

G30 AT Commands Reference Guide

80389ST10087a Rev.0 - 2011-05-12



APPLICABILITY TABLE

PRODUCT
G30



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1.4. Text Conventions



Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

- G30 Module Hardware Description
- G30 Developer's Kit

1.6. General Safety

1.6.1. Remember! . . . safety depends on you!

The following general safety precautions must be observed during all phases of operation, service, and repair of the equipment described in this manual. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment. Motorola, Inc. assumes no liability for the customer's failure to comply with these requirements. The safety precautions listed below represent warnings of certain dangers of which we are aware. You, as the user of this product, should follow these warnings and all other safety precautions necessary for the safe operation of the equipment in your operating environment.

1.6.2. Ground the instrument

To minimize shock hazard, the equipment chassis and enclosure must be connected to an electrical ground. If the equipment is supplied with a three-conductor AC power cable, the power cable must be either plugged into an approved three-contact electrical outlet or used



with a three-contact to two-contact adapter. The three-contact to two-contact adapter must have the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable must meet International Electrotechnical Commission (IEC) safety standards.

1.6.3. Do not operate in an explosive atmosphere

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

1.6.4. Do not service or adjust alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid is present.

1.6.5. Keep away from live circuits

Operating personnel must:

- not remove equipment covers. Only Factory Authorized Service Personnel or other qualified maintenance personnel may remove equipment covers for internal subassembly, or component replacement, or any internal adjustment
- not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed
- always disconnect power and discharge circuits before touching them

1.6.6. Do not substitute parts or modify equipment

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification of equipment. Contact Motorola Warranty and Repair for service and repair to ensure that safety features are maintained.

1.6.7. Dangerous procedure warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed. You should also employ all other safety precautions that you deem necessary for the operation of the equipment in your operating environment.

Warning example:

WARNING:

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling, testing, and adjusting.

1.7. Limitation of Liability

The Products are not designed, intended, or authorized for use as components in systems



2. Product Features

2.1. Connectivity Interface

The user can establish one type of connection in order to establish an AT command session with the G30:

- RS232 connection

2.2. GPRS Operation

2.2.1. Overview

The GPRS allows the service subscriber to send and receive data in an end-to-end packet-transfer mode, without utilizing network resources in circuit-switched mode.

2.2.2. Features and Benefits

GPRS enables the cost-effective and efficient use of network resources for packet mode data applications:

- Always connected.
- No setup time before data transmission.
- Cost change based on current data communication (not time based).

2.2.3. Technical Description (GPRS – Class B Operation)

The G30 is attached to both GPRS and other GSM services, but can only operate one set of services at a time (GPRS or CSD).

The G30 can activate a GPRS context and at the same time be alerted for an incoming CSD call.

This functionality is available on the G30 single serial line by either of two procedure options:

Option 1:

1. While in GPRS, listen to the RI signal (RS232) for an incoming CSD call ring.
2. Upon being interrupted by the RI signal, drop the DTR line to switch to command mode (depending on the previous DTR configuration: AT&D).
3. Answer the call (suspending the GPRS session).
4. At the end of the call, pull the DTR to resume the GPRS session.

Option 2:

- Use the MUX protocol for virtual channels support

2.3. CSD Operation

2.3.1. Overview

GSM CSD bearer service, the most widely used data service, provides both a transparent and



non-transparent (error correction and flow control) data rate of 9.6 kbit/s. Data transfer over Circuit Switched Data (CSD) is possible. Once the connection is established, data can be transferred to and from the remote side. The user should take the CSD call setup time into account. Network operators charge the user for the call time regardless of data usage.

2.3.2. Features and Benefits

CSD operation enables the terminal to perform a data transfer over a circuit switched link. It enables the user to:

- Connect to a remote modem without any Internet network involvement.
- Own a real IP address and enable its access by connecting to an external ISP. The following are examples of standard CSD call uses:
 - Connecting an Internet Service Provider (ISP).
 - Remotely accessing corporate Intranet via Remote Access Server (RAS).
 - User specific protocol, where the user defines both the remote and local sides.

2.3.3. Technical Description

GSM network operators typically support the non-transparent CSD bearer service through a modem interworking function. This means that a G30 initiates a data call and the network routes the call to the modem interworking function, which is located at the Mobile Switching Center (MSC) of the GSM network. The modem interworking function then dials the number supplied by the mobile station.

This is different from voice calls, where the GSM network itself routes the call, often to another mobile station on the same network. The GSM network does not route data calls - it dials the requested number on behalf of the mobile station and leaves the routing to the external wireline telephone network. The main reason for this is that the GSM network has information about what the user wants to do with the data call. For example, the user may be contacting his or her Internet Service Provider (ISP) to send email or dialing the corporate Intranet to set up a virtual private network (VPN) connection to retrieve confidential customer information from a company database.

2.4. Improved OEM Features

G30 contains the following new and improved features:

- SIM Application Toolkit (STK)
- TCP/IP support
- Audio (digital and analog) - path, gain and algorithm
- User-defined profiles

For a full list of G30 features, refer to the G30 Module Hardware Description manual.

2.4.1. SIM Application Toolkit (STK)

2.4.1.1. Overview

The SIM Toolkit (STK, also known as the SIM Application Toolkit or SAT) is a set of applications operated by the network provider (usually the module's SIM provider). If the STK is supported and enabled on the mobile side, specific data can be obtained via menu



browsing.

2.4.1.2. Features and Benefits

The G30 STK enables the terminal to obtain information via menus created by the provider, for example, "local news" or "weather info". These menus are provider dependent. Enabling the STK allows the provider to perform other actions regarding call control, SMS etc.

2.4.1.3. Technical Description

The STK supports the specific mechanism(s) that SIM applications require to interact and operate with the G30. Using this mechanism, the SIM can notify the terminal, via the G30, that a specific action is requested. A full list of supported actions is listed in the Proactive SIM section. For more information regarding the STK mechanism, refer to the GSM 11.11 [20], GSM 11.14 ETSI standards.

2.4.1.4. Profile Download

Profile downloading provides a mechanism for the G30 to transmit information describing its capabilities to the SIM. During the early, profile download phase of the protocol, the G30 negotiates and confirms its ability to support the capabilities requested by the STK.

2.4.1.5. Data Transfer into the SIM

STK data transfer uses the short message service (SMS) as a transfer layer.

2.4.1.6. Set up Idle Mode Text

The proactive SIM mechanism enables the SIM to initiate actions to be handled by the G30. Using this service, the SIM can inform the G30 that it has information pending for action. The SIM can issue a variety of protocol commands through this mechanism, for example:

- Displaying text
- Sending a short message
- Setting up a voice call to a number held by the SIM
- Setting up a data call to a number whose bearer capabilities are held by the SIM
- Sending an SS control or USSD string
- Playing a tone
- Initiating a dialogue with the user (get inkey, get input)
- Providing local information from the G30 to the SIM
- Profile download
- Send DTMF
- Set up idle text mode
- Launch browser
- Set up event list

2.4.1.7. Menu Selection

The SIM supplies a set of possible menu entries via a proactive SIM command. The menu selection mechanism is used to transfer the SIM application menu item selected by the user to the SIM and then via SMS to the provider.



2.4.1.8. Call Control by SIM

When this service is activated by the SIM, all dialed digit strings, supplementary service control strings and USSD strings are first passed to the SIM before the G30 sets up the call, the supplementary service operation or the USSD operation. The SIM has the ability to allow, disable or modify the call. The STK has the ability to replace a call request, a supplementary service operation or a USSD operation with another call, for example, a call request by the G30 can be diverted to a different destination.

2.4.2. STK

2.4.3. TCP/UDP IP Connection

2.4.3.1. Overview

The network capabilities are achieved by using different layers of connections. Every layer of connections provides basic connections to the layer above it. The higher the layer is, the more capabilities it can provide.

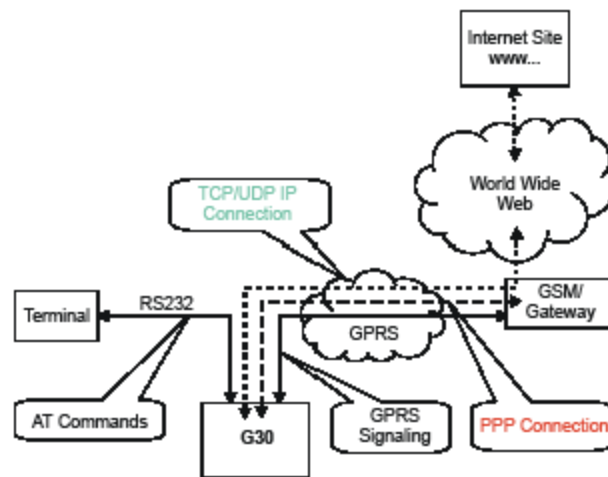


Figure 2-1: System Overview

The three layers of connections are:

- Physical links
- Point-to-point links
- TCP/UDP links

2.4.3.2. TCP/IP

When establishing the TCP/IP connection the G30 can only be the "initiator". The TCP/IP feature enables the G30 to be a wireless end point for a TCP/IP socket.

NOTE:



The TCP protocol use the value TTL (Time to live) = 64.

2.4.3.3. Creating TCP/IP Connections

Connection from the G30 to the Web

The following occurs when creating a TCP/IP connection from the G30 to the Web:

1. The G30 connects to the GPRS network and receives an IP address (using the +MIPCALL command).
2. The G30 opens a TCP/IP stack as one of its "sockets" (it must know the target's IP address and port number).
3. Once the connection is established, data is transferred freely in both directions (upload and download).

Connection with another G30 using the network connection dialer.

The following occurs when creating a TCP/IP connection with another G30 using the network connection dialer:

1. The OEM on the target side (server) uses the connection application. When using this application the TCP/IP is external to the OEM. (External TCP stack is used).
2. The target side activates the "server application" (The term "server application" means an application that has the ability to listen on a given IP address and port number).
3. After connecting to the GPRS network, the "server" sends its IP address to the G30 using an alternative connection (for example, CSD, SMS and so on).
4. The server application listens on a known port, waiting for G30 to connect.
5. The G30 connects to the same GPRS network as the server, and receives an IP address (using the +MIPCALL command).
6. The G30 initiates a TCP/IP connection with the listening "server". (It knows the IP address and port number of the server).
7. Once the server is connected, the TCP/IP connection is created and data can be transferred freely in both directions (upload and download).

2.4.3.4. UDP/IP

The set of AT commands created for the TCP/IP connection is used for the UDP/IP connection as well. Therefore, UDP/IP must open a UDP stack using the MIPOPEN AT command. The connection created does not change any concept regarding the UDP/IP known protocol (which is connectionless), this is just an easy way for the terminal to specify to the G30 which of the four possible stacks should be used.

When establishing the UDP/IP connection, the G30 is both the "initiator" and the "listener".

2.4.3.5. Creating UDP/IP Connections

Connection with another G30

The following occurs during a UDP/IP connection with another G30:

1. Side A:
 - The G30 connects to the GPRS network and receives an IP address (using the +MIPCALL command).
 - The G30 opens a UDP/IP stack as one of its "sockets" (using the +MIPOPEN and selecting the protocol UDP).



2. Side B:
 - The G30 connects to the GPRS network and receives an IP address (using the +MIPCALL command).
 - The G30 opens a UDP/IP stack as one of its "sockets" (using the +MIPOPEN and selecting the protocol UDP).
3. Side A and B previously agree on a port number, and exchange their given IP addresses via other means of connection (SMS, CSD, Voice, DB and so on).
4. The G30 sends and receives data to and from the targeted site as it knows the IP address and port number of the target.
5. Sending (accumulating) data is done using the +MIPSEND command.
6. Actual send is done using the +MIPPUSH command, by specifying the IP address and port number of the destination.

NOTE:

Every +MIPPUSH sets the destination IP address and destination port number for the current and future transactions. These values are used for the next push if not explicitly overwritten.

Connection from the G30 (client/server) to WEB (client/server)

The following occurs when creating a UDP/IP connection from the G30 (client/server) to WEB (client/server):

1. Client side:
 - The G30 client connects to the GPRS network and receives an IP address (using the +MIPCALL command).
 - The G30 opens a UDP/IP stack as one of its "sockets" (using the +MIPOPEN and selecting the protocol UDP).
2. The G30 sends data to the Website, as the Web site's IP address is known and is public, and the port number is previously agreed upon.
3. Sending (accumulating) data is done by the +MIPSEND command.
4. Actual send is done by the +MIPPUSH command by specifying the Website IP address and Website port number.
5. Server side:
 - After receiving the first packet from the client, the server knows the IP address and port number of the G30.
 - The IP address and port number for the specific mobile G30 should be saved in the DB.

NOTE:

Every +MIPPUSH sets the destination IP address and destination port number for the current and future transactions. These values are used for the next push if not explicitly overwritten.

2.4.4. Online Data Mode (ODM)

The Online Data Mode (ODM) feature, allows the user to transfer raw data (without using the +MIPSEND and +MIPPUSH commands) between G30 and a Network. The data transfers via established network connection (socket), based on internal TCP or UDP protocol stack. RS232 connection between G30 and terminal with Hardware flow control is required for the feature execution.

A special AT Command +MIPODM (instead of +MIPOPEN) is used to open a socket in Online Data Mode. The command provides a set of parameters for the feature configuration



and corrects performance, see "+MIPODM, Open a Socket (UDP or TCP) in Online Data Mode". When a socket is successfully opened in Online Data Mode, all data, comes from terminal, "as is" is being sent to Network and vice versa: all data, comes from Network, "as is" is being sent to terminal.

Each socket, opened in Online Data Mode, allocates an accumulating buffer whose size is 1372 bytes. When the user sends amount of data, less then the buffer size, the data is being sent to Network after a spooling timeout (200 mS), otherwise the data is being sent to Network immediately.

When ODM feature is executed, pseudo-command mode is enabled in PREMUX state and disabled in MUX state by default (see RS232 Multiplexer Feature). ODM feature allows the user to disable pseudo-command mode, when G30 is in PREMUX state by setting "pseudo-command mode enable/disable" parameter to "1" - see "+MIPODM, Open a Socket (UDP or TCP) in Online Data Mode". Disabled pseudo-command mode provides better data transfer performance.

When G30 is in MUX state and ODM feature executed, a pseudo-command mode is not supported.

The user can suspend an opened in Online Data Mode socket by entering, for example, ESC sequence (by default "+++") from terminal, when pseudo-command mode is enabled. In this case G30 switches to pseudo-command mode, allowing the user to enter AT commands from terminal. The ATO command used to resume Online Data Mode from pseudo-command mode. When a data comes from Network and G30 is in pseudo-command mode, a special unsolicited event (+MIPDATA) is being sent to terminal (see "+MIPDATA, Network Incoming Data Unsolicited Indication in Pseudo-command Mode").

When socket is in Online Data Mode (not in pseudo-command mode), RS232 communication DCD line is enabled.

There are two options to suspend a socket, opened in Online Data Mode, when G30 is in PREMUX state:

- Enter ESC sequence from terminal.
- Disable DTR line on RS232 communication port in case of AT&D1 parameter configuration. There are two options for valid closing of a socket, opened in Online Data Mode, when G30 is in PREMUX state:
 - Switch G30 to pseudo-command mode and enter +MIPCLOSE command with opened in Online Data Mode Socket ID.
 - Disable DTR line on RS232 communication port in case of A&D2 or AT&D3 parameter configuration.

When G30 is in MUX state, change of DTR or software DTR state on ODM MUX channel closes ODM session in case of A&D1, A&D2 or AT&D3.

When an error occurred with the socket, opened in Online Data Mode, the socket closes automatically and +MIPSTAT unsolicited response is being sent to terminal (see "+MIPSTAT, Status Report").

2.4.5. SSL

2.4.5.1. General Description

SSL (Secure Socket Layer) and its successor TLS (Transport Layer Security) are cryptographic protocols which provide endpoint authentication and communication privacy over the TCP / IP. There are slight differences between SSL 3.0 and TLS 1.0, but the protocol remains substantially the same. The term "SSL" as used here applies to both protocols unless



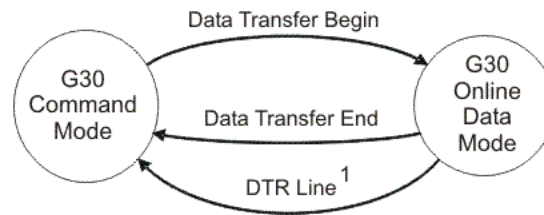


Figure 2-2:G30 Operation Modes Switching

NOTE:

¹AT&D settings = 2 or 3. The operation closes the actual FTP connection and switches G30 to command mode.

AT&D settings = 1 closes the DATA socket and leave the control FTP socket connected. Established FTP connection can be closed when G30 is in command mode by AT+FTPCLOSE command or by changing DTR line status from ON to OFF when data transfer operations are performed (G30 is in online data mode).

2.4.6.3. Manage Remote File System

When FTP connection is established, the user is able to manage file system on the remote FTP server, like create, remove, change directory, rename or delete a file. The following FTP commands are used for remote file system management purpose.

- +FTPCWD - changes the working directory on a remote server.
- +FTPMKD - creates a new directory on a remote server.
- +FTPRMD - removes existing directory on a remote server.
- +FTPPWD - returns actual working directory name from a remote server.
- +FTPCDUP - changes working directory on a remote server, up to parent directory.
- +FTPDEL - deletes a file on a remote server.
- +FTPREN - renames a file on a remote server.

2.4.6.4. File Transfer Operations

The file transfer operation allows the user to transfer a file over an established FTP connection. To avoid end-of-file detection problem for user in download case and for G30 in upload case, G30 implements a special format of transferred files over FTP connection. The format proposed "escaping" one of the ASCII symbols of a file context and using the "escaped" symbol as end-of-file marker. An escaping algorithm is described below.

The algorithm defines two special characters: EOF (end-of-file character) and ESC (escape character). EOF symbol is a hexadecimal 0x03 (decimal 3) ASCII ETX symbol and ESC symbol is a hexadecimal 0x10 (decimal 16) ASCII DLE symbol - not to be confused with the ASCII ESCape character.

To encode a file to FTP File Transfer Format, the user or G30 will read each data byte from the source file and will perform the following operations:

- When a data byte has the same code as EOF character, a two byte sequence of ESC and EOF characters is sent instead.
- When a data byte has the same code as ESC character, a two byte sequence of ESC and ESC characters is sent instead.
- When end of file is reached, EOF character is sent.



2.4.7. Audio

2.4.7.1. Overview

The audio (digital and analog) feature in the G30 module involves three main issues: path (routes the current input and output devices), gain (volume management) and algorithm. For more information, refer to “Audio”.

2.4.7.2. Features and Benefits

The following algorithm related features are provided:

2.4.7.3. Sidetone

Sidetone reduces the microphone audio input that is routed to the selected speaker so that the person speaking can hear himself or herself talking. This creates a slight echo because the speaker sound then gets picked up again by the microphone and is again routed to the speaker, and so on. Echo suppress is designed to take care of this echo.

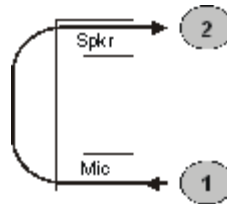


Figure 2-4:Sidetone

2.4.7.4. Echo Suppression

Echo suppression suppresses a large amount of the output sound picked up by the input device (cancels all echoes).



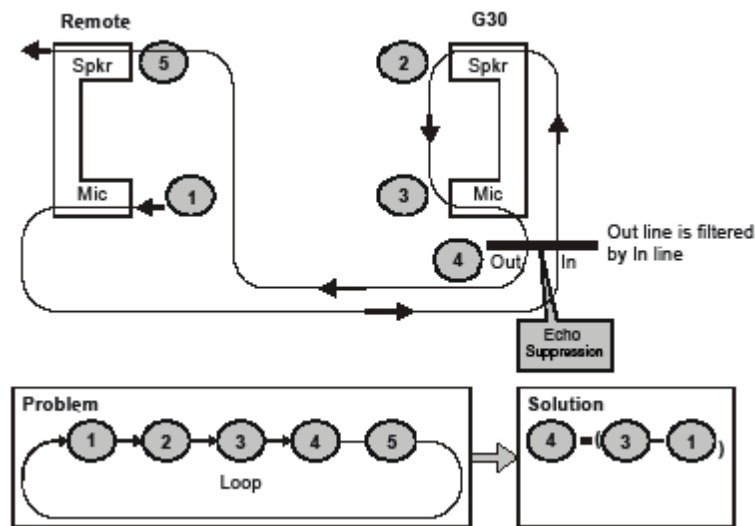


Figure 2-5:Echo Suppression

2.4.7.5. Noise Suppress

Noise suppression improves audio quality in all modes by suppressing environment noise from being picked up by the input device.

2.4.8. Technical Description

The path features provide full control over the navigation of the audio in the product.

The gain features provide full control over the volume levels of the different output accessories and tones.

The algorithm provides full control over activation/deactivation of audio quality features such as echo canceling and noise suppression.

The user can access these features by means of AT commands. These are described later in this document.

2.5. MUX Integration

2.5.1. Overview

The G30 is supplied with an internal GSM 7.10 protocol stack, also referred to as a multiplexer or MUX.

The G30 with multiplexer support utility provides the following capabilities:

- Provides the terminal with up to four virtual channels on one physical RS-232 connection.
- Provides simultaneous data (CSD/GPRS) and command (AT command set) services. In this way, many applications can use a single RS232 line via virtual channels. This enables a user to make network and phone service inquiries and maintain data communication at the same time.



These capabilities are illustrated in the following figure:

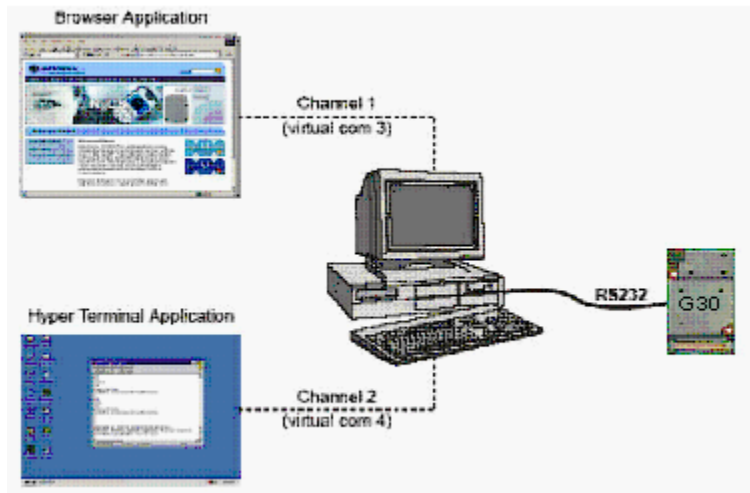


Figure 2-6: G30 with Multiplexer Support Capabilities

2.5.2. Features and Benefits

The G30 with the MUX feature ENABLES multiple channel operation and simultaneous data and control operation. For example, it allows a user to be connected to an Internet website (GPRS session connected), receive a file via CSD Call.

The following actions are enabled during a data session:

- Incoming call alert string RING (while G30 is in GPRS session)
- Answering to incoming call via the ATA command (while G30 is in GPRS session)
- Receive Incoming SMS indication
- Inquiry GSM coverage indication
- Setup a voice call (while G30 is in GPRS session)
- Send & Receive SMS
- Local modem operation
- Network interrogation and settings

2.5.3. Technical Description

The MUX feature adds four virtual channels on a single physical RS232 line:

- Channel #0 - DLC0 for MUX Control
- Channels #1 through #4 are used for Data, GPRS, Voice call and control, and Logger/External modem applications



2.6. Short Message Service (SMS)

2.6.1. Overview

The SMS feature provides means for SMS messages handling and the reporting of SMS reception events.

G30 SMS implementation is based on the GSM27.005 specification.

2.6.2. Features

The SMS, as defined within the GSM 900/1800/1900 digital mobile phone standard:

- A single short message can be up to 160 characters of IRA text in length (7-bit coded). Message text can comprise words, numbers or an alphanumeric combination.
- Short messages can be written and displayed in various coding schemes, including IRA and UCS2.
- Reception of an incoming message can invoke an indication to the terminal. This feature is configurable using the command AT+CNMI. Short messages received during data calls are not indicated.
- Short messages can be sent and received simultaneously with GSM voice and data calls.
- Cell broadcast messages can also be selected and received on the G30. The G30 enables registration to specific broadcast channels.

2.6.3. Technical Description

The G30 memory for incoming short messages is SIM-dependent. A new incoming message is saved in the first free memory location, from index 1, according to the SIM card.

The G30 memory can contain up to 5 CB messages from index 0 up to index 5.

SMS Type	SMS Index	Max Number of SMS
Incoming messages	1	SIM-dependent
	2	
	...	
CB messages	0	6
	1	
	...	
	5	



2.7. Character Sets

The following includes the references to various tables that provide conversions between the different character sets.

For the full content of a specific conversion table, refer to Appendix A, Character Set Tables.

2.7.1. IRA Character Set Management

The IRA character set is a standard seven-bit code that was proposed by ANSI in 1963, and finalized in 1968. IRA was established to achieve compatibility between various types of data processing equipment.

2.7.2. GSM Character Set Management

In G30, the GSM character set is defined as octant stream. This means that text is displayed not as GSM characters but in the hex values of these characters.

2.7.3. UCS2 Character Set Management

UCS2 is the first officially standardized coded character set, eventually to include the characters of all the written languages in the world, as well as all mathematical and other symbols.

Unicode can be characterized as the (restricted) 2-octet form of UCS2 on (the most general) implementation level 3, with the addition of a more precise specification of the bi-directional behavior of characters, as used in the Arabic and Hebrew scripts.

The 65,536 positions in the 2-octet form of UCS2 are divided into 256 rows with 256 cells in each. The first octet of a character representation denotes the row number, the second the cell number. The first 128 characters are thus the IRA characters.

2.8. AT Commands Summary

The following list contains a summary of all the G30 AT commands sorted by functionality.

Table 2-1: AT Commands

AT Command	Description	Page
Modem ID		
Subscriber Unit Identity		
+CGMI	This command displays manufacturer identification.	on page 4-69
+GMI	This command displays manufacturer identification.	on page 4-69
+FMI	This command displays manufacturer identification.	on page 4-69



AT Command	Description	Page
+CGMM	This command displays the model identification.	on page 4-69
+GMM	This command displays the model identification.	on page 4-69
+FMM	This command displays the model identification.	on page 4-69
+CGMR	This command displays the revision identification.	on page 4-70
+GMR	This command displays the revision identification.	on page 4-70
+FMR	This command displays the revision identification.	on page 4-70
+CGSN	This command displays the product serial number identification.	on page 4-71
+GSN	This command requests the product serial number identification.	on page 4-71
+CSCS	This command selects the G30 character set.	on page 4-71
+CIMI	This command displays the International Mobile Subscriber Identity number.	on page 4-73
+CFSN	This command displays the factory serial number.	on page 4-73
I	This command displays various G30 information items.	on page 4-74
+CNUM	This command displays up to five strings of text information that identify the G30.	on page 4-75
+CLAC	This command displays a list of all the AT commands supported by the G30.	on page 4-75
Call Control		
Call Control Commands		
D	This command places a voice call on the current network, when issued from an accessory device.	on page 4-79
DL	This command places a voice call to the last number dialed.	on page 4-80



AT Command	Description	Page
H	This command hangs up, or terminates a particular call.	on page 4-81
A	This command answers an incoming call, placing the G30 into the appropriate mode, as indicated by the RING message.	on page 4-83
+CRC	This command controls whether to present the extended format of the incoming call indication.	on page 4-83
RING	This unsolicited event is received when an incoming call (voice or data) is indicated by the cellular network.	on page 4-83
+CRING	This unsolicited event indicates the type of incoming call.	on page 4-83
+CLIP	This command controls the Calling Line Identity (CLI) presentation to the terminal when there is an incoming call.	on page 4-85
+CCWA	This command controls the Call Waiting supplementary service, including settings and querying of the network by the G30.	on page 4-87
+CHLD	This command controls the Call Hold and Multiparty Conversation supplementary services.	on page 4-90
+CCFC	This command controls the call-forwarding supplementary service.	on page 4-92
+CLIR	This command enables/disables the sending of caller ID information to the called party, for an outgoing call.	on page 4-95
+CBST	This command handles the selection of the bearer service and the connection element to be used when data calls are originated.	on page 4-97
O	This command returns a phone to the Online Data mode and issues a CONNECT or CONNECT <text> result code.	on page 4-98
+CHUP	This command causes the G30 to hang up the current GSM call.	on page 4-99
+MDC	This command enables you to select the desired messages to be displayed upon connection of a voice call with a remote party.	on page 4-99
+MHUP	This command Hung UP call(s) and report specific cause to the NW.	on page 4-100
+MTTY	This command is used to enable/disable the TTY (Tele Typewriter) support in the G30.	on page 4-101



AT Command	Description	Page
Call Status Messages		
+CPAS	This command displays the current activity status of the G30, for example, call in progress, or ringing.	on page 4-103
+CLCC	This command displays a list of all current G30 calls and their statuses, and also enables/disables the unsolicited indication of the call list.	on page 4-104
+MCST	This command displays the current state of the call processing, and also enables/disables the unsolicited indication of any change in the call processing state.	on page 4-107
Call Advice of Charge Messages		
+CAOC	This command displays information about the cost of calls.	on page 4-109
+CACM	This command resets the Advice of Charge accumulated call meter value in the SIM file, EFACM.	on page 4-111
+CAMP	This command sets the Advice of Charge accumulated call meter maximum value in the SIM file, EFACMmax.	on page 4-113
+CPUC	This command sets the parameters of the Advice of Charge-related price per unit and currency table found in the SIM file, EFPUC.	on page 4-115
+CR	This command controls whether or not the extended format of an outgoing call is displayed or not.	on page 4-116
+CCWE	This command allows the sending of an unsolicited report when enabled.	on page 4-118
Supplementary Services		
+CSSN	This command handles the enabling and disabling of supplementary service-related, network-initiated, notifications.	on page 4-119
+CUSD	This command allows control of Unstructured Supplementary Service Data (USSD), according to GSM 02.90.	on page 4-122



AT Command	Description	Page
+COLP	This command refers to the GSM supplementary service COLP, Connected Line Identification Presentation, which enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile-originated call.	on page 4-128
Voice Mail and Clock		
Voice Mail Commands		
+CSVM	This command handles the selection of the number to the voice mail server.	on page 4-130
System Date and Time Access Commands		
+CCLK	This command reads/sets the G30's current date and time settings.	on page 4-132
+CTZU	This command enables and disables automatic time zone update via NITZ.	on page 4-134
+CTZR	This command enables and disables the time zone change event reporting.	on page 4-135
SMS		
SMS Commands		
+CSMS	This command handles the selection of the SMS message service type.	on page 4-136
+CPMS	This command handles the selection of the preferred storage area for messages.	on page 4-139
+CMGF	This command handles the selection of message formats.	on page 4-140
+CSCA	This command handles the selection of the SCA and the TOSCA.	on page 4-141
+CSMP	This command sets the Text Module parameters.	on page 4-144
+CSDH	This command shows the Text Mode parameters.	on page 4-146
+CNMI	This command sends an unsolicited indication when a new SMS message is received by the G30.	on page 4-148



AT Command	Description	Page
+MRST	This command enables customer software to perform a power off to the G30 unit.	on page 4-236
READY	This unsolicited notification indicates UART is ready.	on page 4-236
+MIOC	This command defines the G30 8 GPIO pins data value.	on page 4-236
+MIOD	This command defines the G30 8 GPIO pins configuration.	on page 4-240
+MMAD	This command reads and monitors digital value from a specified ADC.	on page 4-243
+MADCM	This command intends to query and monitor the G30 three ADC's values.	on page 4-244
+MPCMC	This command defines whether the PCM clock is generated continuously or not, when the module is in digital audio mode.	on page 4-247
+MTSM	This command measures the current temperature sensor value in Celsius degrees.	on page 4-248
+MSMPD	This command enables/disables polling for SIM insertion event feature.	on page 4-251
Audio		
Basic Audio Setup Commands		
+CRSL	This command handles the selection of the incoming call ringer and alert tone (SMS) sound level on the alert speaker of the G30.	on page 4-255
+CLVL	This command sets the volume of the internal loudspeaker (which also affects the key feedback tone) of the G30.	on page 4-256
+CMUT	This command mutes/unmutes the currently active microphone path by overriding the current mute state.	on page 4-257
S94	This S-parameter represents the Boolean status, On/Off, of the sidetone feature.	on page 4-258
S96	This S-parameter represents the Boolean status, On/Off, of the echo cancelling feature in the handsfree.	on page 4-258



AT Command	Description	Page
Advanced Audio Setup Commands		
+MAPATH	This command sets/requests the active input accessory, and the output accessory for each feature.	on page 4-259
+MAVOL	This command determines a volume setting for a particular feature in a particular accessory.	on page 4-261
+MAMUT	This command controls the muting/unmuting of all input paths (MIC, HDST_MIC, DIGITAL_RX).	on page 4-264
+MAFEAT	This command controls the algorithm features: Sidetone and Hands free (echo cancel, noise suppression, and agc).	on page 4-265
General Audio Commands		
+MADIGITAL	This command switches between analog and digital audio modes.	on page 4-266
+CALM	This command handles the selection of the G30's alert sound mode.	on page 4-267
+MMICG	This command handles the selection of microphone gain values.	on page 4-268
+MMICV	This command handles the selection of microphone voltage values of 1st channel MIC port.	on page 4-269
+CRTT	This command plays one cycle of a ring tone, stops the cycle in the middle, and sets the ring tone to be used.	on page 4-269
+VTD	This command handles the selection of tone duration.	on page 4-273
+VTS	This command transmits a string of DTMF tones when a voice call is active.	on page 4-274
+MATONE	This command starts/stops the tone play.	on page 4-275
+MUBF	This command change the digital audio filters parameters for a specific uplink path.	on page 4-277
+MDBF	This command change the digital audio filters parameters for a specific downlink path.	on page 4-279



AT Command	Description	Page
E	This command defines whether the G30 echoes the characters received from the user, (whether input characters are echoed to output).	on page 4-301
X	This command defines the data adaptor response set, and the CONNECT result code format.	on page 4-301
Sn	This command reads/writes values of the S-registers, and includes registers 1-49, 94, 96 (Audio) and 102 (Sleep mode).	on page 4-302
+CBAND	This command allows switching from automatic band selection to selection of one or more (up to four) bands.	on page 4-305
&F	This command restores the factory default configuration profile.	on page 4-306
Z	This command resets the default configuration.	on page 4-307
+MSTART	This command enables/disables the two types of reports during the power on process.	on page 4-307
+MTRACE	This command switches the trace tool On/Off.	on page 4-308
Sleep Mode Commands		
S24	This command activates/disables the Sleep mode.	on page 4-312
S102	This command sets the value of the delay before sending data to the terminal.	on page 4-313
S100	ATS100 is a terminal minimum time limit for entering sleep mode.	on page 4-314
+MSCTS	This command defines the behavior of the CTS line when the G30 is in Sleep mode.	on page 4-314
Error Handling Commands		
+CMEE	This command enables/disables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the G30.	on page 4-316



AT Command	Description	Page
+CEER	This command returns an extended error report containing one or more lines of information text, determined by the manufacturer, providing the reasons for the call-clearing errors.	on page 4-321
User Interface		
+CRSM	This command provides limited access to the Elementary Files on the SIM.	on page 4-323
+CCID	This command returns the SIM card identification number.	on page 4-328
&V	This command displays the current active configuration and stored user profiles.	on page 4-329
&W	This command stores the user profile.	on page 4-330
&Y	This command displays the default user profile.	on page 4-332
+CMER	This command enables display changes and indicator state changes.	on page 4-332
+CLAN	This command handles the selection of language in the ME.	on page 4-334
+CIND	This command is used to query the status of various ME indicators.	on page 4-336
+CIEV	An unsolicited indication regarding various phone indications that is sent to the DTE when the <ind> parameter of the +CMER command is set to 1.	on page 4-337
+MDSI	This command enables unsolicited reporting of indications of SIM deactivation and invalidation.	on page 4-338
GPRS/EDGE		
GPRS Commands		
+CGCLASS	This command sets the GPRS mobile station class.	on page 4-341
+CGDCONT	This command specifies the PDP (Packet Data Protocol) context.	on page 4-342
+CGQMIN	This command sets the minimum acceptable quality of service profile.	on page 4-344



AT Command	Description	Page
+CGQREQ	This command displays the requested quality of service profile.	on page 4-347
+CGATT	This command attaches the G30 to the GPRS network.	on page 4-350
D*99	This command enables the ME to perform the actions necessary for establishing communication between the terminal and the external PDN.	on page 4-351
+CGPRS	This command indicates whether there is GPRS coverage.	4.11.2.9 below
+CGACT	This command activates/deactivates the PDP Context.	on page 4-354
+CGPADDR	This command reads the allocated PDP addresses for the specified context identifiers.	on page 4-356
+CGCMOD	The execution command is used to modify the specified PDP context(s) with respect to QoS profiles and TFTs. After the command has completed, the MT returns to V.250 online data state.	on page 4-357
STK		
+STKPRO	This command displays the list of supported proactive commands.	on page 4-359
+STKTR	This action command allows entering the response to a STK proactive command which was displayed by the unsolicited result code +STKPRO.	on page 4-362
+STKENV	This action command allows sending a STK envelope command to the MS.	on page 4-364
+STKPROF	This command allows reading and changing the terminal profile data.	on page 4-365
+STKCC	The SIMAP call control status is displayed using the unsolicited result code +STKCC.	on page 4-367
+STKCNF	The SIMAP proactive session status is displayed using the unsolicited result code +STKCNF.	on page 4-368
TCP/IP		



AT Command	Description	Page
+MIPCONF	This command allows to configure TCP stack parameters, such as retransmissions number, upper and bottom limits of retransmission timeout, close delay.	on page 4-420
+MPING	This command allows to verify IP connectivity to another remote machine (computer) by sending one or more Internet Control Message Protocol (ICMP) Echo Request messages.	on page 4-422
+MPINGSTAT	This is the unsolicited response that the G30 sends to the terminal to inform of ping execution status update and provides summary statistics of ping request when ping request execution is completed.	on page 4-427
+MSDNS	This command set/read DNS (Domain Name Server) IP address (primary/secondary) for each socket.	on page 4-430
+MIPCSC	This AT command is used to configure the SSL feature behavior in case of non - fatal alerts.	on page 4-433
+MIPSSL	This unsolicited event is sent to the terminal indicating an errors, warnings or alerts that occurred during SSL connection.	on page 4-435
+MIPRTCPGET	This command gets the oldest data received from TCP stack and was stored in the internal buffer in G30.	on page 4-436
+MIPRUDPGET	This command gets the oldest data received from UDP stack and was stored in the internal buffer in G30.	on page 4-438
FTP Commands		
Session Commands		
+FTPOPEN	This command causes G30 to open a FTP connection with a remote FTP server.	on page 4-440
+FTPCLOSE	This command causes G30 to close FTP connection.	on page 4-442
+FTPINFO	This command causes the G30 to enable or disable FTP unsolicited indication to the user.	on page 4-443
+FTPCWD	This command causes the G30 to request the remote FTP server to change the working directory.	on page 4-444
+FTPMKD	This command causes the G30 to request the remote FTP server to create a new directory.	on page 4-445



3.3. AT Commands Protocol

The figure below shows a general messaging sequence of AT commands protocol between the terminal and the G30.

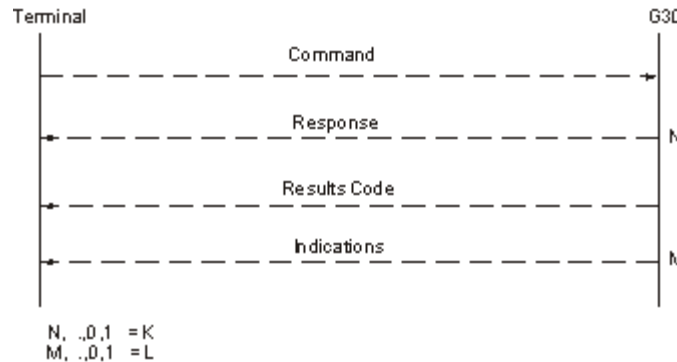


Figure 3-1:AT Commands Protocol

The AT commands interface is basically a Modem Services Upon Request. Communication (almost) always begins from the terminal side. This means that any service should be requested from the terminal. Thus a request is called a "command". Each command must be answered by a "results code" from the G30. The results code reports the command status to the terminal. Some commands may include several "Response" requests (between 0 to K) to send data back to the terminal. Some commands may initiate a mode in which, when specified events are generated in the G30, "Indicator" messages are sent asynchronously. Indicators can be between 0 to L. The G30 can echo characters received from the terminal (commands) back to the terminal.

