unspecified TP-PID error"
	144, "Data coding scheme (alphabet) not supported"
	145, "Message class not supported"
	159, "Unspecified TP-DCS error"
	160, "Command cannot be actioned"
	161, "Command unsupported"
	175, "Unspecified TP-Command error"
	176, "TPDU not supported"

Parameter	Description
	192, "SC busy"
	193, "No SC subscription"
	194, "SC system failure"
	195, "Invalid SME address"
	196, "Destination SME barred"
	197, "SM Rejected-Duplicate SM"
	198, "TP-VPF not supported"
	199, "TP-VP not supported"
	208, "SIM SMS storage full"
	209, "No SMS storage capability in SIM"
	210, "Error in MS"
	211, "Memory Capacity Exceeded"
	212, "SIM Application Toolkit Busy"
	213, "SIM data download error"
	224, "TP_FCS_APPL_ERR_START"
	254, "TP_FCS_APPL_ERR_STOP"
	255, "TP_FCS_UNSPECIFIED"
	300, "ME failure"
	301, "SMS service of ME reserved"
	302, "operation not allowed"
	303, "operation not supported"
	304, "Invalid PDU mode param"
	305, "invalid text mode parameter"
	310, "SIM not inserted"
	311, "SIM PIN required"
	312, "PH-SIM PIN necessary"
	313, "SIM failure"
	314, "SIM busy"
	315, "SIM wrong"
	317, "SIM PIN2 required"
	318, "SIM PUK2 required"
	319, "incorrect PUK1"
	320, "memory failure"

Parameter	Description
	321, "invalid memory index"
	322, "memory full"
	330, "SMSC address unknown"
	331, "no network service"
	332, "network timeout"
	340, "no +CNMA acknowledgement expected"
	512, "MN_SMS_RP_ACK"
	513, "MN_SMS_TIMER_EXPIRED"
	514, "MN_SMS_FORW_AVAIL_FAILED"
	515, "MN_SMS_FORW_AVAIL_ABORTED"
	516, "MS invalid TP-Message-Type-Indicator"
	517, "MS no TP-Status-Report in Phase 1"
	518, "MS no TP-Reject-Duplicate in Phase 1"
	519, "MS no TP-Reply-Path in Phase 1"
	520, "MS no TP-User-Data-Header in Phase 1"
	521, "MS missing TP-Validity-Period"
	522, "MS invalid TP-Service-Centre-Time-Stamp"
	523, "MS missing TP-Destination-Address"
	524, "MS invalid TP-Destination-Address"
	525, "MS missing Service-Centre-Address"
	526, "MS invalid Service-Centre-Address"
	527, "MS invalid alphabet"
	528, "MS invalid TP-User-Data-Length"
	529, "MS missing TP-User-Data"
	530, "MS TP-User-Data too long"
	531, "MS no Command-Request in Phase 1"
	532, "MS Cmd-Req invalid TP-Destination-Address"
	533, "MS Cmd-Req invalid TP-User-Data-Length"
	534, "MS Cmd-Req invalid TP-User-Data"
	535, "MS Cmd-Req invalid TP-Command-Type"
	536, "MN MNR creation failed"
	537, "MS CMM creation failed"
	538, "MS network connection lost"

Parameter	Description
	539, "MS pending MO SM transfer"
	540, "RP-Error OK"
	541, "RP-Error OK no icon display"
	542, "SMS-PP Unspecified"
	543, "SMS rejected By SMS CONTROL"

2.3 TCP/IP Error

Parameter	Description
<Err>	2000, "TCPIP Param wrong "
	2001, "TCPIP not supported in ppp mode"
	2002, "TCPIP dns convert to ip fail"
	2003, "TCPIP socket number limited"
	2004, "TCPIP invalid operation"
	2005, "TCPIP protol error"
	2006, "TCPIP send data too long"
	2007, "TCPIP send data memory failed"
	2008, "TCPIP service not in correct state "
	2009, "TCPIP pdp not defined "
	2010, "TCPIP new socket failed"
	2011, "TCPIP socket bind fail"
	2012, "TCPIP socket connect fail"
	2013, "TCPIP socket send fail "
	2014, "TCPIP socket close fail"
	2015, "TCPIP get socket receive buffer failed"
	2016, "TCPIP receive data failed"
	2017, "TCPIP socket used"
	2018, "TCPIP get send buffer size failed"
	2019, "TCPIP socket send data failed"
	2020, "TCPIP socket send data size limited"
	2021, "TCPIP socket set listening mode failed"
	2022, "TCPIP socket listen fail"

Parameter	Description
	2023, "TCPIP socket error"
	2024, "TCPIP socket not opened "
	2025, "TCPIP tcp stack confige failed"
	2026, "TCPIP socket no data to send "
	2027, "TCPIP socket send invalid data state"
	2028, "TCPIP socket close client"
	2029, "TCPIP ping error "
	2030, "TCPIP ppp not connected "
	2031, "TCPIP mipcall not active"
	2032, "TCPIP etcpip not active"
	2033, "TCPIP not def4 "