FIBOCOM
Perfect Wireless Connection

G620 GPRS Module
AT Command User Manual

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Revision History

Version	Date	Remarks
V1.0.0	2012-03-27	First version
V1.0.1	2012-06-25	Upadate FIBOCOM logo
V1.0.2	2012-07-30	Add new command "MGAUTH"
V1.0.3	2012-08-09	Update command IPR
V1.0.4	2013-03-28	Add rssi=99 description
V1.0.5	2013-04-27	Delete SSL description(not supported)

Contents

1 Preface

1.1 Manual Scope

This manual introduces the G620 AT command set, and describes how software developers can use these commands to communicate with the G620 device, and to create software applications that communicate with the G620 using these commands.

Note: The software developers should read the corresponding software release notes for the G620, as there maybe difference between the latest version and this manual.

1.2 Target Audience

This manual is intended for software developers who communicate with the G620 device using the AT commands, and create applications to communicate with the G620 device using the AT commands.

2 Introduction to AT Commands

2.1 AT Commands Overview

AT commands are sets of commands used for communication with the G620 module. AT commands are comprised of assemblies of ASCII characters which start with the "AT" prefix (except the commands A/ and +++). The AT prefix is derived from the word "Attention", which asks the modem to notice the current request (command).

AT commands are used to request services from the G620 module, such as:

- Call services: dial, answer and hang up
- Cellular utilities: send/receive SMS
- Modem profiles: Auto Answer
- Cellular Network queries: GSM signal quality

2.2 General System Abbreviations

The basic system configuration contains a modem and a terminal.

The G620 is the modem and may be referred to as the DCE or TA, such as the phone, the mobile or the radio.

The terminal (PC or MCU) may be referred to as the DTE or the TE.

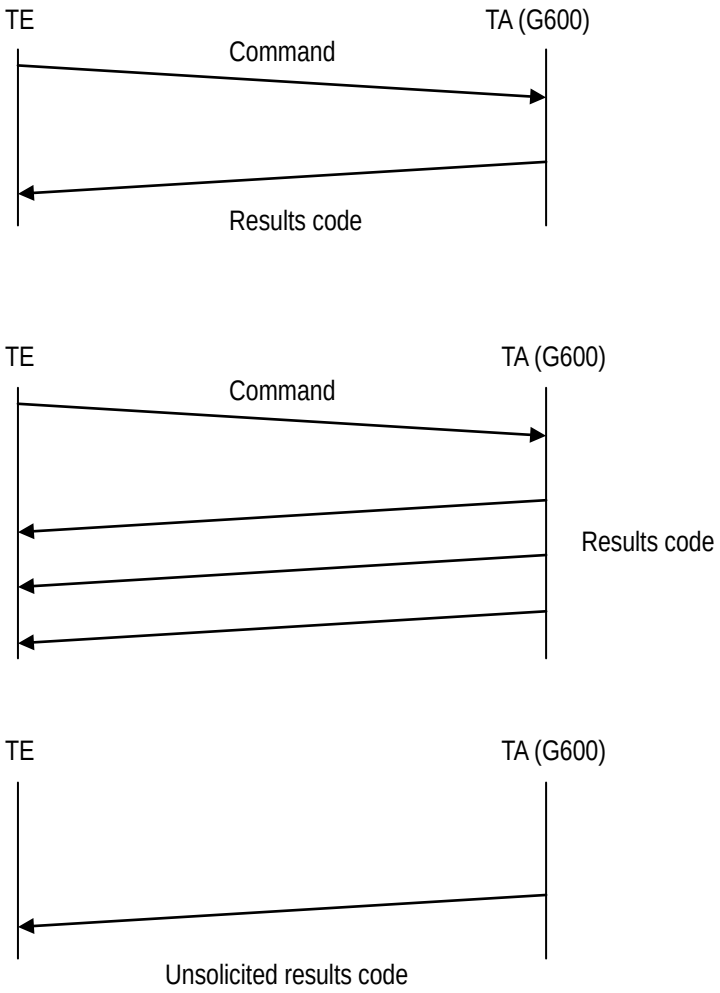
2.3 AT Commands Protocol

The AT commands interface is basically a Modem Services Upon Request.