3.4. AT Commands Structure

3.4.1. Command Structure

An AT command line may contain one or more commands. Delimiters are used to separate the commands from each other, according to the following structure:

Prefix	Command1	Delimiter	Command2	Delimiter	...	CommandN	Suffix
--------	----------	-----------	----------	-----------	-----	----------	--------

Each AT command has the "AT" prefix string.
 Each AT command has the suffix <CR>.
 The delimiter is either a semicolon ";" or none, meaning space (basic commands).
 Each AT command has the following structure:

Token	Mode	Arguments
-------	------	-----------



The following figure outlines the basic structure of an AT command line:

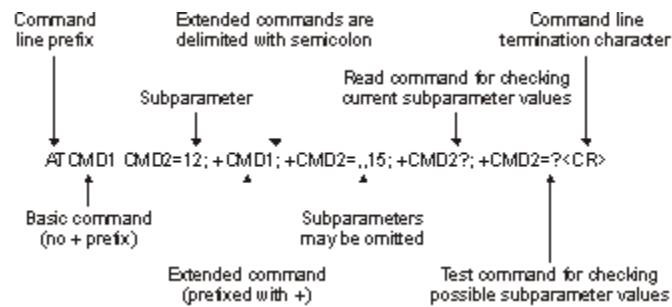


Figure 3-2: Basic Structure of a Command Line

The following rules must be observed when issuing a command line to the modem:

- Every command line must begin with the letters AT.
- Several commands can be concatenated as one line, as long as the total line does not exceed 140 characters with semicolon characters.
- Characters:

Spaces are ignored. You can leave spaces between each command and between characters of a command. You can also include punctuation in telephone numbers, and type commands in either UPPERCASE or lowercase. For example, the following commands are identical:

ATDT8005551234 < Enter > or
atdt (800) 555-1234 < Enter >

Backspace <S5> character is allowed.

- To cancel a dialing command in progress, send any ASCII character to the modem.
- To execute the command line, send the <CR> ASCII character.

3.4.2. Results Code Structure

When a command is issued, the G30 responds with a message, called a "Result Code", which tells the terminal the result of the command that was requested. Result codes can indicate, for example, the execution status of the command or the remote modem connection status.

Result codes can be represented either as numerical codes or as verbose responses. By default, the G30 responds with verbose response codes.

The result code has the following structure:

Prefix	Code	Suffix
--------	------	--------

where:

The results code prefix is <CR><LF>.

The results code suffix is <CR><LF>.

3.4.3. Response and Indications Structure

The following is the information response and indications structure:



3.5. AT Commands Protocol & Structure Configuration

The AT commands message flow and structure may be configured by the terminal. The G30 can be configured not to follow a command with an echo and/or results code. It can be configured to transmit the results code in either of two ways: Verbose or Numeric. This (and other) configurations can be set using the following commands:

Command	Description
S3=[<value>]	Command line termination character (default setting 0x13).
S4=[<value>]	Response formatting character (default 0x10).
S5=[<value>]	Command line editing character (default 0x 8).
E[<value>]	Command echo (default 0, meaning the G30 does not echo commands).
Q[<value>]	Result code suppression (default 0, meaning the G30 transmits result codes).
V[<value>]	G30 response format (default 1, meaning verbose format).
X[<value>]	Defines CONNECT result code format.

The figure below shows the flow and structure configuration commands:

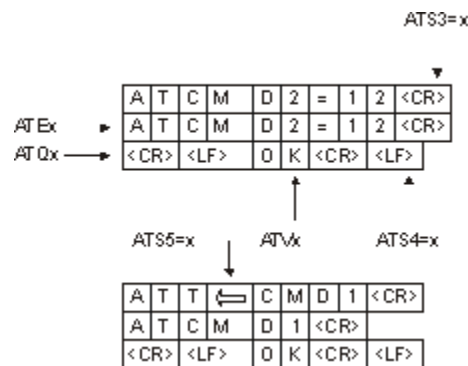


Figure 3-4:Flow and Structure Configuration Commands



3.6. Command Token Types

3.6.1. Basic Syntax Command Format

The format of Basic Syntax commands (except for the D and S commands) is:
<command>[<number>]

where:

<command> is either a single character, or the "&" character (IA5 2/6) followed by a single character.

Characters used in **<command>** are taken from the set of alphabetic characters.

<number> may be a string of one or more characters from "0" through "9" representing a decimal integer value.

3.6.2. S-parameters

Commands that begin with the letter S constitute a special group of parameters known as "S-parameters". These differ from other commands in important respects:

- The number following the S indicates the "parameter number" being referenced. If the number is not recognized as a valid parameter number, an ERROR result code is issued.
- Immediately following this number, either a "?" or "=" character (IA5 3/15 or 3/13, respectively) appears:
 - "?" is used to read the current value of the indicated S-parameter.
 - "=" is used to set the S-parameter to a new value. "<parameter_number>" "<parameter_number>="[<value>]"

If the "=" is used, the new value to be stored in the S-parameter is specified in decimal form following the "=".

3.6.3. Extended Syntax Command Format

Both actions and parameters have names, which are used in the related commands. Names always begin with the character "+" (IA5 2/11). Following the "+", from one to sixteen (16) additional characters appear in the command name.

All (GSM) cellular commands have the prefix "+C".

All General modem commands have the prefix "+G".

Most Motorola propriety commands have the prefix "+M".

3.7. Command Argument Types

<value> consists of either a numeric constant or a string constant.

<compound_value> consist of several **<value>** parameters separated by commas.

Example of compound_value: **<value1>,<value2>,...,<valueN>**

3.7.1. Numeric Constants

Numeric constants are expressed in decimal, hexadecimal, or binary form. In the G30, the definition of each command specifies which form is used for values associated with that command.



&D	This command determines how the G30 responds when the DTR (Data Terminal Ready) status is changed from ON to OFF during the online data state.	on page 4-228
&F	This command restores the factory default configuration profile.	on page 4-306
&K	This command configures the RTS/CTS flow control.	on page 4-225
&V	This command displays the current active configuration and stored user profiles.	on page 4-329
&W	This command stores the user profile.	on page 4-330
&Y	This command displays the default user profile.	on page 4-332
+CBAND	This command allows switching from automatic band selection to selection of one or more (up to four) bands.	on page 4-305
+CBST	This command handles the selection of the bearer service and the connection element to be used when data calls are originated.	on page 4-97
+CCLK	This command reads/sets the G30's current date and time settings.	on page 4-132
+CBAUD	This command sets the baud rate.	on page 4-222
+CEER	This command returns an extended error report containing one or more lines of information text, determined by the manufacturer, providing the reasons for the call- clearing errors.	on page 4-321
+CFSN	This command displays the factory serial number.	on page 4-73
+CFUN	This command shuts down the phone functionality of smart phones and PDAs with phone capabilities.	on page 4-230
+CGMI	This command displays manufacturer identification.	on page 4-69
+CGMM	This command requests the model identification.	on page 4-69
+CGMR	This command requests the revision identification.	on page 4-70
+CGPRS	This command indicates whether there is GPRS coverage.	on page 4-353



+CGREG	This command enables/disables the GPRS network status registration unsolicited result code.	on page 4-194
+CGSN	This command requests the product serial number identification.	on page 4-71
+CHUP	This command causes the G30 to hang up the current GSM call.	on page 4-99
+CLAC	This command displays a list of all the AT commands supported by the G30.	on page 4-75
+CLCC	This command displays a list of all current G30 calls and their statuses, and also enables/disables the unsolicited indication of the call list.	on page 4-104
+CLVL	This command sets the volume of the internal loudspeaker of the G30.	on page 4-256
+CMEE	This command enables/disables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the G30.	on page 4-316
+CMUT	This command mutes/unmutes the currently active microphone path by overriding the current mute state.	on page 4-257
+CMUX	This command is used to enable/disable the GSM MUX multiplexing protocol stack.	on page 4-466
+CPAS	This command displays the current activity status of the G30, for example, call in progress, or ringing.	on page 4-103
+CPIN	This command is only relevant for phones that use SIM cards. It unlocks the SIM card when the proper SIM PIN is provided, and unblocks the SIM card when the proper SIM PUK is provided.	on page 4-287
+CR	This command controls whether or not the extended format of an outgoing call is displayed or not.	on page 4-116
+CRC	This command controls whether to present the extended format of the incoming call indication.	on page 4-83
+CREG	This command enables/disables the network status registration unsolicited result code.	on page 4-192
+CRLP	This command displays the Radio Link Protocol parameters.	on page 4-191
+CRSL	This command handles the selection of the incoming call ringer and alert tone (SMS) sound level on the alert speaker of the G30.	on page 4-255



+MADIGITAL	This command switches between analog and digital audio modes.	on page 4-266
+MAFEAT	This command controls the algorithm features: Sidetone and Hands free (echo cancel, noise suppression, and agc).	on page 4-265
+MAHF	This command controls the algorithm features: Hands free (echo cancel, noise suppression, and agc).	on page 4-282
+MAHFD	This command controls the algorithm features: Hands free Default (echo cancel, noise suppression, and agc).	on page 4-281
+MAI2SY	This command switches between PCM and I2S audio modes.	on page 1-18
+MAMUT	This command controls the muting/unmuting of all input paths (MIC, HDST_MIC, DIGITAL_RX).	on page 4-264
+MAPATH	This command sets/requests the active input accessory, and the output accessory for each feature.	on page 4-259
+MAVOL	This command enables you to determine a volume setting for a particular feature in a particular accessory.	on page 4-261
+MCELL	This command displays information about the Cellular Network.	on page 4-205
+MCST	This command displays the current state of the call processing, and also enables/disables the unsolicited indication of any change in the call processing state.	on page 4-107
+MCWAKE	This command displays reports on the status of the GPRS/GSM coverage.	on page 4-229
+MSCTS	This command defines the behavior of the CTS line when the G30 is in Sleep mode.	on page 4-314
+MDC	This command enables you to select the desired messages to be displayed upon connection of a voice call with a remote party.	on page 4-99
+MGGIND	This command configures the service indicator on pin #16 in LGA or 49 of the 70 pin connector to be GPRS or GSM.	on page 4-229
+MIOC	This command defines the G30 8 GPIO pins data value.	on page 4-236
+MIOD	This command defines the G30 8 GPIO pins configuration.	on page 4-240



Command Type	Syntax	Response/Action
Set	+CSCS=<chset>	OK or: +CMS ERROR: <err>
Read	AT+CSCS?	+CSCS: <selected character set>
Test	AT+CSCS=?	+CSCS: (<supported character sets>)

NOTE:

The following table shows the +CSCS parameters optional values.

Table 4-2: +CSCS Parameters

<chset>	Character Set	Input/Output Format
"IRA"	IRA (0x00 - 0x7F)	Quoted string. (For example, "AB" equals two 8-bit characters with decimal values 65, 66.)
"GSM"	GSM default alphabet (GSM23.038 subclause 6.2.1)	HEX representation.
"UCS2"	Unicode (ISO/IEC 10646 [32])	HEX representation. (For example, 00410042 equals two 16-bit characters with decimal values 65, 66.)
"HEX"	Hexadecimal format presentation.	Character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original ME character set will be done. Used for +CUSD AT command only. Can be defining by the second parameter of the command.

NOTE:

HEX character set is treated as GSM.

Example
AT+CSCS=?
+CSCS: ("IRA" , "GSM" , "UCS2" , "Hex")
OK



4.1.9. I, Request Identification Information

This command displays various G30 information items.

Command	Response/Action
ATIn	<information item n> or: +CMS ERROR: <err>

The following table shows the information items that are supported by the G30.

ATIn	Description	Output
0		144
1		000
2		OK
3	Reports Product Title	Motorola Mobile Phone
4		000000 2001
5	Reports Software Architecture	ULC2+6416Mb
6		RFPATQE4028E
7	Reports Product Description	G30 OEM Module
8	Reports Software Version	<current software revision>
9	Reports Flex Version	<current flex version>

Example

```

ATI7
G30 OEM Module
OK
ATI8
G30_G_05.02.02R
OK
ATI9
G30_F_XXXXXXXXXX
    
```



Example
AT+CLAC
%C
&C
&D
&F
&G
&K
&L
&M
&P
&R
&T
*D
+CACM
+CALC
+CALM
+CAMP
+CAOC
+CBAND
+CBAUD
+CBC
+CBST
+CCFC
+CCLK
+CCWA
+CEER
:
:
:
:
?
A
D
DL
E
F
H
I
L
M
N
O
P
Q
S
T
V
X
Y
Z
\A
\S
OK



transmitting and receiving data. This may vary from sending messages to each other, sending or receiving files, logging on to an information service, or any other data communication task you wish to perform.

4.2.1.2. Switching From Data Mode to Command Mode

To switch the connection from Data mode to Command mode, send the Escape Sequence command (+++).

If the modem responds with "OK" to the Escape command, the modem is in Command mode and the dial connection is still active, and you can use the AT command set.

NOTE:

The character '+' in the Escape Sequence pattern can be changed using the S2 S-register.

Escape is detected only by the G30 and not by the remote side. The remote side stays in the Data mode.

4.2.1.3. Hanging Up

If you are using a communications program, use the "Hang up" or "Disconnect" AT command in the program to disconnect the call.

When using computers in the "Dumb Terminal mode", return to the Command mode by typing the Escape Sequence, +++, and then hang up by typing the Hang up command as follows:

ATH <Enter>

If the G30 responds with "OK", the dial connection is closed.

4.2.1.4. Dialing to an Electronic Telephone Service

When you dial to an electronic telephone service such as telephone banking, you must typically instruct the modem to dial a number, then to wait for call establishment, and then send the password for entering the banking account. A typical command line might look like this:

ATD876-5555,123456; <Enter>

The modem dials the number, then pauses to wait for the call connection (the comma in the command line causes the pause).

You can also create a longer pause by including several commas in a row in the command line, and then send the password to the service.

4.2.2. Receiving a Data Call

ATA <Enter>

This command instructs the modem to be the "answering modem". Either party may be the answering or the originating modem, but both parties cannot be the same modem at the same time.

You hear the modem handshake and see the result code "CONNECT".

NOTE:

Outgoing Voice Call during CSD Call, when switching to Command mode.

If using Dial Command to make Outgoing Voice Call, currently active CSD Call is dropped and the new Voice Call is generated.



4.2.3. Call Control AT Commands

4.2.3.1. D, Dial Command

This command places a DATA/VOICE call on the current network.
The default call type is a data call (CSD).

There must be an explicit request in order to make a VOICE call.

If a DATA call was originated and answered by the remote side, a "OK" notification is sent to the terminal from the G30, and it moves to the online Data state.

For more information about call failure, use the AT+CEER command, described in [+CEER, Extended Error Report](#)

The maximum number of digits that can be set in ATD command is 54 digits. Trying to set more than the maximum limit causes the following error message "dial string too long" to be displayed.

NOTE:

If there is an active voice call and the terminal sends another ATD voice call command to the G30, the active call is put on hold and the new number is called.

Command	Response/Action
ATD<number>[;]	<p>VOICE CALL:</p> <p>1st response - Voice call place begins OK</p> <p>2nd response - Voice call connected: OK</p> <p>DATA:</p> <p>2nd response only - Data call connected CONNECT</p> <p>When MO call fails:</p> <ol style="list-style-type: none"> 1. Connection Failure - NO CARRIER or BUSY or NO ANSWER 2. General Failure - ERROR 3. Security reason (such as SIM not present) - OPERATION NOT ALLOWED 4. Unknown reason - UNKNOWN CALLING ERROR



The following table shows the DL parameters.

Table 4-5: DL Parameters

<Parameter>	Description
semicolon (;)	<p>If the semicolon (;) is given, a voice call is originated to the last dialed number. If the semicolon (;) is not given, a Data call is originated.</p> <p>Note: The last dialed call type is irrelevant to the DL command.</p>

Note: When ATDL is issued after a dialed number with comma digit:

- ATDL; (Voice) dials the exact number that was last dialed, including the DTMF tones sent.
- ATDL (Data) dials the addressing information only (comma and tones are discarded).
- If ATDL is sent before any Dial command was issued (mainly after Power On, when the last number is an empty field), the G30 will return NO CARRIER, as mentioned in the ITU V.25-ter standard.

Example

```

atdl          //Last called number is "035658278"
ATDL: "035658278"
OK           //DATA call
atdl;
ATDL: "035658278"
OK
OK          //VOICE call
atdl        //Last called number is "035658278,123,78;"
ATDL: "035658278"
CONNECT    //DATA call
atdl;      //Last called number is "035658278,123,78"
ATDL: "035658278,123,78"
OK
OK          //VOICE call
1 2 3      //Sent as DTMF tones
...        //Pause
7 8        //Sent as DTMF tones
    
```

4.2.3.4. H, Hang-up Call

This command hangs up a call. The G30 terminates the call whether it is a data or voice call, and whether it is an incoming, originating, waiting, or connected call.

A NO CARRIER message is returned to the terminal before the regular OK approval.

Note: To terminate (hang-up) a MO data call while call is placed: Any character sent from the terminal to the G30 causes the Data call termination, and NO CARRIER is sent from the G30 to the terminal.

4.2.3.5. To terminate a held Voice call or to terminate a call out of a MTPY call, refer to +CHLD, Call Related Supplementary Services Command

The following table shows the call states of the H command.



Call State	Response/Action
IDLE	Error 3 ("operation not allowed") or OK, depending on a FLEX bit
Single Active	Call released
MTPY Active	Call released (all calls)
Incoming call (RING)	Call released
Single Active and Waiting Call	Single Active released (waiting not affected)
MTPY Active and Waiting Call	MTPY Active released (waiting not affected)
Single Held or MTPY Held	Error 3
Single (or MTPY) Active and Single (or MTPY) Held	Single (or MTPY) Active released
Held (Single or MTPY) and Waiting Call	Waiting call released
Single (or MTPY) Active and Single (or MTPY) Held & Waiting call	Single (or MTPY) Active released

```

Example
RING //Incoming call
RING //Incoming call
ath //Hang-up incoming call
NO CARRIER
OK //Incoming call has been terminated - user determined user busy
RING
ata
OK //Voice call connected
ath //Hang-up connected call
NO CARRIER
OK //Active call has been hung-up - terminated
(... Active multi party call, with 3 numbers ...)
ath
NO CARRIER
NO CARRIER
NO CARRIER
OK
atd035659260;
OK
ath //Terminate MO voice call while placed
NO CARRIER
OK

```



```

Example - Hanging up a data call:
atd035659260
CONNECT //Data call connected - Online Data mode
...
+++ //ESC Sequence is sent from the terminal to the G30
OK //The G30 is in Command mode
ath //Terminate Data call
NO CARRIER
OK
    
```

4.2.3.6. A, Answer Incoming Call

This command answers an incoming VOICE/DATA call after a RING/+CRING indication is sent to the terminal.

If the incoming call is answered (connected), the G30 sends a CONNECT notification to the terminal.

If the MT call fails, the possible notifications are:

- NO CARRIER - Connection Failure
- ERROR - General Failure

Note: A waiting call (an incoming call while a call is in progress) is announced by +CCWA rather than RING. A waiting call can be answered only if it is a voice call. The waiting voice call should be answered using the ATA command, which will put the active call on hold and will connect the waiting call, making it the active call. This ATA action is the same action as AT+CHLD=2.

```

Example
Example - Answering a voice call:
AT+CRC=1
+CRING: VOICE
+CRING: VOICE
ata
OK //VOICE call connected - G30 is in Command mode
ath
NO CARRIER
OK
Example - Answering a data call:
+CRING: REL ASYNC
+CRING: REL ASYNC
ata
... //Connecting (dots are not displayed)
OK //DATA call connected - G30 is in Online Data mode
    
```

Note: In a CSD call, call release is not valid during the phase of call negotiation (from OK until connect call).

4.2.3.7. +CRC, Cellular Result Codes and RING, +CRING - Incoming Call Indication

This command controls whether or not to present the extended format of an incoming call indication. The RING/+CRING indication is sent from the G30 to the terminal when the G30 is alerted by an incoming call from the network. Once this indication is sent, information is available on the calling line via +CLIP. When +CRC is disabled, the indication is RING, and when +CRC is enabled, the indication is +CRING.

Command Type	Syntax	Response/Action	Remarks
--------------	--------	-----------------	---------




```
OK
+CRING: ALT Voice
NO CARRIER
OK
```

4.2.3.8. +CLIP, Calling Line Identification

This command controls the Calling Line Identity (CLI) presentation indication to the terminal when an incoming call is detected by the G30.

This command allows the user to query the provisioning status of the CLI by the network and by the G30. The command also allows the user to enable/disable the CLI presentation by the G30 to the terminal.

The +CLIP indication information varies depending on what is provided by the network.

Command Type	Syntax	Response/Action	Remarks
Set	AT+CLIP=[<n> <m>]	OK +CME ERROR: <err>	The Set command enables or disables the presentation of the CLI indication from the G30 to the terminal. Note: The Set command does not address the network.
Read	AT+CLIP?	+CLIP: <n>, <m> OK	The Read command returns the +CLIP enable/disable state in the G30 as well as in the network provisioning state of the CLI presentation.
Test			The Test command returns the Set command options (0,1).

+CLIP Indication

When the CLI presentation indication is enabled by the G30 (<n>=1), this unsolicited indication is sent to the terminal after the RING indication.

```
+CLIP:<number>,<type>[,<subaddr>,<satype>[,<alpha>][,<CLI validity>]]
```

The following table shows the +CLIP parameters.

Table 4-7: +CLIP Parameters

<Parameter>	Description
<n>	Enables/disables the CLI presentation indication after the ring indication: 0 Disable CLI presentation 1 Enable CLI presentation The default is 0.
<m>	Shows the subscriber CLIP service status in the network: 0 CLIP not provisioned 1 CLIP provisioned 2 Unknown (for example, no network and so on)



<"number">	Calling line number. The number format is specified by <type>.
<type>	Type of address octet in integer format: 145 Default when the dialing string includes the international access code character "+". 129 Default when making a local call. 128 Type of number is unknown (usually the output when the number itself is unknown).
<subaddr>	NULL, field not used (String type subaddress of format specified by <satype>)
<"alpha">	Name of the calling party (if provided by the network).
<CLI validity>	The Validity of the Calling Line Identity presentation: 0 CLI valid. 1 CLI has been withheld by the originator. 2 CLI is not available due to networking problems or limitations of the originating network.

Example

```

AT+CLIP=?
+CLIP: (000,001) //CLI presentation is disabled by the G30 (0) and
is enabled by the network (1)
OK
AT+CLIP=1
OK
Example +CLIP indication:
(...incoming call...)
RING
+CLIP: "2173845400",129,,,"Doe John",0
Example +CLIP indication with restricted CLI:
AT+CLIR=1
OK
(...incoming call..., caller restricted the CLI presentation (used AT+CLIR)...)
+CRING: VOICE
+CLIP: "",128,,,"",1

```



Table 4-8T: +CCWA Parameters

<Parameter>	Description
<n>	Enables/disables the call waiting indication to the terminal by the G30. 0 - Disable 1 - Enable The default is 0.
<mode>	Call waiting service request to the network. When the <mode> parameter is not given, the network is not interrogated. 0 - Disable 1 - Enable 2 - Query status
<class>	Sum of integers each representing a class of information. 1 - Voice (telephony) 2 - Data (data calls) The default value is 1.
<"number">	Calling line number. The number format is specified by <type>.
<type>	Type of address octet in integer format: 145 - Default when the dialing string includes the international access code character "+". 129 - Default when making a local call. 128 - Type of number is unknown (usually the output when the number itself is unknown)
<status>	Call waiting support by the network (output for <mode>=2). 0 - Not active 1 - Active
<"alpha">	Name of the calling party (if provided by the network).
<CLI validity>	The Validity of the Calling Line Identity presentation: 0 - CLI valid. 1 - CLI has been withheld by the originator. 2 - CLI is not available due to networking problems or limitations of the originating network.

Note: When the parameter <mode> is 2 (Query status), the first parameter is ignored and the third parameter is always treated as class = 1 unless it was set in Set Mode.

Example
AT+CCWA=1 //Enable call waiting on G30
OK
AT+CCWA=?



4.2.3.10. +CHLD, Call Related Supplementary Services Command

This command controls the Call Hold and Multiparty Conversation services. This command manipulates voice calls only.

Set Command

The Set command allows the control of the following call related services:

- Call HOLD: A call can be temporarily disconnected from the G30, but the connection is retained by the network.
- MTPY (Multi party) Conversation: Conference calls.

The network does not reserve more than one traffic channel for a mobile station, therefore the G30 can have only one call on hold at a time.

Note: Only voice calls can be put on HOLD.

A precondition for the multi-party service is that the G30 is in control of one active call and one call on hold. In this situation, the G30 can request the network to begin the MTPY (Multi Party) service. Once a MTPY call is active, remote parties may be added, disconnected or separated (removed from the MTPY call, but remain connected to the served mobile subscriber). The maximum number of remote parties is 5.

In this command, the term CALL refers to a single or MTPY call.

A single Active call is considered a MTPY call with one call index numbered as 1.

Command	Response/Action
+CHLD=<n>	If the call is terminated: OK (approve request was submitted) NO CARRIER If the call state is changed (link, split, from active to hold, and so on): OK (approve request was done) If the call is terminated and another call is answered: OK (approve request was submitted) NO CARRIER OK (call answered and is now connected)

Command Type	Syntax	Response/Action	Remarks
Test	+CHLD=?	+CHLD: (list of supported <n>s) OK	The Test command returns <n> values supported by the G30 to the terminal



4.2.3.11. +CCFC, Call Forwarding Number and Conditions

This command enables control of the call-forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Command Type	Syntax	Response/Action	Remarks
Set	+CCFC=<reason>,<mode> > [,<number>[,<type>[, <class> [,<subaddr>[,<satype> >[,<time>]]]]]]	If the command succeeds: +CCFC: <status>,<class1>[,<number> ,<type> [,<subaddr>,<satype>[,<time >]]]]<CR><LF> OK +CCFC: <status>,<class2>[,<number> ,<type> [,<subaddr>,<satype>[,<time >]]]][...] +CCFC: (list of supported <reason>s) OK	The Set command instructs the G30 which call forwarding settings to request from network. The Set command, in query mode, interrogates the network about the subscriber current call forwarding status.
Test	+CCFC=?	+CCFC:<reason> OK	The Test command returns <reason> values supported by the G30 to the terminal.



The following table shows the +CCFC parameters.

Table 4-10: +CHLD Parameters

<Parameter>	Description
<reason>	0 - Unconditional 1 - Mobile busy 2 - No reply 3 - Not reachable 4 - All call forwarding 5 - All conditional call forwarding
<mode>	0 - Disable 1 - Enable 2 - Query status 3 - Registration 4 - Erasure
<"number">	Calling line number. The number format is specified by <type>.
<type>	Type of address octet in integer format- 145 Default when dialing string includes international access code character "+". 129 Default when making a local call.
<subaddr>	NULL, field not used (String type subaddress of format specified by <satype>).
<satype>	Field not used. Value is always 128 (unknown) - type of sub address octet in integer format.
<class>	The sum of integers each representing a class of information. 1 - Voice 2 - Data - refers to all bearer services. The default value is 1.
<time>	1-30 - The number of seconds to wait before calls are forwarded, when "no reply" is enabled or queried. The default value is 20. Note: The parameter must be a multiple of 5, for example, 5, 10, 15 and so on. If not, the modulo of 5 will be ignored.
<status>	0 - Not active 1 - Active

Note: A forward-to phone <number> (and the optional fields <type>, <subaddr> and <satype>) are tied to a <reason> and a <class>. This means that there can be a different <number> for the same <reason> because of a different <class>. When registering without mentioning a <class>, <class>=7 is selected.

A <number> field is mandatory when registering (<mode>=3) and it is irrelevant (ignored) in all other <mode>s.




```

Example
AT+CCFC=?
+CCFC: (0,1,2,3,4,5)
OK
AT+CCFC=0,3,"01256316830",129,1
OK
AT+CCFC=1,3,"0545658278",129,1 //Register UC forward-to of all classes.
OK
AT+CCFC=1,1 //Activate UC forward-to of all classes.
OK
AT+CCFC=1,2 //Interrogate reason not-reachable of all classes.
+CCFC: 1,1,"+97254151200",145
+CCFC: 0,2,"",0
+CCFC: 0,4,"",0
OK //For <reason>=3, forward only voice calls is activated.
AT+CCFC=4,2 //Interrogate reason all-call-forwarding for all classes.
+CME ERROR: no network service //Interrogation of <reason>=30 is not supported by
network.
AT+CCFC=2,3,"+972545658278"
OK
AT+CCFC=2,0 //Disable call-forwarding for reason no-reply of all classes.
OK
AT+CCFC=2,2
+CCFC: 0,1,"+972545658278",145,,25
+CCFC: 0,2,"+972545658278",145,,25
+CCFC: 0,4,"+972545658278",145,,25
OK

```



The following table shows the +CLIR parameters.

Table 4-11: +CLIR Parameters

<Parameter>	Description
<n>	Adjustment for outgoing calls 0 - Presentation indicator is used according to the subscription of the CLIR service 1 - CLIR invocation 2 - CLIR suppression The default is 2.
<m>	Subscriber CLIR service status in the network 0 - CLIR not provisioned 1 - CLIR provisioned in permanent mode 2 - Unknown (for example, no network and so on) 3 - CLIR Temporary mode presentation restricted (can be the default) 4 - CLIR Temporary mode presentation allowed (can be the default)

Example

```

AT+CLIR=?
+CLIR: (0,1,2)
OK
AT+CLIR?
+CLIR: 1,4
AT+CLIR=2
OK
atd054565195; //MO voice call
OK
(... calling ...)
(... a G30 that has 054565195 SIM and is CLIP enabled will receive the following on the terminal:
RING
+CLIP: "",128,,128,"",1
RING
+CLIP: "",128,,128,"",1)
ath
NO CARRIER
OK
AT+CLIR=0
OK
atd054565195; //MO voice call
OK
(... calling ...)
(... a G30 that has 054565195 SIM and is CLIP enabled will receive the following on the terminal:
RING
+CLIP: "054565006",129,,128,"",0
RING
+CLIP: "054565006",129,,128,"",0 ...)
ath
NO CARRIER
OK

```



4.2.3.13. +CBST, Select Bearer Service Type

This command sets the GSM bearer service (data circuit duplex asynchronous and synchronous). It chooses one of the bearer services, the data rate of the service (actually the modulation when modem IWFs are used), and enables or disables the Radio Link Protocol.

Command Type	Syntax	Response/Action	Remarks
Set	AT+CBST=[<speed> [, <name> [, <ce>]]]	OK +CME ERROR: <err>	The Set command selects the bearer service <name> with data rate <speed> and the connection element <ce> to be used when data calls are originated (refer to GSM 02.02). Values may also be used during mobile terminated data call setup, especially in the case of single numbering scheme calls. Note: For incoming calls, the bearer service will be taken automatically from incoming parameters and not according to the CBST Set command. The G30 does not change the output, but for incoming calls, the phone works in automatic mode.
Read	AT+CBST?	+CBST: <speed> , <name> , <ce> OK	
Test	AT+CBST=?	+CBST: (list of supported <speed>s) , (list of supported <name>s) , (list of supported <ce>s) OK	The Test command returns values supported by the MA as compound values.



The following table shows the +CBST parameters.

Table 4-12: +CBST Parameters

<Parameter>	Description
<speed>	0 - Auto-bauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service) 6 - 4800 bps (V.32) 7 - 9600 bps (V.32) 70 - 4800 bps (V.110 or X.31 flag stuffing) 71 - 9600 bps (V.110 or X.31 flag stuffing) The default value is 7. Note: Currently the G30 supports: 2 baud rates: 4800 and 9600 bps 2 protocols: V.110 and V.32
<name>	0 - Data circuit asynchronous (UDI or 3.1 kHz modem) The default value is 0.
<ce>	0 - Transparent 1 - Non-transparent (default)

Example

```

AT+CBST=?
+CBST: (0,6,7,70,71),(0),(0-1)
OK
AT+CBST?
+CBST: 7,0,1
OK
AT+CBST=6
OK
AT+CBST?
+CBST: 6,0,1
OK
  
```

4.2.3.14. O, Return to Online Data State

This command returns the G30 from the Command mode to the Online Data mode and issues a CONNECT or CONNECT <text> result code.

After dialing or answering (atd/ata commands and connect), the phone enters the Online Data mode where it is able to transfer data, but not to enter AT commands.

The ESC command +++, transfers the phone to the Command mode (able to input AT commands, while preserving the Data call). The O command returns the phone to the fully Online Data mode (as it was before using the ESC command).

Note: The escape character '+' can be changed using the S2-register.

The time delay between consecutive escape characters is configured using the S12-register.



Read	+MDC?	++MDC: <mode> OK	The Read command should return the current selection of <mode>.
Test	+MDC=?	+MDC: (list of supported <mode>s) OK	The Test command returns the possible <mode> values.

```

Example
AT+MDC=?
+MDC: (0-1)
OK
AT+MDC=1
OK
ATD<number>;
OK
CONNECT
AT+MDC?
+MDC: 1
OK
AT+MDC=0
OK
ATD<number>;
OK
OK
AT+MDC?
+MDC: 0
OK
    
```

4.2.3.17. +MHUP, Motorola Hung UP call

This command hung up specific call or all calls, and report a specific disconnect cause to the NW.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MHUP=<cause> [,<call_id>]	OK or: +CME ERROR: <err>	
Test	AT+MHUP=?	+MHUP: (1,16,17,18, 27,31),(0-7) OK	Show list of supported <cause>'s and list of supported <call_id>'s.



Read	AT+MTTY?	+ MTTY : <n> OK or: +CME ERROR: <err>	The READ command returns the current TTY mode <n>.
Test	AT+MTTY=?	+MTTY : (0-3) OK or: +CME ERROR: <err>	The Test command returns the possible value's range.

The following table shows the +MTTY parameters.

Table 4-14: +MTTY Parameters

<Parameter>	
<n>	0 Normal voice mode. 1 Full TTY mode (both uplink and downlink support TTY data; used when both side parties are deaf). 2 VCO mode (Voice Carry Over- uplink is voice active downlink is TTY). 3 HCO mode (Hearing Carry Over-downlink is voice active uplink is TTY). The default value: <ul style="list-style-type: none"> • On Power Up - as previously saved in FLEX bytes. • Before set command is first used, mode is set to Normal voice mode.

Notes:

VCO: Voice Carry Over is intended for people who cannot hear but are able to speak clearly. During a VCO relay call, the Deaf or Hard-of-Hearing caller speaks directly to the person they are conversing with. When that person responds, a Communication Assistant (CA) will type back exactly what is said and it will appear on the screen of your TTY or VCO phone.

HCO: Hearing Carry Over allows Speech Disabled callers who can hear well on the telephone to listen directly to the person they are talking with. The Speech Disabled Relay user types his or her part of the conversation on a TTY. A Communication Assistant (CA) then speaks the typed conversation, word for word, to the standard telephone user.

Error! Reference source not found. shows the TTY hardware



Table 4-15: +CPAS Parameters

<Parameter>	Description
<pas>	0 - Ready - The G30 allows commands from the terminal 1 - Unavailable (MT does not allow commands from TA/TE) 2 - Unknown - The G30 is not guaranteed to respond to instructions 3 - Ringing (MT calls) - The G30 is ready for commands from the terminal, but the ringer is active 4 - Call in progress - The G30 is ready for commands from the terminal, but a call is in progress 5 - Sleep (MT is unable to process commands from TA/TE because it is in a low functionality state)

```

Example
AT+CPAS
+CPAS: 0
OK
AT+CPAS=?
+CPAS: (0-5)
OK
AT+CPAS?
+CPAS: 4
OK
AT+CPAS //Voice call active state
+CPAS: 4
OK
    
```

4.2.4.2. +CLCC, List Current Calls

This command displays a list of all current G30 calls and their statuses, and also enables/disables the unsolicited indication of the call list. (If no calls are received, no information response is sent to the terminal.)

If the command succeeds but no calls are available, no information response is sent to the terminal. The maximum number of simultaneous multiparty calls is 5+1 (5 in active group and 1 on hold).

Command Type	Syntax	Response/Action	Remarks
Set	AT+CLCC=<state> >	OK or: +CME ERROR: <err>	The Set command enables/disables unsolicited indications.



<p><state></p>	<ul style="list-style-type: none"> 1 - Idle call state 2 - Single incoming call 3 - Single call active 4 - Multi-party call active 5 - Single call held 6 - Multi-party call held 7 - Dual call (fully connected active call and held call) 8 - Dual multi-party call active 9 - Dual multi-party call held 10 - Single active call plus call waiting 11 - Multi-party call active plus call waiting 12 - Single call held plus call waiting 13 - Multi-party call held plus call waiting 14 - Dual calls plus call waiting 15 - Dual multi-party calls active plus call waiting 16 - Dual multi-party calls held plus call waiting 17 - Call control busy 64 - Calling 68 - No Service 69 - No Redial 72 - Security Fail
<p><alpha></p>	<p>Text representation of the phone book entry. String type alphanumeric representation of <number> corresponding to the entry found in the phone book. Contains a string of up to 20 characters.</p>

```

Example
AT+MCST?
+MCST: // <idle>
AT+MCST=1
OK
atd035684423;
+MCST: 17
OK
+MCST: 17
+MCST: 255
OK
+MCST: 3
+MCST: 17
NO CARRIER
+MCST: 1

```

```

AT+MSELINT=1
OK
AT+MCST=?
+CME ERROR: operation not supported

```

```

OK
AT+MSELINT=0
OK

```

```

AT+MCST=?
+MCST: (0-1)

```



<mode>	0	Queries the CCM value
	1	Deactivates unsolicited reporting of the CCM value
	2	Activates unsolicited reporting of the CCM value

Note: <CCM>: String type value representing three bytes of the current call meter value in hexadecimal format (for example, "00001E" indicates decimal value 30).

Example

Example with prepaid SIM card with 56700.00L prepaid before the test.

```

AT
OK
AT+CAOC=2
OK
atd+97254565190;
OK
OK
+CCCM: "000000"
+CCCM: "000006"
AT+CAOC
+CAOC: "000009"
OK
+CCCM: "00000e"
+CCCM: "000016"
AT+CAOC
+CAOC: "00001d"
OK
+CCCM: "00001e"
+CCCM: "000027"
AT+CAOC=0
+CAOC: "00002d"
OK
AT+CAOC=2
OK
+CCCM: "00003d"
AT+CAOC
+CAOC: "00003f"
OK
+CCCM: "000046"
AT
+CCCM: "00004e"
+CAOC
+CAOC: "00004f"
OK
+CCCM: "000056"
AT+CAOC
+CAOC: "00005d"
OK
+CCCM: "00005e"
NO CARRIER
AT+CAOC
+CAOC: "000066"
OK
//567 (prepaid SIM value) - 102 (price per call unit by provider) x 66 (call units) = 465
left in prepaid SIM
OK

```

There is now 46500.00L prepaid remaining on the SIM card.

Note: The above example shows first time activation of the AOC feature using the G30. Therefore, the accumulated cost is equal to the current call cost.



4.2.5.2. +CACM, Accumulated Call Meter

This command resets the Advice of Charge accumulated call meter value in the SIM file, EFACM. ACM contains the total number of home units for both the current call and preceding calls.



+CACC, A .

Command Type	Syntax	Response/Action	Remarks
Set	+CACM=<passwd>	OK +CME ERROR: <err>	The Set command resets the accumulated call meter value. SIM PIN2 is required.
Read	+CACM?	+CACM: <acm> +CME ERROR: <err>	The Read command displays the current value of ACM.
Test	+CACM=?	OK	The Test command indicates whether the +CACM command is functioning.

The following table shows the +CACM parameters.

Table 4-19: +CACM Parameters

<Parameter>	Description
<passwd>	SIM PIN2 password Maximum string length is 8 characters. If this value is exceeded, the command terminates in an error. If PIN2 is incorrect, "+CME ERROR: incorrect password" is displayed.
<acm>	4.2.5.3. Accumulated call meter maximum value (similar to CCM; +CAOC, Advice of Charge)) . The default is 0. <ccm> String type; three bytes of the current call meter value in hexadecimal format (for example, 00001E indicates a decimal value of 30). Value is given in home units; bytes are similarly coded as the ACMmax value in the SIM.

Example

```
AT+CACM=?
OK
AT+CACM?
+CACM: "000000"
OK
AT+CACM="2222"
OK
```



+CACC, A) reaches ACCmax, additional calls (mobile-originated and mobile-terminated calls that incur charges) are prohibited, except for emergency calls. Refer to GSM 02.24.

Command Type	Syntax	Response/Action	Remarks
Set	+CACC=[<accmax> , <passwd>]	OK +CACC ERROR : <err>	The Set command sets the accumulated call meter maximum value. SIM PIN2 is required. The value that is set remains after a power cycle. Note: This command is activated if Advice of Charge is supported by the network.
Read	+CACC?	+CACC: <accmax> +CACC ERROR : <err>	The Read command displays the current value of ACCmax.
Test	+CACC=?	OK	The Test command indicates whether the +CACC command is functioning.

The following table shows the +CACC parameters.

Table 4-20: +CACC Parameters

<Parameter>	Description
<accmax>	<p>4.2.5.5. Accumulated call meter maximum value (similar to CCM; +CAOC, Advice of Charge)</p> <p>ccm></p> <p>String type; three bytes of the current call meter value in hexadecimal format (for example, 00001E indicates a decimal value of 30). Value is given in home units; bytes are similarly coded as the ACCmax value in the SIM.</p> <p>Range is from 00001 to FFFFFFF.</p> <p>0 Disables ACCmax (default)</p>
<passwd>	<p>SIM PIN2 password</p> <p>Maximum string length is 8 characters. If this value is exceeded, the command terminates in an error. If PIN2 is incorrect, "+CACC ERROR: incorrect password" is displayed.</p>

Example

```
AT+CACC=?
OK
AT+CACC="FFFFFF" , "2222"
OK
AT+CACC?
+CACC: "FFFFFF"
OK
```



4.2.5.6. +CPUC, Price per Unit and Currency Table

This command sets the parameters of the Advice of Charge-related price per unit and currency table found in the SIM file, EFPUCT. PUCT information is used to convert the home units (used in +CAOC, +CACM and +CAMP) into currency units.

Command Type	Syntax	Response/Action	Remarks
Set	+CPUC=<currency>,<ppu>,<passwd>	OK +CME ERROR: <err>	The Set command sets the price per unit and the currency table. SIM PIN2 is required. The new value is retained after a power cycle.
Read	+CPUC?	+CPUC: <currency>,<ppu> +CME ERROR: <err>	The Read command displays the current price per unit and currency table.
Test	+CPUC=?	OK	The Test command indicates whether the +CPUC command is functioning.

The following table shows the +CPUC parameters.

Table 4-21: +CPUC Parameters

<Parameter>	Description
<currency>	Currency code character set (3 characters) defined by +CSCS command. (Error! Reference source not found.) If the string begins with an alphanumeric character, it may be entered with or without quotation marks, for example, "GBP", "DEM".
<ppu>	Price per unit A dot is used as a decimal separator (precision of 1/1000; 15 digit maximum), for example, "2.667". [See notes below]
<passwd>	SIM PIN2 password Maximum string length is 8 characters. If this value is exceeded, the command terminates in an error. If PIN2 is incorrect, "+CME ERROR: incorrect password" is displayed.

Example

```
AT+MSELINT = 0
OK
```

```
AT+CPUC=?
OK
AT+CPUC?
```



```

+CPUC: " ", " "

AT+CPUC="GBP", "0.125", "2222"
OK
AT+CPUC?
+CPUC: "GBP", "0.125"
OK

AT+MSELINT = 1
AT+CPUC?
+CPUC: " ", "0.000"

OK
AT+CPUC=?
OK
AT+CPUC?
+CPUC: " ", "0.000"

OK
OK
AT+CPUC="GBP", "0.125", "2222"
OK
AT+CPUC?
+CPUC: "GBP", "0.125"

```

Note: If <ppu> contains a dot, a maximum of three digits may appear after the dot, otherwise an error is generated. For example, if <ppu>=0.61, the Read command displays 0.610. <ppu>=1.2345 terminates in an error. If <ppu> does not contain a dot, the number is divided by 1000. For example, if <ppu>=1, the Read command displays 0.001. Due to storage constraints, the <ppu> value is limited to a range of 0 to 4095. Values beyond this range may result in rounding errors. For example, if <ppu>=4095, the Read command displays 4.095. However, if <ppu>=4096, the Read command displays 4.090 (the last digit is replaced by 0). If <ppu>=456789, the Read command displays 456.000.

4.2.5.7. +CR, Service Reporting Control

This command controls whether or not the extended format of an outgoing call is displayed or not. The +CR indication is sent from the G30 to the terminal whenever a data call is initiated by the G30.

Command Type	Syntax	Response/Action	Remarks
Set		OK	The Set command enables/disables the extended format of an outgoing data call. When enabled, the outgoing data call is indicated to the terminal through the unsolicited result code +CR:<serv>. When the command is disabled, no +CR



			is sent to the terminal.
Read	+CR?	+CR:<mode>	The Read command displays the current service reporting control setting.
Test	+CR=?	+CR:list of supported <mode>	The Test command displays the list of supported CR modes.

The following table shows the +CR parameters.

Table 4-22: +CR Parameters

<Parameter>	Description
<mode>	0 Extended format disabled (default) 1 Extended format enabled
<serv>	Type of outgoing data calls: ASYNC - Asynchronous transparent SYNC - Synchronous transparent REL ASYNC - Asynchronous non-transparent REL SYNC - Synchronous non-transparent

```

Example
AT+CR=1           //Enable reporting
OK
ATD1234567890
+CR: REL ASYNC

AT+CR=?
    
```



Table 4-26: +CSSU Notification Values

Value	Description	G30 Support
0	This is a forwarded call (mobile-terminated call setup).	Yes
1	CUG call (<index> is present; mobile-terminated call setup).	Yes
2	Call has been put on hold (during a voice call)	Yes
3	Call has been retrieved (during a voice call)	Yes
4	Multiparty call has been entered (during a voice call)	Yes
5	Call on hold has been released (during a voice call; not a supplementary service notification)	Yes
6	Forward check supplementary service message received (can be received at any time)	Yes
7	Call is being connected with the remote party in an alerted state using an explicit call transfer operation (during a voice call).	Yes



Command Type	Syntax	Response/Action	Remarks
Set	AT+CUSD=[<n>[, <str>[, <dcs>]]]	OK or: +CME ERROR: <err>	The Set command enables/disables the display of the unsolicited result code.
UnsolicitedReport		+CUSD: <m>[, <str>[, <dsc>]]]	The USSD response from the network.
Read	+CUSD?	+CUSD: <n> or: +CME ERROR: <err>	The Read command displays the current value of <n>.
Test	+CUSD=?	+CUSD: (list of supported <n>s) or: +CME ERROR: <err>	The Test command displays the supported values of <n>.

The following table shows the +CUSD parameters.

Table 4-27: +CUSD Parameters

<Parameter>	Description
<n>	0 Disable the result code presentation in the TA. 1 Enable the result code presentation in the TA. 2 Cancel session (not applicable to read command response).
<str>	String type USSD-string (when <str> parameter is not given, network is not interrogated): If <dcs> indicates that GSM23.038 [25] default alphabet is used: <ul style="list-style-type: none"> • If TE character set other than "HEX" (refer command Select TE Character Set +CSCS): ME/TA converts GSM alphabet into current TE character set according to rules of GSM27.005 [24] Annex A. • If TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character ? (GSM 23) is presented as 17 (IRA 49 and 55)). If <dcs> indicates that 8-bit data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).



<p><dc></p>	<p>GSM23.038 - Cell Broadcast Data Coding Scheme in integer format. The supported value are:</p> <p>17 - USC2 Language Indicator. (The first character in a USC2 Lang IND has the language ID in it. This situation is not defined by the GSM 7.07 or the 3GPP 27.007 so the assuming that the first character should have the correctly formatted and packed language ID already in it).</p> <p>72 - USC2 (16 bit).</p> <p>68 - 8 bit.</p> <p>Each other value except of 96, 80, and 240 are 7 bit.</p> <p>Not supported values are: 96, 80, 240</p> <p>The default value is 15 (7 bit).</p>
<p><m></p>	<p>0 No further user action required (network initiated USSD-Notify, or no further information needed after mobile Initiated operation).</p> <p>1 Further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation).</p> <p>2 USSD terminated by network. the reason for the termination is indicated by the index, as described in Table 4-28.</p> <p>3 Other local client has responded.</p> <p>4 Operation not supported.</p> <p>5 Network time out.</p>



```

Example
AT+CUSD=1,"*00*0549598743#"
+CUSD: 0,"Connecting...",15
+CUSD: 0,"Connected",15
+CLCC: 1,1,4,0,0,"0545550099",129,""    >Call from USSD server
RING
ATA > answer to the server (when answered, the server call to 0549598743)
OK
+CLCC: 1,1,0,0,0,"0545550099",129,""
NO CARRIER
+CLCC: 1,1,6,0,0,"0545550099",129,""
    
```

Table 4-28: CUSD Termination Cause Table Index

Termination Cause	Index
NO_CAUSE	0
CC_BUSY	1
PARAMETER_ERROR	2
INVALID_NUMBER	3
OUTGOING_CALL_BARRED	4
TOO_MANY_CALLS_ON_HOLD	5
NORMAL	6
DROPPED	10
NETWORK	12
INVALID_CALL_ID	13
NORMAL_CLEARING	14
TOO_MANY_ACTIVE_CALLS	16
UNASSIGNED_NUMBER	17



MAX_MPTY_PARTICIPANTS_EXCEEDED	48
SYSTEM_FAILURE	49
DATA_MISSING	50
BASIC_SERVICE_NOT_PROVISIONED	51
ILLEGAL_SS_OPERATION	52
SS_INCOMPATIBILITY	53
SS_NOT_AVAILABLE	54
SS_SUBSCRIPTION_VIOLATION	55
INCORRECT_PASSWORD	56
TOO_MANY_PASSWORD_ATTEMPTS	57
PASSWORD_REGISTRATION_FAILURE	58
ILLEGAL_EQUIPMENT	59
UNKNOWN_SUBSCRIBER	60
ILLEGAL_SUBSCRIBER	61
ABSENT_SUBSCRIBER	62
USSD_BUSY	63
CANNOT_TRANSFER_MPTY_CALL	65
BUSY_WITH_UNANSWERED_CALL	66
UNANSWERED_CALL_PENDING	68
USSD_CANCELED	69



	Set
).

Example
 AT+COLP=0
 OK
 AT+COLP=2
 +CME ERROR: Numeric parameter out of bounds

4.3. Voice Mail and Clock

4.3.1. Voice Mail Commands

4.3.1.1. +CSVM, Set Voice Mail Server

This command handles the selection of the number to the voice mail server. The new value should also remain after power cycle.

Command Type	Syntax	Response/Action		Remarks
Set	+CSVM=<mode> [,<number>[,<type>]]	OK +CME ERROR: <err>		The Set command sets the number to the voice mail server.
Read	+CSVM?	+CSVM:<mode>,<number>,<type> +CME ERROR: <err>		The Read command displays the currently selected voice mail number and status (enabled or disabled).
Test	+CSVM=?	+MSELINT = 0 +CSVM: (list of supported <mode>s), (list of supported <type>s) +CME ERROR: <err>	+MSELINT = 1 +CSVM: (list of supported <mode>s), (list of supported <type>s) +CME ERROR: <err>	+CSVM=?

The following table shows the +CSVM parameters.

Table 4-30: +CSVM Parameters

<Parameter>	Description
<mode>	0 Disables the voice mail number (default) 1 Enables the voice mail number



4.3.2. System Date and Time Access Commands

4.3.2.1. +CCLK, Read/Set System Date and Time

This command reads and sets the G30 current date, time and time zone.

Command Type	Syntax	Response/Action	Remarks
Set	+CCLK=<time>	OK or: +CME ERROR: <err>	The Set command sets the date, time and time zone of the system clock. Note: Set Command sets user defined system clock values and saves them in the NVM memory. These saved values are kept after power-cycle as well.
Read	+CCLK?	+CCLK: <time> OK or: +CME ERROR: <err>	The Read command returns the current date, time and time zone setting. By default, <time> will represent the network updated time. If the user has used the Set command once, then <time> will represent the Set command setting. Note: If network operator does not support System Clock Update Message, the initial date, time and time zone, displayed by CCLK Read Command could be invalid (user's responsibility to set date, time and time zone by CCLK Set Command). Note: See Execute Command for how-to enable back network update time.
Test	+CCLK=?	+CCLK (list of supported <time>s) OK or: +CME ERROR: <err>	The Test command returns valid parameters for the +CCLK Set command.
Execute	+CCLK	OK or: +CME ERROR: <err>	The Execute command causes system clock to be overridden by network System Clock value immediately. Note: CCLK Read command will represent the network update time after CCLK Execute command. This value will be represented after power-cycle as well.



4.4. SMS

4.4.1. SMS Commands

G30 supports SMS PDU and SMS TEXT mode according to ETSI specifications GSM27.005 & GSM23.040.

4.4.1.1. +CSMS, Select Message Service

This command handles the selection of messaging <service>. It returns the types of messaging services supported by G30.

Command Type	Syntax	Response/Action		Remarks
Set	+CSMS=<service>	+CSMS: <mt>, <mo>, <bm> or: +CMS ERROR: <err>		The Set command sets the type of service and returns the types of messages supported by the G30.
Read	+CSMS?	+MSELINT = 0 +CSMS: <service>, <mt>, <mo>, <bm>	+MSELINT = 1 +CSMS: <service>, <mt>, <mo>, <bm>	+CSMS?
Test	+CSMS=?	+MSELINT = 0 +CSMS: <service>	+MSELINT = 1 +CSMS: (128)	+CSMS=?

The following table shows the +CSMS parameters.

Table 4-34: +CSMS Parameters

<Parameter>	Description
-------------	-------------



4.4.1.4. +CSCA, Service Center Address

This command enables to write/read SCA to/from SIM.

In SMS text mode, SCA stored in SIM is added to any stored and sent SMS.

In SMS pdu mode, SCA stored in SIM is added to stored SMS and send SMS only when SCA address length coded in PDU equals zero.

Command Type	Syntax	Response/Action	Remarks
Set	+CSCA=<sca>[, <tosca>]	OK or: +CMS ERROR: <err>	Sets service center address stored in SIM (EF-SMSP -Short message service parameters). <tosca> is optional parameter, default value is 129 (local number). When <sca> is prefixed with '+' it indicates that <tosca> is set to 145(International number).
Read	+CSCA?	+CSCA: <sca> , <tosca>	Read command displays <sca> and <tosca> stored in SIM*EF-SMSP).
Test			Test command for +CSCA is not defined exactly by ETSI.

Table 4-37: +CSCA Parameters

<Parameter>	Description
<sca>	<p>Service Center Address" ""+" character prefix of <sca> indicates <tosca> of 145.</p> <p>Minimum 1 and up to 20 characters, where each character is represented by semi octets (excluding '+' character).</p> <p>If <sca> contains an odd number of digits, bits 4 to 7 of the last octet shall be filled with an end mark coded "s" "1"11".</p>




```

Example
AT+CSCA?
+CSC": "+972123"56",145 // Read SCA address and TOSCA stored in SIM (EF-
smsp)

OK

AT+CS"A="972123"56"
OK
AT+CSCA?
+CSC": "972123"56",129

OK

AT+CSCA?
+CSC": "*A"C#",129

OK

AT+CMGW=13
> 0481ABCD1211640A8150224902450000A700 // '*'->'A', 'A'->'B', 'B'->'C',
'#'->'D'

+CMGW: 15

OK

AT+CMGR=15
+CMGR: 2,,13
0481ABCD1211640A8150224902450000A700 // SCA read as stored for current SMS

OK
AT+CSCA?
+CSC": "*A"C#",129 // Read command remained // SCA settings didn't
change

OK

AT+CSCA?
+CSC": "*A"C#",129

OK

AT+CMGW=
65 > 0011640A8150224902450000A700

+CMGW: 16

OK
AT+CMGR=16
+CMGR: 2,,13
0481CAEDFB11640A8150224902450000A700 // SCA is: ACDEB in pdu, mapped to
*ABC#
OK

AT+CMGW=13
> 0381AB1211640A8150224902450000A700 / Set SCA to BA21

+CMGW: 17

```



The following table shows the +CSDH parameters.

Table 4-40: +CSDH Parameters

<Parameter>	Description
<show>	0 - Means do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS- DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata> (default). 1 - Means show the values in result codes.

```

Example
AT+CSDH=?
+CSDH: (0-1)OK
AT+CSDH?
+CSDH: 0
OK
AT+CMGR=160 // SMS-SUBMIT
+CMGR: "STO UNSENT", "0544565034",
ABC
OK
AT+CSDH=1
OK
AT+CMGR=160
+CMGR: "STO
UNSENT", "0544565034", ,81,29,0,0,"04/11/04,09:48:36+08", "+97254120032",145,3
ABC
OK
    
```

Command	Response/Action
+CSDH=[<show>]	OK or: +CMS ERROR: <err>
Command	Response/Action
AT+CSDH?	+CSDH: <show> OK or: +CMS ERROR: <err>
Command	Response/Action



AT+CSDH=?	+CSDH: (list of supported <show>s) OK or: +CMS ERROR: <err>
-----------	--

Table 4. +CSDH Parameters

<Parameter>	Description
<show>	0 - Means do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) nor <length>, <toda> or <toa> in +CMT, +CMGL, +CMGR result codes for SMS- DELIVERS and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata> (default). 1 - Means show the values in result codes.

4.4.1.7. +CNMI, New Message Indications to Terminal

This command selects the procedure of how a message reception from network is being indicated.

Command Type	Syntax	Response/Action
Set	+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	OK or: +CMS ERROR: <err>
Read	+CNMI?	+CNMI:<mode> ,<mt> ,<bm> ,<ds> ,<bfr>
Test	+CNMI=?	+CNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>s), (list of supported <bfr>s)



The following table shows the +CNMI parameters.

Table 4-41: +CNMI Parameters

<Parameter>	Description
<mode>	<p>Determines incoming SMS unsolicited result code indication processing:</p> <p>0 - Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications (default).</p> <p>1 - Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE.</p> <p>2 - Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation. Otherwise forward them directly to the TE.</p> <p>3 - Forward unsolicited result codes directly to the TE.</p>



<mt>

Determine SMS-Deliver indication report:

0 - No SMS-DELIVER indications are routed to TE (default).

1 - If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the following unsolicited result code (+CMTI parameters are described in [Table 4-43](#)):

+CMTI: <mem>,<index>

2 - SMS-DELIVERS are routed directly to the TE using the unsolicited result code (+CMT parameters are described in [Table 4-44](#)).

- Class 2 messages result in indication as defined in <mt>=1.
- Message waiting indication group (discard message): route message to TE and do not try to store it in memory.
- Message waiting indication group: (store message): as <mt>=1.

PDU Mode:

+CMT: [<alpha>],<length><CR><LF><pdu>

TEXT Mode:

When +CSDH=0:

+CMT:<da>,<scts>
<CR><LF><data>

When +CSDH=1:

+CMT:<da>,<alpha>,<scts>,<toda>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length><CR><LF><data>

3 - Class 3 SMS-DELIVERS are routed directly to TE using unsolicited result codes defined in <mt>=2.

Messages of other data coding schemes result in indication as defined in <mt>=1.



<p><bm></p>	<p>Determine Cell broadcast indication report:</p> <p>0 - No CBM indications are routed to the TE (default).</p> <p>1 - If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index></p> <p>2- Received CBMs are routed directly to the TE using unsolicited result code (+CBM parameters are described in Table 4-45):</p> <p>PDU Mode: +CBM : <length><CR><LF><pdu></p> <p>Text Mode: +CBM :<sn>,<mid>,<dc>,<page>,<pages><CR><LF> <data></p> <p>3 - Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. Messages of other classes result in indication as defined in <bm>=1.</p>
<p><ds></p>	<p>Determine SMS-STATUS-REPORTs indication report:</p> <p>0 - No SMS-STATUS-REPORTs are routed to the TE (default).</p> <p>1 - SMS-STATUS-REPORTs are routed directly to the TE using the following unsolicited result code: (+CDS parameters are described in Table 4-48).</p> <p>PDU Mode: +CDS: <length><CR><LF><PDU></p> <p>Text Mode: +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st></p> <p>2 - If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code (+CDSI parameters are described in Table 4-47):</p> <p>+CDSI: <mem>,<index></p>
<p><bfr></p>	<p>Handle buffering result codes:</p> <p>0 - TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is Entered (default).</p> <p>1- TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.</p>
<p><mem></p>	<p>Memory storage where the new message is stored according to +CPMS <mem3> settings.</p>



<index>	Index where short message as been stored in <mem>.
----------------------	--

Example
See +CMT, +CMTI, +CDS and +CDSI examples.

4.4.1.8. +CNMA, New Message Acknowledgment

This command allows acknowledge of received incoming SMS-DELIVER (+CMT) or SMS-STATUS-REPORT (+CDS) routed directly to TE when +CSMS command <service>=1. In case acknowledge is not send within required time, an RP-ERROR is send to network, +CNMI parameters <mt> and <ds> are clear and next incoming SMS indication is disabled. In TEXT mode, only positive acknowledgement to the network (RP-ACK) is possible. In PDU mode, either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the Network is possible.

Command Type	Syntax	Response/Action	Remarks
Set	<u>Text Mode:</u> AT+CNMA <u>PDU Mode:</u> 1) AT+CNMA= [<n> [, <length> [<CR> <PDU> <ctrl-Z / ESC>]]]	OK or: +CMS ERROR: <err>	<u>Text Mode:</u> Command enable sending positive acknowledgement to network - RP-ACK <u>PDU Mode:</u> Command enables sending both positive and negative acknowledgement to network (RP-ACK or RP-ERROR) together with PDU message.
Test	+CNMA=?	<u>Text Mode:</u> AT+CNMA=? OK <u>PDU Mode:</u> AT+CNMA=? +CNMA: (0-2) OK	



The following table shows the +CGML/+MMGL parameters.

Table 4-49: +CMGL/+MMGL Parameters

<Parameter>	Description																					
<index>	1-352 Index of message in storage.																					
<stat>	Status of message in memory: <table border="1"> <thead> <tr> <th>PDU mode</th> <th>Text mode</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>“REC UNREAD”</td> <td>Received unread messages (default)</td> </tr> <tr> <td>1</td> <td>“REC READ”</td> <td>Received read messages</td> </tr> <tr> <td>2</td> <td>“STO UNSENT”</td> <td>Stored unsent messages</td> </tr> <tr> <td>3</td> <td>“STO SENT”</td> <td>Stored sent message</td> </tr> <tr> <td>4</td> <td>“ALL”</td> <td>All messages</td> </tr> <tr> <td>5</td> <td>“HEADER ONLY”</td> <td>Header only (applies to +MMGL only)</td> </tr> </tbody> </table>	PDU mode	Text mode	Description	0	“REC UNREAD”	Received unread messages (default)	1	“REC READ”	Received read messages	2	“STO UNSENT”	Stored unsent messages	3	“STO SENT”	Stored sent message	4	“ALL”	All messages	5	“HEADER ONLY”	Header only (applies to +MMGL only)
PDU mode	Text mode	Description																				
0	“REC UNREAD”	Received unread messages (default)																				
1	“REC READ”	Received read messages																				
2	“STO UNSENT”	Stored unsent messages																				
3	“STO SENT”	Stored sent message																				
4	“ALL”	All messages																				
5	“HEADER ONLY”	Header only (applies to +MMGL only)																				
<oa/da>	Original/destination address.																					
<data>	Message contents in text mode.																					
<length>	In PDU mode: Size of message, in octets, excluding SMSC data. In TEXT mode: Number of characters included in <data>.																					
<pdu>	Message header and contents in PDU mode format. See description in +CMGR, +MMGR,.																					
<toda/toda>	Type of origination address / destination address																					
<fo>	First octet of the SM																					
<mr>	Message reference																					
<ra>	Recipient-Address																					
<tora>	Type Of Recipient-Address																					
<scst>	Service center time stamp																					



The following table shows the +CMGR parameters.

Table 4-50: +CMGR/+MMGR Parameters

<Parameter>	Description																		
<index>	1-352 Index in storage of the message. to be retrieved.																		
<stat>	Status of message in memory: <table border="1"> <thead> <tr> <th>PDU mode</th> <th>Text mode</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>“REC UNREAD”</td> <td>Received unread messages (default)</td> </tr> <tr> <td>1</td> <td>“REC READ”</td> <td>Received read messages</td> </tr> <tr> <td>2</td> <td>“STO UNSENT”</td> <td>Stored unsent messages</td> </tr> <tr> <td>3</td> <td>“STO SENT”</td> <td>Stored sent message</td> </tr> <tr> <td>4</td> <td>“ALL”</td> <td>All messages</td> </tr> </tbody> </table>	PDU mode	Text mode	Description	0	“REC UNREAD”	Received unread messages (default)	1	“REC READ”	Received read messages	2	“STO UNSENT”	Stored unsent messages	3	“STO SENT”	Stored sent message	4	“ALL”	All messages
PDU mode	Text mode	Description																	
0	“REC UNREAD”	Received unread messages (default)																	
1	“REC READ”	Received read messages																	
2	“STO UNSENT”	Stored unsent messages																	
3	“STO SENT”	Stored sent message																	
4	“ALL”	All messages																	
<alpha>	Alpha ID of message (not present).																		
<length>	In PDU mode: Size of message, in octets, excluding SMSC data. In TEXT mode: Number of characters included in <data>.																		
<pdu>	Message header and contents in PDU mode format. See description in the tables below.																		
<oa/da>	Original/destination address.																		
<data>	Message contents in text mode.																		
<toda/toda>	Type of origination address / destination address																		
<fo>	First octet of the SM																		
<pid>	Protocol Identifier																		
<dcs>	Data Coding Scheme																		
<sca>	Service Center Address																		



<tosca>	Type of Service Center Address
<vp>	Validity Period. Either in integer format (see Table 4-38) or in time-string format ("yy/MM/dd,hh:mm:ss±zz").
<mr>	Message reference
<scst>	Service center time stamp
<ct>	Command type
<sn>	Message serial number
<mn>	Message Number
<cdata>	Command-Data
<mid>	Message ID
<page>	Current page number
<pages>	Total number of pages
<mr>	Message Reference
<ra>	Message Recipient address
<tora>	Type of Recipient address
<scts>	Service center time stamp
<dt>	Discharge-Time
<st>	Status



Note: Any unused bits will be set to zero and shall be ignored by the receiving entity.

Table 4-52: <fo> for SMS-DELIVER Message

Bit/s	Reference	Description
0-1	Message-Type-Indicator	Parameter describing the message type. 0 0 SMS-DELIVER (in the direction SC to MS)
2	TP-More-Message-To-Send	Parameter indicating whether or not more messages are waiting to the MS in the SC. 0 More messages are waiting for the MS in this SC 1 No more messages are waiting for the MS in this SC
5	TP-Status-Report-Indication	Parameter indicating if a status report is requested by the MS 0 A status report is not requested 1 A status report is requested
6	TP-User-Data-Header-Indicator	Parameter indicating whether or not a status report will be returned to the SME. 0 A status report will not be returned to the SME 1 A status report will be returned to the SME
7	TP-Reply-Path	Parameter indicating that Reply Path is set or not. 0 TP-Reply-Path parameter is not set 1 TP-Reply-Path parameter is set



Table 4-53: Layout of SMS-STATUS-REPORT in PDU Mode (according to GSM23.040)

Reference	Description	Length
<sca>	Mandatory: Service Center address: 1 BYTE: length (number of followed octets) Mandatory: 1 BYTE: <tosca> - value between 128-255	1, 3-12 BYTES (When length is 1, length BYTE = 0)
<fo>	Mandatory: First Octet. See Table 4-54 .	1 BYTE
<mr>	Mandatory: Message Reference number, which identifying the previously submitted SMS-SUBMIT or SMS-COMMAND	1 BYTE
<TP-RA>	Mandatory: Recipient address formatted according to the formatting rules of address fields.	2-12 BYTES
<TP-SCTS>	Mandatory: The TP-Service-Center-Time-Stamp field is given in semi-octet representation, and represents the local time as described in GSM23.040	7 BYTE
<TP-DT>	Mandatory: Discharge-Time of <TP-ST>, is given in semi-octet representation, and represents the local time as described in GSM23.040	7 BYTES
<TP-ST>	Mandatory: Status of the MO message	1 BYTE
<TP-PI>	Optional: Parameter indicating the presence of any of the optional parameters which follow. See Table 4-54 .	1 BYTE
<TP-PID>	Optional: Protocol-Identifier. Values between 0-255.	1 BYTE



Table 4-54: <fo> for SMS-STATUS-REPORT Message

Bit/s	Reference	Description
0-1	Mandatory: Message-Type-Indicator	Parameter describing the message type. 1 0 SMS-STATUS-REPORT (in the direction SC to MS)
2	Mandatory: TP-More-Message-To-Send	Parameter indicating whether or not more messages are waiting to the MS in the SC. 0 More messages are waiting for the MS in this SC 1 No more messages are waiting for the MS in this SC
5	Mandatory: TP-Status-Report-Qualifier	Parameter indicating whether the previously submitted TPDU was an SMS-SUBMIT or an SMS-COMMAND: 0 The SMS-STATUS-REPORT is the result of a SMS-SUBMIT. 1 The SMS-STATUS-REPORT is the result of an SMS-COMMAND
6	Optional: TP-User-Data-Header-Indicator	Parameter indicating whether or not a status report will be returned to the SME. 0 A status report will not be returned to the SME 1 A status report will be returned to the SME

Table 4-55: <TP-PI> for SMS-STATUS-REPORT Message

Bit/s	Description
0	0 TP-PID not presence 1 TP-PID not presence
1	0 TP-DCS not presence 1 TP-DCS presence
2	0 TP-UDL not presence 1 TP-UDL presence
3-7	Reserved

Note: Reserved bits are ignored.



- If <da> and/or <to> are not given by the command, the <oa> and <tooa> will be set instead.

Command Type	Syntax	Response/Action	Remarks
Set	+CMSS=<index>[,<da>[,<to>da]]	+CMSS: <mr> or: +CMS ERROR: <err>	The Set command sends a message from storage to the network.

- The following table shows the +CMSS parameters.

Table 4-56: +CMSS Parameters

<Parameter>	Description
<index>	Index in storage of the message to be sent.
<da>	Destination address in quoted string. This field contains a single phone number.
<to>	Type of DA. Value between 128-255 (according to GSM23.040, 9.1.2.5). If this field is not given and first character of <da> is '+', <to> will be 145, otherwise 129.
<mr>	Sent message reference number.

Example

```
AT+CMSS=7
+CMSS: 12
OK
AT+CMSS=7, "054565132", 129
+CMSS: 13
OK
```

Note: Any character sent by TE to G30 before G30 has reported a result of AT+CMSS operation, will abort AT+CMSS command execution. However, if SMS was already sent to network and sending operation was successful, the result of operation "+CMSS <mr>" will be reported by G30. If after aborting AT+CMSS command execution and before result of operation was reported by G30, a second AT+CMSS command is executed, then the result of the second AT+CMSS operation only will be reported by G30.



Table 4-58: Layout of SMS-SUBMIT in PDU Mode: (according to GSM23.040)

Reference	Description	Length
<sca>	Service Center address: 1 BYTE: length (number of followed octets). Mandatory 1 BYTE: <tosca> - value between 128-255	1, 3-12 BYTES (When length is 1, length BYTE = 0)
<fo>	First Octet. See the table below.	1 BYTE
<TP-MR>	Message Reference. An integer representation of a reference number of the SM submitted to the SC by the MS. Values between 0-255.	1 BYTE
<TP-DA>	Destination address formatted according to the formatting rules of address fields.	2-12 BYTES
<TP-PID>	Protocol-Identifier. Values between 0-255.	1 BYTE
<TP-DCS>	Data Coding Scheme. Values between 0-255.	1 BYTE
<TP-VP>	Validity Period. depending on <fo>, TP-Validity-Period-Format bits setting.	0, 1, 7 BYTE
<TP-UDL>	User data length	1 BYTE
<TP-UD>	User data	0-140 BYTES



Table 4-60: <fo> for SMS-SUBMIT Message

Bit/s	Reference	Description
0-1	Message-Type-Indicator	Parameter describing the message type. 0 1 SMS-SUBMIT (in the direction MS to SC)
2	TP-Reject-Duplicates	Parameter indicating whether or not the SC shall accept an SMS-SUBMIT for an SM still held in the SC which has the same MR and the same DA as a previously submitted SM from the same OA. 0 Instruct the SC to accept an SMS-SUBMIT as mention above 1 Instruct the SC to reject an SMS-SUBMIT as mention above. In this case an appropriate TP-FCS value will be returned in the SMS-SUBMIT-REPORT.
3-4	TP-Validity-Period-Format	Parameter indicating whether the TP-VP field is present and in which format. 0 0 TP-VP field not present 1 0 TP-VP field present - relative format 0 1 TP-VP field present - enhanced format - valid only in PDU mode 1 1 TP-VP field present - absolute format
5	TP-Status-Report-Request	Parameter indicating if a status report is requested by the MS 0 A status report is not requested 1 A status report is requested
6	TP-User-Data-Header-Indicator	Parameter indicating whether the beginning of the User Data field contains a Header in addition to the short message or contains only the short message 0 The TP-UD field contains only the short message 1 The beginning of the TP-UD field contains a Header in addition to the short message
7	TP-Reply-Path	Parameter indicating that Reply Path is set or not. 0 TP-Reply-Path parameter is not set 1 TP-Reply-Path parameter is set



Table 4-63: +CGSMS Parameters

<Parameter>	Description
<service>	Indicates the service or service preference to be used. 0 GPRS 1 Circuit switched (default) 2 GPRS preferred (use circuit switched if GPRS is not available) 3 Circuit switched preferred (use GPRS if circuit switched is not available) Other values are reserved and will result in an ERROR response to the Set command.

```
Example
AT+CGSMS=?
CGSMS: (0-3)
OK
AT+CGSMS?
CGSMS: 1
OK
```

4.4.1.30. +CMGS, Send SM to Network

This command sends an SM from the G30 to the network. The message reference value <mr> is returned to the G30 upon successful delivery of the message.

Valid <tda> will be any value between 128-255.

The header parameters in TEXT mode will be set according to CSMP settings.

Command Type	Syntax	Response/Action	Remarks
Set	If text mode (+CMGF=1): +CMGS=<da>[, <tda>]<CR> text is entered<ctrl-Z/ESC> If PDU mode (+CMGF=0): +CMGS=<length><CR> PDU is entered<ctrl-Z/ESC>	+CMGS: <mr> +CMS ERROR: <err>	The Set command validates the input parameters, sends the SM to network and reports the result of the operation to the G30.

The following table shows the +CMGS parameters.

Table 4-64: +CMGS Parameters

<Parameter>	Description
<da>	Destination address in quoted string. This field contains a single MIN number.
<tda>	Type of DA. Value between 128-255 (according to GSM23.040, 9.1.2.5). If this field is not given and first character of <da> is '+', <tda> will be 145, otherwise 129.



- A combination of discrete values or intervals can be entered for <mids> and <dcss>, for example, "0,1,5,320-324,922".
- Parameter values must be entered in ascending order.
- The default value for missing <mode> is 0.
- Clear all <mids> & <dcss> might be done by one of the following commands: AT+CSCB=0 or AT+CSCB=
- The string type lists <mids> and <dcss> may include only numbers (0-9), comma and minus (-) characters.
- <mids> = 1-5 is equivalent to five channels.
- When <mode> is 0, and <mids> is a non empty list, the list will be added to the current G30 list, as long as the accumulated G30 list does not exceed the maximum allowed.
- When <mode> is 1, and <mids> is a non empty list, <mids> items from the list will be deleted from the G30 list. Nothing will be done with item that does not exist in the G30 list.
- When <mode> is 0, and <mids> is a non empty list, the <mids> will be added to the current G30 list, as long as the accumulated G30 list does not exceed the maximum allowed.
- The dcss specified refers to all incoming messages, and not only to mids specified in the same AT command. For example, AT+CSCB=0,"1-5","1-7" followed by AT+CSCB=0,"6-10","8" will update the G30 mids list to 1-10, and the dcs list to 1-8. Any CB message that arrives with mid value of 1-10 and a dcs value between 1-8, will be accepted by G30.

Example

Testing the modes supported:

AT+CSCB=?

+CSCB: (0,1)

OK

Reading the current mid and dcs lists:

AT+CSCB?

+CSCB: 0,"",""

OK

Adding channels 3, 4,5,6,22 to mid list and languages 1,8 to dcs list:

AT+CSCB=0,"3-6,22","1,8"

OK

AT+CSCB?

+CSCB: 0,"3-6,22","1,8"

OK

Removing channels 4 and 6 from channel list, and removing dcs 1 from the dcs list:

AT+CSCB=1,"4,6","1"

OK

AT+CSCB?

+CSCB: 0,"3,5,22","8"

OK

Clear all <mids> and <dcss>

AT+CSCB=0 / Or AT+CSCB=

OK

AT+CSCB?

+CSCB: 0,"",""

OK

4.4.1.33. +MRICS, Motorola Ring Indicator Configuration for SMS

This command allows configuring the behavior of RI line in a case of SMS arrival.

The command setting supports 3 SMS types:

- SMS-DELIVER
- SMS-STATUS-REPORT




```

AT+CRLP=?
+CRLP: (0-61),(0-61),(39-255),(1-255)

OK
AT+CRLP?
+CRLP: 61,61,48,6

OK
AT+MSELINT=1
OK
AT+CRLP=?
+CRLP: (000-061),(000-061),(039-255),(001-255)

OK
AT+CRLP?
+CRLP: 061,061,048,006

OK

```

4.5.1.3. +CREG, Network Registration Status

Command type	Syntax	Response/action <i>+mselint=0</i>	Response/action <i>+mselint=1</i>	Remarks
Set	AT+CREG=[<n>]	OK or: +CME ERROR: <err>	OK or: +CME ERROR: <err>	The Set command controls the presentation of an unsolicited result code and the result of the Read operation.
Read	AT+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>] OK or: +CME ERROR: <err>	+CREG: <n>,<stat>[,<lac>,<ci>] OK or: +CME ERROR: <err>	The Read command returns the status of the result code presentation and shows whether the network has currently indicated the registration of the G30. Location information elements <lac> and <ci> are returned only when <n>=2 and the G30 is registered in the network.
Test	AT+CREG=?	+CREG: (list of supported <n>s) OK	+CREG: (list of supported <n>s) OK	

The following table shows the +CREG parameters.



Table 4-70: +CREG Parameters

<Parameter>	Description	
	+MSELINT = 0	+MSELINT = 1
<n>	<p>0 Disables the network registration unsolicited result code.</p> <p>1 Enables the network registration unsolicited result code +CREG: <stat>.</p> <p>2 Enables the network registration and location information in unsolicited reports and Read command +CREG:<stat>[,<lac>,<ci>]. The default is 0.</p>	<p>0 Disables the network registration unsolicited result code.</p> <p>1 Enables the network registration unsolicited result code +CREG: <stat>.</p> <p>2 Enables the network registration and location information in unsolicited reports and Read command +CREG:<stat>[,<lac>,<ci>]. The default is 0.</p>
<stat>	<p>0 Not registered, and the ME is not currently searching for a new operator to which to register.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but the ME is currently searching for a new operator to which to register.</p> <p>3 Registration denied.</p> <p>4 Unknown.</p> <p>5 Registered, roaming.</p>	<p>0 Not registered, and the ME is not currently searching for a new operator to which to register.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but the ME is currently searching for a new operator to which to register.</p> <p>3 Registration denied.</p> <p>4 Unknown.</p> <p>5 Registered, roaming.</p>
<lac>	Two-byte location area code in hexadecimal format.	Two-byte location area code in hexadecimal format.
<ci>	Two-byte cell ID in hexadecimal format.	Two-byte cell ID in hexadecimal format.

Example:

```
AT+MSELINT?
+MSELINT: 0
```

```
OK
AT+CREG=?
+CREG: (0-2)
```

OK

```
AT+CREG?
+CREG: 0,1
```



```

OK

AT+MSELINT=1
OK

AT+CREG=?
+CREG: (000-002)

OK

AT+CREG?
+CREG: 000,001
OK
AT+CREG=2
OK
AT+CREG?
+CREG: 002,001, a065,988b
OK
AT+CREG=1
OK
AT+CREG?
+CREG: 001,001
OK
AT+CREG=0
OK

```

4.5.1.4. +CGREG, GPRS Network Registration

Command type	Syntax	Response/action +mselint=0	Response/action +mselint=1	Remarks
Set	AT+CGREG=[<n>]	OK or: +CME ERROR: <err>	OK or: +CME ERROR: <err>	The Set command controls the presentation of an unsolicited result code "+CGREG:" and the result of the Read operation.
Read	AT+CGREG?	+CGREG: <n>,<stat>[,<lac>,<ci>] OK or: +CME ERROR: <err>	+CGREG: <n>,<stat>[,<lac>,<ci>] OK or: +CME ERROR: <err>	The Read command returns the status of the result code presentation and shows whether the network has currently indicated the GPRS registration of the G30. Location information elements <lac> and <ci> are returned only when <n>=2 and the G30 is registered in the network.
test	AT+CGREG=?	+CGREG: (list of supported <n>s) OK	+CGREG: (list of supported <n>s) OK	The Test command displays the supported values of <n>.