Communication (almost) always begins from the TE side. This means that any service should be requested from the TE. Thus a request is called a "Command".

Each command must be answered by a "Results code" from the TA. The results code reports the command status to the TE. Some commands may include several "Results code" to send data back to the TE. Some commands may initiate a mode in which, when specified events are generated in the G620, "Indicator" messages are sent data asynchronously. The “indicators” can be called “Unsolicited results code”.

The G620 can echo characters received from the TE (commands) back to the TE.



2.4 AT Commands Structure

2.4.1 General Symbols Used in AT Commands Description

The following table lists the syntax definitions used in this manual.

Syntax	Definition
<CR>	Carriage returns character, specified by the value of the S3-register.
<LF>	Line-feed character, specified by the value of the S4-register.
<…>	Name enclosed in angle brackets is a syntax element. The brackets themselves do not appear in the command line.

[...]	Optional sub-parameter of a command or an optional part of terminal information response, enclosed in square brackets. The brackets themselves do not appear in the command line. When the sub-parameter is not provided in the parameter type commands, the new value equals its previous value. In action type commands, the action should be performed on the basis of the recommended default setting of the sub-parameter.
//	Denotes a comment, and should not be included in the command.

2.4.2 Command Structure

Each AT command has the "AT" or “at” prefix string (except the commands A/ and +++).

Each AT command has the suffix <CR> (except the commands A/ and +++).

Example:

AT+CSQ<CR>

ATS24?<CR>

An AT command line may contain one or more commands. Delimiters are used to separate the commands from each other. The delimiter is either a semicolon ";" or none, meaning space (basic commands).

Example:

ATS0=1V1Q0E0<CR>

AT+IFC=0,0;+ICF=3,4;+CNMI=2,1,0,0,0<CR>

2.4.3 Results Code Structure

By default, the G620 responds with verbose response codes. The results code prefix is <CR><LF>. The results code suffix is <CR><LF>.

Example:

<CR><LF>+CSQ: 99,99<CR><LF>

<CR><LF>OK<CR><LF>

The Unsolicited results code is same as the Results code.

2.5 Command Syntax

Execute command syntax	AT+xxx ATxxx ATxxx;
Parameter set command syntax	AT+xxx=<Value> ATxxx=<Value>
Parameter read Command syntax	AT+xxx? ATxxx?
Parameter test Command syntax	AT+ xxx =? ATxxx?

<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>

- Numeric Constants

Numeric constants are expressed in decimal, hexadecimal, or binary form. In the G620, the definition of each command specifies which form is used for values associated with that command.

- String Constants

String constants consist of a sequence of characters, bounded at the beginning and end by the double-quote character (").

3 Modem ID

These commands allow the user to query the type of device that is attached, the technology used in the device, as well as basic operating information about the G620.

3.1 +CGMI, +GMI, +FMI, Request Manufacturer ID

These commands display manufacturer identification. The G620 outputs a string containing manufacturer identification information.

Command	Response/Action
AT+CGMI AT+CGMI?	+CGMI: <manufacturer_ID> OK
AT+GMI AT+GMI?	+GMI: <manufacturer_ID> OK
AT+FMI AT+FMI?	+FMI: <manufacturer_ID> OK

Example:

AT+CGMI
+CGMI: " Fibocom "
OK

3.2 +CGMM, +GMM, +FMM, Request Model ID

These commands request the model identification. The G620 outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.

Command	Response/Action
AT+CGMM AT+CGMM?	+CGMM: <list of supported technologies>,<model> OK
AT+GMM AT+GMM?	+GMM: <list of supported technologies>,<model> OK
AT+FMM AT+FMM?	+FMM: <list of supported technologies>,<model> OK

Example:

AT+CGMM?

+CGMM: "EGSM900/1800","G620"

OK

The following table shows the+CGMM string parameters.