The following table shows the +CGREG parameters.



Table 4-71: +CGREG Parameters

<Parameter>	Description	
	+MSELINT = 0	+MSELINT = 1
<n>	<p>0 Disables the network registration unsolicited result code.</p> <p>1 Enables the network registration unsolicited result code +CGREG: <stat>.</p> <p>2 Enables the network registration and location information in unsolicited result code and Read command +CGREG:<stat>[,<lac>,<ci>].</p> <p>The default is 0</p>	<p>0 Disables the network registration unsolicited result code.</p> <p>1 Enables the network registration unsolicited result code +CGREG: <stat>.</p> <p>2 Enables the network registration and location information in unsolicited result code and Read command +CGREG:<stat>[,<lac>,<ci>].</p> <p>The default is 0</p>
<stat>	<p>0 Not registered, and the ME is not currently searching for a new operator to which to register.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but the ME is currently searching for a new operator to which to register.</p> <p>3 Registration denied.</p> <p>4 Unknown.</p> <p>5 Registered, roaming.</p>	<p>0 Not registered, and the ME is not currently searching for a new operator to which to register.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but the ME is currently searching for a new operator to which to register.</p> <p>3 Registration denied.</p> <p>4 Unknown.</p> <p>5 Registered, roaming.</p>
<lac>	Two-byte location area code in hexadecimal format.	Two-byte location area code in hexadecimal format.
<ci>	Two-byte cell ID in hexadecimal format.	Two-byte cell ID in hexadecimal format.

Example:

```
AT+MSELINT?
+MSELINT: 0
```

```
OK
AT+CGREG?
+CGREG: 0,4
```

OK

```
AT+CGREG=?
+CGREG: (0-2)
OK
```



```

AT+MSELINT=1
OK

AT+CGREG?
+CGREG: 000,004

OK

AT+CGREG=?
+CGREG: (000-002)
OK
AT+CGREG=2
OK
AT+CGREG?
+CGREG: 002,001,2648,988b
OK
AT+CGREG=1
OK
AT+CGREG?
+CGREG: 001,001
OK
AT+CGREG=0
OK
//Example for unsolicited reports:
AT+CGREG=1
OK
AT+CGATT=0
OK
+CGREG: 000
AT+CGATT=1
OK
+CGREG: 002
+CGREG: 001
//Remove GPRS enabled SIM
+CGREG: 000
//Insert GPRS enabled SIM
+CGREG: 002
+CGREG: 001

```

4.5.1.5. +COPS, Operator Selection

This command enables accessories to access the network registration information, and the selection and registration of the GSM network operator. The G30 is registered in the Home network. The Enhanced Operator Name String (EONS) feature enables the G30 to return the operator name displayed on the handset. This feature allows the SIM card to store a mapping of MCC/MNC code pairs to the displayed operator name. As a result, several operators can share a single network while having their handsets display their own name as the network operator. Testing the enhanced ONS feature requires a "SIM ONS" SIM card.

Note: +COPS Test command type execution does not require a SIM card.

Note: +COPS Test command type execution does not require a SIM card.



				supported <mode>s and <format>s. These lists are separated from the operator list by two commas.
--	--	--	--	--

The following table shows the +COPS parameters.

Table 4-72: +COPS Parameters

<Parameter>	Description	
	+MSELINT = 0	+MSELINT = 1
<format>	The operator format type: 0 Long alphanumeric 1 Short alphanumeric 2 Numeric The default value is 0.	The operator format type: 0 Long alphanumeric 1 Short alphanumeric 2 Numeric The default value is 0.



<mode>	<p>Determines whether what is displayed is defined by <oper>, or is done automatically by the G30.</p> <p>0 Automatic (<oper> field is ignored)</p> <p>1 Manual (<oper> field is present)</p> <p>2 De-register from network</p> <p>3 Set only <format> (<oper> field is ignored); used for Read command only, do not attempt registration/deregistration</p> <p>4 Manual/automatic (<oper> field is present; if manual selection fails, use automatic mode)</p> <p>The default value is 0.</p>	<p>Determines whether what is displayed is defined by <oper>, or is done automatically by the G30.</p> <p>0 Automatic (<oper> field is ignored)</p> <p>1 Manual (<oper> field is present)</p> <p>2 De-register from network</p> <p>3 Set only <format> (<oper> field is ignored); used for Read command only, do not attempt registration/deregistration</p> <p>4 Manual/automatic (<oper> field is present; if manual selection fails, use automatic mode)</p> <p>The default value is 0.</p>
<stat>	<p>0 Unknown</p> <p>1 Available</p> <p>2 Current</p> <p>3 Forbidden</p>	<p>0 Unknown</p> <p>1 Available</p> <p>2 Current</p> <p>3 Forbidden</p>
<oper>	<p>Operator name displayed. The long alphanumeric format can be up to 16 characters long. The short alphanumeric format can be up to 8 characters long. The numeric format is the GSM Location Area Identification number (refer to GSM 04.08 [8] subclause 10.5.1.3), consisting of a three BCD digit country code (as per ITU-T E.212 Annex A [10]), plus a two BCD digit network code, which is administration specific. The returned <oper> is not in BCD format, but in IRA characters converted from BCD, and therefore the number has the following structure:</p> <p>(country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)</p>	<p>Operator name displayed. The long alphanumeric format can be up to 16 characters long. The short alphanumeric format can be up to 8 characters long. The numeric format is the GSM Location Area Identification number (refer to GSM 04.08 [8] subclause 10.5.1.3), consisting of a three BCD digit country code (as per ITU-T E.212 Annex A [10]), plus a two BCD digit network code, which is administration specific. The returned <oper> is not in BCD format, but in IRA characters converted from BCD, and therefore the number has the following structure:</p> <p>(country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)</p>

Example:

```
AT+MSELint=0
OK
```

```
AT+COPS?
+COPS: 0,0,"ORANGE"
```

OK



The following table shows the +CPOL parameters.

Table 4-73: +CPOL Parameters

<Parameter>	Description	
	+MSELINT = 0	+MSELINT = 1
<indexn>	s	Order number of network operator in the SIM preferred operator list
<format>	Defines the <oper> format: 0 Long alphanumeric format (up to 16 characters) (default) 1 Short alphanumeric format (up to 8 characters) 2 Numeric	Defines the <oper> format: 0 Long alphanumeric format (up to 16 characters) 1 Short alphanumeric format (up to 8 characters) 2 Numeric (default)
<oper>	Name of the network operator	Name of the network operator



Note 1:

- If <index> is given but <oper> is left out, entry is deleted.
- If <oper> is given but <index> is left out, <oper> is put in the next free location.
- If only <format> is given, the format of the <oper> in the read command is changed.

Note 2:

- User is prevented from editing index No. 0. This index is reserved for the HPLMN record and can not be modified. When entering a new item with an <index> to a full list, the G30 deletes the last item, stores the new item in the requested entry, and shifts the rest of the list down. When entering a new item without an <index> to a full list, the G30 replaces the last entry with the new item.

Note 3: MT may also update the User controlled PLMN selector with Access Technology list - EFPLMNwAcT, automatically when new networks are selected.

Note 4: The Operator controlled PLMN selector with Access Technology EFOPLMNwAcT and HPLMN selector with Access Technology - EFHPLMNwAcT can not be written since the access conditions is Administrative. The command is implemented according to 3GPP TS 27.007 without acceptance in attention the <GSM_Act2>, <GSM_Compact_Act2>, <UTRAN_Act2>] bits since the G30 device not using this bits to get the best PLMN.

The command is implemented according to 3GPP TS 27.007 without acceptance in attention the <GSM_Act2>, <GSM_Compact_Act2>, <UTRAN_Act2>] bits since the G30 device not using this bits to get the best PLMN

Example:

```
AT+MSELINT=0
OK

at+cpol?
+CPOL: 1,0,"Beeline" // Long alphanumeric format - default

OK
at+cpol=?
+CPOL: (1-50),(0-2)

OK

AT+MSELINT=1
OK

AT+CPOL?
+CPOL: 000,002,"42501" // Numeric format - default

+CPOL: 001,002,"25099"

OK

AT+CPOL=?
+CPOL: (001-050),(000-002)
OK
```



```

AT+CPOL=, 0
OK

AT+CPOL?
+CPOL: 000,000,"IL ORANGE"

+CPOL: 001,000,"Beeline"

OK

AT+CPOL=1,2,"42502"
OK
AT+CPOL?
+CPOL: 000,000,"IL ORANGE"

+CPOL: 001,000,"IL Cellcom"
OK

AT+CPOL=1
OK
AT+CPOL?
+CPOL: 000,000,"IL ORANGE"
OK

```

4.5.1.7. +CPLS, Selection of Preferred PLMN List.

This AT command is used to select one Public Land Mobile Network (PLMN) selector with Access Technology list in the SIM card or active application in the UICC (GSM or USIM), that is used by +CPOL AT command.

Command Type	Syntax	Response/Action	Remarks
Set	AT+CPLS=<list>	OK or: +CME ERROR: <err>	The set command is used to select PLMN list in the SIM/USIM. It is used by the +CPOL AT command.
Read	AT+CPLS?	+CPLS: <list>[, <ef>] or +CME ERROR: <err>	The read command displays the current selected PLMN list and the Elementary File name.
Test	AT+CPLS=?	+CPLS: (list of supported <list>s) or +CME ERROR: <err>	The test command displays the supported list values for the current SIM/USIM.

The following table shows the +CPLS parameters.



Table 4-74: +CPLS Parameters

<Parameter>	Description
<list>	Represents the chosen PLMN selector list: 0 User controlled PLMN selector with Access Technology - EFPLMNwAcT, if not found in the SIM/UICC, then PLMN preferred list EFPLMNsel. (Default value). 1 Operator controlled PLMN selector with Access Technology - EFOPLMNwAcT. 2 HPLMN selector with Access Technology - EFHPLMNwAcT.
<ef>	Selected elementary file name. String type: PLMNwAcT - User controlled PLMN selector with Access Technology - EFPLMNwAcT. PLMNsel - PLMN preferred list EFPLMNsel. OPLMNwAcT - Operator controlled PLMN selector with Access Technology - EFOPLMNwAcT. HPLMNwAcT - HPLMN selector with Access Technology - EFHPLMNwAcT.

Note: After phone power up <list> default value is retrieved.

```

Example
AT+CPLS=0
OK
AT+CPLS?
+CPLS: 0, "PLMNwAcT"
OK
AT+CPLS=?
+CPLS: (0)
OK
AT+CPLS=1
OK
AT+CPLS?
+CPLS: 1, "OPLMNwAcT"
OK
  
```

4.5.1.8. +MCELL, Motorola Cell Description

This command displays information about the Cellular Network. The information is divided throughout 20 screens, each of them with different parameters data.

Command Type	Syntax	Response/Action	Remarks
Set	+MCELL=<mode>, <screen_num>	+MCELL: <screen_title> <CR><LF><screen_info> OK or: +CME ERROR: <err>	The Set command will return the relevant <screen_info> according to requested <screen_num>.



- 4.5.1.8.3. I-PI Serving Cell Miscellaneous Information Screen**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID: <value>,(PD)TCH ARFCN:<value>,Timeslot:<value>,CBA:<value>,CBQ: <value>,T3314:<value>
- 4.5.1.8.4. TBF Uplink Data Transfer Screen**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID: <value>,(PD)TCH ARFCN:<value>,TxPower:<value>,Coding Scheme:<value>
- 4.5.1.8.5. TBF Downlink Data Transfer Screen**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID: <value>,(PD)TCH ARFCN:<value>,Coding Scheme:<value>
- 4.5.1.8.6. Neighbor Cell Information Screen**
MCC:<value>,MNC:<value>,LAC:<value>,Cell ID:<value>,BSIC: <value>,(P)BCCH ARFCN:<value>,RxLev:<value>
- 4.5.1.8.7. Neighbor Cell Summary Screen**
(P)BCCH ARFCN:<value>,RxLev:<value>,BSIC:<value>
(P)BCCH ARFCN:<value>,RxLev:<value>,BSIC:<value>
(P)BCCH ARFCN:<value>,RxLev:<value>,BSIC:<value>
(P)BCCH ARFCN:<value>,RxLev:<value>,BSIC:<value>
(P)BCCH ARFCN:<value>,RxLev:<value>,BSIC:<value>
(P)BCCH ARFCN:<value>,RxLev:<value>,BSIC:<value>
- 4.5.1.8.8. Reselection Screen**
(P)BCCH ARFCN:<value>,,C1:<value>,C2:<value>,C31:<value>,C32:<value>
- 4.5.1.8.9. Hopping Information Screen**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID: <value>,(PD)TCH ARFCN:<value>,Timeslot:<value>,HSN:<value>,MAIO: <value>,Number of ARFCN:<value>
- 4.5.1.8.10. PDP Context Information Screen**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID:<value>,(PD)TCH ARFCN:<value>
- 4.5.1.8.11. I-PI Serving Cell Paging Parameters Screen**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID:<value>,(PD)TCH ARFCN:<value>,Timeslot:<value>,BS_PA_MFRMS:<value>,BS_AG_BLK_RES:<value>, BS_PAG_BLK_RES:<value>,BS_PBCCH_BLOCKS:<value>
- 4.5.1.8.12. I-PI Serving Cell Optional SYSINFOs**
(P)BCCH ARFCN:<value>,BSIC:<value>,RxLev:<value>,Cell ID:<value>,(PD)TCH ARFCN:<value>,Timeslot:<value>



Access class	GSM access control class, represented in hexadecimal.
ATT flag	Bit that allows or prohibits IMSI attach/detach procedures (from SI 3).
Attach state	Either states that the mobile is not camped (in which case it can be either attached and out-of-coverage, or just not attached), or indicates whether the mobile is IMSI-attached, GPRS attached, or combine-attached (that is, both IMSI- and GPRS-attached).
Average throughput	Average LLC or RLC throughput for the current TBF in kilobits per second. Throughput is calculated and displayed in the following format: ddd.ff (kbps). The nine Most Significant Bits provide the kbit/s part of the calculation (ddd<511); The seven Least Significant Bits provide the decabit/s part (ff<99). Throughput is calculated as follows: throughput = kbps*1000 + dbps*10. Warning: LLC throughput counts repeated data as transmitted data, whereas RLC throughput does not. Note that: the RLC/LLC data flow rates do not take headers into account; throughput refers to the useful data flow rate.
(P)BCCH ARFCN for serving cell	ARFCN of the serving cell, for either its BCCH in idle and packet/idle modes, or its PBCCH in packet idle mode (when a PBCCH is present in the cell).
Beacon carrier	BC for BCCH. PB for PBCCH.
BS_AG_BLK_RES	Number of paging blocks reserved for AGCH (and not PCH) on the serving cell. This value (between 0 and 7) is broadcast on System Info 3.
BS_PA_MFRMS	Number of 51-frame multiframes between two consecutive paging blocks (on CCCH). This value (between 2 and 9) is broadcast on System Info 3.
BSIC	Base Station Identity Code - The value is represented by an octal format.
C1	The path loss criterion. This is used in cell selection and reselection.
C2	The reselection criterion, which is used only in cell reselection.
C31	GPRS signal-level threshold criterion for reselection, indicating whether or not to consider a hierarchical reselection.
C32	GPRS cell-ranking criterion for reselection, used to select among cells that have the same priority.
CBA or CBA2	Cell Bar Access (from System Info 1, 2, 2bis, 3, 4).
CBQ/EXC ACC	Cell Bar Qualify. Broadcast on System Info 3 rest octets and 4 rest octets.
Cell ID	Cell Identity parameter, from System Info 3.



CellResHys	Cell reselect hysteresis, used to compute C2, in Bm (0 to 14 dBm). It is broadcast on System Info 3.
Cell Resel. Offset	Cell Reselect Offset, in dBm (between 0 and 63 dBm). It is broadcast on System Info 3 rest octets.
Channel type	Type of channel used in the current operating mode.
Cipher mode	GSM encryption algorithm used. "5x" is displayed for the A5/x algorithm. "00" means there is no encryption. Hashes ("##") indicate an unknown algorithm.
Coding Scheme	CS1 to CS4 for GPRS or modulation and coding scheme MC1 to MC9 for EDGE.
Deliver order	Indicates whether the GPRS bearer shall provide in-seq SDU delivery or not.
Downlink coding scheme from (Timeslot, coding scheme)	Coding scheme for the downlink data transmission (between 1 and 4). "*" indicates an unknown coding scheme.
Downlink timeslot from (Timeslot, coding scheme)	Timeslot used for downlink data transfer in the current TBF. Information for as many as four timeslots can be displayed.
DTX	Indicates whether the use of discontinuous transmission has been reported to the network at least once during the last period of EFEM parameter refresh.
ECSC	Indicates whether the network accepts Early Classmark Sending (which it indicates in System Info 3).
Erroneous SDU delivered	Indicates whether the GPRS bearer detected as erroneous shall be delivered or discarded.
GPRS cell indicator	Indicates whether the serving cell offers GPRS services.
Granted delay class	Delay class (between 1 and 6; 0 or 7 for reserved) granted by the network for the current PDP context.
Granted mean throughput	Mean throughput (in decimal, between 0 and 32) granted by the network for the current PDP context.
Granted peak throughput	Peak throughput (in decimal, between 0 and 15) granted by the network for the current PDP context.
Granted reliability class	Reliability class (between 0 and 7) granted by the network for the current PDP context.




```
OK
+MCELL:PDP Context
(P)BCCH ARFCN:00072,BSIC:029,RxLev:053,Cell ID:03623,(PD)TCH
ARFCN:INVALID_ARFCN
```

4.5.1.9. +MGAUTH, Enable Authentication Protocol Setting (CHAP/PAP)

This command allows setting the authentication type for a user-name (using a password) for the specified PDP context.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MGAUTH=<cid>,<auth>,<user name>,<password>	OK or: +CME ERROR: <err>	
Read	AT+MGAUTH?	+MGAUTH: <auth> OK	
Test	AT+MGAUTH=?	+MGAUTH: (List of supported <cidr>s),(list of supported <auth>s),<name length>,<password length> OK	

The following table shows the +MGAUTH parameters.

Table 4-79:: +MGAUTH Parameters

<Parameter>	Description
<cid>	PDP context identifier, must be defined by AT+CGDCONT first.
<auth>	0 Meaning authentication protocol not used (NONE). 1 Meaning personal authentication protocol (PAP). 2 Meaning handshake authentication protocol (CHAP).



The following table shows the +MCI parameters.

Table 4-80:+MCI Parameters

<Parameter>	Description
<Filter>	The requested GSM band's ARFCNs. This is an integer which can be a combination of all (1-15): 1 - GSM 850 2 - GSM 900 4 - GSM 1800 8 - GSM 1900 The default value is 15.
<ARFCN>	Absolute Radio Frequency Channel Number Range: [1-124], [128-251], [512-885], [975-1023].
<BSIC>	Base transceiver Station Identity Code Range: [0 - 63]
<signal strength>	Range: -110 - (-48) dBm. For serving cell signal strength is defined as: <ul style="list-style-type: none"> • In dedicated mode - TCH Rx level • In idle mode average BCCH Rx level For adjacent cells, signal strength is defined as the average Rx level in the both modes.
<bitmask>	Required report of additional cell information. This is an integer which can be a combination of: 0 - Do not report any additional value. 1 - Report <TA> value. The default value is 0.
<TA>	TA (Timing Advance) is defined for serving cell only. This value will be reported only in Dedicated and TBF modes. Valid value range is from 0 to 63.

Example

```

AT+MCI // Get the current serving and neighbor's info.
+MCI: 74,17,-68,642,52,-77,77,53,-90,76,11,-93,81,, -94,66,57,-96
OK
AT+MCI=2 // Get serving cell info and GSM 900 neighbor's only
info.
+MCI: 74,17,-68,77,53,-90,76,11,-93,81,, -94,66,57,-96
OK
AT+MCI=6 // Get serving cell info and GSM 1800 only neighbor's
only info.
+MCI: 74,17,-68,642,52,-77
OK
AT+MCI=? // Get <Filter> and <enable TA> supported values.
+MCI: (1-15),(0-1)
  
```



```

OK
AT+MCI=,1
+MCI: 605,45,-78,,594,3,-88,592,4,-96,599,15,-97,597,60,-97,608,3,-99,590,,-
101
OK
AT+MCI? // Get current set <Filter> and <enable TA> values.
+MCI: 15,1
OK

//While a call is connected.
AT+MCI // Get the current serving info including TA and
neighbor's info.
+MCI: 512,45,-78,0,605,45,-75,594,3,-85,608,3,-95,597,60,-95,599,15,-
96,596,20,-99
OK

```

4.5.1.11. +MJDC, Jamming Detection Control

This command is used to enables/disable the Jamming Detection feature.

When the Jamming detector is enabled, an unsolicited report with the current jamming state will be sent to the DTE. Then, an update report will be sent to the DTE each time a change in the jamming state is detected.

This command is a basic command.

The AT+MJDC's settings will be stored in a non-volatile memory and will also be effective after power cycle.

Default value: On first power up, the jamming detector is not active (i.e. the default value for <mjdc_mode> is "0").

Command Type	Syntax	Response/Action	Remarks
Set	AT+MJDC=<mjdc_mode>	OK +MJDC:<jamming_detection> Or: +CME ERROR: <err>	The set command configures the jamming mode. NOTE: <jamming_detection> will be displayed only when jamming detector is enabled (i.e. Note: <mjdc_mode>=1).
Read	AT+MJDC?	+MJDC: <mjdc_mode>,<jamming_detection> OK	The read command returns the current settings. NOTE: [<jamming_detection>] will be Note: displayed only when jamming detector is enabling (i.e. <mjdc_mode>=1).
Test	+MJDC=?	+MJDC:(range <mjdc_mode>) OK	The test command returns the possible ranges of <mjdc_mode>s.
Unsolicited Report		+MJDC:<jamming_detection>	Indicates the jamming state.



Read	AT&K?	&K: <param>
Test	AT&K=?	&K: (list of supported <param>s)

The following table shows the &K parameters.

Table 4-85: &K Parameters

<Parameter>	Description
<param>	0 Disable all terminal/G30 flow control 3 Enable CTS/RTS terminal/G30 flow control 4 Enable Xon/Xoff terminal/G30 flow control 5 Enable Xon/Xoff terminal/G30 flow control 6 Enable CTS/RTS terminal/G30 flow control The default value is 3.

```
Example
AT&K?
&K: 3
OK
AT&K4
OK
```

4.6.1.6. &C, Circuit 109 Behavior

This parameter determines how the state of the DCD line relates to the detection of the received line signal from the distant end. Changing the parameters will take effect immediately in both the command and online command states.

The DCD line is an output line that indicates the following:

- In Circuit Switch Data mode an active (low) indicates that a valid carrier (data signal) was detected by the G30 (CONNECT message is received), and inactive (high) indicates idle. The AT&C command always puts the DCD command ON, when set to 0. If the AT&C command is set to 1 then the "+++" escape command sets the DCD signal to an inactive state and the ATO command is set to active. The AT&C set to 2 sets the DCD signal OFF.
- In GPRS mode, the DCD line indicates the PDP context status. PDP context active sets the DCD to active (low); PDP context inactive sets the DCD to inactive (high). The DCD is activated only when the PDP context is achieved. The DCD is de-activated when the PDP context is off.
- In Local Link mode, the DCD line indicates the Local Link data status.

When AT&C is set to 0, the DCD signal is always ON.

When AT&C is set to 1:

- DCD signal is set to OFF when Local link has been stopped.

When AT&C is set to 2, the DCD signal is always OFF.

When AT&C is set to 0, the DCD signal is always ON. When AT&C is set to 1, the DCD is activated in online mode. When AT&C is set to 2, the DCD is activated only when the PDP context is achieved (temporary IP address is received).



4.6.1.14. ATS97, Antenna Diagnostic

This command indicates whether an antenna is physically connected to the G30 RF connector. This information is also provided by a dedicated hardware signal, which is outputted on LGA pin #13 or on pin 41 (ANT_DET) of the interface connector.

Command Type	Syntax	Response/Action	Remarks
Execute		OK or: +CME ERROR: <err>	
Read		<info> OK or: +CME ERROR: <err>	The Read command indicates whether the antenna is connected.

The following table shows the ATS97 parameters.

Table 4-94: ATS97 Parameters

<Parameter>	Description
<info>	000 The antenna is not connected 001 The antenna is connected

```

Example
// Connect the antenna
ATS97?
001
ATS97
OK
ATS97=?
ERROR
// Disconnect the antenna
ATS97?
000
    
```



Test	+ MIOC=?	<pre>+MIOC: (list of supported <Pin selection>s), (list of supported <Data vector>s) OK or: +CME ERROR: <err></pre>	<p>The test command returns the possible ranges of <Pin selection>s and <Data vector>s.</p>
-------------	----------	---	---



The following table shows the +MIOC parameters.

Table 4-95: +MIOC Parameters

<Parameter>	Description
<pin selection>	<p>Selected pins for the action invoked. This is a binary vector in which each bit points to pin number. Vector size is 9.</p> <p>0 Not selected 1 Selected pin (default)</p>
<data vector>	<p>This is a binary vector in which each bit show the physical value of pin. Data vector size is 9.</p> <p>0 Physical low signal. 1 Physical high signal (default).</p> <p>The default value: On Power Up - as previously saved in FLEX bytes. Before set command first used with <Data vector> and <Mode>=0, or after +MIOC without <Data vector> and before +MIOC command used - 1.</p>



Example

```
AT+MIOC=?
+MIOC: (000000000-11111111),(000000000-11111111)
OK
```

Light control example:

Client has an electronic controlled light switch. The intent is to connect this switch to the G30 (IO pin 5 - for example) and control the light by setting the logical values of pin 5.

Example of code is as follows:

```
AT+MIOD=000010000,0          // Set IO pin #5 to be output.
OK
AT+MIOD?                     // (Optional) Read the IO pin definitions to confirm
correct settings.
+MIOD: 111101111           // Pins 1-4 and 6-9 are input pins. Pin 5 is output.
OK                          // At this point the module is configured to control the logic
values of
                             pin 5.
AT+MIOC=000010000, 000010000 // Turn on the light by setting pin 5 to
high.
AT+MIOC?                     // (Optional) read the pins status.
+MIOC: 000010000           // Pin 5 is set to high.
OK
AT+MIOD=000010000,0, 000010000 // All previous defined in one
command.
OK
AT+MIOC=000010000,000000000 // Turn off the light by setting pin
5 to low.
OK
AT+MIOC?                     // (Optional) read the pins status.
+MIOC: 000000000           // Pin 5 is set to low.
OK
```

Data sending (vector example):

Client has a data bus with 9 bits and plans to implement some protocol over it. In this example 4 pins (pins 1-4) are used as an output and 4 pins (5-9) are used as input.

Example of code is as follows:

```
AT+MIOD=000001111,0          // Set IO pins 1-4 to be output level mode.
OK
AT+MIOD=011110000,1          // Set IO pins 5-8 to be input level mode.
OK // Unnecessary, because by default all pins are input.
AT+MIOD?                     // (Optional) Read the IO pin definitions to confirm
correct settings.
+MIOD: 011110000           // Pins 1-4 output pins 5-8 input.
OK                          // At this point the module is configured to control the logic
values of
                             all pins.
AT+MIOC=000001111,000000011 // Write vector, 0x3 on pins 1-4.
OK                          // (pins 1,2 high, pins 3,4 low).
AT+MIOC?                     // Read the pins status.
+MIOC: 001000011           // Pins 1,2,7 show the logical value high.
OK
AT+MIOC=000001111,000000000 // Write vector 0x0 on pins 1-4.
OK
AT+MIOC?                     // (Optional) read the pins status.
+MIOC: 001110000           // Pin 1-4 low, pins 5,6,7 show logical high.
OK
```



4.6.1.18. +MIOD, Motorola I/O Define

This command defines the G30 9 GPIO pins configuration. The feature is flex enabled or disabled. This command is a basic command.

The feature is active by default, however, changing the FLEX can eliminate it.

Note: When using the GPIO lines feature, lines should not be connected directly to ground, a resistor must be used. This is applicable when changing an I/O from input to output.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MIOD=<Pin selection>,<Mode> [,<Data vector>]	OK or: +CME ERROR: <err>	The set command defines the behavior mode of each selected IO pin. The G30 saves the new setting in flex. The selected pins are affected. Validity check of all parameters will be done and appropriate standard error will be issued. In case of legal parameters the new configuration is set. If <Data vector> doesn't supply and new <Mode> is output a line will care physical high signal. In case <Data vector> is supply and includes values of input pins, those values will be ignored. In case <Mode> is input and <Data vector> is supply, an error will be issued "Operation not allowed". No action will be done.
Read	+ MIOD?	+MIOD: <Mode vector> OK	The read command returns the current behavior mode of the 9 GPIO pins.
Test	+ MIOD=?	+MIOD: (list of supported <Pin selection>s),(list of supported <Mode>s),(list of supported <Data vector>s) OK or: +CME ERROR: <err>	The test command returns the possible ranges of <Pin selection>s, <Mode>s and <Data vector>s.

Note: The following table shows the +MIOD parameters.



Table 4-96: +MIOD Parameters

<Parameter>	Description
<pin selection>	<p>Selected pins for the action invoked. This is a binary vector in which each bit points to pin number. Vector size is 9.</p> <p>0 Not selected 1 Selected pin (default)</p>
<mode>	<p>GPIO pin operation mode.</p> <p>0 Output (level only) 1 Input (level mode)</p>
<mode vector>	<p>This is a binary vector in which each bit shows the operation mode of pin. Data vector size is 9.</p> <p>0 Output (level only) 1 Input (level mode)</p> <p>The default value: On Power Up - as previously saved in FLEX bytes. Before set command first used - 1. (This means that all lines are configured as Input before set command first used).</p>
<data vector>	<p>This is a binary vector in which each bit shows the physical value of pin. Data vector size is 9.</p> <p>0 Physical low signal. 1 Physical high signal (default).</p> <p>The default value: On Power Up - as previously saved in FLEX bytes. Before set command first used with <Data vector> and <Mode>=0, or after +MIOD without <Data vector> and before +MIOD command used - 1.</p>



The following table shows the GPIOs pin numbers.

Table 4-97: GPIOs Pin Numbers

GPIO Number	LGA	70 pin
1	80	28
2	81	30
3	34	32
4	33	34
5	1	36
6	2	38
7	5	40
8	6	42
9	12	NA

Example

```

+MIOD: (000000000-111111111),(0,1),( 000000000-111111111)
AT+MIOD=000010000,0 // Set IO pin #5 to be output.
OK
AT+MIOD?
+MIOD: 111101111 // Pins 1-4 and 6-9 are input. Pin 5 is output.
OK
AT+MIOD=000011111,0 // Set IO pins 1-5 to be output level mode.
OK
AT+MIOD=111110000,1 // Set IO pins 5-9 to be input level mode.(Default
settings).
OK
AT+MIOD?
+MIOD: 111110000 // Pins 1-4 output pins, 5-9 input pins.
OK

```



The following table shows the +MMAD parameters.

Table 4-98: +MMAD Parameters

<Parameter>	Description	Range/Remark
<Converter Number>	1-3 Select the A2D converter.	
<Converted Value>	A decimal value represents the returned digital value. The returned value represent the input level multiplied by 1000.	

```
Example
AT+MMAD
+MMAD: 1,1248
+MMAD: 2,1963
+MMAD: 3,1963
OK
```

4.6.1.20. +MADCM, Motorola Analog to Digital Measurement

This command intends to query and monitor the G30 three ADC's values.

This command returns the current ADC values for the requested channel:

- The 1st converter (ADC1) represents the (external) DC voltage levels of G30, LGA #36 (70 pin connector #37).
 - The 2nd converter (ADC2) represents the (external) DC voltage levels of G30, LGA #35 (70 pin connector #43).
 - The 3rd converter (ADC3) represents the (internally) supply DC voltage levels of the G30 (pins #2/#3 VCC).
- All parameters should be saved on the NVM, and used after power up.
<Rate> value should be 1, the rest of the parameters values should be 0 (zero) after manufacturing.

Note: In case we set the AT parameters (of course we execute the AT), and a reset or a power-cycle occurs, G30 should continue the execution of the AT command with the saved parameters, until the user changes the settings.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MADCM=<adc_id>, <report>[, <rate>] [, <low>, <high>]	For <Report>=0 OK For <Report>=1 +MADCM: <adc_id>, <value> OK For <Report>=2 or 3 OK +MADCM: <adc_id>, <value> ... +MADCM: <adc_id>, <value> or ERROR: <error code>	Read the value of specific ADC.



Read	AT+MADCM?	+MADCM: 1,<report>,<rate>,<low>,<high> 2,<report>,<rate>,<low>,<high> 3,<report>,<rate>,<low>,<high> OK	Read the setting parameters.
Test	AT+MADCM=?	+MADCM: (range of <adc_id>),(range of <report>),(range of <rate>),(range of <low>/<high> for each ADC) OK	

Note:

The following table shows the +MADCM parameters.

Table 4-99: +MADCM Parameters

<Parameter>	Description	Range/Remark
<acc-id>	1; ADC1 (LGA #36) (70 pin connector #37). 2; ADC2 (LGA #35) (70 pin connector #43). 3; ADC3 (internally VCC).	
<Report>	0; Deactivate unsolicited report. 1; Report once the current value. 2; Activate unsolicited report. 3; Activate unsolicited report only for out-of-boundaries events.	
<Rate>	1-255; Select the time interval in seconds between the unsolicited reports. (Default value = 1 Second).	
<low>,<High>	0-1920; ADC1 boundaries (milliVolts). 0-1920; ADC2 boundaries (milliVolts). 0-5180; ADC3 boundaries (milliVolts). (Default value = 0).	Setting corresponding <Low> and <High> voltage boundaries for <Report>=3 only.
<value>	0-1920; ADC1 measured value (milliVolts). 0-2500; ADC2 measured value (milliVolts). 0-5180; ADC3 measured value (milliVolts).	

Example

```
AT+MADCM=? // Test the range of the parameters.
+MADCM: (1-3),(0-3),(1-255),(0-1920, 0-1920, 0-5180)
OK
```

```
AT+MADCM=1,1 // Set ADC1 to read for once the current measurement
```



```

// and after that the <report> will set to 0.
+MADCM: 1, 635 // ADC1 current measurements is 635 millivolts.
OK

AT+MADCM =2,2,5 // Set ADC2 to unsolicited reports for every 5
seconds.
OK
+MADCM: 2,1000 // ADC2 current measure report 1000 millivolts
+MADCM: 2,1500 // ADC2 unsolicited report 1500 millivolts after 5
seconds.
+MADCM: 2,0 // ADC2 unsolicited report 0 millivolts after 10 seconds.
+MADCM: 2,2000 // ADC2 unsolicited report 2000 millivolts after
15 seconds.
...
+MADCM: 2,1500 // ADC2 unsolicited report 1500 millivolts after
Nx5 seconds.
...
+MADCM: 2,1500 // (continue) ADC2 unsolicited report 1500
millivolts after Nx5 seconds.
...

AT+MADCM? // Read the current setting of all ADC's.
+MADCM: 1,0,0,0,0 // ADC1 sets to not to report (already report
once).
+MADCM: 2,2,5,0,0 // ADC2 sets to unsolicited reports for every 5
seconds.
+MADCM: 3,0,0,0,0 // ADC3 sets to not to report.
OK

...
+MADCM: 2,1500 // (continue) ADC2 unsolicited report 1500
millivolts after Nx5
seconds.
...

AT+MADCM =3,3,30,1800,1900 // Set ADC3 to out-off boundary (1800-1900
millivolts)
// unsolicited reports for every 30 seconds.
OK
...
+MADCM: 3, 1770 // ADC3 unsolicited current report out-off the
Low boundary.
...
+MADCM: 2,1500 // (continue) ADC2 unsolicited report 1500
millivolts after Nx5
seconds.
...
+MADCM: 3, 1600 // ADC3 unsolicited report out-off the Low
boundary after 30
seconds.
...
+MADCM: 2,1500 // (continue) ADC2 unsolicited report 1500
millivolts after Nx5
seconds.
...
+MADCM: 3, 1984 // ADC3 unsolicited report out-off the High
boundary after Nx30
seconds
...
...

```



- Gain: Control of volume levels for rings, voice, etc.
- Algorithm: Activation of audio algorithms (echo cancellation, noise suppression and sidetone).
The G30 incorporates two audio modes: 'Basic Audio' and 'Advanced Audio'. Each mode has a different behavior and a set of relevant AT commands. **Error! Reference source not found.** describes the two audio modes, switching between them and the AT commands related to each mode.
Audio Control of Path, Gain and Algorithms is available by these two different modes' sets of commands. It is advised to select the audio mode according to the application needs, either the 'Basic Audio' set or the 'Advanced Audio' set.
Switching between the Basic mode and advance mode will be done using the +MAPATH command, but basic commands will still function in this mode as well.

Basic Audio

This mode of commands suits most users. It provides a simple audio control. In this mode the G30 will also adjust the paths automatically upon headset interrupt. The G30 powers up in 'Basic Audio' mode.

Basic audio specific commands are: +CRSL, +CLVL, +CMUT, S94, S96.

Advanced Audio

This mode suits users who require a full control of the audio. When using these advanced commands, the audio control will ignore the headset interrupt (when the headset will be connected the paths will not change automatically). Upon invoking, any of the advanced Audio specific commands: +MAVOL, +MAPATH, +MAMUT and +MAFEAT, the G30 enters 'Advanced Audio' mode. G30 remains in 'Advanced audio' mode until the next power up.

General Audio Commands

The following audio commands can be used in both Basic and Advanced audio modes:

+CRTT, +VTD, +VTS, +CALM, +MMICG, +MADIGITAL, +MATONE, +MUBF, +MDBF, +MAHF and +MAHFD.

Table 4-103 shows the differences between Basic and Advanced audio modes in controlling the audio.

Table 4-103: Basic and Advanced Audio Modes Comparison

	Basic Audio	Advanced Audio
Path	Paths are set automatically (upon interrupt).	Paths are set manually. All routings are available; any microphone with any speaker for each type of sound (voice, feedback tone, alert, etc.).
Gain	There are two types of gains: phone (voice, feedback) and alerts.	There is a matrix of gains: a different gain is saved for each type of sound through a specific speaker. For example, one volume level for rings through the speaker and a different volume level for rings through the transducer. Therefore, there will be 16 different volume levels, which is the product of the number of output accessories (speaker, headset speaker, transducer and digital output) and the number of audio tones (voice, feedback tone and alert).



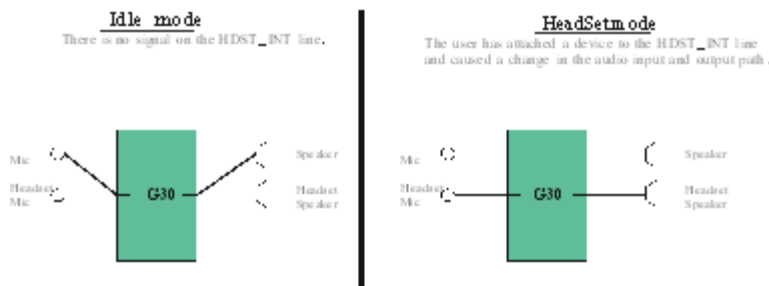


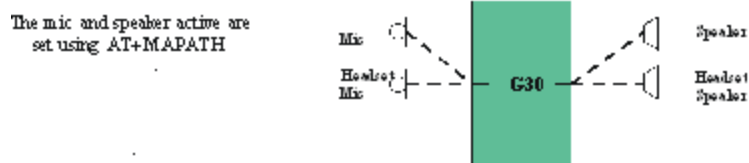
Figure 4-3: Basic Audio Setup

4.7.2.2. A

4.7.2.3. Advanced Audio Setup

This mode suits users which require a full control of the audio. When using these advanced commands the audio control will ignore the headset interrupt (when the headset will be connected the paths will not change automatically). Upon invoking +MAPATH the G30 will enter 'Advanced Audio' mode. G30 will remain in 'Advanced audio' mode until power cycle.

Error! Reference source not found. shows the advanced

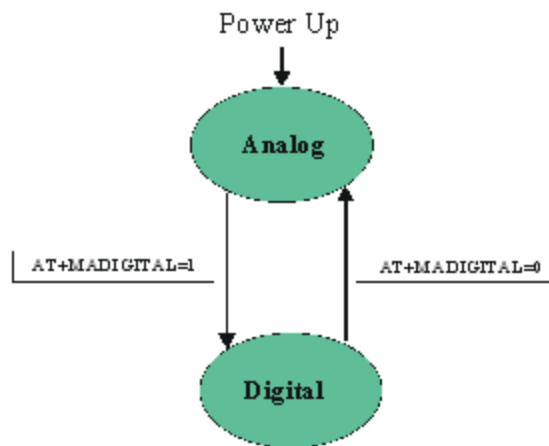


setup.

Figure 4-4: Advanced Audio Setup

G30 supports both analog and digital audio. Digital audio is supported in both basic and advanced audio setups. Switching between analog and digital audio modes is done by AT+MADIGITAL command. The default state is





analog.

Figure 4-5; Analog/Digital Switching

4.7.2.4. General Audio Commands

The following audio commands can be used in both Basic and Advanced audio modes.

General audio commands are: +CRTT, +VTD, +VTS, +CALM, +MMICG, +MADIGITAL, +MATONE, +MUBF, +MDBF and +MAHF.

4.7.3. Basic Audio Setup Commands

4.7.3.1. +CRSL, Call Ringer Level

This command handles the selection of the incoming call ringer and alert tone (SMS) sound level on the alert speaker of the G30. The new value remains after power cycle. This command has no effect on digital audio mode.

Command Type	Syntax	Response/Action	Remarks
Set	+CRSL=<level>	OK +CME ERROR: <err>	The Set command sets the call ringer and alert (SMS) level.
Read	+CRSL?	+CRSL: <level> +CME ERROR: <err>	The Read command displays the current ringer alert (SMS) sound level setting.
Test	+CRSL=?	+CRSL: (list of supported <level>s) +CME ERROR: <err>	The Test command displays the list of supported sound level settings.

The following table shows the +CRSL parameters.




```

AT+CMUT=1      uplink voice is muted
OK
AT+CMUT?
+CMUT: 1
OK
AT+CMUT =2
+CME ERROR: <err>
    
```

4.7.3.4. S94, Sidetone Effect

This command reduces the microphone audio input that is routed to the selected speaker, so that people speaking will hear themselves talking (The default value of S94 is "4").

Note: The value of the command is saved after a power cycle (flex).

Command Type	Syntax	Response/Action	Remarks
Set	ATS94=<n>	OK or: +CME ERROR: <err>	The Set command sets the sidetone status.
Read	ATS94?	<n> OK or: +CME ERROR: <err>	The Read command returns the sidetone status.
Test	ATS94=?	+CME ERROR: <err>	The Test command displays the supported values of <n>.

Note:

The following table shows the S94 parameters.

Table 4-107: S94 Parameters

<Parameter>	Description
<n>	0-7 Sidetone range. 0 - Disable sidetone. Default value is 4.

Example

```

ATS94=0          //Disable sidetone
OK
ATS94?
000             //Sidetone disabled
OK
    
```

4.7.3.5. S96, Echo Canceling/Noise Suppressions/AGC (Hands Free)

This command suppresses a large amount of the output sound picked up by the input device. S96



value is saved in the Flex.

The following table explains the use of the ATS96 set.

Command Type	Syntax	Response/Action	Remarks
Set	ATS96=<n>	OK or: +CME ERROR: <err>	The Set command sets the echo canceling/noise suppressions/agc (hands free) status.
Read	ATS96?	<n> OK or: +CME ERROR: <err>	The Read command returns the echo canceling/noise suppressions/agc (hands free) status.
Test	ATS96=?	+CME ERROR: <err>	

The following table shows the S96 parameters.

Table 4-108: S96 Parameters

<Parameter>	Description
<n>	0-3 levels select of echo canceling/noise suppressions/agc (hands free). Default value is 3.

```
Example
ATS96=1           //Hands free table number 1
OK
ATS96?
001              //Hands free table
OK
```

4.7.4. Advanced Audio Setup Commands

This group of commands enables accessory devices to control certain audio aspects within the system.

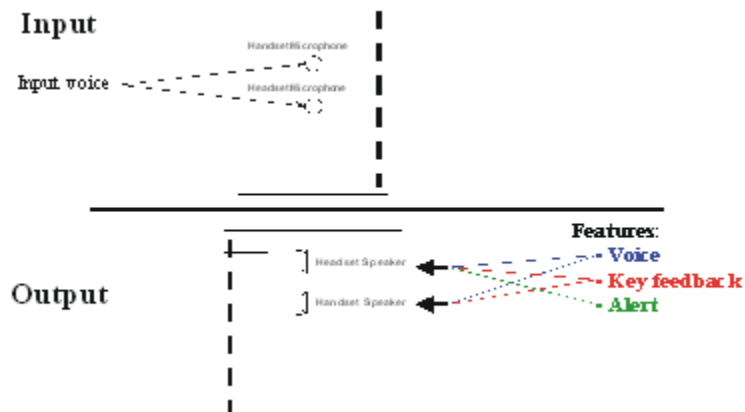
4.7.4.1. +MAPATH, Audio Path

This command sets/requests the active input accessory, and the output accessory for each feature. For example, you can choose the headset mic to be active, the voice and key feedbacks to go to the speaker, and the alerts to the headset speaker. On power up, the default path, are restored.

Note: +MAPATH cannot be used to set digital audio, but only to read it. In order to set the digital audio path, use +MADIGITAL. For more information, refer to section +MADIGITAL, Analog/Digital Audio Switching . The value of the command is not saved after power cycle.

The following diagram shows the audio





paths:
Figure 4-6: Audio Paths

Command Type	Syntax	Response/Action	Remarks
Set	+MAPATH= <direct>,<accy> [,<features>]	OK or: +CME ERROR: <err>	The Set command sets the audio path mode. The mode indicates which I/O accessories are now active for the different audio features. The <features> field is only used for outputs (direct=2).
Read	+MAPATH?	+MAPATH:1(mode in),<accy> +MAPATH:2(mode out), <accy>,<feature> [<CR><LF>+MAPATH:2(mode out), <accy>,<feature> [...]] OK	The Read command returns the active input audio accessory and the output accessory for each feature.
Test	+MAPATH=?	+MAPATH: (list of supported directions),(list of supported accessories),(list of supported features combinations) OK	The Test command returns the supported audio directions (input/output), accessories and features.

Figure 3-6:




```

AT+MAMUT?
+MAMUT: 1,1 //Accy=1 (mic), state=1 (mute)
+MAMUT: 2,0 //Accy=2 (headset mic), state=0 (unmute)
+MAMUT: 4,1 //Accy=4 (Digital RX), state=1 (mute)
AT+MAMUT=?
+MAMUT: (1-7),(0,1)
OK
    
```

4.7.4.4. +MAFEAT, Features Selection

This command controls the algorithm features: sidetone, Hands free (echo cancel, noise suppression, and agc).

Note: The value of the command is saved after a power cycle (flex).

Command Type	Syntax	Response/Action	Remarks
Set	AT+MAFEAT=<feature>,<side tone state>,<hands free>	OK or: +CME ERROR: <err>	The Set command selects the table feature combinations.
Read	AT+MAFEAT?	+MAFEAT: <feature><state>, <table> OK or: +CME ERROR: <err>	The Read command returns the table features combinations.
Test	AT+MAFEAT=?	+MAFEAT: (<list of supported <feature>s), (<range of Sidetone values>), (<range of hands free values> OK or: +CME ERROR: <err>	The Test command returns the list of supported features' numbers and supported tables states.

Note: The following table shows the +MAFEAT parameters.

Table 4-112: MAFEAT Parameters

<Parameter>	Description
<feature>	A number between 1 to 3 which is built from a combination of: 1 - Side tone 2 - Hands free (echo cancel, noise suppression, and agc)



2	Alert
3	Bells
4	Bits & Bytes
5	Charger1
6	Charger2
7	Door Bell
8	Triads
9	Wind Chimes
10	Up and Down
11	Random
12	Start Up
13	Cosmic
14	Cosmic2
15	Interlude
16	Power Surge




```

Example
AT+VTD=?
+VTD: (0-600)
OK
AT+VTD?
+VTD: 5
OK
AT+VTD=10
OK
    
```

4.7.5.7. +VTS, Command-Specific Tone Duration

This command transmits a string of DTMF tones when a voice call is active. DTMF tones may be used, for example, when announcing the start of a recording period. The duration does not erase the VTD duration.

Note: In GSM, the tone duration value can be modified depending on the specific network.

If the active call is dropped in the middle of playing a DTMF tone, the following unsolicited message transfers to TE: +VTS: "Call termination stopped DTMF tones transmission".

Command Type	Syntax	Response/Action	Remarks
Set	+VTS= <DTMF>,[<duration>]	OK +CME ERROR: <err>	The Set command sets the tone and duration (if entered).
Read	+VTS?	+VTS: <DTMF> +CME ERROR: <err>	The Read command displays the currently transmitted DTMF tone. An error is displayed if no tone is active.
Test	+VTS=?	+VTS: (list of supported <DTMF>, (list of supported <duration>s) +CME ERROR: <err>	The Test command displays the list of supported DTMF tones and tone lengths.

The following table shows the +VTS parameters.

Table 4-122: +VTS Parameters

<Parameter>	Description
<DTMF>	String of ASCII characters (0-9, #, *, A-D) String length is up to 32 characters long.
<duration>	A DTMF tone of different duration from that set by the +VTD command. 0-255



<tone_id>	<ul style="list-style-type: none"> 0: aud_tone_DTMF_0 1: aud_tone_DTMF_1 2: aud_tone_DTMF_2 3: aud_tone_DTMF_3 4: aud_tone_DTMF_4 5: aud_tone_DTMF_5 6: aud_tone_DTMF_6 7: aud_tone_DTMF_7 8: aud_tone_DTMF_8 9: aud_tone_DTMF_9 10: aud_tone_DTMF_hash 11: aud_tone_DTMF_asterix 12: aud_tone_key_tone_1 13: aud_tone_key_tone_2 14: aud_tone_key_tone_3 15: aud_tone_key_tone_4 16: aud_tone_key_tone_5 17: aud_tone_sv_subscriber_busy 18: aud_tone_sv_congestion 19: aud_tone_sv_radio_path_ack 20: aud_tone_sv_radio_path_not_avail 21: aud_tone_sv_error_info 22: aud_tone_sv_call_waiting 23: aud_tone_sv_call_alert 24: aud_tone_info_free_tone 25: aud_tone_info_connection 26: aud_tone_info_disconnect 27: aud_tone_info_device_in 28: aud_tone_info_device_out 29: aud_tone_info_msg_full 30: aud_tone_info_ussd 31: aud_tone_info_minutte_minder 32: aud_tone_info_error_1 33: aud_tone_info_error_2 34: aud_tone_info_sms_in_call 35: aud_tone_info_broadcast_in_call 36: aud_tone_info_alarm_in_call 37: aud_tone_info_low_bat_in_call 38: aud_tone_info_power_off 39: aud_tone_info_power_on 40: aud_tone_info_single_beep 41: aud_tone_info_positive_acknowledgement 42: aud_tone_info_negative_acknowledgement 43: aud_tone_info_auto_redial 44: aud_tone_info_network_attention 45: aud_tone_info_dial_tone 46: aud_tone_info_low_bat 47: aud_tone_ringing_test
<nof_play_times>	<p>Indicating the amount of tone repetitions; range 0 .. 32767 (0x7FFF); 0 means repeats for ever; for other values a response is returned when the tone generation is finished.</p>
<mix_factor>	<p>Indicating the kind of volume for tone generation; range 0 .. 7.</p>



The following table shows the +MAHFD parameters.

Table 4-126: +MAHFD Parameters

<Parameter>	Description
<n>	0 - 3 List of Hands Free table

Example
 AT+MAHFD=1 //Hands free table number 1 set to default
 OK

4.7.5.12. +MAHF, Features Selection

This command controls the algorithm features: Hands free (echo cancel, noise suppression, and agc).

Note: The value of the command is saved after a power cycle.

Note: This command is available for advanced models only.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MAHF=<table>,< hf_algorithm_init>,< hf_algorithm_restart>,<step_width>,<lms_length>,<lms_offset>,<block_length>,<rxtx_relation>,<add_atten>,<min_atten>,<max_atten>,<nr_sw_2>,<nr_u_fak_0>,<nr_u_fak>	OK or: +CME ERROR: <err>	The Set command set Hands Free values for each table.
Read	AT+MAHF?	+MAHF:<feature><state>,<table> OK or: +CME ERROR: <err>	The Read command returns the table features combinations and Hands Free values.
Test	AT+MAHF=?	+MAHF: (<list of number of table>), (<range of hf_algorithm_init values>),...(<range of nr_u_fak values>) OK or: +CME ERROR: <err>	The Test command returns the list of supported table and Hands Free values range.

Note: The following table shows the +MAHF parameters.




```
AT+ MAI2SY?
+ MAI2SY: 0
OK
AT+ MAI2SY =3
ERROR
AT+ MAI2SY?
+ MAI2SY: 0
OK
```

4.8. Access

4.8.1. Access Control Commands

When the phone or SIM card is locked or blocked, the only accessory operations allowed are those found in the list of Core AT commands (allowed while phone/SIM card is locked), shown in “[Core AT Commands](#)”. All other AT commands are not executed. However, the phone is still capable of sending asynchronous message events via AT responses, for example, incoming call notification.

4.8.1.1. A/, Repeat Last Command

This command repeats the last command. It is not necessary to press <Enter> after this command.

Command Type	Syntax	Response/Action
Execute	A/	Repeats last command

```
Example
AT&D?
&D: 2
OK
A/
&D: 2
OK
```

4.8.1.2. AT, Check AT Communication

This command only returns OK.

Command Type	Syntax	Response/Action
Execute	AT	OK

```
Example
AT
OK
```



4.8.1.3. +CPIN, Enter PIN for Unlocking SIM Card or Enter PUK for Unlocking SIM Card

This command locks the SIM card, and therefore is only relevant for phones that use SIM cards. It unlocks the SIM card when the proper SIM PIN is provided and unblocks the SIM card when the proper SIM PUK is provided.

The SIM card is unlocked only once the provided pin is verified as the SIM PIN. If the required PIN (determined by the error code returned from the requested operation or the Read command) is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the SIM card. When entering the pin, a <new pin> is not required.

Note: For a list of commands that can be given when the G30 is awaiting the SIM PIN or SIM PUK, refer to [Table 3-1: Core AT Commands](#).

Note: The SIM card lock is another level of security independent of the phone lock (See Access Control C for more information).

Error! Reference source not found. presents a diagram of what occurs when using the SIM card. Note that if an incorrect password is entered three times, the G30 requires that a master password be entered. If this also fails three times, the SIM will be blocked, and you will have to go to your provider to unblock it.

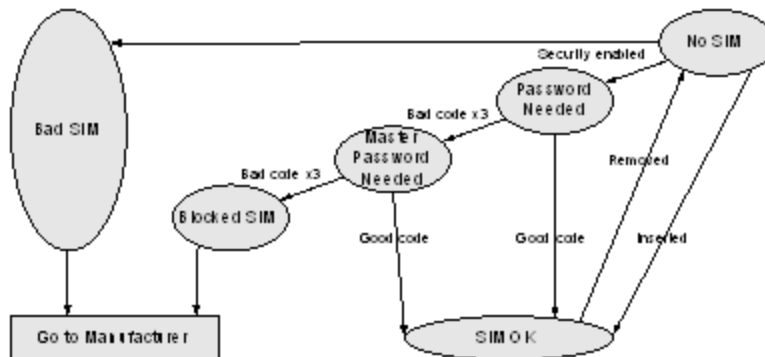


Figure 4-8: SIM States

A SIM card related error is returned if an AT command operation is unsuccessful due to a SIM card problem. The following table shows the SIM card errors.

Table 4-129: SIM Card Errors

Error	Description
10 SIM not inserted	SIM Card is not inserted
11 SIM PIN required	SIM Card waiting for SIM PIN to be entered
12 SIM PUK required	SIM PIN is blocked



13 SIM failure	SIM Card is permanently blocked
17 SIM PIN2 required	SIM Card is waiting for SIM PIN2 to be entered
18 SIM PUK2 required	SIM PIN2 is blocked

Command Type	Syntax	Response/Action	Remarks
Set	AT+CPIN=[<puk> or <pin>], [<newpin>]	OK or: +CME ERROR: <err>	The Set command sends the password to the G30 that is necessary before it can be operated (SIM PIN or SIM PUK). If there is no PIN request pending, no action is taken towards the G30, and an error message, +CME ERROR, is returned to the terminal. The Set command issued gives the code (SIM PIN or SIM PUK) corresponding to the error code required or returned as the result of the Read command. For example, if the SIM PIN is blocked, the error code 11 or "SIM PIN required" is returned. The user must then issue the Set command with the SIM PIN.
Read	AT+CPIN?	+CPIN: <code> OK or: +CME ERROR: <err>	The Read command returns an alphanumeric string indicating the status of the SIM card, and whether a password is required or not. This is an independent SIM card lock status check only, and does not check the phone lock status.
Test	AT+CPIN=?	OK or: +CME ERROR: <err>	



The following table shows the +CPIN parameters.

Table 4-130: +CPIN Parameters

<Parameter>	Description
<puk>	PUK code for unblocking a blocked phone
<pin>	Current PIN for unlocking a locked phone
<newpin>	New PIN (after changing or after entering PUK) 4 - 8 digits
<code>	READY - Not waiting for a password SIM PIN - Waiting for SIM PIN SIM PUK - Waiting for SIM PUK SIM PIN2 - Waiting for SIM PIN, this response is given when the last executed command resulted in PIN2 authentication failure SIM PUK2 - Waiting for SIM PUK2, this response is given when the last executed command resulted in PUK2 authentication failure
SIM PIN SIM PUK SIM PUK2 SIM PIN 2	AT+CPIN=<pin> AT+CPIN=<puk>,<newpin> AT+CPIN=<puk2>,<newpin2> AT+CPIN=<pin2>



```
Example
AT+CPIN=?
OK
AT+CLCK="SC",1,"<correct PIN>"           //Not case-sensitive
OK
```

4.8.1.4. The facility is enabled by the +CLCK command (Refer to +CLCK, Facility Lock

```
)
AT+CPIN?
+CPIN: SIM PIN
OK
AT+CPIN="<correct PIN>"
OK
AT+CPIN?
+CPIN: READY
OK
The status of the SIM is still enabled, but the PIN is READY for this
session.
The SIM is enabled per session. After power-up SIM must be unlocked again by
using the +CLCK command.
The following case shows an example of three unsuccessful attempts at
entering the PIN:
AT+CPIN?
+CPIN: SIM PIN
OK
AT+CPIN="<wrong pin>"
+CME ERROR: incorrect password
AT+CPIN="<wrong pin>"
+CME ERROR: incorrect password
AT+CPIN="<wrong pin>"
+CME ERROR: SIM PUK required
AT+CPIN?
+CPIN: SIM PUK           //PIN is blocked. The PUK is needed for unblocking.
OK
AT+CPIN="<PUK>","<NEW PIN>"           //Enter PUK and new PIN
OK
AT+CLCK="FD",1,"<wrong PIN2>"
+CME ERROR: incorrect password
AT+CLCK="FD",1,"<wrong PIN2>"
+CME ERROR: incorrect password
AT+CLCK="FD",1,"<wrong PIN2>"
+CME ERROR: SIM PUK2 required
AT+CPIN?
+CPIN: SIM PUK2           //PIN2 is blocked. The PUK2 is needed for
unlocking.
OK
AT+CPIN="<PUK2>","<NEW PIN2>"           //Enter PUK2 and new PIN2
OK
```



4.8.1.5. +TPIN, Query Number of Remaining SIM PIN/PUK Entering Attempts

This command returns the number of remaining attempts of entering the PIN and PUK for the SIM card in use. The command returns the number of remaining attempts for PIN1 (CHV1), PIN2 (CHV2), PUK1 (unlock CHV1) and PUK2 (unlock CHV2).

Number of available attempts is provider dependant. Typically it is 3 attempts for PIN, 10 attempts for PUK.

This command will return error if SIM is not inserted.

Command Type	Syntax	Response/Action	Remarks
Read	AT+TPIN?	+TPIN: <chv1> , <unbl_chv1> , <chv2> , <unbl_chv2> or ERROR	

The following table shows the +TPIN parameters.

Table 4-131: +TPIN Parameters

<Parameter>	Description
<chv1>	Number of remaining PIN attempts
<chv2>	Number of remaining PIN2 attempts
<unbl_chv1>	Number of remaining PUK attempts
<unbl_chv2>	Number of remaining PUK2 attempts

```

Example
AT+TPIN=?
+TPIN: 3,10,3,10
OK
AT+CPIN="7777"
+CME ERROR: incorrect password
AT+TPIN?
+TPIN: 2,10,3,10
OK
    
```



The following table shows the +CLCK parameters.

Table 4-133: +CLCK Parameters

<Parameter>	Description
<fac>	SC SIM Card PIN setting <mode> 0 Disable PIN 1 Enable PIN) FD SIM Fixed Dialing memory setting <mode> 0 Disable fixed dialing feature 1 Enable fixed dialing feature) PS PH-SIM (lock Phone to SIM card) ME asks password when other than current SIM card inserted PN Network Personalization PU Network sUbset Personalization PP Service Provider Personalization PC Corporate Personalization AO BAOC (Bar All Outgoing Calls) OI BOIC (Bar Outgoing International Calls) OX BOIC-exHC (Bar Outgoing International Calls except to Home Country) AI BAIC (Bar All Incoming Calls) IR BIC-Roam (Bar Incoming Calls when Roaming outside the home country) AB All Barring services (applicable only for <mode>=0) AG All outgoing barring services (applicable only for <mode>=0) AC All incoming barring services (applicable only for <mode>=0)
<passwd>	String type, 4-8 character password
<mode>	0 Unlock 1 Lock 2 Query status (<passwd> does not apply) Note: Query mode return only the active <fac>. In case no <fac> is active the query will return the default (7).
<class>	Sum of integers, each representing a class of information <class>. Only applies to call barring related facilities. 1 Voice (telephony) 2 Data (refers to all bearer services) 8 SMS (Short Message Services) The default value is 7.
<status>	0 Inactive 1 Active

Example

AT+CLCK=?

+CLCK:

("SC", "PS", "PN", "PU", "PP", "PC", "FD", "AO", "OI", "OX", "AI", "IR", "AB", "AG", "AC", "FD")

OK

AT+CLCK="SC",2

+CLCK: 0



Set	+CSIM=<length> , <command>	+CSIM: <length> , <response>+CME ERROR: <err>	Set command transmits to the MT the <command> it then shall send as it is to the SIM. In the same manner the SIM <response> shall be sent back by the MT to the TA as it is.
Test	+CSIM=?	+CME ERROR: <err>	

Note:

The following table shows the +CSIM parameters.

Table 4-134: +CSIM Parameters

<Parameter>	Description
<length>	Length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response).
<command>	Command passed on by the MT to the SIM in the format as described in GSM 51.011 [28] (hexadecimal character format; refer to +CSCS, Select Terminal Character Set
<response>	Response to the command passed on by the SIM to the MT in the format as described in GSM 51.011 [28] (hexadecimal character format; refer to +CSCS, Select Terminal Character Set

4.9. Modem Configuration and Profile

4.9.1. Modem Register Commands

The G30 holds certain data items in selected memory space, named Software Registers (S-registers) and Modem Registers. Some of these registers are used as bitmaps, where one register holds more than one data item.

All S-registers can be accessed using the S command, described in [“S, Bit Map Registers”](#)

4.9.1.1. V, G30 Response Format

This command determines the response format of the data adapter and the contents of the header and trailer transmitted with the result codes and information responses. This command also determines whether the result codes are transmitted in a numeric or an alphabetic ("verbose") form. The text portion of information responses is not affected by this setting.

The following table shows the effect that setting this parameter has on the format of information text




```
ERROR //No response because result codes are suppressed.  
ATQ1 //No response because result codes are suppressed.  
ATQ4 //No response because result codes are suppressed.
```



dial tone when it first goes off-hook to begin dialing, and whether the engaged tone (busy signal) detection is enabled.

Command Type	Syntax	Response/Action	Remarks
Set	ATX<value>	OK or: +CME ERROR: <err>	The Set command sets the result code and call progress monitoring control.
Test			The Test command for X is not defined by ITU, and therefore is not supported by the G30. The G30 returns an error.

The following table shows the X parameters.

Table 4-139: X Parameters

<Parameter>	Description
<value>	0 CONNECT result code given upon entering online data state: 1 CONNECT <text> result code given upon entering online data state 2 CONNECT <text> result code given upon entering online data state 3 CONNECT <text> result code given upon entering online data state 4 CONNECT <text> result code given upon entering online data state The default value is 0.

4.9.1.5. S, Bit Map Registers

This command reads/writes values of the S-registers. The G30 supports this command for various S values, according to official specifications (ITU-I, ETSI, or manufacturer specific).

Command Type	Syntax	Response/Action	Remarks
Set	ATSn=<value	OK or: +CME ERROR: <err>	The Set command is allowed for read/write S-registers, and not allowed for read-only S-registers.
Read	ATSn?	<current value of S-register n> or: +CME ERROR: <err>	
Test			The Test command for Sn is not defined by ITU, and therefore is not supported by the G30. The G30 returns an error.

The following table shows the different S-registers and their associated values.

Sn	Description	Min Value	Max Value	Default Value



S0	Sets/gets number of rings before auto answer.	0	255	0
S2	Sets/gets escape code character.	0	255	43
S3	Sets/gets carriage return code character.	0	127	13
S4	Sets/gets line feed code character.	0	127	10
S5	Sets/gets command line editing character (backspace).	0	127	8
S6	Sets/gets the amount of time in seconds, that the DCE waits between connecting to the line and dialing, when dial tone is not implemented or enabled.	2	10	2
S7	Sets the number of seconds in which connection must be established before the call is disconnected.	1	255	30
S8	Sets/get the amount of time in seconds, that the DCE shall pause, during dialing, when a ", " dial modifier is encountered in a dial string.	0	255	4
S10	Sets/get the amount of time in tenth of second, that the DCE will remain connected to the line after the DCE has indicated the absence of received line signal. The command is not supported in GSM but OK returned.	1	254	
S12	Sets/gets guard time (in units of 50 msec) for the escape character during CSD connections.	0	255	20

Note: S0 (Auto Answer) should work regardless of the DTR HW line state. This is a deviation from the ITU V. 25-ter standard.



```
Example
ATS36?
005
OK
ATS0=3
OK
ATS0?
003
OK
```

4.9.1.5.1. S2

This command handles the selection of the escape characters, which are stored in S-Register 2, and specifies the escape character used in CSD connections.

Command Type	Syntax	Response/Action	Remarks
Set	S2=<escape_character>	OK +CME ERROR: <err>	The Set command sets the CSD escape character value if all parameters are valid.
Read	S2?	<escape_character> OK +CME ERROR: <err>	The Read command displays the currently defined escape character for CSD connections.

The following table shows the S2 parameters.

Table 4-140: S2 Parameters

<Parameter>	Description
<escape_character>	CSD escape character. Range is 0 to 255. The default value is 43 ("+").

4.9.1.5.2. S12

This command handles the selection of the guard time, which is stored in S-Register 12, and specifies the behavior of escape characters during CSD connection.

Note: For a guard time specified by S-Register 12, no character should be entered before or after "+++". The duration between escape codes must be smaller than the guard time.

Command Type	Syntax	Response/Action	Remarks
Set	S12=<guard_time>	OK +CME ERROR: <err>	The Set command sets the CSD escape character guard time value if all parameters are valid.



When the data transmission is complete, the G30 gets the output wakeup line to high

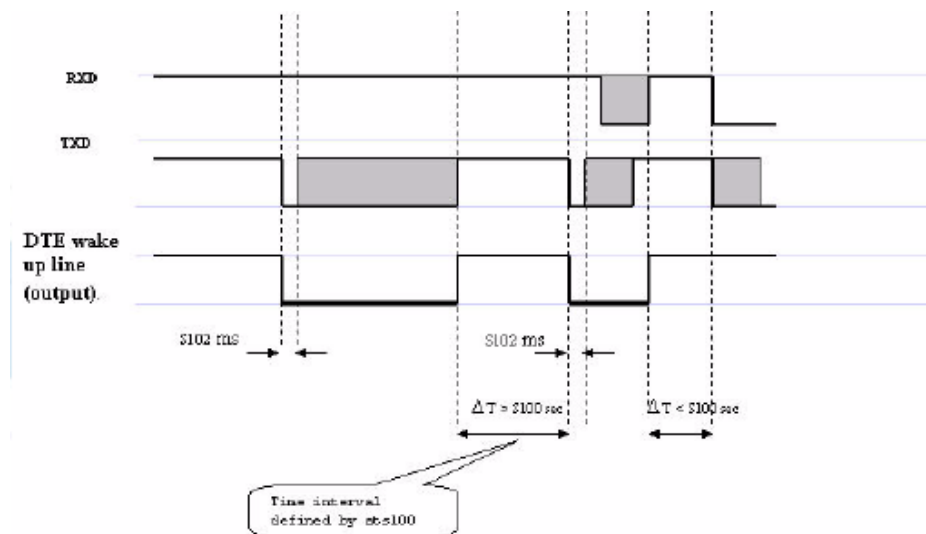


Figure 4-10: Wake up Outline

Two modes exist:

- Idle mode: The G30 has no data to send.
- Wakeup mode: The G30 has data to send to the terminal.
After the G30 changes the line edge to Wakeup mode, there will be a delay (the default is 30 ms) sent by the ats102 command before sending any data to the terminal (using RS232 protocol).

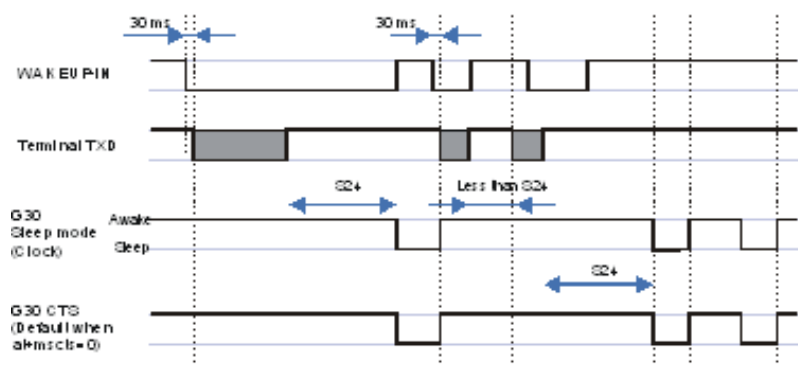


Figure 4-11: Sleep Mode when S24 > 0



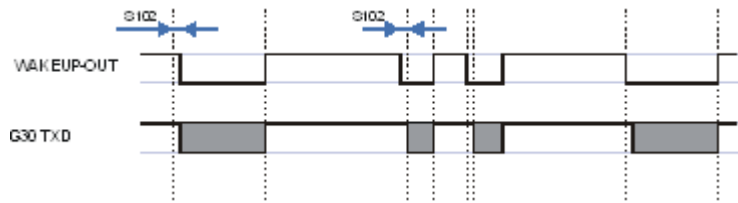


Figure 4-12: G30 Lines when S24 > 0

4.9.2.3. S24, Set Number of Seconds Delay Before G30 Enters Sleep Mode

This command activates/disables the Sleep mode. The terminal sends `ATS24=5`, and if there are no radio and UART activities, the G30 enters sleep mode in 5 seconds.

If terminal has some indication of the CTS pin activity, it can see:

4.9.2.4. If +MSCTS=0 (default), the line changes its state periodically. (For more information refer to +MSCTS, Enable/Disable CTS During Wakeup Period

- .)
- If +MSCTS=1, the line is switched off at the moment of entering Sleep mode and stays off even if G30 is awakened.

Note: The G30 will wake up from sleep mode and timer will reset only in case the DTE wakes up the module. In case of a report to the terminal the G30 continue to sleep.

S24 timer is relevant only when receiving an interrupt from UART.

Command Type	Syntax	Response/Action	Remarks
Set	<code>ATS24=[<value>]</code>	OK	The Set command sets the amount of time, in seconds, the G30 should wait before entering Sleep mode.
Read	<code>ATS24?</code>	<value> OK	The Read command returns the current value.

The following table shows the S24 parameters.

Table 4-147: S24 Parameters

<Parameter>	Description
<value>	Number of seconds ($0 \leq n \leq 255$) 0 Disable Sleep mode >0 Enable Sleep mode The default value is 0.



Table 4-152: +CME Errors

<Parameter>	Description
<err>	Numeric format followed by verbose format: 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" 20, "memory full" 21, "invalid index" 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" 33, "command aborted" 34, "numeric parameter instead of text parameter" 35, "text parameter instead of numeric parameter" 36, "numeric parameter out of bounds" 37, "text string too short" 40, "network personalization PIN required" 41, "network personalization PUK required" 42, "network subset personalization PIN required" 43, "network subnet personalization PUK required" 44, "service provider personalization PIN required" 45, "service provider personalization PUK required" 46, "corporate personalization PIN required" 47, "corporate personalization PUK required" 60, "SIM service option not supported" 100, "unknown" 103, "Illegal MS (#3)" 106, "Illegal ME (#6)" 107, "GPRS services not allowed (#7)"



<p><err> Continued</p>	<p>111, "PLMN not allowed (#11)" 112, "Location area not allowed (#12)" 113, "Roaming not allowed in this location area (#13)" 132, "service option not supported (#32)" 133, "requested service option not subscribed (#33)" 134, "service option temporarily out of order (#34)" 147, "long context activation" 151, "GPRS disconnection timer is active" 149, "PDP authentication failure" 150, "invalid mobile class" 148, "unspecified GPRS error" 256, "too many active calls" 257, "call rejected" 258, "unanswered call pending" 259, "unknown calling error" 260, "no phone num recognized" 261, "call state not idle" 262, "call in progress" 263, "dial state error" 264, "unlock code required" 265, "network busy" 266, "Invalid phone number" 267, "Number Entry already started" 268, "Cancelled by user" 269, "Number Entry could not be started" 280, "Data lost" 281, "Invalid message body length" 282, "inactive socket" 283, "socket already open"</p>
---	---

Note: +CME ERROR:280, Data lost, is sent to the terminal in extreme cases when the G30 has to transmit data to the terminal and the buffers are full (Flow control Xoff status).

This error occurs when:

- An unsolicited indication (such as RING, +CLCC and so on) encounters the Xoff status. When the flow control status returns to Xon, Error 280, Data lost, is sent to the terminal instead of the unsolicited indication.
- An initiated AT command is waiting for a response, and the response encounters the Xoff status. When the flow control status returns to Xon, the AT command is aborted (if not yet aborted) and Error 280, Data lost is sent to the terminal instead of OK (and the missing data).

Table 4-153: +CMS Errors

<Parameter>	Description
-------------	-------------



+CMEE: (0-2)

OK

4.9.3.2. +CEER, Extended Error Report

This execution command returns an extended error report containing one or more lines of information text <report>, determined by the manufacturer, providing reasons for the following errors:

- Failure in the last unsuccessful call setup (originating or answering) or the in-call modification.
- Last call release.

Typically, the text consists of a single line containing the reason for the error according to information given by GSM network, in textual format.

Command Type	Syntax	Response/Action
Set		
Read	AT+CEER?	
Execute	AT+CEER	+CEER: <report> OK
Test	AT+CEER=?	OK

The following table shows the +CEER parameters.

Table 4-155: CEER Parameters

<Parameter>	Description
-------------	-------------



<p><report></p>	<p>The total number of characters and line terminators (up to 2041) in the information text.</p> <p>The text must not contain the sequence 0<CR> or OK<CR>.</p> <p>Numeric format followed by verbose format:</p> <ul style="list-style-type: none"> 0 No cause information available 1 Unassigned or unallocated number 3 No route to destination 6 Channel unacceptable 8 Operator determined barring 16 Normal call clearing 17 User busy 18 No user responding 19 User alerting, no answer 21 Call rejected 22 Number changed 26 Non selected user clearing 27 Destination out of order 28 Invalid number format (incomplete number) 29 Facility rejected 30 Response to STATUS ENQUIRY 31 Normal, unspecified 34 No circuit/channel available 38 Network out of order 41 Temporary failure 42 Switching equipment congestion 43 Access information discarded 44 Requested circuit/channel not available
<p><report> (continued)</p>	<ul style="list-style-type: none"> 47 Resources unavailable, unspecified 49 Quality of service unavailable 50 Requested facility not subscribed 55 Incoming calls barred within the CUG 57 Bearer capability not authorized 58 Bearer capability not presently available 63 Service or option not available, unspecified 65 Bearer service not implemented 69 Requested facility not implemented 70 Only restricted digital information bearer capability is available 79 Service or option not implemented, unspecified 81 Invalid transaction identifier value 87 User not member of CUG 88 Incompatible destination 91 Invalid transit network selection 95 Semantically incorrect message 96 Invalid mandatory information 97 Message type non-existent or not implemented 98 Message type not compatible with protocol state 99 Information element non-existent or not implemented 100 Conditional IE error 101 Message not compatible with protocol state 102 Recovery on timer expiry 111 Protocol error, unspecified 127 Interworking, unspecified



```

Example
AT+CEER
+CEER: "No information available"
OK
AT+CEER?
+CEER: 2
OK
AT+CEER=?
+CEER: (1-2)
OK
    
```

4.10. UI (User Interface)

4.10.1. +CRSM, Restricted SIM Access

This command provides limited access to the Elementary Files on the SIM. Access to the SIM database is restricted to the commands which are listed at <command>. All parameters of AT+CRSM are used as specified by GSM 11.11 version 8.7.0. As response to the command, the G30 sends the actual SIM information parameters and response data. Error result code "+CME ERROR" may be returned if the command cannot be transferred to the SIM, e.g. if the SIM is not inserted, or defected, or PIN1/PUK authentication required, or required input parameters not present. However, failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Some of the AT+CRSM commands require PIN/PIN2 authentication.

Command Type	Syntax	Response/Action	Remarks
Set	AT+CRSM=<command> , [<file_id> [,<P1>,<P2>,<P3> [,<data>]]]	+CRSM: <sw1>,<sw2>[,<response>] OK or: +CME ERROR: <err>	Set command transmits the SIM <command> and its required parameters to the ME. ME sends the actual SIM information parameters and response data.
Test	AT+CRSM=?	+CRSM: (list of supported <command>s), (possible <file_id>s range value), (possible <P1> range value), (possible <P2> range value), (possible <P3>range value), OK or: +CME ERROR: <err>	The test command returns the possible ranges of CRSM parameters.

The following table shows the +CRSM parameters.



Table 4-156: +CRSM Parameters

<Parameter>	Description
<command>	Integer type. Command passed on by the ME to the SIM. 176 Read BINARY 178 Read RECORD 192 Get RESPONSE 214 Update BINARY 220 Update RECORD 242 STATUS
<file_id>	Integer type. This is the identifier of a elementary data file on SIM. Mandatory for every <command> except of STATUS.



<p><P1>,<P2>,<P3></p>	<p>Integer type. Parameters passed on by the ME to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS.</p> <p>READ BINARY</p> <p><P1> Offset high (0...255) <P2> Offset low (0...255) <P3> Length (0...255)</p> <p>READ RECORD</p> <p><P1> Rec. No. (0...255) <P2> Mode "02" = next record "03" = previous record "04" = absolute mode/current mode, the record number is given in P1 with P1='00' denoting the current record. <P3> Length (0...255)</p> <p>GET RESPONSE</p> <p><P1> "00" <P2> "00" <P3> Length (0...255)</p> <p>UPDATE BINARY</p> <p><P1> Offset high (0...255) <P2> Offset low (0...255) <P3> Length (0...255)</p> <p>UPDATE RECORD</p> <p><P1> Rec. No. (0...255) <P2> Mode "02" = next record "03" = previous record "04" = absolute mode/current mode, the record number is given in P1 with P1='00' denoting the current record. <P3> Length (0...255)</p> <p>STATUS</p> <p><P1> "00" <P2> "00" <P3> Length (0...255)</p>
<p><data></p>	<p>Information which shall be written to the SIM (hexadecimal character format). Mandatory for UPDATE BINARY and UPDATE RECORD.</p>



<sw1>	<sw2>	Error Description
152	80	Increase cannot be performed, Max value reached.
103	XX	Incorrect parameter P3 (NOTE: 'XX' gives the correct length or states that no additional information is given ('XX' = '00')).
107	XX	Incorrect parameter P1 or P2.
109	XX	Unknown instruction code given in the command.
110	XX	Wrong instruction class given in the command.
111	XX	Technical problem with no diagnostic given.