String	Description
"GSM900"	EGSM at 900 MHz
"GSM1800"	DCS at 1800 MHz

3.3 +CGMR, +GMR, +FMR, Request Revision

These commands request the revision identification. The G620 outputs a string containing the revision identification information of the software version contained within the device.

Command	Response/Action
AT+CGMR AT+CGMR?	+CGMR: <revision> OK
AT+GMR AT+GMR?	+GMR: <revision> OK
AT+FMR AT+FMR?	+FMR: <revision> OK

Example:

AT+CGMR

+CGMR: "0B.00.05"

OK

3.4 +CGSN, +GSN, Request Product Serial Number Identification

This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.

Command	Response/Action
AT+CGSN AT+CGSN?	+CGSN: <imei> OK
AT+GSN AT+GSN?	+GSN: <imei> OK

The following table shows the +CGSN, +GSN parameters.

<Parameter>	Description
<imei>	The IMEI (International Mobile Station Equipment Identity) number is comprised of 15 digits, as specified by GSM 03.03 [3]. IMEI numbers are composed of the following elements, all in decimal digits: Type Approval Code (TAC) - 6 digits Serial Number (SNR) - 6 digits Spare digit - 1 digit The TAC and SNR are protected against unauthorized changes.

Example:

AT+CGSN?

+CGSN: "004400013805666"

OK

3.5 +CSCS, Select Terminal Character Set

This command selects the G620 character set. The G620 supports the following character sets: "IRA","GSM","UCS2" and "HEX". The default value is "IRA".

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

The following table shows the +CSCS parameter optional values.

<chset>	Character Set
“IRA”	International Reference Alphabet (ITU-T T.50)
“GSM”	GSM default alphabet (GSM 03.38 subclause 6.2.1)
"UCS2"	2-byte Universal Character Set, Unicode (ISO/IEC 10646 [32])
“HEX”	Charater strings consist only of hexadecimal numbers from 00 to FF

Example:

AT+CSCS=?

+CSCS: ("IRA","GSM","UCS2","HEX")

OK

AT+CPBS="ME"

OK

AT+CPBW=1,"8475763000",129,"Lin Zhao"

OK

AT+CSCS="UCS2"

OK

AT+CPBR=1

+CPBR: 1,"8475763000",129,004C006E006E0020005A00680061006F

OK

3.6 +CIMI, Request IMSI

This command displays the IMSI (International Mobile Subscriber Identity number). IMSI code usually saved in the SIM card.

Command	Response/Action
AT+CIMI AT+CIMI?	+CIMI: <imsi> OK or: +CME ERROR: <err>

Example:

AT+CIMI

+CIMI: 314566320021400

OK

3.7 +CFSN, Read Factory Serial Number

This command is used to query the factory serial number.

Command	Response/Action
AT+CFSN AT+CFSN?	+CFSN: <fsn> OK

Example:

AT+CFSN
+CFSN: "000000000"
OK

3.8 I, Request Identification Information

This command displays various G620 information items.

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

The following table shows the information items that are supported by the G620.

ATIn	Description	Output	Reference
ATI	Reserve		
ATI0	Reserve		
ATI1	Reserve		
ATI2	Reserve		
ATI3	Reports product description	"GPRS Module"	
ATI4	Reserve		
ATI5	Reserve		
ATI6	Reserve		
ATI7	Reports product description	"EGSM900/1800"	

ATI8	Reports software version	“0B.06.18”	
ATI9	Reserve		

3.9 +CNUM, Request MSISDN(s)

This command displays up to 2 strings of text information that identify the G620. The output string contains double quotes.

On SIM cards that have EFmsisdn file, the string(s) returned are the MSISDN numbers and their associated data.

On SIM cards that don't have EFmsisdn file, the strings returned are the MSISDN numbers and their associated data stored in G620 NVM.