<response>	Response of a successful completion of the command previously issued (hexadecimal character uppercase format). STATUS and GET RESPONSE return data, which gives information about the current elementary data file_id. This information includes the type of file and its size (refer to GSM 11.11). After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command.
-------------------------	--

Example

```

AT+CRSM=176,28478,0,0,20           //READ BINARY, GID1(6F3E),0 ,0 , 20 bytes
+CRSM: 144,0,FFFFFFFF             //Generic success code, 20 bytes of file
data
                                FFFFFFFFFF0000000000000000000000
OK

AT+CRSM=178,28474,1,4,26           //READ RECORD, ADN file(6F3A) data, 1,
current, 26 bytes
+CRSM: 144,0,72656EFFFFFFFFFFFFFFF06818984143243FFFFFFFFFFFFFFF
                                //Generic success code, 26 bytes data of the 1st record
OK
AT+CRSM=192,12258                 //GET RESPONSE, ICCID(2fe2)

+CRSM: 144,0,0000000A2FE204000B00BB01020000
                                //Generic success code, 0000-> RFU 000A->File size 2FE2-> File ID 04->
Type of the file (EF) 00->RFU 0B00BB->Access conditions (READ=0-ALW,
UPDATE=B-NEVER) 01->File status 02->Length of the following data (byte 14 to
the end) 00->Structure of EF (transparent) 00->Length of a record (For
cyclic and linear fixed EFs this byte denotes the length of a record. For a
transparent EF, this byte shall be coded '00')

OK

AT+CRSM=214,28498,0,0,8,C69018C7958C87
                                //UPDATE BINARY, KcGPRS(6F52), 0,0, 8 bytes , data to be write to the
file

+CRSM: 152,4                       //Error: access condition not fulfilled
OK

```




```
S08:002 S10:014 S12:020
STORED PROFILE 0:
E1 Q0 V1 X0 &C1 &D2 &K3
S00:000 S02:043 S03:013 S04:010 S05:008 S07:030 S12:020
STORED PROFILE 1:
E1 Q0 V1 X0 &C1 &D2 &K3
S00:000 S02:043 S03:013 S04:010 S05:008 S07:030 S12:020

OK
```

4.10.4. &W, Store User Profile

Command Type	Syntax	Response/Action	Remarks
Set		OK or: +CME ERROR: <err>	The Set command stores the current active configuration to user profile 0 or 1.

The following table shows the &W parameters.

Table 4-157: &W Parameters

<Parameter>	Description
<n>	User's profile number: 0 Store to user's profile 0 1 Store to user's profile 1 The default value is 0.

The parameters that are set in a profile are described in the table below.

Table 4-158: Profile Parameters

Profile Parameter	Description	Parameter Range	Default Value	Length in Bits
ATE	Echo	0-1	1	1
ATQ	Result code return mode	0-1	0	1
ATV	Display result code	0-1	1	1
ATX	Select result code	0-4	0	3



AT&C	Set circuit 109 (DCD) behavior	0-2	1	2
AT&D	Set circuit 109 (DTR) behavior	0-4	2	3
AT&K	Flow control	0, 3-6	3	3
ATQ	Set local flow control between DTE and DCE			
S0	Auto-answer	0-255	0	8
S2	Escape code character	0-255	43	8
S3	Carriage return character	0-127	13	7
S4	Line feed character	0-127	10	7
S5	Backspace character	0-32	8	6
S6	Pause before blind dialling			
S7	Wait time for carrier. Register S7 tells the data adaptor how many seconds to wait for a remote data adaptor's carrier signal before hanging up. The register value can be increased if the data adaptor does not detect a carrier within the specified time. If the data adaptor detects a remote carrier signal within the specified time, it sends a CONNECT response and enters Data mode. If it does not detect a remote carrier signal within the specified time, it sends the NO ANSWER (or 8) response, hangs up, and returns to the Command Mode.	1-255	30	8
S8	Command dial modifier time (pause)			
S10	Automatic disconnect delay			
S 12	Time, in 50ths of a second, until OK is displayed after entering command mode by an escape sequence.	0-255	20	8

Example
AT&W0
OK



AT&W1
OK

4.10.5. &Y, Default User Profile

Command Type	Syntax	Response/Action
Set	&Y[<n>]	OK or: +CME ERROR: <err>

The following table shows the &Y parameters.

Table 4-159: &Y Parameters

<Parameter>	Description
<n>	User's profile number: 0 Selects power-up configuration to user's profile 0 1 Selects power-up configuration to user's profile 1 The default value is 0.

Example
AT&Y0
OK
AT&Y1
OK

4.10.6. +CMER, Mobile Equipment Event Reporting Language

This command enables display changes and indicator state changes.

Command Type	Syntax	Response/Action	Remarks
Set	+CMER=[<mode> [,<keyp>[,<disp> [,<ind>[,<bfr>]]]]]	OK or: +CME ERROR: <err>	The Set command enables/disables an external accessory to receive event reports from the G30. In some cases, this is used to track the user activity for redisplay on a vehicle system, or to perform



			accessory-specific menu operations.
Read	+CMER?	+CMER: <mode>, <keyp>, <disp>, <ind>, <bfr> OK or: +CME ERROR: <err>	The Read command queries the current settings for the AT+CMER command.
Test	+CMER=?	+CMER: (list of supported <mode>s), (list of supported <keyp>s), (list of supported <disp>s), (list of supported <ind>s), (list of supported <bfr>s)	The Test command returns the possible <mode>, <keyp>, <disp>, <ind>, and <bfr> values.

The following table shows the +CMER parameters.

Table 4-160: +CMER Parameters

<Parameter>	Description
<mode>	Controls the processing of unsolicited result codes specified within this command. 0 Buffer unsolicited result codes in G30. 1 Discard unsolicited result codes when the V.24 interface is reserved for data, otherwise display them on the TE directly. 2 Buffer unsolicited result codes in ATC when the V.24 interface is reserved and flush them after reservation, otherwise display them on TE directly.
<keyp>	Not used in G30.
<disp>	Not used in G30.
<ind>	0 No indicator events reporting. 1 Indicator event reporting using result code +CIEV:<ind>,<value>. All indicator events are directed from TA to TE The default value is 0.



SW	Swedish
DA	Danish
PT	Portuguese
FI	Finnish
NO	Norwegian
EL	Greek
TR	Turkish

Example

AT+CLAN?

+CLAN: "EN"

OK

AT+CLAN=?

+CLAN: "DE", "EN", "IT", "FR", "ES", "NL", "SW", "DA", "PT", "FI", "NO", "EL", "TR"

OK

AT+CLAN="DE"

OK

AT+CLAN?

+CLAN: "DE"

OK



4.10.8. +CIND, Indicator Control

This command is used to query the status of various ME indicators.

Command Type	Syntax	Response/Action	Remarks
Read	AT+CIND?	+CIND:<ind>,<ind>...	Read command returns the status of ME indicators.
Test	AT+CIND=?	+CIND :(<descr>,(list of supported <ind>s)) ,(<descr>,(list of supported<ind>s))...	Test command returns pairs, where string value <descr> is a short description of the indicator and compound value is the allowed values for the indicator.

The following table shows the +CIND parameters.

Table 4-162: +CIND Parameters

<ind>	<Parameter>	Description	<value> Range	Explanation
1	<battchg>	Battery indicator	0-5	0 Low battery. 5 Full battery.
2	<signal>	Signal strength	0-5	0 No signal. 1 Low signal strength. 5 High signal strength.
3	<service>	Service availability	0-1	0 Service not available. 1 Service available.
4	<SIM present>	SIM presence	0-1	0 SIM removed. 1 SIM inserted.
5	<message>	Unread message indication	0-1	0 No unread messages. 1 Unread messages exist.
6	<call>	Call active	0-1	0 No call active. 1 Call is active.
7	<roam>	Roaming indicator	0-1	0 Not roaming. 1 Roaming.



8	<smsfull>	SIM SMS full	0-1	0 1	SIM SMS storage is not full. SIM SMS storage is full.
9	<gprs>	GPRS coverage	0-2	0 1 2	GPRS network not available. GPRS network available but not registered. GPRS registered.
10	<SIM PIN>	SIM Pin requested	0-1	0 1	SIM pin ready. SIM pin required.

4.10.10. +MDSI, Motorola Deactivate SIM Card Indication

This command enables unsolicited reporting of indications of SIM deactivation and invalidation. The indications include the cause for deactivation and invalidation.

This command is a basic command, which means that the G30 will accept the command and act according to received parameters regardless of SIM presence and phone lock state.

Command Type	Syntax	Response/Action	Remarks
Set	+MDSI=<mode>	When mode is 1 and SIM was invalidated or deactivated: [+MDSI: <type>, <cause>, <type text>, <cause text>] OK +CME ERROR: <err>	The following is the available mode values for the Set command. <mode> = 1 - Defines that unsolicited +MDSI messages will be sent to the DTE. If the SIM card was invalidated or deactivated, the current status will be sent to the DTE. <mode> = 0 - No unsolicited message is sent to the DTE.
Read	+MDSI?	+MDSI: <mode> OK +CME ERROR: <err>	The Read command queries the current settings for <mode>.
Test	+MDSI=?	+MDSI: (list of supported <mode>s) OK +CME ERROR: <err>	The Test command returns the possible <mode> values.

The following table shows the +MDSI parameters.

Table 4-164: +MDSI Parameters

<Parameter>	Description
-------------	-------------



<mode>	0 Unsolicited indications off 1 Unsolicited indications on
<type>, <type text>	0 "DEACTIVATE". SIM deactivate request was sent with <cause> 1 "GSM". Invalidate SIM for GSM services was sent with <cause> 2 "GPRS". Invalidate SIM for GPRS services was sent with <cause>
<cause>, <cause text>	<cause> and <cause text> related to <type> = 0 ("DEACTIVATE"): 1 "Bad SIM" <cause> and <cause text> related to <type> = 1 ("GSM") and <type> = 2 ("GPRS"): 0 "No reject cause" 2 "IMSI unknown in HLR" 3 "Illegal MS" 4 "IMSI unknown in VLR" 6 "Illegal ME" 7 "GPRS service not allowed" 8 "GPRS and non-GPRS services not allowed" 9 "MS identity cannot be derived by the network" 11 "PLMN not allowed" 12 "Location area not allowed" 13 "Roaming not allowed in this location area" 14 "GPRS services not allowed in this PLMN" 240 "Location update failure" 241 "Combined LU failure" 242 "Authentication and ciphering reject" 243 "Authentication reject" 244 "Attach failure"

```

Example
AT+MDSI?
+MDSI: 0
OK
AT+MDSI=?
+MDSI: (000,001)
OK
AT+MDSI=1
OK
//Until now there was no deactivation or invalidation of SIM card.
AT+MDSI?
+MDSI: 1
OK
//SIM card does not support GPRS
+MDSI: 2, 7, "GPRS", "GPRS services not allowed"
//Insert a SIM card that is no longer subscribed
AT+CPIN="1764"
OK
AT+COPS=0
OK
//Unsolicited messages
+MDSI: 1, 2, "GSM", "IMSI unknown in HLR"
+MDSI: 0, 1, "DEACTIVATE", "Bad SIM"
// Insert a good SIM card, and roam to a network that doesn't have a
GPRS roaming agreement.
//Unsolicited messages
+MDSI: 2, 14, "GPRS", "GPRS services not allowed in this PLMN"
AT+CGATT?
+CGATT: 0
OK

```



4.11.2.1. +CGCLASS, GPRS Mobile Station Class

This command is used to set the G30 to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Command Type	Syntax	Response/Action +MSELINT = 0	Response/Action +MSELINT = 1	Remarks
Read	AT +CGCLASS?	+CGCLASS: <class> OK or: +CME ERROR: <err>	+CGCLASS: <class> OK or: +CME ERROR: <err>	The Read command returns the current GPRS mobile class.
Test	AT +CGCLASS=?	+CGCLASS: (list of supported <class>s) OK or; +CME ERROR: <err>	+CGCLASS: (list of supported <class>s) OK or; +CME ERROR: <err>	The Test command is used for requesting information on the supported GPRS mobile classes.

Note: Issuing GPRS actions over a poor-quality connection may cause protocol errors and harm data validity. To prevent these problems, G30 is equipped with a protection mechanism that confirms GPRS signal strength before issuing GPRS network-related commands.

The following table shows the +CGCLASS parameters.

Table 4-165: +CGCLASS Parameters

<Parameter>	Description	
<class>	+MSELINT = 0 String parameter that indicates the GPRS mobile class: B default CC CG	+MSELINT = 1 String parameter that indicates the GPRS mobile class: B default

```

Example
at+cgclass?
+CGCLASS: "B"

OK
at+cgclass=?
+CGCLASS: ("B", "CC", "CG")
OK
    
```




```
+CGDCONT: (1-2),("IP"),,,(0),(0,1)

OK
AT+CGDCONT?
+CGDCONT: 1,"IP","", "0.0.0.0",0,0

+CGDCONT: 2,"IP","", "0.0.0.0",0,0

OK
AT+CGDCONT= 1,"IP","internetg","0.0.0.0",0,0
OK
AT+CGDCONT?
+CGDCONT: 1,"IP","internetg","0.0.0.0",0,0

+CGDCONT: 2,"IP","", "0.0.0.0",0,0

OK
```

4.11.2.3. +CGQMIN, Quality of Service Profile (Min Acceptable)

This command enables the terminal to specify the minimum acceptable profile which is checked by the ME against the negotiated profile returned in the Activate PDP Context Accept message.

AT+CGQMIN=[<cid> [,<precedence> [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK or: +CME ERROR: <err>	The Set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. As this is the same parameter that is used in the +CGDCONT command, the +CGQMIN command is effectively an extension of the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.
AT+CGQMIN?	+CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean>[<CR><LF>+CGQMIN: <cid>, <precedence>, <delay>, <reliability.>, <peak>, <mean>[...]] OK or: +CME ERROR: <err>	The Read command returns the current settings for each defined context. That +MSELINT = 0 and the +CGDCONT command doesn't execute return only OK.




```
+CGQMIN: 2,0,0,0,0,0
```

```
OK
```

```
AT+CGQMIN=?
```

```
+CGQMIN: ("IP"),(0-3),(0-4),(0-5),(0-9),(0-18,31)
```

```
OK
```



		<err>	
--	--	-------	--

The following table shows the +CGQREQ parameters.

Table 4-168: +CGQREQ Parameters

<Parameter>	Description
<cid>	A numeric parameter that specifies a particular PDP context definition. The value is from 1 to 2.
<precedence>	A numeric parameter that specifies the precedence class.
<delay>	A numeric parameter that specifies the delay class.
<reliability>	A numeric parameter that specifies the reliability class.
<peak>	A numeric parameter that specifies the peak throughput class.
<mean>	A numeric parameter that specifies the mean throughput class.

```

Example
AT+CGQREQ=?
+CGQREQ: ("IP"),(0-3),(0-4),(0-5),(0-9),(0-18,31)
OK
AT+CGQREQ?
+CGQREQ: 1,2,4,3,9,10
+CGQREQ: 2,2,4,3,9,10
+CGQREQ: 3,2,4,3,9,10
OK
AT+CGQREQ=1,0,,0,0,0
OK
AT+CGQREQ?
+CGQREQ: 1,0,4,0,0,0
+CGQREQ: 2,2,4,3,9,10
+CGQREQ: 3,2,4,3,9,10
OK
Example:
at+mselect=0
OK
    
```



<state>	Indicates the state of GPRS attachment 0 Detached 1 Attached
<cid>	A numeric parameter that specifies a particular PDP context definition

- In some GPRS networks, for example Germany, +CGACT is not supported. The ATD*99# command can be used to make a connection.

4.11.2.5. +CGATT, GPRS Attach or Detach

This command attaches/detaches the ME to/from the GPRS service. When the command has completed, the ME remains in V.25ter command state. If the ME is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.



The ITU V.25ter 'D' (Dial) command causes the ME to enter the ITU V.25ter Online Data state and together with the terminal, to start the specified layer 2 protocol. The ME returns CONNECT to confirm acceptance of the command prior to entering the ITU V.25ter Online Data state. No further commands may follow on the AT command line.

The detailed behavior after the Online Data state has been entered is dependent on the PDP type, and is described briefly. GPRS attachment and PDP context activation procedures may take place prior to, or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

When the layer 2 protocols have terminated, either as a result of an orderly shut down of the PDP or an error, the ME enters the ITU V.25ter command state and returns the NO CARRIER final result code.

If <called address> is supported and provided, the ME automatically sets up a virtual call to the specified address after the PDP context has been activated.

If <L2P> and <cid> are supported, the +CGDCONT, +CGQREQ and other such commands may then be used in the modem initialization AT command string to set values for PDP type, APN, QoS and so on.

If <L2P> is not supported, or is supported but omitted, the ME uses a layer 2 protocol appropriate to the PDP type.

If <cid> is not supported, or is supported but omitted, the ME attempts to activate the context using one of the following:

- Any information provided by the terminal during the PDP startup procedure. For example, the terminal may provide a PDP type and/or PDP address to the ME.
 - A prior knowledge, for example, the ME may implement only one PDP type.
- Using the "Empty PDP type" No PDP address or APN is sent in this case and only one PDP context subscription record is present in the HLR for this subscriber.

Note: The G30 stack should be able to start PPP negotiation.

This command may be used in both normal and modem compatibility modes.

Command Type	Syntax	Response/Action
Set	ATD*<GPRS_SC> [*[<called_address>][* [<L2P>] [*[<cid>]]]]#	CONNECT or: ERROR

The following table shows the D*99 parameters.

Table 4-169: D*99 Parameters

<Parameter>	Description
<GPRS_SC> (GPRS Service Code)	Digit string (value 99) which identifies a request to use GPRS.



<p><called_addresses></p>	<p>4.11.2.7. String that identifies the called party in the address space applicable to the PDP. For communications software that does not support arbitrary characters in the dial string, a numeric equivalent may be used. Also, the comma character "," may be used as a substitute for the period character ".". For PDP type OSP:IHOSS, the following syntax may be used for <called_address>:[<host>][@ [<port>]][@ [<protocol>]] where <host>, <port> and <protocol> are defined in +CGDCONT, Define PDP Context</p> <p>.</p> <p>For communications software that does not support arbitrary characters in the dial string, a numeric value equivalent to the hostname may be used. However, this should be avoided if at all possible.</p>
<p><L2P></p>	<p>String variable which indicates the layer 2 protocol to be used. For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents are used:</p> <p>0 NULL 1 PPP 2 PAD 3 X25 9 yyyy M-xxxx</p> <p>Other values are reserved and result in an ERROR response to the Set command. Note: V.250 (and certain communications software) do not permit arbitrary characters in the dial string. The <L2P> and <called_address> strings are therefore specified as containing digits (0-9) only.</p>
<p><cid>:</p>	<p>4.11.2.8. Digit string which specifies a particular PDP context definition (See +CGDCONT, Define PDP Context</p> <p>).</p>

```
Example
ATD*99 //Try connecting to GPRS according to the first <cid>, defined
in
+CGDCONT
```

4.11.2.9. +CGPRS, GPRS Coverage

This command indicates whether there is GPRS coverage.

Note: GPRS coverage will be detected only when SIM has GPRS ability.



Command Type	Syntax	Response/Action	Remarks
Execute	AT+CGPRS	+CGPRS: <mode> OK or: +CME ERROR: <err>	The Execute command returns the mode of the GPRS coverage.
Read	AT+CGPRS?	+CGPRS: <mode> OK or: +CME ERROR: <err>	The Read command returns the mode of the GPRS coverage
Test	AT+CGPRS=?	+CGPRS: (list of supported <mode>s) OK or: +CME ERROR: <err>	

Note:

The following table shows the +GPRS parameters.

Table 4-170: +GPRS Parameters

<Parameter>	Description
<mode>	0 No GPRS coverage 1 GPRS coverage There is no parameter default value

Example

Without GPRS coverage

```
AT+CGPRS
+CGPRS: 0
OK
```

```
AT+CGPRS?
+CGPRS: 0
OK
```

With GPRS coverage

```
AT+CGPRS
+CGPRS: 1
OK
```

4.11.2.10. +CGACT, PDP Context Activate or Deactivate

This command activates/deactivates the specified PDP context(s).



Table 4-171: +CGACT Parameters

<Parameter>	Description
<state>	Indicates the activation state of the context: 0 Non-active 1 Active
<cid>	1-2 A numeric parameter that specifies a particular PDP context definition

Example

```
at+mselint=0
```

```
AT+CGACT=?
```

```
+CGACT: (0,1)
```

```
OK
```

```
AT+CGACT?
```

```
OK
```

```
AT+CGACT=1
```

```
ERROR //GPRS network not present.
```

```
at+mselint=1
```

```
OK
```

```
AT+CGACT=?
```

```
+CGACT: (0,1)
```

```
OK
```

```
AT+CGACT?
```

```
+CGACT: 1,0
```

```
+CGACT: 2,0
```

```
OK
```

Note: In some GPRS networks, +CGACT is not supported. the ATD*99 # command can be used to establish a connection.

Activating a context can take up to 150 seconds.

Deactivating a context can take up to 40 seconds.

When aborting a +CGACT Set command, the context is closed. This can take up to 40 seconds.

4.11.2.11. CGPADDR, GPRS ADDResses

This command reads the allocated PDP addresses for the specified context identifiers.

Command Type	Syntax	Response/Action	Remarks
--------------	--------	-----------------	---------



Command Type	Syntax	Response/Action
Set	+STKPROF=<length>, <data>	OK or +CME ERROR: <error>
Read	+STKPROF?	+STKPROF: <length>, <data> OK
Test	+STKPROF=?	OK

The following table shows the +STKPROF parameters.

Table 4-177: +STKPROF Parameters

<Parameter>	Description
<length>	Integer type value; length in bytes that are sent to TE in <data> Note: <length> set to 0 forces a reset to the default terminal profile stored in the ME.
<data>	Terminal profile data coded in hex format

Example

```
+STKPROF=2,"1F7F"
OK
+STKPROF?
+STKPROF=2,"1F7F"
OK
```



4.11.3.5. +STKCC, Call Control Commands

The SIMAP call control status is displayed using the unsolicited result code +STKCC:
<cc_comand>,... defined as:

+STKCC: 1,<res_val>,<alpha>,<number>

+STKCC: 2,<res_val>,<alpha>,<ss_code>

+STKCC: 3,<res_val>,<alpha>,<ussd_code>

+STKCC: 4,<res_val>,<alpha>,<ton_npi>,<sc_addr>,<ton_npi>,<dest_addr>

The following table shows the +STKCC parameters.

Table 4-178: +STKCC Parameters

<Parameter>	Description
<cc_command>	1: set up call 2: send SS 3: send USSD 4: send SM
<res_val>	Call control result value
<alpha>	Text string
<number>	Called party number
<ton_npi>	Type of number and numbering plan
<sc_addr>	Service center address
<dest_addr>	Destination address



Mode Text	
Launch Browser	Defined as part of the proactive SIM service, this command requests a browser inside a browser-enabled user terminal to interpret the content corresponding to a URL. .
Set Up Event List	Defined as part of the proactive SIM service, this command supplies a list of events, which the SIM wants the G24 to provide details of when these events happen. .



b4	Menu selection
b5	9EXX' response code for SIM data download error
b6	Timer expiration
b7	USSD string data object supported in Call Control
b8	Envelope Call Control always sent to the SIM during automatic redial mode

Table 4-182: Profile Structure – Byte 2 (Other)

Bit	Description
b1	Command result
b2	Call Control by SIM
b3	Cell identity included in Call Control by SIM
b4	MO short message control by SIM
b5	Handling of the alpha identifier according to reference 1 subclause 9.1.3
b6	UCS2 Entry supported
b7	UCS2 Display supported
b8	Display of the extension text

Table 4-183: Profile Structure – Byte 3 (Proactive SIM)

Bit	Description
-----	-------------



b1	Proactive SIM: DISPLAY TEXT
b2	Proactive SIM: GET INKEY
b3	Proactive SIM: GET INPUT
b4	Proactive SIM: MORE TIME
b5	Proactive SIM: PLAY TONE
b6	Proactive SIM: POLL INTERVAL
b7	Proactive SIM: POLLING OFF
b8	Proactive SIM: REFRESH

Table 4-184: Profile Structure – Byte 4 (Proactive SIM)

Bit	Description
b1	Proactive SIM: SELECT ITEM
b2	Proactive SIM: SEND SHORT MESSAGE
b3	Proactive SIM: SEND SS
b4	Proactive SIM: SEND USSD
b5	Proactive SIM: SET UP CALL
b6	Proactive SIM: SET UP MENU
b7	Proactive SIM: PROVIDE LOCAL INFORMATION (MCC, MNC,LAC, Cell ID & IMEI)
b8	Proactive SIM: PROVIDE LOCAL INFORMATION (NMR)



b7	
b8	

Table 4-187: Profile Structure – Byte 7 (Multiple card proactive commands)

Bit	Description
b1	Proactive SIM: POWER ON CARD
b2	Proactive SIM: POWER OFF CARD
b3	Proactive SIM: PERFORM CARD APDU
b4	Proactive SIM: GET READER STATUS (Card reader status)
b5	Proactive SIM: GET READER STATUS (Card reader identifier)
b6	RFU, bit = 0
b7	
b8	

Table 4-188: Profile Structure – Byte 8 (Proactive SIM)

Bit	Description
b1	Proactive SIM: TIMER MANAGEMENT (start, stop)
b2	Proactive SIM: TIMER MANAGEMENT (get current value)
b3	Proactive SIM: PROVIDE LOCAL INFORMATION (date, time and time zone)



b7	
b8	

Table 4-192: Profile Structure – Byte 12 (Bearer independent protocol proactive commands – class "e")

Bit	Description
b1	Proactive SIM: OPEN CHANNEL
b2	Proactive SIM: CLOSE CHANNEL
b3	Proactive SIM: RECEIVE DATA
b4	Proactive SIM: SEND DATA
b5	Proactive SIM: GET CHANNEL STATUS
b6	RFU, bit = 0
b7	
b8	

Table 4-193: Profile Structure – Byte 13 (Bearer independent protocol supported bearers – class "e")

Bit	Description
b1	CSD supported by ME
b2	GPRS supported by ME



b3	RFU, bit = 0
b4	
b5	
b6	Number of channels supported by ME
b7	
b8	

Table 4-194: Profile Structure – Byte 14 (Screen height)

Bit	Description
b1	Number of characters supported down the ME display, as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, subclause 5.3.1
b2	
b3	
b4	
b5	
b6	RFU, bit = 0
b7	
b8	Screen Sizing Parameters supported as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, section 5.3



Table 4-195: Profile Structure – Byte 15 (Screen width)

Bit	Description
b1	Number of characters supported across the ME display, as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, subclause 5.3.2
b2	
b3	
b4	
b5	
b6	
b7	
b8	Variable size fonts supported

Table 4-196: Profile Structure – Byte 16 (Screen effects)

Bit	Description
b1	Display can be resized as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, subclause 5.3.3
b2	Text Wrapping supported as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, subclause 5.3.4
b3	Text Scrolling supported as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, subclause 5.3.5
b4	RFU
b5	
b6	Width reduction when in a menu as defined in 3GPP TS 11.14 version 8.9.0 Release 1999, subclause 5.3.6



b7	
b8	

Table 4-197: Profile Structure – Byte 17 (Bearer independent protocol supported transport interface – class "e")

Bit	Description
b1	TCP
b2	UDP
b3	RFU, bit = 0
b4	
b5	
b6	
b7	
b8	



Table 4-198: Profile Structure – Byte 18 (Reserved)

Bit	Description
b1	RFU, bit = 0
b2	
b3	
b4	
b5	
b6	
b7	
b8	

Table 4-199: Profile Structure – Byte 19 (Reserved for TIA/EIA-136 facilities)

Bit	Description
b1	Protocol Version, coded as indicated in TIA/EIA-136-123
b2	
b3	
b4	
b5	RFU, bit = 0
b6	



Table 4-201: +MTKP Parameters of MTKP Field Descriptions (Cont.)

<Parameter>	Description
ProactiveCmdType=1 (Display Text)	
<Priority>	0 Normal priority of display. 1 High priority of display.
<Text>	Text information in ASCII format.
ProactiveCmdType=2 (Get Inkey)	
<ResponseType>	0 Digit (0-9, *, #, and +) 1 SMS alphabet. 2 UCS2 characters 3 Yes/No
<HelpInfo>	0 No help information available. 1 Help information is available.
<Text>	Text information in ASCII format.
ProactiveCmdType=3 (Get Input)	
<ResponseType>	0 Digit (0-9, *, #, and +) 1 SMS alphabet. 2 UCS2 characters.
<SecurityMode>	0 Security off. 1 Security on.
<SizeMin>	Minimum length of input.
<SizeMax>	Maximum length of input.
<HelpInfo>	0 No help information available. 1 Help information is available.
<Text>	Text information in ASCII format.
Values when ProactiveCmdType=5 (Play tone)	



Command Type	Syntax	Response/Action	Remarks
Set	AT+MTKP=<CmdType>,<Result> [,<Data>]	OK +CME ERROR : <err>	The Set command allows the user to answer the following proactive commands: <ul style="list-style-type: none"> • GET_INKEY Key pressed from the user. • GET_INPUT Message entered by the user. • Enable/disable the DTMF service by the user. • Launch browser • Set up event list
Test	+ MTKP =?	+MTKP: (list of supported <CmdType>s OK or: +CME ERROR : <err>	The Test command returns the possible <CmdType> values.

Table 4-202: MTKP Command Parameters (Cont.)

<Parameter>	Description
<CmdType>	2 Response for a "Get Inkey" 3 Response for a "Get Input" 16 Response for a " Set Up Event List" 24 Response for a " Send DTMF command" 26 Response for a " Launch browser"
Values when CmdType=2 (Get Inkey)	
<Result>	0 Session ended by user. 1 Response given by the user. 2 Help information required by user.
<Data>	Key pressed by the user.
Values when CmdType=3 (Get Input)	
<Result>	0 Session ended by user. 1 Response given by the user. 2 Help information required by user.



Table 4-203: +MTKP Parameters – Response Code 26

<Parameter>	Description
<result>	0 Success 1 Failure
<additional info>	0 No specific cause can be given 1 Bearer unavailable 2 Browser unavailable 3 G24 unable to read provisioning data Additional info should be added only in case of failure.
<err>	1 Unknown result value

Table 4-204: Current Event Types (Cont.)

Event	Notes
MT Call Event	Performed by G24; no indication sent to the TE.
Call Connected Event	Performed by G24; no indication sent to the TE.
Call Disconnected Event	Performed by G24; no indication sent to the TE.
Location Status Event	Performed by G24; no indication sent to the TE.
User Activity Event	Initiated by TE and reported via +MTKP command. TE is responsible for deciding what triggers this event. Only the event occurrence is monitored by G24; no additional information is required.
Idle Screen Available Event	Initiated by TE and reported via +MTKP command. TE is responsible for deciding what triggers this event. Only the event occurrence is monitored by G24; no additional information is required.
Card Reader Status Event	Issued by message handler of SCIM_CARD_DETECT_IND_ID message. Performed by G24; no indication sent to the TE.



<Data>	None	User Activity event
	None	Idle Screen Available event
	0	Browser Termination event (User terminated)
	1	Browser Termination event (Error terminated)
	4	Language Selection event, with string coded as follows:
	Byte(s)	Description Length
	1	Language tag 1
2	Length='02' 1	
3-4	Language 2	

Table 4-206: Sample Language Codes (Cont.)

Code	Language
aa	Afar
ab	Abkhazian
af	Afrikaans
am	Amharic
ar	Arabic
as	Assamese
ay	Aymara
az	Azerbaijani
ba	Bashkir
be	Byelorussian
bg	Bulgarian
bh	Bihari
bi	Bislama



mi	Maori
mk	Macedonian
ml	Malayalam
mn	Mongolian
mo	Moldavian
mr	Marathi
ms	Malay
mt	Maltese
my	Burmese
na	Nauru
ne	Nepali
nl	Dutch
no	Norwegian
oc	Occitan
om	(Afan)
or	Oriya
pa	Punjabi
pl	Polish
ps	Pashto,



pt	Portuguese
qu	Quechua
rm	Rhaeto-Romance
rn	Kirundi
ro	Romanian
ru	Russian
rw	Kinyarwanda
sa	Sanskrit
sd	Sindhi
sg	Sangho
sh	Serbo-Croatian
si	Sinhalese
sk	Slovak
sl	Slovenian
sm	Samoan
sn	Shona
so	Somali
sq	Albanian
sr	Serbian



ss	Siswati
st	Sesotho
su	Sundanese
sv	Swedish
sw	Swahili
ta	Tamil
te	Telugu
tg	Tajik
th	Thai
ti	Tigrinya
tk	Turkmen
tl	Tagalog
tn	Setswana
to	Tonga
tr	Turkish
ts	Tsonga
tt	Tatar
tw	Twi
ug	Uighur



uk	Ukrainian
ur	Urdu
uz	Uzbek
vi	Vietnamese
vo	Volapuk
wo	Wolof
xh	Xhosa
yi	Yiddish
yo	Yoruba
za	Zhuang
zh	Chinese
zu	Zulu

Command Type	Syntax	Response/Action	Remarks
Execute	AT+MTKM	+MTKM: <Alpha Identifier menu> +MTKM: <Idx1>, <NoOfItems>, <Alpha Idx1>, <Help Info> [<CR><LF>+MTKM: <Idx2>, <NoOfItems>, <Alpha Idx2>, <Help Info> [...]] OK	This command is sent when the customer application wants to see the SIM Toolkit Main menu.



Set	AT+MTKM=<CmdType> [,<ItemId>]	OK or: +CME ERROR: <err>	The Set command is issued when the user wants to select an item from the menu.
------------	-----------------------------------	--------------------------------	--



+MTKC	+MTKC: <CCResult>[,<Number>]
-------	--------------------------------

Table 4-209: +MTKC Parameters

<Parameter>	Description
<CCResult>	0 Control response not allowed. 1 Control response with modification.
<Number>	Called number or SS String in ASCII format.



4.11.4. TCP/IP

4.11.4.1. +MIPCALL, Create a Wireless Link

This command sets up a PPP (Point to Point Protocol) connection with the GGSN (Gate GPRS Support Node) or with the CSD provider - depending on operation parameter value, and returns a valid dynamic IP for the G30.

Command Type	Syntax	Response/Action
Set	+MIPCALL= <Operation> [,<"APN"> [,<"User name">, <"Password"> [,<Auth_type>]]]	OK +MIPCALL: <"local IP address"> or: ERROR: <err> +MIPCALL: 0
Read	+MIPCALL?	+MIPCALL: <status>[,<IP>]
Test	+MIPCALL=?	+MIPCALL: (list of supported <operation>s)

Note:

- The +MIPCALL command does not return the prompt to the terminal until the IP is received from the provider, or time out has occurred, therefore, no other commands can be issued in the meantime.
- The +MIPCALL command does not have a general ABORT mechanism, therefore a command cannot be issued until the previous command ends.
- In case FTP is established and MIPCALL is set to zero, this will close and disconnect the FTP connection.



- When a call exists the dynamic IP address will be returned.
For example:
AT+MIPCALL?
+MIPCALL: 1,"172.17.237.80"
- In case of MUX : Each MUX channel can accept MIP command. When MIPCALL is detected on a channel, the channel is allocated for MIP operations (MIP commands on other channels are blocked). When MIPCALL=0 is detected on the channel, the channel is released and next MIPCALL can be start in some other MUX channel.

The following table shows the +MIPCALL parameters

Table 4-210: +MIPCALL Parameters

<Parameter>	Description
operation	0 - disconnect a link 1 - establish GPRS link
<status>	0 Disconnected 1 Connected
"APN"	APN of service provider (in quotation marks). Contact your service provider for details.
"Phone Number"	Phone number of CSD 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.
Local IP-address	IP address given by server after PPP negotiation.
Auth_type	1 - PAP(DFLT) 2 - CHAP

Note: The "User name" and the "Password" parameters can be up to 64 characters each. The "APN" / "Phone number" parameters can be up to 50 characters each.

Example

Establish GPRS connection with GGSN and obtain an IP:

```
AT+MIPCALL=1,"internet","User","Password"
OK
```

```
+MIPCALL: "123.145.167.230"
```



Establish CSD connection with CSD provider and obtain an IP:

```
AT+MIPCALL=2," 01234567890","User","Password"
OK
```

```
+MIPCALL: "234.123.253.78"
```

Close an active connection

```
AT+MIPCALL=0
OK
```

4.11.4.2. +MIPOPEN, Open a Socket (UDP or TCP)

This command causes the G30 module to initialize a new socket that waits for a connection from a remote machine or opens a common or TCP secured with SSL connection with a remote side (according to received parameters). Each socket allocates an accumulating buffer whose size is 1372 bytes.

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.

The +MIPOPEN command returns a +MIPSSL unsolicited event(s) in case of alert(s) occurring during secure connection. See [Table 4-198](#).

SSL connection is not supported for listening sockets.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MIPOPEN= <Socket ID>, <Source Port>, <Remote IP>, <Remote Port>, <Protocol>, <buffering mode>, <data type>	OK or: +MIPOPEN: <Socket ID>,<State>[,<Remote IP>,<Remote Port>] or: +MIPSTAT: <Socket ID>,<Status> or: ERROR: <err>	The Set command returns <Remote IP> and <Remote Port> parameters only for sockets opened in Listen mode.
Read	AT+MIPOPEN?	+MIPOPEN:[<SocketID>] for each socket that can be opened or: +MIPOPEN 0 if there are no free sockets.	The Read command returns the numbers of the sockets that can be opened.
Test	AT+MIPOPEN=?	+MIPOPEN: (list of supported <socket ID>s), (list of supported <source port>s), (list of supported <destination IP>s), (list of <destination port>s), (list of supported <protocol>s)	

Example




```

AT+MIPOPEN=1,1222,"123.245.213.012",1234,0,1,1 //Opening socket 1, using TCP protocol, from port 1222,
targeting 123.245.213.012 port 1234, received data is stored in internal buffer and data type is ascii
AT+MIPOPEN: //Invalid command
ERROR
AT+MIPOPEN? //Terminal checking the free sockets
+MIPOPEN: 3 4
OK
AT+MIPOPEN=1,0,"WWW.GOOGLE.COM",80,0 //TCP
OK
+MIPOPEN: 1,1
AT+MIPOPEN=1,0,"www.google.com",80,0 //TCP
OK
+MIPOPEN: 1,1
AT+MIPOPEN=2,0,"www.google.com",80,1 //UDP
OK
+MIPOPEN: 2,1
// Listen socket over TCP:
AT+MIPOPEN=1,1100,"0.0.0.0",0,0 // Listens to any port at any IP.
OK

```

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

This command causes the G30 to initialize a new socket that waits for a connection from a remote machine or opens a common or TCP secured with SSL 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. When the user sends amount of data, less than buffer size, the data is being sent to Network after a spooling timeout (200 mS), otherwise the data is being sent to Network immediately.

Only one socket is allowed at the same time in Online Data Mode.

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

The +MIPODM command returns a +MIPSSL unsolicited event(s) in case of alert(s) occurring during secure connection establishment or in pseudo-command mode. See [Table 4-198](#).

Command Type	Syntax	Response/Action	Remarks
--------------	--------	-----------------	---------



Protocol	Type of protocol stack. 0 TCP 1 UDP 2 TCP secured with SSL
State	0 Inactive 1 Active 2 SSL secured

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

Example

Opening socket 3 in Online Data Mode, using TCP protocol, from port 1104, designation IP 123.245.213.012, designation port 1124:

```
AT+MIPODM=3,1104,"172.90.237.221",1124,0
OK
+MIPODM: 3,1
```

Enter invalid command format:

```
AT+MIPODM
ERROR
```

Check opened in Online Data Mode socket state when G30 is pseudo-command mode:

```
AT+MIPODM?
+MIPODM: 3,1
OK
```

Listen socket over TCP:

```
AT+MIPODM=1,1100,"0.0.0.0",0,0 // Listens to any port at any IP.
OK
+MIPODM: 1,1,122.221.32.64,1200 // Remote side connected to the listen socket.
AT+MIPODM=3,3212,"122.1.222.134",0,0 // Listen to any port at specific IP.
OK
+MIPODM: 3,1,122.1.222.134,1222 // Remote side connected to the listen socket.
//SSL
AT+MIPODM=2,2222,"www.google.com",443,2 // TCP secured with SSL.
OK
+MIPODM: 2,2// SSL connection opened.
AT+MIPODM=3,1234,"www.xyz.com",443,2 // TCP secured with SSL.
OK
+MIPSSL: 3,10 // SSL_BAD_CERTIFICATE alert.
+MIPODM: 3,2
```

4.11.4.4. +MIPCLOSE, Close a Socket

This command causes the G30 to free the socket accumulating buffer and to close the socket.

4.11.4.5. All data stored in the accumulating buffer will be lost. Refer to +MIPSETS, Set Size, and +MIPPUSH, Push Data into Protocol Stack

Note: .

Command Type	Syntax	Response/Action
--------------	--------	-----------------



and then send this data using an existing protocol stack when the amount of data reaches the predefined amount (see +MIPSETS, Set Size,). When the data is sent, an unsolicited report of +MIPPUSH will be displayed. Before sending data, a valid connection must be created using the +MIPCALL and +MIPOPEN commands. Data type to be sent can be ascii or Hex type. The type is set using the +MIPOPEN command.

Telit 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 1372 bytes of data.

Command Type	Syntax	Response/Action	Remarks
Set	+MIPSEND = <Socket ID>, <Data>	ERROR +MIPSEND: <Socket ID>, <Status>, <Free Size>	Data in the +MIPSEND command is limited to 504 characters. <Status>: 0 - Success 1 - Socket is flowed off
Read	+MIPSEND?	+MIPSEND <Socket ID>, <Free Size>>[<Socket ID> <Free Size>]<CR><LF> For all ACTIVE sockets.	
Test	+MIPSEND=?	ERROR	

The following table shows the +MIPSEND parameters.

Table 4-215: +MIPSEND Parameters

<Parameter>	Description
<socket ID>	1,2,3,4 Number of valid socket
<Free Size>	Free space in current buffer. Free size is calculated from the 1372. 0 < Free Size < 1372
<Data>	- Ascii data type. User data string, using ascii chars. See notes below. - Hex data type. User data string is sent encoded with 0-F hexadecimal digits (String ends with a <CR>)

Note 1: <Data type> is set using the +MIPOPEN command.

Note 2: When <data type> is ascii mode , <cr> <lf> and <\> has special treatment.

- <cr> should be replaced by the couple "\r"
- <lf> should be replaced by the couple "\n"
- <\> should be replaced by the couple "\\"
- <"> should be replaced by the couple "\"q"



			Size of <accumulated_sent_length> is four octets unsigned digit (0-4294967295). <Status>: 0 - Success 1 - socket is flowed off 2 - there is no data in socket to send
Read	+MIPPUSH?	MIPPUSH:[<socket ID>]	
Test	+MIPPUSH=?	MIPPUSH=<socket ID>,<IP>,<Port>	

The following table shows the +MIPPUSH parameters.

Table 4-216: +MIPPUSH Parameters

<Parameter>	Description
Socket ID	1,2,3,4 Number of valid socket
Destination IP	IP of destination site in the format AAA.BBB.CCC.DDD. The value can be written in 1, 2 or 3 digits.
Destination Port	0-65535 Port of destination site. Written in decimal digits.

Example

AT+MIPPUSH=1

//Terminal asks the G30 to flush the buffer in socket 1 (was opened



using the +MIPOPEN command)
+MIPPUSH: 0
OK

4.11.4.9. +MIPFLUSH, Flush Data from Buffers

This command causes the G30 to flush (delete) data accumulated in its accumulating buffers.

Command Type	Syntax	Response/Action
Set	+MIPFLUSH = <Socket ID>	ERROR or: +MIPFLUSH: <Socket ID> OK
Read	+MIPFLUSH?	+MIPFLUSH: [<socket ID>]
Test	+MIPFLUSH=?	+MIPFLUSH= (<Socket ID>)

The following table shows the +MIPFLUSH parameters.

Table 4-217: +MIPFLUSH Parameters

<Parameter>	Description
Socket ID	1,2,3,4 - Number of valid sockets



Example

```
AT+MIPFLUSH=2 //Socket number 2 was previously opened using the +MIPOPEN
                command
+MIPFLUSH: 2
OK
AT+MIPFLUSH=5
ERROR
AT+MIPFLUSH?
+MIPFLUSH: 1 2
OK
```

4.11.4.10. +MIPRUDP, Receive Data from UDP Protocol Stack

This unsolicited event is sent by the G30 to the terminal when data is received from the UDP protocol stack.

Set Command Event

```
+MIPRUDP:<Source IP>,<Source Port><socket ID>,<Left>,<Data>
```

The following table shows the +MIPRUDP parameters.

Table 4-218: +MIPRUDP Parameters

<Parameter>	Description
Source IP	IP of the source.
Source Port	Port of the source.
Socket ID	1,-4 - Number of valid socket.
Left/accumulated	- Size of received data still left in protocol stack in display mode, or - Number of bytes that are accumulated in internal buffer in buffering mode. Note: Socket can be opened in 2 buffering modes: - Display received data immediately to TE. - Storing received data in an internal buffer.
Data	Display mode only. Data that was received from protocol stack.

Example

```
AT+MIPOPEN=1,1111,"193.222.129.55",9119,1,0 // opening in display to TE mode
+MIPOPEN: 1,1
OK
AT+MIPOPEN=2,2222,"193.222.129.55",9119,1,1 // opening in buffering mode
+MIPOPEN: 2,1
OK
AT+MIPSEND=1,"1122556677889900" // 8 bytes
+MIPSEND: 1,0,1364
OK
```




```

AT+MIPSEND=2,"21222324252627282920" // 10 bytes
+MIPSEND: 2,0,1362
OK
AT+MIPPUSH=2 // sending data to server that shall echo the data back
+MIPPUSH: 2,0
OK
+MIPRTCP: 2,10 // 10 bytes were received and 10 bytes only are stored in the buffer
AT+MIPSEND=2,"3132333435" // 5 bytes
+MIPSEND: 2,0,1367
OK
AT+MIPPUSH=2 // sending data to server that shall echo the data back
+MIPPUSH: 2,0
+MIPRTCP: 2,15 // 5 bytes were received and 15 bytes are stored in the buffer.

```

4.11.4.12. +MIPSTAT, Status Report

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.

Note: In case of SSL secured connection, the encryption increases the amount of data and SSL protocol uses encrypted alerts, therefore the <number_of_acknowledged_bytes> parameter shows gross number of acknowledged bytes (including encrypted alert messages), which is greater than actual amount of sent user data.

Syntax

+MIPSTAT: <socket_ID>,<n>[,<number_of_acknowledged_bytes >]

The following table shows the +MIPSTAT parameters.

Table 4-220: +MIPSTAT Parameters

<Parameter>	Description
<SocketID>	A unique number that identifies a connection. Valid socket numbers - 1, 2, 3 and 4
<n>	0 - ACK indication 1 - Broken protocol stack 2 - Connection closed automatically due to non - fatal alert
<number_of_acknowledged_bytes >	Total number of bytes that were acknowledged. This parameter will be display only in case < is_nack_ind_req> parameter of +MIPCONF command ios set to 2.

Example

+MIPSTAT: 1,2

4.11.4.13. +MIPDATA, Network Incoming Data Unsolicited Indication in Pseudo-command Mode

This unsolicited event is sent to the terminal indicating a data comes from Network when G30 is in pseudo-command mode.

Note: Pseudo-command mode is a special mode, allowing the user to enter AT commands from terminal, when



actually opened in Online Data Mode socket suspended. The way to suspend the socket is to enter ESC sequence from terminal. The way to resume the socket (return to Online Data Mode) is to enter ATO command from terminal.

Syntax

+MIPDATA: <Socket ID>,<Number of received data bytes>

The following table shows the MIPDATA parameters.

Table 4-221: MIPDATA Parameters

<Parameter>	Description
<Socket ID>	Identification Number of Socket: 1,2,3,4
<number of received data bytes >	Amount of data in bytes, received from Network, when G30 is in pseudo-command mode.

Example

+MIPDATA: 1,1372

4.11.4.14. +MIPXOFF, Flow Control - Xoff

This command is the unsolicited response that the G30 sends to the terminal to stop sending data when it does not have enough memory to process new +MIPSEND requests. The G30 uses the accumulating buffer prior to pushing data into the protocol stack. This memory resource is protected by a Xoff_upper watermark.

Event

+MIPXOFF: <Socket ID>

Example

+MIPXOFF: //The G30 detects that the accumulating buffer 1 has reached its Xoff watermark.

From this point, the terminal is not allowed to send data, until it receives the +MIPXON command.

4.11.4.15. +MIPXON, Flow Control - Xon

This command is the unsolicited event that the G30 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.

Event

+MIPXON: <Socket ID>

Example

+MIPXON: 1 //The G30 pushed the data into the protocol stack on socket 1 and is able to handle more data from the terminal.

4.11.4.16. +MIPCONF, Configure Internal TCP/IP stack

This command allows to configure TCP stack parameters, such as retransmissions number, upper and bottom limits of retransmission timeout, close delay. It can be used to configure TCP socket parameters only before socket activation. Configuration values will be stored in G30 until power



<max_close_delay>	Closing delay required by RFC 793 (1 ms to 120 ms) Default value: 8
<is_nack_ind_req>	NACK/ACK TCP indication feature. Activating this parameter enables G30 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. <ul style="list-style-type: none"> • Power Up - 0 • Default value - previously set value This parameter resets after power cycle.

Example

```

AT+MIPCONF=2,5,10,600,75,2
OK
AT+MIPOPEN=2,0,"66.249.87.99",80,0
OK
+MIPOPEN: 2,1
AT+MIPSETS=2,10
+MIPSETS: 0
OK
AT+MIPSEND=2,"474554202F20485454502F312E300D0A486F73743A207777772E676F6F676C652E636
F6D0D0A0D0A"
+MIPPUSH: 2,0,40
+MIPSEND: 2,0,1372
OK
AT+MIPSEND=2,"474554202F20485454502F312E300D0A486F73743A207777772E676F6F676C652E636
F6D0D0A0D0A"
+MIPSEND: 2,1,1372
OK
+MIPSTAT: 2,0,30 < incorrect unsolicited, copied from G24 but not implement in G30 stuck.
+MIPSTAT: 2,0,40 < incorrect unsolicited, copied from G24 but not implement in G30 stuck.
Example should be change to:
AT+MIPCONF=2,5,10,600,75,2
OK
AT+MIPOPEN=2,0,"66.249.87.99",80,0
OK
+MIPOPEN: 2,1
AT+MIPSETS=2,10
+MIPSETS: 0
OK
at+mipSEND=2,"474554202F20485454502F312E300D0A486F73743A207777772E676F6F676C652E
636F6D0D0A0D0A"
+MIPPUSH: 2,0,40
+MIPSEND: 2,0,1372
OK
+MIPSTAT: 2,0,40 < missing in example (need to be added)
at+mipSEND=2,"474554202F20485454502F312E300D0A486F73743A207777772E676F6F676C652E
636F6D0D0A0D0A"
+MIPPUSH: 2,0,80
+MIPSEND: 2,0,1372
OK
+MIPSTAT: 2,0,80 < correct unsolicited
    
```

4.11.4.17. +MPING, Start Ping Execution (ICMP Protocol)

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



<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 unsolicited response, with <status> equal to 1, will be sent to DTE. Valid value range is from 500 ms to 600,000 ms (10 minutes). Default value: 4000
------------------------	---

The following table shows the +MPING unsolicited response parameters.

Table 4-224: +MPING Unsolicited Response Parameters

<Parameter>	Description
<"Destination IP">	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 a ICMP type field, which specifies the format of the ICMP message. Refer to 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.

Notes:

1. Ping request is being executed from the moment the valid AT+MPING set command was received by G30 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.
2. 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>



Example

```

AT+MIPCALL=1,"internet"
OK
+MIPCALL: 10.170.4.111
AT+MPING=1,"10.170.4.112" // Ping remote computer using default parameters
OK

+MPING: "10.170.4.112",0,0,400 //Echo Reply message received, RTT is 400 ms.

+MPING: "10.170.4.112",0,0,420

+MPING: "10.170.4.112",0,0,440
+MPING: "10.170.4.112",0,0,410
//Ping request execution is completed. Four Echo Request
//messages were sent, and four //Echo Reply messages
//were received. Average RTT is 417 milliseconds.
+MPINGSTAT: 0,"10.170.4.112",4,4,417
    
```

4.11.4.18. +MPINGSTAT, Status Update for +MPING Execution

This is the unsolicited response that the G30 sends to the terminal to inform of ping execution status update and provides summary statistics of ping request when ping request execution is completed.

Command Type	Syntax	Response/Action	Remarks
Unsolicited Response		+MPINGSTAT: <status>[,<"Destination IP">,<SentMessages>,<ReceivedMessages> [, <AverageRTT>]]	The unsolicited response that the G30 sends to the terminal to inform it with ping execution status update. This response also provides a statistics summary of ping request when ping request execution is completed.



The following table shows the +MPINGSTAT unsolicited response parameters.

Table 4-225: +MPINGSTAT Unsolicited Response Parameters

<Parameter>	Description
<status>	<p>Specifies a status of ping request execution.</p> <p>Defined values:</p> <ul style="list-style-type: none"> 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">	<p>Specifies the target machine (computer) for ping request, 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.</p>
<SentMessages>	<p>Specifies a total number of sent Echo Request messages.</p>
<ReceivedMessages>	<p>Specifies a total number of received Echo Reply messages corresponding to Echo Request messages.</p>
<AvarageRTT>	<p>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.</p>



Example

```

AT+MIPCALL=1,"internet"
OK
+MIPCALL: 10.170.4.111
//Ping host www.motorola.com 3 times with <TTL>=255. All other parameters are
default.

AT+MPING=1, "www.motorola.com" , 3 , , 255
OK

//ICMP Echo Reply message received, RTT is 522 ms.

+MPING: "88.221.5.223",0,0,522
+MPINGSTAT: 1 // No corresponding reply within timeout.

+MPINGSTAT: 3 // Flow Control OFF.

+MPINGSTAT: 4 // Flow Control ON, a new Echo Request message is sent immediately.
+MPING: "88.221.5.223",0,0,638
//Ping request execution is completed. Statistics displayed to terminal. Three Echo Request messages were sent, and two
Echo Reply messages were received. Average RTT is 580 milliseconds.

+MPINGSTAT: 0,"88.221.5.223",3,2,580
//Ping host www.motorola.com 1 time with <TTL>=1 and <size>=1372.
AT+MPING=1, " www.motorola.com" ,1,1372,1
OK

//ICMP Time Exceeded message received. TTL expired in transit.

+MPING: "192.168.252.65",11,0

//Ping request execution is completed.

+MPINGSTAT: 0,"88.221.5.223",1,0

```

4.11.4.19. +MSELINT, Select Interface Feature

This command is used for setting the interface mode feature. Reset will be activated after the setting.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MSELINT=<mode>	OK or: +CME ERROR: <err>	
Read	AT+MSELINT?	+MSELINT: <mode> OK or: +CME ERROR: <err>	
Test	AT+MSELINT=?	+MSELINT: (0-1) OK or: +CME ERROR: <err>	



Read	AT+MSDNS?	+MSDNS: 1,<Primary DNS server IP>,< Secondary DNS server IP><CR><LF> +MSDNS: 2,<Primary DNS server IP>,< Secondary DNS server IP><CR><LF> +MSDNS: 3,<Primary DNS server IP>,< Secondary DNS server IP><CR><LF> +MSDNS: 4,<Primary DNS server IP>,< Secondary DNS server IP><CR><LF> +MSDNS: 5,<Primary DNS server IP>,< Secondary DNS server IP><CR><LF> <CR><LF> OK	
Test	AT+MSDNS=?	+MSELINT = 0 +MSDNS: (List of supported <Socket_id>s),”(<IP>”),”(<IP>)”	+MSELINT = 1 +MSDNS: (List of supported <Socket_id>s),(<IP>),(<IP>)

The following table shows the +MSDNS parameters.

Table 4-227: +MSDNS Parameters

<Parameter>	Description
<Socket_id>	A unique number that identifies a connection (provided by the terminal application). 0 - Invalid socket number 1,2,3,4 - Valid socket number 5 - Valid socket number dedicated to +MPING.
<Primary DNS server IP>, <Secondary DNS server IP>	IP of the destination site in the form“t "AAA.BBB.CCC."DD". The range of each octant is 0-255. The value can be written in 1, 2, or 3 digits.



```

Example
AT+MSELINT=0
OK
AT+MSDNS=?
+MSDNS: (1-5),(<IP>),(<IP>)

OK
AT+MSELINT=1
OK
AT+MSDNS=?
+MSDNS: (1-5),(<IP>),(<IP>)

OK

AT+MSDNS? // read when MIPCALL is disconnected
+MSDNS:"1,"0.0."", "0.0."0"
+MSDNS:"2,"0.0."", "0.0."0"
+MSDNS:"3,"0.0."", "0.0."0"
+MSDNS:"4,"0.0."", "0.0."0"
+MSDNS:"5,"0.0."", "0.0."0"

OK
AT+MSDNS"2,"212.150.49"1"", "206.49.94."34" //set socket 2 prim & sec DNS
OK
AT+MSDNS"4,"62.120.55"10" //set socket 4 prim DNS only
OK
AT+MSDNS"5,"212.150.49"1"", "206.49.94."34" //set socket 5 prim & sec DNS
OK
AT+MSDNS? // read when MIPCALL is disconnected
+MSDNS:"1,"0.0."", "0.0."0"
+MSDNS:"2,"212.150.49"1"", "206.49.94."34"
+MSDNS:"3,"0.0."", "0.0."0"
+MSDNS:"4,"62.120.55"1"", "0.0."0"
+MSDNS:"5,"212.150.49"1"", "206.49.94."34"

OK
AT+MIPCALL"1,"inter"et"
OK

+MIPCALL: 10.170.7.91

AT+MSDNS? // read when MIPCALL is connected
+MSDNS:"1,"192.118.9."7"", "192.118.11"77"
+MSDNS:"2,"212.150.49"1"", "206.49.94."34"
+MSDNS:"3,"192.118.9."7"", "192.118.11"77"
+MSDNS:"4,"62.120.55"1"", "192.118.11"77"
+MSDNS:"5,"212.150.49"1"", "206.49.94."34"

OK
AT+MSDNS=2 // socket #2 set to default values
OK
AT+MSDNS?
+MSDNS:"1,"192.118.9."7"", "192.118.11"77"
+MSDNS:"2,"192.118.9."7"", "192.118.11"77"
+MSDNS:"3,"192.118.9."7"", "192.118.11"77"
+MSDNS:"4,"62.120.55"1"", "192.118.11"77"
+MSDNS:"5,"212.150.49"1"", "206.49.94."34"

OK
AT+MSDNS= // all sockets set to default values
OK
AT+MSDNS?
+MSDNS:"1,"192.118.9."7"", "192.118.11"77"

```



The following table shows the +MIPCSC parameters.

Table 4-228: +MIPCSC Parameters

<Parameter>	Description
<SocketID>	A unique number that identifies a connection. Valid socket numbers - 1, 2, 3 and 4
<n>	b11 . . . b5 b4 b3 b2 b1 Bitmap parameter that represents SSL feature behavior configuration. Every 1 bit indicates whether each alert will cause automatically connection termination or not. Bit value 1 indicates automatically connection termination, 0 indicates that connection will not be terminated in case of such an alert. b1 represents the first alert; b2 represents the 2nd alert, and so on. Values range: 0 - 2047 The list of alerts to configure: 1 - SSL_BAD_CERTIFICATE For more information about alerts see Table 4-198 .

Notes: This command allows configuring SSL feature behavior for each socket separately.

This command can be used to configure SSL feature behavior before socket activation or when a socket in active state.

In case of receiving the alert, defined by user as source for closing the connection, the connection is closed and +MIPSTAT: <SocketID>,2 unsolicited report sent to TE.

Configuration value <n> is not stored into non volatile memory (NVM) therefore after power recycle it should be reconfigured.



Example

```
AT+MIPSCS=?
+MIPSCS: (1-4),(0-2047):
```

OK

```
AT+MIPSCS?
+MIPSCS: 1,0
+MIPSCS: 2,0
+MIPSCS: 3,0
+MIPSCS: 4,0
```

OK

```
AT+MIPOPEN=1,1111,www.xyz.com,443,2// Connect to site using SSL protocol
```

OK

```
+MIPSSL: 1,10 // SSL_BAD_CERTIFICATE alert received.
+MIPOPEN: 1,2 // Connection established despite of receiving alert.
```

```
AT+MIPSCS=2,1 // 1 = 0000000001 (binary), so in case of
// SSL_BAD_CERTIFICATE alert,
// connection would be closed automatically.
```

OK

```
AT+MIPSCS?
+MIPSCS: 1,0
+MIPSCS: 2,1
+MIPSCS: 3,0
+MIPSCS: 4,0
```

OK

```
AT+MIPOPEN=2,2222,www.xyz.com,443,2// connect to site using SSL protocol
```

OK

```
+MIPSSL: 2,10 // SSL_BAD_CERTIFICATE alert received.
+MIPSTAT: 2,2 // Connection closed automatically due to received alert.
```

4.11.4.22. +MIPSSL, SSL Alerts Unsolicited Report

This unsolicited event is sent to the terminal indicating an errors, warnings or alerts that occurred during SSL connection.

Note: The +MIPSSL alerts are not sent to TE in ODM mode.

Syntax

```
+MIPSSL: <Socket_ID>,<Alert_ID>
```

The following table shows the +MIPSSL parameters.

Table 4-229: +MIPSSL Parameters

<Parameter>	Description
<Socket_ID>	1,2,3,4 - Identification Number of Socket.
<Alert_ID>	Alert ID. All alerts are described in Table 4-198 .

The following table shows the +MIPSSL Alerts.



Table 4-230: +MIPSSL Alerts

Alert ID	Alert Name	Description
10.	SSL_BAD_CERTIFICATE	A certificate was corrupt, contained signatures that did not verify correctly, etc.

Example

```
+MIPSSL: 2,10 // While opening the SSL connection for socket 2, server certificate
                was received, but was not accepted because the certificate was
                corrupt, contained signatures that did not verify correctly, etc..
```

4.11.4.23. +MIPRTCPGET, Receive Data from TCP Protocol Stack Buffer

This command gets the oldest data received from TCP stack and was stored in the internal buffer in G30.

G30 holds 4 buffers associate with 4 concurrent TCP/UDP connections; each can hold up to 1300 byte.

When TCP data arrives from a connection, this data is stored in the relevant buffer.

MIPRTCPGET command retrieves the requested number of bytes from the requested buffer (connection) and displays it on TE, and then it updates the index of data for the next request.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MIPRTCPGET=<ConId>, <NumOfBytes>	+MIPRTCPGET: <ConId>, <DataLengthLeft>, <requested data> OK	The Set command instructs the G30 to retrieve <NumOfBytes> bytes from the internal buffer associated with requested <Connection Id>.
Read	AT+MIPRTCPGET?	+MIPRTCPGET: <ConId>, <Accumulated buffer length>	Read command shows all connection id's with their accumulated buffer length.
Test	AT+MIPRTCPGET=?	+MIPRTCPGET: (list of supported <ConId>s), (range of requested data) OK	The Test command returns list of connection id's.



OK
AT+MIPRTCPGET=1,5 // no data to be retrieved, buffer 1 is empty
+MIPRTCPGET: 1, 0

OK
AT+MIPRTCPGET=2,10 // 10 bytes are displayed, 0 data left on buffer 2
+MIPRTCPGET: 2, 0, 21222324252627282920

OK
AT+MIPRTCPGET=2,10 // no data to be retrieved, buffer 2 is empty
+MIPRTCPGET: 2, 0

OK

4.11.4.24. +MIPRUDPGET, Receive Data from UDP Protocol Stack Buffer

This command gets the oldest data received from UDP stack and was stored in the internal buffer in G30.

G30 holds 4 buffers associate with 4 concurrent TCP/UDP connections; each can hold up to 1300 byte.

When UDP data arrives from a connection, it is stored in the relevant buffer.

MIPRUDPGET command retrieves the requested number of bytes from the requested buffer (connection) and displays it on TE, and then it updates the index of data for the next request.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MIPRUDPGET=<ConId> , <NumOfBytes>	+MIPRUDPGET: <ConId> , <DataLengthLeft> , <requested data> OK	The Set command instructs the G30 to retrieve <NumOfBytes> bytes from the internal buffer associated with requested <Connection Id>.
Read	AT+MIPRUDPGET?	+MIPRUDPGET: <ConId> , <Accumulated buffer length>	Read command shows all connection id's with their accumulated buffer length.
Test	AT+MIPRUDPGET=?	+MIPRUDPGET: (list of supported <ConId>s), (range of requested data) OK	The Test command returns list of connection id's.

Note: RTCP/UDPGET buffer can accumulate a maximum of 1300 bytes, so maximum <NumOfBytes> value can be 1300.



The following table shows the +MIPRUDPGET parameters.

Table 4-232: +MIPRUDPGET Parameters

<Parameter>	Description
<Con Id>	1..4 - associated to MIOPEN command.
<NumOfBytes>	1..1300 - number of bytes for retrieve from RTCP/UDPGET buffer.
<DataLengthLeft>	Indicates the length of data left on 'RTCP/UDPGET' buffer that wasn't yet retrieved. This value is after reduction of the present data displayed.
<Requested data>	Requested data as received by UDP stack.

Example

```
AT+MIPRUDPGET=?
+MIPRUDPGET: (1-4),(1-1300)
```

```
OK
AT+MIPSEND=1,"1122556677889900" // 8 bytes
+MIPSEND: 1,0,1364
```

```
OK
AT+MIPSEND=2,"21222324252627282920" // 10 bytes
+MIPSEND: 2,0,1362
```

```
OK
AT+MIPPUSH=1 // sending data to server that shall echo the data back
+MIPPUSH: 1,0
```

```
OK
+MIPRUDP: 1,8 // 8 bytes were received - unsolicited response
```

```
AT+MIPPUSH=2 // sending data to server that shall echo the data back
+MIPPUSH: 2,0
```

```
OK
+MIPRUDP: 2,10 // 10 bytes were received - unsolicited response
```

```
AT+MIPRUDPGET?
+MIPRUDPGET: 1,8
+MIPRUDPGET: 2,10
+MIPRUDPGET: 3,0
+MIPRUDPGET: 4,0
```

```
OK
AT+MIPRUDPGET=1,5
+MIPRUDPGET: 1, 3, 1122556677 // 5 bytes are displayed, 3 bytes left
```

```
OK
AT+MIPRUDPGET=1,5 // 3 last bytes displayed, buffer 1 is empty
+MIPRUDPGET: 1, 0, 889900
```



Test	+FTPOPEN=?	+FTPOPEN: (<destination_ip/url>), (<username>),(<password>) [,(<account>), (range of supported port's), (range of supported port's), (range of supported port's)] OK	Returns command format.
-------------	------------	--	-------------------------

The following table shows the +FTPOPEN parameters.

Table 4-233: +FTPOPEN Parameters

<Parameter>	Description	Range
destination_ip/url¹	IP or URL of remote FTP site.	IP address in dotted decimal notation form: XXX.XXX.XXX.XXX. URL: ASCII chars, max length is 255 octets.
username²	Username for FTP login procedure.	ASCII chars, max length is 255 octets.
password³	Password for FTP login procedure.	ASCII chars, max length is 255 octets.
account⁴	User Account for FTP login procedure.	ASCII chars, max length is 255 octets.
source_control_port⁵	Port for FTP control connection on source side.	Number in 0-65535 range.
destination_control_port⁵	Port for FTP control connection on remote side.	Number in 0-65535 range.
source_data_port⁶	Port for FTP data connection on source side.	Number in 0-65535 range.

Notes:

- ¹ Mandatory parameter.
- ² Mandatory parameter. Use "anonymous" user name for anonymous connection.
- ³ Mandatory parameter. For anonymous connection use "**guest**" or valid e-mail address or an empty string ("").
- ⁴ Optional parameter, default value is empty string ("").
- ⁵ Optional parameter, default value is 21.
- ⁶ Optional parameter, default value is 20.



Example

The example illustrates FTP connection open success case, when FTP unsolicited indication is enabled.

```
AT+FTPINFO=1
OK

AT+FTPOPEN="someftpsite.com","anonymous","qwerty@somemail.com",,,,
OK

+FTPINFO: 220-

+FTPINFO: 220-Welcome to someftpsite.com!

+FTPINFO: 220-

+FTPINFO: 220 someftpsite.com FTP server (SecureMb FTP Version 1.0) ready.

+FTPINFO: USER anonymous

+FTPINFO: 331 Guest login ok, send your complete e-mail address as password.

+FTPINFO: PASS qwerty@somemail.com

+FTPINFO: 230 Guest login ok, access restrictions apply.

+FTPOPEN: 1
```

4.12.1.4. +FTPCWD, Change Working Directory

This command causes the G30 to request the remote FTP server to change the working directory in accordance to a given name.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPCWD=<directory_name>	OK +FTPCWD: <result> Or: ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded
Read	+FTPCWD?	ERROR	Not supported
Test	+FTPCWD=?	+FTPCWD: (<"directory name">) OK	Returns command format.

The following table shows the +FTPCWD parameters.



Table 4-235: +FTPCWD Parameters

<Parameter>	Description	Range
Directory name	Name of directory to be changed on the remote side.	String, max length is 255 octets.

Example

The first example illustrates change in working directory success case.

```
AT+FTPCWD="data"
OK
```

```
+FTPCWD: 1
```

The second example illustrates change working directory fail case; because the given directory name was not found on the remote server.

```
AT+FTPCWD="user"
OK
```

```
+FTPCWD: 0
```

The third example illustrates change working directory fail case; because no FTP connection was open. The AT+CMEE=2 command enables verbose error report.

```
AT+CMEE=2
OK
```

```
AT+FTPCWD="data"
+CME ERROR: FTP session is inactive
```

4.12.1.5. +FTPMKD, Make Directory

This command causes the G30 to request the remote FTP server to create a new directory in accordance to a given name.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPMKD=<directory_name>	OK +FTPMKD: <result> Or: ERROR : <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded
Read	+FTPMKD?	ERROR	Not supported



Test	+FTPMKD=?	+FTPMKD: (<"directory name">) OK	Returns command format.
-------------	-----------	--	-------------------------

The following table shows the +FTPMKD parameters.

Table 4-236: +FTPMKD Parameters

<Parameter>	Description	Range
Directory name	Name of directory to be created on the remote side.	String, max length is 217 octets.

Example

The first example illustrates make new directory success case.

```
AT+FTPMKD="somedir"
OK
```

```
+FTPMKD: 1
```

The second example illustrates make new directory fail case, because the directory name already present on the remote server.

```
AT+FTPMKD="somedir"
OK
```

```
+FTPMKD: 0
```

4.12.1.6. +FTPRMD, Remove Directory

This command causes the G30 to request the remote FTP server to remove a directory in accordance to a given name.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPRMD=<directory_name>	OK +FTPRMD: <result> Or: ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded



Read	+FTPRMD?	ERROR	Not supported
Test	+FTPRMD=?	+FTPRMD: (<"directory name">) OK	Returns command format.

The following table shows the +FTPRMD parameters.

Table 4-237: +FTPRMD Parameters

<Parameter>	Description	Range
Directory name	Name of directory to be removed on the remote side.	String, max length is 255 octets.

Example

The first example illustrates remove directory success case.

```
AT+FTPRMD="somedir"
OK
```

```
+FTPRMD: 1
```

The second example illustrates remove directory fail case, because the directory name was not found on the remote server. FTP unsolicited indication enabled.

```
AT+FTPINF=1
OK
```

```
AT+FTPRMD="somedir"
OK
```

```
+FTPINF: RMD 1
```

```
+FTPINF: 550 1: No such file or directory.
```

```
+FTPRMD: 0
```

4.12.1.7. +FTPPWD, Print Working Directory

This command causes G30 to request the remote FTP server to return the working directory name.

Command Type	Syntax	Response/Action	Remarks
--------------	--------	-----------------	---------



Set	+FTPPWD	OK ... +FTPPWD: <result>[,<directory_name>] or ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded 2 - text message follows <directory_name> parameter follows only when <result> = 2
Read	+FTPPWD?	ERROR	Not supported
Test	+FTPPWD=?	ERROR	Not supported

Example

The example illustrates print working directory success case.

```
AT+FTPPWD
OK
```

```
+FTPPWD: 2, "/home/somedir" is current directory.
+FTPPWD: 1
```

4.12.1.8. +FTPCDUP, Change Directory Up

This command causes the G30 to request the remote FTP server to change the working directory up.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPCDUP	OK ... +FTPCDUP: <result> or ERROR: <error_code>	The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded
Read	+FTPCDUP?	ERROR	Not supported
Test	+FTPCDUP=?	ERROR	Not supported



Example

The example illustrates change working directory up success case.

```
AT+FTPCDUP
OK

+FTPCDUP: 1
```

4.12.1.9. +FTPDEL, Delete File

This command causes the G30 to request the remote FTP server to delete a file, in accordance to a given name.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPDEL=<file_name>	OK ... +FTPDEL: <result> or ERROR: <error_code>	<file_name> parameter consists of the file name as well as the file path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded
Read	+FTPDEL?	ERROR	Not supported
Test	+FTPDEL=?	+FTPDEL: (<"file name">) OK	Return command format

The following table shows the +FTPDEL parameters.

Table 4-238: +FTPDEL Parameters

<Parameter>	Description	Range
File name	Name of file to be deleted on the remote side.	String, max length is 255 octets.

Example

The example illustrates delete file success case.

```
AT+FTPDEL="somefile"
OK
```



The second example illustrates rename file fail case, because the file name was not found on the remote server. FTP unsolicited indication enabled.

```
AT+FTPINFO=1
OK
```

```
AT+FTPREN=" somefile.name","anotherfile.name"
OK
```

```
+FTPINFO: RNFR somefile.name
```

```
+FTPINFO: 550 somefile.name: No such file or directory.
```

```
+FTPREN: 0
```

4.12.1.11. +FTPLIST, Request List

This command causes the G30 to request the remote FTP server to send a list, in accordance with a given parameter.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPLIST [=<file/directory name>]	OK ... +FTPLIST: <result> <list of directory/files> ... +FTPLIST: <result> or ERROR: <error_code>	Parameter consists of the file/directory name as well as the file/directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded 2 - data follows
Read	+FTPLIST?	ERROR	Not supported
Test	+FTPLIST=?	+FTPLIST: (<"file/directory name">) OK	Return command format

Notes:

- Parameter is optional. When +FTPLIST command without a parameter is entered, G30 requests the remote side to return the last requested list.
- The command execution result returns to the user as an unsolicited response (command mode), as well as a list in data mode.
- When +FTPLIST command is executed, a requested list is being sent to the user when G30 is in data mode, immediately after +FTPLIST: 2 unsolicited response, but before +FTPLIST: 1 unsolicited response.

The following table shows the +FTPLIST parameters.



Set	+FTPSTAT[=<file/directory name>]	OK ... +FTPSTAT: <result>[,<status>] or ERROR: <error_code>	Parameter (optional) consists of directory name as well as directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded 2 - text message follows <status> parameter follows only when <result>= 2
Read	+FTPSTAT?	ERROR	Not supported
Test	+FTPSTAT=?	+FTPSTAT: (<"file/directory name">) OK	Return command format

Note: Parameter is optional. When +FTPSTAT command without a parameter is entered, G30 requests the remote side to return a general system status.

The following table shows the +FTPSTAT parameters.

Table 4-241: +FTPSTAT Parameters

<Parameter>	Description	Range
File/directory name	Name of file or directory on the remote side for status request.	String, max length is 255 octets.

Example

When the user enters +FTPSTAT command without parameters, the last requested status within actual FTP connection returns. When there is first status request within actual FTP connection, the remote server returns general FTP connection status, like in the following example:

The first example illustrates +FTPSTAT command without parameter first time (for actual FTP connection) use. In this case general FTP connection status returns.

```
AT+FTPSTAT
OK
```

```
+FTPSTAT: 2, SecureMb FTP Version 1.0
+FTPSTAT: 2, Connected to name.provider.com (255.255.255.255)
+FTPSTAT: 2, Logged in as anonymous
+FTPSTAT: 2, TYPE: ASCII, FORM: Nonprint; STRUcture: File; transfer MODE: Stream
+FTPSTAT: 2, No data connection
```



```
+FTPSTAT: 2, 0 data bytes received in 0 files
+FTPSTAT: 2, 0 data bytes transmitted in 0 files
+FTPSTAT: 2, 0 data bytes total in 0 files
+FTPSTAT: 2, 30 traffic bytes received in 0 transfers
+FTPSTAT: 2, 535 traffic bytes transmitted in 0 transfers
+FTPSTAT: 2, 614 traffic bytes total in 0 transfers
+FTPSTAT: 1
```

The second example illustrates using +FTPSTAT command with a parameter containing a name of actually present on remote server file. In this case, the specific file status is returned.

```
AT+FTPSTAT="somefile.name"
OK
```

```
+FTPSTAT: 2,-rw-rw-r-- 1 1001 653793 May 2 03:33 somefile.name
+FTPSTAT: 1
```

The third example illustrates using +FTPSTAT command with a parameter containing a name of file, which does not exist on the remote server file. In this case, the remote server returns "No such file or directory" string and command is finished successfully.

```
AT+FTPSTAT="anotherfile.name"
OK
```

```
+FTPSTAT: 2,/bin/ls: anotherfile.name: No such file or directory
+FTPSTAT: 1
```

The fourth example illustrates using +FTPSTAT command with a parameter containing an illegal file name. In this case, the remote server returns error and FTP connection is closed by the remote side.

```
AT+FTPSTAT="."
OK
```

```
+FTPSTAT: 0
```

```
+FTPCLOSE: 1
```

The fifth example illustrates using +FTPSTAT command for receiving the status of all files in the actual working directory.

```
AT+FTPSTAT="*.*"
OK
```

```
+FTPSTAT: 2,-rw-rw-r-- 1 1001 129886 Mar 23 06:20 somefile1.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 4968 Jan 8 07:57 somefile2.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 23948 Jan 8 07:32 somefile3.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 0 Feb 7 01:56 somefile4.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 204673 Jan 10 02:28 somefile5.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 9348 Jul 19 2006 somefile6.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 653793 May 2 03:33 somefile7.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 645120 Mar 25 04:27 somefile8.name
+FTPSTAT: 2,-rw-rw-r-- 1 1001 0 Mar 26 2006 somefile9.name
+FTPSTAT: 1
```



4.12.1.13. +FTPSYST, Request Remote FTP Server Operating System Type

This command causes the G30 to request the remote FTP server to send the operating system type.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPSYST	OK ... +FTPSYST: <result>[,<system>] or ERROR: <error_code> ³	The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded 2 - text message follows <system> parameter follows only when <result>=2
Read	+FTPSYST?	ERROR	Not supported
Test	+FTPSYST=?	ERROR	Not supported



Example

The example illustrates the command execution.

```
AT+FTPSYST
OK
```

```
+FTPSYST: 2, UNIX Type: L8
+FTPSYST: 1
```

4.12.1.14. +FTPNOOP, No Operation

This command causes the G30 to request the remote FTP server to do nothing (possible use for PING).

Command Type	Syntax	Response/Action	Remarks
Set	+FTPNOOP	OK ... +FTPNOOP: <result> or ERROR: <error_code>	The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded
Read	+FTPNOOP?	ERROR	Not supported
Test	+FTPNOOP=?	ERROR	Not supported

Example

The example illustrates the command execution.

```
AT+FTPNOOP
OK
```

```
+FTPNOOP: 1
```



4.12.1.15. +FTPSTOR, Store File On Remote FTP Server

This command causes the G30 to request the remote FTP server to store a file sent by the G30.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPSTOR=<file_name>, [<file_type>]	OK ... +FTPSTOR: <result> or ERROR: <error_code>	<file_name> parameter consists of the file name as well as the file path (optional). <file_type> parameter is optional. Default value is 1 (binary). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded 2 - data connection (ODM) enabled
Read	+FTPSTOR?	ERROR	Not supported
Test	+FTPSTOR=?	+FTPSTOR: (<"file name">)[,(0-1)] OK	Return command format

Notes:

The user can send a file to the G30 only when the G30 returns <result> = 2. In this case, the G30 switches to Online Data Mode and all data sent to RS232 transfers as-is to the remote server.

Important: Before transferring to the remote side, data file is converted (encoded), see “[FTP Connection](#)”. When end-of-file is reached, G30 switches back to Command Mode and return <result> = 1 (success case).

In any stage of file transfer, an error can occur. In this case, G30 switches to Command Mode and <result> = 0 is returned to the user.



Example

The example illustrates the command execution. Requested file type is binary.

```
AT+FTPSTOR="somefile.name",1
```

```
+FTPSTOR: 2
```

The user sends a file with <end-of-file> here

```
+FTPSTOR: 1
```

4.12.1.16. +FTPRETR, Retrieve a File From a Remote FTP Server

This command causes the G30 to request the remote FTP server to send a file to the G30.