Command	Response/Action
+CNUM +CNUM? (MSISDN supported)	+CNUM: [<MSISDN1_string>],<MSISDN1>,<MSISDN1_type><CR><LF> [+CNUM: [<MSISDN2_string>],<MSISDN2>,<MSISDN2_type>]<CR><LF> [...] OK
+CNUM +CNUM? (MSISDN not supported)	+CNUM: <phone_number> OK

The following table shows the +CNUM parameters.

<Parameter>	Description
<MSISDN type>	Phone number type 129 Use for local call 145 Use “+” for international access code 128 Unknown

Example:

AT+CNUM?

+CNUM: "VoiceMail","09876543210987654321098765432 1",129

OK

3.10 +CLAC, List of All Available AT Commands

Command	Syntax	Response/Action	Remarks
Execute	+CLAC	List of available AT commands	The Execute command displays a list of all the AT commands supported by the G620.

4 Modem Control and Status

4.1 Modem Register Commands

The G620 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”. Some registers can also be accessed using dedicated commands, detailed below.

4.1.1 V, G620 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 and result codes.

V0	V1	Information Responses
<ATV0><cr><lf>	<ATV1><cr><lf>	0 - "OK" 1 - "CONNECT" 2 - "RING" 3 - "NO CARRIER" 4 - "ERROR" 5 - "NO DIALTONE" 6 - "BUSY" 7 - "NO ANSWER"
<numeric code><cr>	<verbose code><cr><lf>	

Command	Syntax	Response/Action	Remarks
Set	ATV<value>	OK or: +CME ERROR: <err>	The Set command sets the format of information responses and result codes.

The following table shows the V parameters.

<Parameter>	Description	
<value>	0	Transmits limited headers and trailers, and numeric text.
	1	Transmits full headers and trailers, and verbose response text.

	The default value is 1.

Example:

ATV0
0
ATV1
OK

4.1.2 Q, Result Code Suppression

This command determines whether to output the result codes. Information text transmitted in response to commands is not affected by the setting of this parameter.

Command	Syntax	Response/Action	Remarks
Set	ATQ<value>	OK or: +CME ERROR: <err>	The set commands sets whether or not to output result codes.
Read	ATQ?	Q: <value> OK	

The following table shows the Qn parameters.

<Parameter>	Description
<value>	0 Transmit result codes. 1 Suppress result codes. The default value is 0.

Example:

ATQ0
OK
ATQ?
Q: 0
OK
ATQ4
ERROR
ATQ1 //No response because result codes are suppressed.

ATQ4 //No response because result codes are suppressed.

4.1.3 E, Command Echo

This command defines whether input characters are echoed to output. If so, these characters are echoed at the same rate, parity and format at which they were received.

Command	Syntax	Response/Action	Remarks
Set	ATE<value>	OK or: +CME ERROR: <err>	The Set command sets whether or not to echo characters.
Read	ATE?	<value> OK	The Test command for E is not defined by ITU, and therefore is not supported by the G620. The G620 returns an error.

The following table shows the E parameters.

<Parameter>	Description
<value>	000 Does not echo characters 001 Echoes characters The default value is 1.

Example:

ATE?

001

OK

4.1.4 X, Result Code Selection and Call Progress Monitoring Control

This command defines the CONNECT result code format. It determines whether or not the G620 transmits particular result codes to the user. It also controls whether the G620 verifies the presence of dial tone when it first goes off-hook to begin dialing, and whether the engaged tone (busy signal) detection is enabled.

Command	Syntax	Response/Action	Remarks
Set	ATX<value>	OK or: +CME ERROR: <err>	The Set command sets the result code and call progress monitoring control.

The following table shows the X parameters.

<Parameter>	Description
<value>	0 CONNECT result code given upon entering online data state: Dial tone detection - Disabled Busy detection - Disabled 1 CONNECT <text> result code given upon entering online data state: Dial tone detection - Disabled Busy detection - Disabled 2 CONNECT <text> result code given upon entering online data state: Dial tone detection - Enabled Busy detection - Disabled 3 CONNECT <text> result code given upon entering online data state: Dial tone detection - Disabled Busy detection - Enabled 4 CONNECT <text> result code given upon entering online data state: Dial tone detection - Enabled Busy detection – Enabled The default value is 4.