Command Type	Syntax	Response/Action	Remarks
Set	+FTPRETR=<file_name>, [<file_type>]	OK ... +FTPRETR: <result> or ERROR: <error_code>	<file_name> parameter consists of the file name as well as the file path (optional). <file_type> parameter is optional. Default value is 1 (binary). The command execution result return to the user as an unsolicited response: 0 - operation failed 1 - operation succeeded 2 - data connection (ODM) enabled
Read	+FTPRETR?	ERROR	Not supported
Test	+FTPRETR=?	+FTPRETR: (<"file name">)[,(0-1)] OK	Return command format

Notes:

The user can store a file, received from G30, immediately after G30 returns <result> = 2. In this case G30 switches to Online Data Mode and all data, received from the RS232 is the requested file.

Important: The user converts (decode) the received data file for end-of-file detect, see [“FTP Connection”](#). When the remote FTP server closes data connection, G30 switches back to Command Mode and returns <result> parameter = 1 (success case).

In any stage of file transfer, an error can occurred. In this case, G30 switches to Command Mode and <result> = 0 is returned to the user.

In case of <result> = 0 (operation failed) the FTP connection is closed (+FTPCLOSE: 0).

The following table shows the +FTPRETR parameters.



Table 4-243: +FTPRETR Parameters

<Parameter>	Description	Range
File name	Name of file to be retrieved from the remote side.	String, max length is 255 octets.
File type	Type of file (ASCII or Binary).	Numeric, in the range of 0-1 (0 = ASCII, 1 = Binary).

Example

The example illustrates the command execution. Requested file type is binary.

```
AT+FTPRETR="somefile.name",1
```

```
+FTPRETR: 2
```

```
....
```

```
....
```

```
....
```

```
<ETX>
```

```
+FTPRETR: 1
```



4.13.1.3. Product Architecture

The following figure shows the former architecture (PREMUX).

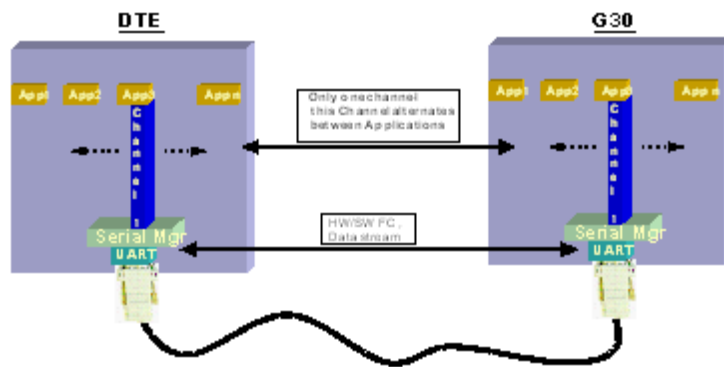


Figure 4-14: PREMUX Architecture

The following figure shows the current product architecture (MUX).

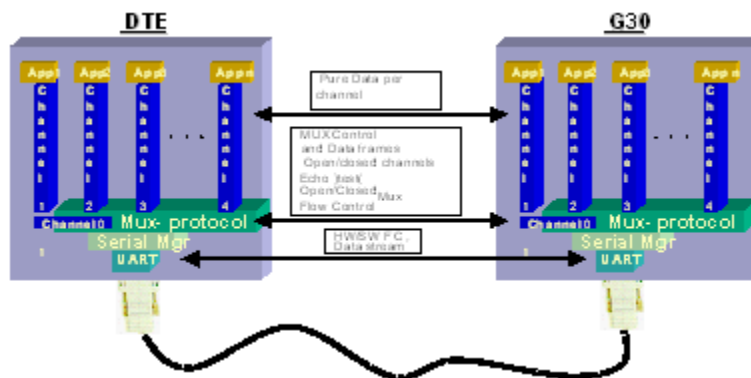


Figure 4-15: Current MUX Architecture



4.13.1.8. UART Flow Control

The following sections describe UART flow control in the MUX.

4.13.1.8.1. UART Hardware Flow Control

G30 supports automatic UART hardware flow control.

4.13.1.8.2. UART Software Flow Control

Software flow control at the physical UART level is not supported in MUX.

4.13.1.9. MUX Software Flow Control Per Channel

The MUX feature supports software flow control per channel at basic mode, according to 3G TS 27.010 V3.3.0.

4.13.1.10. MUX UART Port Speed

Auto baud rate detection is disabled in the MUX. To set the UART baud rate, the G30 uses the <port speed> parameter in +CMUX command. If the parameter is absent, the MUX uses the same baud rate that was in PREMUX state.



- MUI (Mux User Implementation): The GSM 27.010 protocol is implemented by the user. The MUI is the user implementation device for the GSM 27.010 protocol.

4.13.4. APIs

There are five API user integrations, as follows:

- Open service
- Close service
- Sending Data service
- Receiving Data service
- MUX service test, MSC, FC and so on (refers only to the control channel)

4.13.5. MUX Channels (Information Data Link Control - IDLC)

The following sections describe the MUX channels.

4.13.5.1. Basic MUX Channel Definitions

- Each MUX channel functions as a regular RS232 connection that follows ETSI 07.07 and ITU V.25 standards. However, there are some limitations, as described in this paragraph.
- The G30 IDLC channel switches to Data mode as specified in ETSI 07.07 [4].
- When the MUX protocol layer releases the IDLC channel, any GPRS/DATA session or established call is hung up. Only active voice calls remain connected.
- AT command requests by an IDLC may result in an ERROR, while in PREMUX state the same request would never have returned an ERROR. This may happen because the addressed resource in the G30 is busy with a second IDLC request. For example, if two channels send the AT+CLIP? command, which addresses the GSM engine, only one channel receives the +CLIP: response, while the other receives an ERROR.

4.13.5.2. Channel Priorities

The control channel has the highest priority. All other IDLCs have the same priority.

Note: All control frames are processed before any other channels. IDLC frame validation is also performed after all control frames are processed.

4.13.5.3. Multiple Channel Configuration

The configurations listed below are recommended to achieve maximum use of parallel channels with minimum conflicts.

4.13.5.3.1. Two Channel Configuration

- DLC1 – Data channel dedicated to CDS



be kept unchanged until the G30 returns to PREMUX state. If an IDLC tries to change the settings it receives an OK response, but the real value is NOT changed. When the G30 is in MUX state, these two settings have either the values that were defined in PREMUX, or the value set by the AT+CMUX command. If a value was set with the AT+CMUX command, it is retained even after returning to PREMUX state.

4.14. M2M

4.14.1. M2M Command

4.14.1.1. +M2M, Enable/Disable M2M Feature

This command is used to enable/disable the M2M feature.

Command Type	Syntax	Response/Action	Remarks
Set	AT+M2M=<M2M_State> >	OK or: +CME ERROR: <err>	The SET command is used for Enable/Disable the M2M feature. (If disabled, G30 behaves in basic mode).
Read	AT+ M2M?	+M2M: < M2M_State> OK or: +CME ERROR: <err>	The READ command returns the current M2M_state (Enabled or Disabled).
Test	AT+ M2M=?	+M2M: (0-1) OK or: +CME ERROR: <err>	The Test command returns the possible value's range.

The following table shows the +M2M parameters.

Table 4-246: +M2M Parameters

<Parameter>	Description
<M2M_State>	0 Disabled 1 Enabled The default value: M2M_State shall be flex parameter - Default: "Enabled" for premium models. "Disabled" for basic models. On Power -p - as previously saved in FLEX bytes.



4.15.5. +MFOTAIND, Send Unsolicited FOTA Indications to the DTE

When set, the module will send all the indications mentioned.
By default, FOTA unsolicited information report is disabled.
This command is a basic command.

Command Type	Syntax	Response/Action	Remarks
Set	AT+MFOTAIND=<ind>	OK or: +CME ERROR: <err>	The set command enables/disables unsolicited indications.
Read	AT+MFOTAIND?	+MFOTAIND: <ind> OK	The read command returns current <ind> value.
Test	AT+MFOTAIND =?	+MFOTAIND: (list of <ind>s OK	
Unsolicited Report	+MFOTAIND	+MFOTAIND: <FOTA indication>	FOTA information reports during FOTA process.

The following table shows the +MFOTAIND parameters.

Table 4-250: +MFOTAIND Parameters

<Parameter>	Description	Remark
<ind>	0 - Disable FOTA unsolicited informational report. 1 - Enable FOTA unsolicited informational report.	The default value is 0. Enables the Module to indicate the DTE a FOTA process progress.



4	Future use.
11	Expected length error.
12	Expected length error.
13	Structural error.
14	Signature error.
15	Foreign key not signed.
16	Not for current version.
17	Non-compatible UPI.
18	Update for UPI does not match its version.
19	Update for UPI does not match its version.
30	Given RAM is not enough.
31	Does not behave as RAM.
32	New version is too big.
33	Flash writing failure.
34	Flash erasing failure.
35	Flash reading failure.
36	Memory allocation failure.
40	Can not restore new.
41	Signature error of new.
42	Foreign key not signed.



43	One API function is not declared.
205	File does not exist.
206	RO or no access rights.
207	File does not exist.
208	No access rights.
209	Cannot resize file.
210	Cannot read specified size.
211	Cannot close file handle.
300	Bad operation number for FS update.
301	Bad operation number for FW update.
302	Unsupported compression.
303	Can not apply reverse update for delta not generated as reverse delta.
304	Number of backup buffers given to UPI does not match number in delta file.
305	Sector size mismatch between UPI and delta.
306	UPI was not compiled to support reverse update.
307	UPI was not compiled to support IFS on compressed images.
308	UPI was not compiled to support IFS.
309	Image verified is not source image.
310	In scout only operation we should do only verify of image
311	There is not enough RAM to run with operation=2.



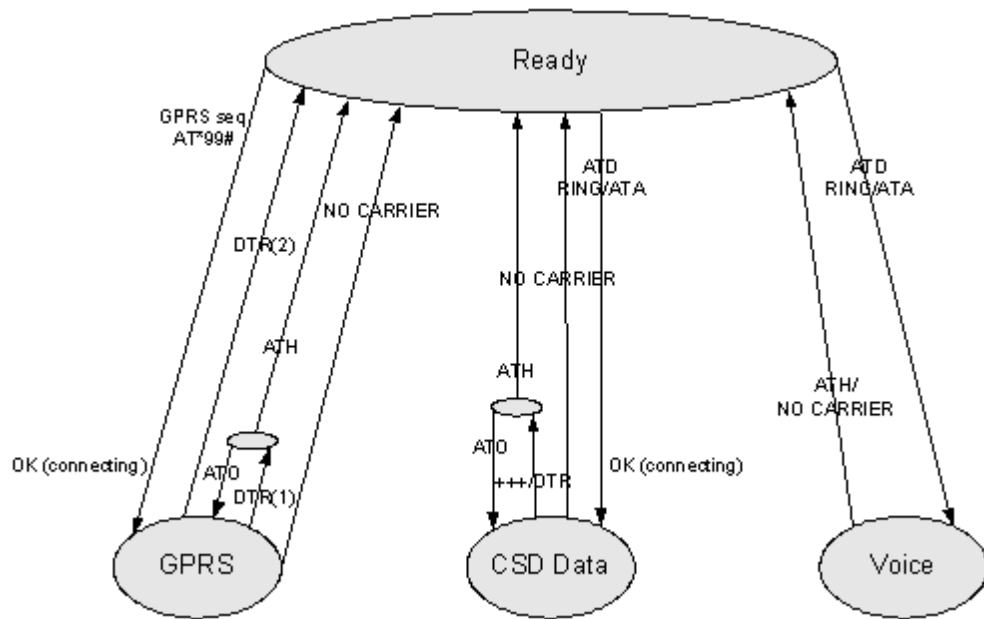


Figure 5-2: Detailed Phone State Transactions



5.2. Recommended G30 Initialization after Powerup

Error! Reference source not found. provides a recommended workflow for initializing the G30 after startup. The following sections explain this workflow in detail.

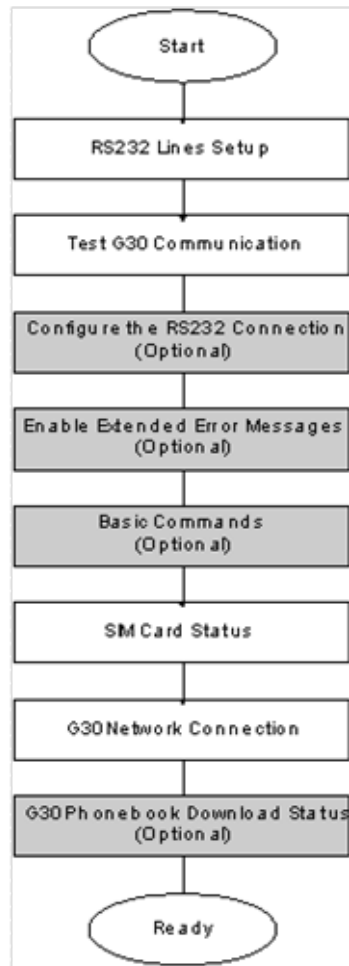


Figure 5-3: Recommended G30 Initialization Workflow



5.2.1. RS232 Lines Setup

There is no dynamic detection. Upon power up, the hardware is detected. For a pin description, refer to the G30 Developer's Kit Manual: 6802986C48.

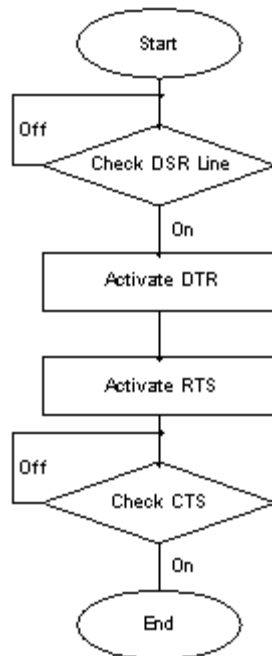


Figure 5-4: RS232 Lines Setup



5.2.2. Test G30 Communication

This is a preliminary step. During this step, the ability to communicate with the G30 using AT commands is tested.

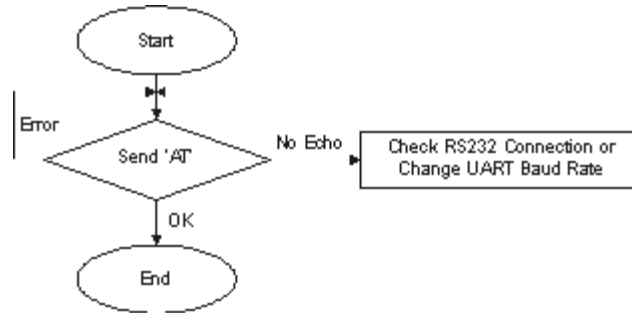


Figure 5-5: Test G30 Communication

Communication example:

```

AT
ATE1 //By default, the echo should be enabled
AT
OK //Confirm that G30 replies with OK
  
```

5.2.3. Basic Configuration

These are optional steps. If required, specific RS232 pin behavior can be selected. Extended error notification is recommended for debugging and field-support purposes.



1. Baud setting example:

```
AT+CBAUD=6          //Setting baud rate for 19200
OK
AT+CBAUD=19200      //Same as issuing this command
OK
```

2. RS232 HW lines configuration: &C(DCD), &D(DTR), &K(flow-control).

Default settings should be:

```
AT&C1
OK
AT&D2
OK
AT&K3
OK
```

3. Modem IDs (optional): +CGMI,+CGMM,+CGMR,+CGSN

```
AT+CGMI
+CGMI: "Motorola"
OK
AT+CGMM
+CGMM: "GSM900","GSM1800","GSM1900","GSM850","MODEL=G30"
OK
AT+CGMR
+CGMR: "G30_G_00.01.00D"
OK
AT+CGSN //Read the IMEI number of the G30
+CGSN: 448954035283579
OK
```

4. Error messages (optional): +CMEE, +CEER

```
AT+CMEE=2 //Enable +CME ERROR: error messages verbose string
OK
```



5.2.5. G30 Network Connection

In this step, the G30 detects existing networks (the user must register to a specific network).

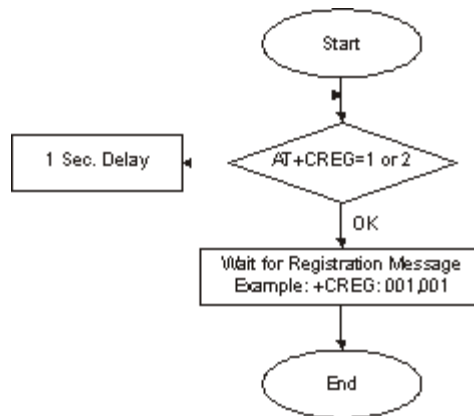


Figure 5-8: G30 Network Connection

1. Registration and call indications example: +CREG, +CLCC
`AT+CREG=2`
`OK`
`AT+CLCC=1`
`OK`
2. Get available networks example: +COPS
`AT+COPS=? //To read all possible operators`
`+COPS: (002,"ILORANGE","ORANGE","42501"), //G30 answer example`
`(000,"AT&T Wireless", "AT&T","31038"),`
`(001,"IL Cellcom","Cellcom","42502"),`
`(003,"IL-77","IL-77","42577"),,(000,001,002,003,004),`
`(000,001,002)`
3. Get registration messages example: +CREG
`AT+CGREG=1`
`OK`
`+CREG: 001//G30 example output when it is registered on the home network`
`Get GSM registration status: +CREG`
`AT+CREG=2 //Get unsolicited GSM registration reports`
`+CREG: 001,2648, 988b`
4. Get GPRS registration status example: +CGREG
`AT+CGREG=2 //Get unsolicited GPRS registration reports`
`+CGREG: 001,2648,988b`



5.3. SMS

Managing Stored Messages in the G30 Memory

```

AT+CMGF=1      // move to TEXT mode
OK
AT+CMGL="ALL" //List all messages in memory storage
+CMGL: 225,"STO UNSENT","054565132"
<Message body>
+CMGL: 223,"STO UNSENT","4565029"           //Example of G30 response
<Message body>
+CMGL: 222,"STO SENT","054565029"
<Message body>
+CMGL: 221,"STO SENT","054565132"
<Message body>
+CMGL: 220,"STO UNSENT",""
<Message body>
OK
AT+CMGL="STO UNSENT" //List all messages of a certain type (for example, stored
unsent messages)
+CMGL: 225,"STO UNSENT","054565132"
<Message body>
+CMGL: 223,"STO UNSENT","4565029"
<Message body>
+CMGL: 220,"STO UNSENT",""
<Message body>
OK
AT+CMGR=225    //Read any message from the list using its index
+CMGR: "STO UNSENT","054565132"
<Message body>
OK
AT+CMGR=9
+CMGR: "REC UNREAD","+97254565132",,"05/02/18,"21:22:23+08"
<Message body>
OK
AT+CSDH=1
OK
AT+CMGR=9
+CMGR: "REC UNREAD","+97254565132",,"05/02/18,"21:22:23+08",145,4,0,0,"+ 97254120032",145,<message
length>
<Message body>
OK

```

5.3.1. Setting the Notification Indication for Incoming Messages (Using AT+CNMI)

```

AT+CNMI=1,1    //To receive indications of new incoming MT messages, the second
parameter of +CNMI should be set to 1
OK
+CMTI: "SM",4  //When a new MT message is received, the unsolicited response
+CMTI will be displayed, denoting the message index
AT+CMGR=4      //Use the new message index to read it
+CMGR: "REC UNREAD","+97254565132",,"05/02/13,07:15:36+08"
<message body>
OK
AT+CMGD=4      //Delete the message after reading it
OK

```



5.3.2. Another Possible Option for Setting the CNMI Notification Indication

```
AT+CNMI=1,2 //To have new incoming MT messages displayed on the terminal, the second parameter of
+CNMI should be set to 2
OK
+CMT: "+97254565132","03/3/24,15:38:55"
<message contents> //When a new MT message is received, the unsolicited response
+CMT is displayed along with the message
AT+CNMA //To acknowledge receipt of a message, use the AT+CNMA command within 60 seconds of the
+CMT unsolicited response
OK
```

The acknowledged message is not saved in the database. If the +CMT unsolicited response is not acknowledged within 60 seconds, the new message is saved in database.

5.3.3. Setting TEXT Mode Parameters (Using AT+CMGW and AT+CMGS)

```
AT+CSMP?
+CSMP=17,167,0,0
OK
AT+CMGW="0544565034"
> text is entered <ctrl z>
+CMGW: 141
OK
AT+CSDH=1
OK
AT+CMGR=141
+CMGR: "STO UNSENT","0544565034",,,129,17,0,0,167,"+ 97254120032",145,<message length>
<message body>
AT+CSMP= 1,256,0,0
+CMS ERROR: numeric parameter out of bounds
```

5.3.4. Writing, Saving and Sending Messages (Using AT+CMGW and AT+CMSS)

Writing messages into the database, with or without destination address. In TEXT mode, the header parameters will be set according to CSMP settings:

```
AT+CMGW //Writing a message without destination address
> message text <ctrl z>
+CMGW: 142
OK
AT+CMGW="054565132" //Writing a message with destination address
> message text <ctrl z>
+CMGW: 143
OK
:
AT+CMSS=143 //Send a message to the destination address with which it was stored, using the message index
OK
AT+CMSS=143,"054565029" //Send a message to a destination address, regardless of the destination address with
which it was stored (if any), using the message index
OK
AT+CMSS=3,"054565029" //In this way, received messages (stored in the inbox) can also be sent
OK
AT+CSMP=25,"05/03/15,21:22:23+08"
OK
AT+CMGW="0544565034"
A<CTRL+Z>
+CMGW: 129
```



5.4. Call Control

The following figure is a detailed view of the states the G30 goes through for Voice and CSD Data, as shown in **Error! Reference source not found.**. Note that between the time the OK is received and the actual connection occurs, call state alerts are received.

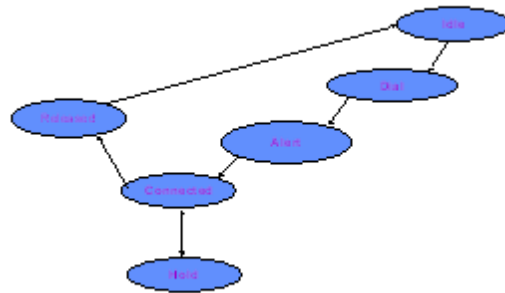


Figure 5-9: Call States

5.4.1. Dialing Using ATD

```

atd+44 34 56 78; // VOICE call; number includes international access code
OK
OK
atd17085763400; //Second VOICE call
OK
OK //Call to 44345678 is being put on hold
ath //Hang up active call
NO CARRIER
OK
AT+CHLD=0 //Hang up held call
NO CARRIER
OK
atd+44 34 56 78 //DATA call
...
OK //Move to online Data state
//ESC sequence back to the Command state. +++ is sent from the terminal (+++ is not displayed)
ath //Hang up data call
NO CARRIER
OK //Data call terminated
AT+FCLASS=1
OK
atd035659260,345,22; //VOICE call with tones sent after connecting
OK
OK
3 4 5 //Sent as DTMF tones
... //Pause
2 2 //Sent as DTMF tones
ath //Voice call is hung up
  
```




```
NO CARRIER
OK
//Comma is ignored; 035659260 is dialed
OK
```

5.4.2. Dialing the Last Number Example

```
atd035658278;
OK
OK
ath
NO CARRIER
OK
atdl //Last called number is "035658278"
ATDL: "035658278"
OK //DATA call
atdl;
ATDL: "035658278"
OK
OK //VOICE call
atdl //Last called number is "035658278,123,78;"
ATDL: "035658278"
OK //DATA call
```

5.4.3. Voice Call Manipulations

5.4.3.1. Call Waiting

```
AT+CCWA=1 //Enabling the call waiting on G30
OK
atd9311234567; //Originate a voice call
OK
OK //Voice call connected
(...conversation...)
+CCWA: "+358317654321",145,1,"Bob" //Call-waiting indication received by the G30; Bob is calling
+CCWA: "+358317654321",145,1,"Bob"
AT+CHLD=0 //Release the waiting call
OK
NO CARRIER //Current call is still active
```

5.4.3.2. Call Forwarding

```
AT+CCFC=1,3,"0545658278" //Network register UC forward-to of all classes
OK
AT+CCFC=1,1 //Network activate UC forward-to of all classes
OK //At this point, the G30 will not receive any calls; all calls will be
forwarded by the network to phone number 0545658278
AT+CCFC=1,2 //Interrogate reason unconditional of all classes
+CCFC: 1,1,"0545658278",129 //Class voice - UC forwarding is activated
+CCFC: 2,1,"0545658278",129 //Class data - UC forwarding is activated
OK
```

5.4.3.3. Conference Call

```
atd051632601; //Dialing the first member of the conference
OK
OK
AT+CHLD=2 //Call hold, switch command
OK //Active call switched to hold
atd035659260; //Calling the second member of the conference
OK
OK
```



```
(Dual call state: one call on hold; 2nd is active.)
AT+CHLD=3 //Call link command
OK //Held call is linked to active call
(Active conference of two calls)
AT+CLCC //Verifying call state through CLCC
//(Verifying call state is optional.)
+CLCC: 1,0,0,0,1,"051632601",129,""
+CLCC: 2,0,0,0,1,"035659260",129,""
ath //Hang up the conference call
NO CARRIER //First member dropped
NO CARRIER //Second member dropped
OK
```

5.5. Data Call

5.5.1. Switching Modes (Data Mode/Command Mode)

```
atd054565190 //Calling the remote modem
OK
aaaaaaaaaaaa //Receiving binary data from remote side (G30 is in Data mode)
//Sending escape sequence +++ to G30 (the remote side does not treat +++ as escape)
OK //G30 is in Command mode
ati3 //Issuing an AT command
Motorola Mobile Phone
OK
ato //Switching back to Binary mode
OK
ffffff //Receiving binary data from remote side
fghhgatfhgfhfghhfhfhfhgfhffhgfghfghfghh
//Sending escape sequence +++ to the G30
ath //Hang up the CSD call (return to Command mode)
OK
NO CARRIER
```

5.6. GPRS

When using the GPRS, it is recommended to implement a "keep alive" mechanism. The G30 memory resources should not be used as a buffer for the user, the user maintains its own memory and flow control in its own application. The G30 has finite limited resources such as network related, SIM card and phone memory. In general the user should use a single resource at a time. As an example, when G30 GPRS network resources are in an active session, user should not manually detach from the network or place a CSD call etc.

Note: The basic GPRS concept is be "always connected" and there is no charge for being connected (only per real data transferred). GPRS users are advised to connect the GPRS network once in the beginning of a session and remain connected rather than to toggle from online to offline and back in a high rate. In specific cases when this is needed, contact customer care for advice and knowledge base.

5.6.1. Establishing GPRS PDP Context

When using the GPRS network for any IP data, you must be attached to the GPRS network before activating PDP context.

5.6.1.1. Activating a Saved Profile in G30

```
AT+CGATT=1 //By default, after power-up, the G30 attaches to the GPRS network, if possible (if the network and
SIM allow)
AT+CGATT? //Check your connection status
```




```

OK
+MIPCALL: 172.17.242.86
AT+MIOPEN=1,1222,"123.245.213.012",1234,0 //Opening socket 1 using TCP protocol, from port 1222,
targeting 123.245.213.012 port 1234
OK
+MIOPEN: 1,1
AT+MIOPEN? //Terminal checking the status of socket to be opened (socket 1 opened OK)
+MIOPEN: 2 3 4
+MIPSETS=1,340 //Asking the G30 to accumulate 340 bytes on socket 1 prior to sending
+MIPSETS: 0
OK
AT+MIPSETS?
+MIPSETS: 1 340
OK
AT+MIPSEND=1,"444444" //Sent coded "DDD" string
+MIPSEND: 1,1497 //Free storage in the accumulating buffer
OK

```

Note: This step can be repeated several times until the buffer is full or until the amount of data reaches 340 bytes and data pushed into the stack.

```

AT+MIPSEND? //Checking the size remaining (optional)
+MIPSEND: 1 1497
OK
+MIPPUSH=1 //Terminal asks G30 to flush the buffer in socket 1
+MIPPUSH: 0
+MIPCLOSE=1 //Terminal closes the socket
+MIPCLOSE: 1
OK
+MIPCALL=0 //Terminal hangs up the link
OK

```

5.8.2. TCP Raw Data Transfer Example (Online Data Mode)

```

// create a wireless link:
AT+MIPCALL=1,"internetg"
OK

+MIPCALL: 172.17.242.86
// open a socket in Online Data Mode:
AT+MIPODM=1,1204,"123.245.213.12",1205,0
OK

+MIPODM: 1,1

// send a data from terminal to G30 via RS232 communication port:
GPRS is the new packet-oriented data service for GSM. Soon it will be possible
to take advantage of the features provided by GPRS for Internet Access like fast connection set-up, volume based
charging etc...

// switch G30 to pseudo-command mode:
+++
OK

// check socket status
AT+MIPODM=?
+MIPODM 1,1

OK
// receive incoming from Network data indication (18 bytes of data comes):
+MIPDATA 1,18
// restore Online Data Mode and receive incoming from Network 18 bytes of data:
ATO
OK
CONNECT

```




```

abcdefghijklmnopqr
// switch G30 to pseudo-command mode:
+++
OK
// close the socket:
AT+MIPLOSE=1
+MIPCLOSE: 1
OK
// close the link:
AT+MIPCALL=0
+MIPCALL=0
NO CARRIER
OK

```

5.8.3. Multi-point Data Transfer Example

```

AT+MIPCALL=1,"orange","test","test"
OK
+MIPCALL: 172.17.242.86
AT+MIPOPEN=1,1001,"172.17.238.44",1001,0
OK
+MIPOPEN: 1,1
AT+MIPOPEN=2,1111,"172.17.238.44",1111,0
OK
+MIPOPEN: 2,1
+MIPSETS=1,200 //Asking the G30 to accumulate 200 bytes on socket 1 prior to sending
+MIPSETS: 0
OK
+MIPSETS=2,400 //Asking the G30 to accumulate 400 bytes on socket 2 prior to sending
+MIPSETS: 0
OK
+MIPSEND=1,"444444"
+MIPSEND:1,1497
OK
+MIPSEND=2,"DD" //Passing data to the G30 socket 2
+MIPSEND:2,1499
OK
+MIPPUSH=1 //Terminal asks the G30 to flush the buffer in sockets 1 and 2
+MIPPUSH:0
+MIPPUSH=2
+MIPPUSH:0
+MIPCLOSE=1 //Terminal closes sockets 1 and 2
+MIPCLOSE:1
OK
+MIPCLOSE=2
+MIPCLOSE:2
OK
+MIPCALL=0 //Terminal hangs up the link
OK
+MIPSETS=1,120 //Asking the G30 to accumulate 120 bytes on socket 1 prior to sending
+MIPSETS: 0
OK
+MIPSEND=1,"444444" //Passing 3 bytes of data to the G30 socket 1

```

Note: Size remaining in socket 1 buffer is 1497 bytes.

```

+MIPSEND:1,1497
+MIPPUSH=1 //At this point, the terminal can decide on flushing the remainder to the stack

```

5.8.4. Error in Reopening a Valid Socket

```

AT+MIPCALL=1,"orange","test","test"
OK
+MIPCALL:123.145.167.230

```




```
+MIOPEN=1,1222,"123.245.213.012",1234,0 //Opening socket 1 using TCP protocol, from port 1222, targeting
123.245.213.012 port 1234
OK
+MIOPEN:1,1
+MIOPEN? //Terminal checking the status of socket to be ready
+MIOPEN: 2 3 4
MIOPEN=1,12,123.245.213.012,234,0 //Terminal tries to reopen socket 1
ERROR
```

5.9. Audio

Scenarios for Setting Up Handset Mode or Handsfree Mode

Handset Mode

```
AT+MAPATH=1,1 //Set the input path through the microphone
AT+MAPATH=2,1,3 //Set voice and feedback tones through the speaker
AT+MAPATH=2,2,4 //Set alerts to go through the headset speaker
```

5.9.1.1. Handsfree Mode

```
AT+MAPATH=1,1 //Set the input path through the microphone
AT+MAPATH=2,1,7 //Set all tones through the speaker
```

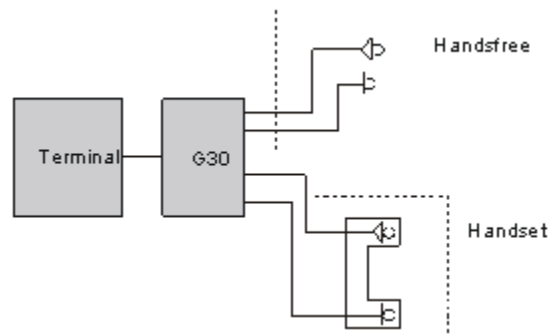


Figure 5-11: Handset or Handsfree Setup



6. Tools

6.1. Tools Overview

This chapter describes the PC flashing tools provided by the application. PC flashing tool is a PC-based software application that enables users to reprogram G30 modules through an RS232 interface.

Note: When using a PC with maximum UART COMM port speed of 115200 baud rate, A USB to UART converter cable may be used to speed up communication and reduce programming time of the G30, up to a speed of 230400 baud rate.

6.2. PC Driver

6.2.1. Overview

The G30 can be used as a PC external modem for performing GPRS packet data connections. The network connection application is recommended for GPRS packet data connections.



7. Appendix A: Reference Tables

This appendix contains the following sections:

- AT Commands Alphabetical Summary, below
- Character Set Table CS1: (GSM -> UCS-2)
- Character Set Table CS6: (UCS-2 Full Table)
- Character Set Table CS7: (IRA table)

Note: Character Set Table CS6: (UCS-2) is provided on CD due to its size.

7.1. AT Commands Alphabetical Summary

The following table contains an alphabetical list of all the G30 AT commands.

Table 7-1: AT Commands (Alphabetical)

AT Command	Description	Page
\Q	This command controls the operation of local flow control between DTE and DCE used when data are sent or received.	on page 4-234
&C	This command determines how the state of the DCD line relates to the detection of the received line signal from the distant end.	on page 4-226
&D	This command determines how the G30 responds when the DTR (Data Terminal Ready) status is changed from ON to OFF during the online data state.	on page 4-228
&F	This command restores the factory default configuration profile.	on page 4-306
&K	This command configures the RTS/CTS flow control.	on page 4-225
&V	This command displays the current active configuration and stored user profiles.	on page 4-329
&W	This command stores the user profile.	on page 4-330
&Y	This command displays the default user profile.	on page 4-332
+CACM	This command resets the Advice of Charge accumulated call meter value in the SIM file, EFACM.	on page 4-111
+CALM	This command handles the selection of the G30's alert sound mode.	on page 4-267



+CFSN	This command displays the factory serial number.	on page 4-73
+CFUN	This command shuts down the phone functionality of smart phones and PDAs with phone capabilities.	on page 4-230
+CGACT	This command activates/deactivates the PDP Context.	on page 4-354
+CGATT	This command attaches the G30 to the GPRS network.	on page 4-350
+CGCLASS	This command sets the GPRS mobile station class.	on page 4-341
+CGCMOD	The execution command is used to modify the specified PDP context(s) with respect to QoS profiles and TFTs. After the command has completed, the MT returns to V.250 online data state.	on page 4-357
+CGDCONT	This command specifies the PDP (Packet Data Protocol) context.	on page 4-342
+CGMI	This command displays manufacturer identification.	on page 4-69
+CGMM	This command displays the model identification.	on page 4-69
+CGMR	This command displays the revision identification.	on page 4-70
+CGPADDR	This command reads the allocated PDP addresses for the specified context identifiers.	on page 4-356
+CGPRS	This command indicates whether there is GPRS coverage.	on page 4-353
+CGQMIN	This command sets the minimum acceptable quality of service profile.	on page 4-344
+CGQREQ	This command displays the requested quality of service profile.	on page 4-347
+CGREG	This command enables/disables the GPRS network status registration unsolicited result code.	on page 4-194
+CGSMS	This command handles the selection of the service or service preference used by the G30 to send mobile-originated SMS messages.	on page 4-181
+CGSN	This command displays the product serial number identification.	on page 4-71



+MCST	This command displays the current state of the call processing, and also enables/disables the unsolicited indication of any change in the call processing state.	on page 4-107
+MCWAKE	This command displays reports on the status of the GPRS/GSM coverage.	on page 4-229
+MDBF	This command change the digital audio filters parameters for a specific downlink path.	on page 4-279
+MDC	This command enables you to select the desired messages to be displayed upon connection of a voice call with a remote party.	on page 4-99
+MDSI	This command enables unsolicited reporting of indications of SIM deactivation and invalidation.	on page 4-338
+MFOTACNFG	This command enables to set the FOTA session mode as Automatic/Non-Automatic.	on page 4-472
+MFOTAIND	When set, the module will send all the indications mentioned in Table 4-250: +MFOTAIND Parameters	on page 4-475
+MFOTAINSTL	If update package was downloaded prior to execution of this command then the module will start update installation, otherwise the module will reply with CME error: "operation not allowed".	on page 4-474
+MFOTAWSCF G	This command specify a particular PDP context definition to be used when web session need to be initiated.	on page 4-473
+MGAUTH	This command enables Authentication Protocol setting.	on page 4-215
+MGGIND	This command configures the service indicator on pin #16 in LGA or 49 of the 70 pin connector to be GPRS or GSM.	on page 4-229
+MHUP	This command Hung UP call(s) and report specific cause to the NW.	on page 4-100
+MIOC	This command defines the G30 8 GPIO pins data value.	on page 4-236
+MIOD	This command defines the G30 8 GPIO pins configuration.	on page 4-240
+MIPCALL	This command creates a wireless PPP connection with the GGSN or CSD service provider and returns a valid dynamic IP for the G30.	on page 4-403
+MIPCLOSE	This command causes the G30 module to free the socket accumulating buffer and disconnect the G30 from a remote side.	on page 4-409



030	036	01E	00011110	RS	(Request to Send)(Record Separator)
031	037	01F	00011111	US	(Unit Separator)
032	040	020	00100000	SP	(Space)
033	041	021	00100001	!	(exclamation mark)
034	042	022	00100010	"	(double quote)
035	043	023	00100011	#	(number sign)
036	044	024	00100100	\$	(dollar sign)
037	045	025	00100101	%	(percent)
038	046	026	00100110	&	(ampersand)
039	047	027	00100111	'	(single quote)
040	050	028	00101000	((left/opening parenthesis)
041	051	029	00101001)	(right/closing parenthesis)
042	052	02A	00101010	*	(asterisk)
043	053	02B	00101011	+	(plus)
044	054	02C	00101100	,	(single quote)
045	055	02D	00101101	-	(minus or dash)
046	056	02E	00101110	.	(dot)
047	057	02F	00101111	/	(forward slash)



126	176	07E	01111110	~	(tilde)
127	177	07F	01111111	DEL	(delete)



that not able to receive data. If terminal continues to send data to that virtual channel, G30 will buffer incoming data and deassert CTS (hardware flow control) when the buffer is full. When G30 MUX virtual channel is ready and able to receive data, it sends the appropriate MSC command (according to 3G TS 27.010 V3.3.0), that contains the number of virtual channel that ready to receive data.

If the terminal is not able to receive data (typically because its receive buffer is almost full), it sends the appropriate MSC command (according to 3G TS 27.010 V3.3.0) with the number of virtual channel, that not able to receive data. In this case, G30 stops to send data at appropriate virtual channel. When the terminal is ready and able to receive data, it sends the appropriate MSC command to G30 (according to 3G TS 27.010 V3.3.0) with the number of virtual channel, to indicate this.

8.4.10. MUX Mode

The following table describes the basic mode in a non-ERM environment.

Table 8-1: MUX Mode

Feature	Basic Mode
Start flag	0xF9
Close flag	0xF9
Length field	Yes
Data transparency	No
Frame	UIH (or UI)
Processing cost	Low
Recovery of synchronization	Slow
SW flow control per channel	Yes

Note: The length is still required in the information field of the UIH frame.

8.4.11. MUX State Procedures

Valid channel indexes in MUX state are 0 to 4, where 0 is the index of the control channel and 1-4 are indexes of the information channels (IDLC).



	Checksum
USB	Universal Serial Bus
VCO	Voice Carry Over. This is available for people who cannot hear but are able to speak clearly. During a VCO relay call, the Deaf or Hard of Hearing caller speaks directly to the person they are conversing with. When that person responds, a Communication Assistant (CA) types back exactly what is said to the screen of the TTY or VCO phone.

9.1. Document History

Revision	Date	Changes
0	2011-05-12	Conversion in Telit Layout