4.1.5 S, Bit Map Registers

This command reads/writes values of the S-registers. The G620 supports this command for various S values, according to official specifications (ITU-I, ETSI, or manufacturer specific).

Command	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> OK or: +CME ERROR: <err>	
Test			The Test command for Sn is not defined by ITU, and therefore is not

			supported by the G620. The G620 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.	1	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 be-tween 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	60
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	2
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	40

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:

ATS0?

000

OK

ATS0=3

OK

ATS0?

003

OK

4.1.6 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	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	The Read command displays the currently defined escape character for CSD connections.

The following table shows the S2 parameters.

<Parameter>	Description
<escape_character>	CSD escape character. Range is 1 to 255. The default value is 43 ("+").

4.1.7 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	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.
Read	S12?	<guard_time> OK	The Read command displays the current CSD escape character guard time.

The following table shows the S12 parameters.

<Parameter>	Description
<guard_time>	CSD escape character guard time (units of 50 msec). Range is 0 to 255. The default value is 20.

4.1.8 &V, View Configuration

This command reports the current S-registers and the stored user profile.

Command	Syntax	Response/Action	Remarks
Execute	&V	ACTIVE PROFILE: ... (profile data) STORED PROFILE 0: ... (profile data) STORED PROFILE1: ... (profile data) OK or +CME ERROR: <err>	The Execute command displays the current active configuration and stored user profiles.

Example:

AT&V

ACTIVE PROFILE:
&C1, &D2, &K3, E1, Q0, V1, X0, Y0, S00:000, S02:043, S03:013, S04:010, S05:008,
S07:030, S12:020, +CBST:007, 000, 001, +CRLP:061, 061, 048, 006, +CR:000, +CRC:000

STORED PROFILE 0:
&C1, &D2, &K3, E0, Q0, V1, X0, S00:000, S02:043, S03:013, S04:010, S05:008,
S07:030, S12:020, +CBST:007, 000, 001, +CRLP:061, 061, 048, 006, +CR:000, +CRC:000

STORED PROFILE 1:
&C1, &D2, &K3, E1, Q0, V1, X0, S00:000, S02:043, S03:013, S04:010, S05:008,
S07:030, S12:020, +CBST:007, 000, 001, +CRLP:061, 061, 048, 006, +CR:000, +CRC:000

OK

4.1.9 &F, Set to Factory Defined Configuration

This command restores the factory default configuration profile. The G620 only supports one factory default profile, 0.

Command	Syntax	Response/Action	Remarks
Set	AT&F<value>	OK or: +CMS ERROR: <err>	
Read	AT&F?	<current profile number>	
Test			The Test command for &F is not defined by ITU, and therefore is not supported by the G620. The G620 returns an error.

The following table shows the &F parameters.

<Parameter>	Description
<value>	0 Factory default configuration profile. This is the only value supported.

Example:

AT&F?

&F: 0

OK

4.1.10 Z, Reset to Default Configuration

This command drops the current call, and resets the values to default configuration.

Command	Syntax	Response/Action	Remarks
Set	ATZ<value>	OK or: +CMS ERROR: <err>	
Read			The Read command for Z is not defined, and therefore is not supported by the G620. The G620 returns an error.
Test			The Test command for Z is not defined, and therefore is not supported by the G620. The G620 returns an error.

The following table shows the Z parameters.

<Parameter>	Description
<value>	0 Set to user profile 0 1 Set to user profile 1 The default value is 0.

Example:

ATZ0

OK

4.1.11 &W, Store User Profile

This command saved the active profile to one of two user profiles.

Note: The user must power off the module in regular process. Otherwise, this command cannot take effect.

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

The following table shows the &W parameters.

<Parameter>	Description
<n>	User's profile number: 0 Store to user's profile 0 1 Store to user's profile 1

Example:

AT&W0

OK

AT&W1

OK

4.1.12 &Y, Default User Profile

This command selects user profile will be used after hardware reset.

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

The following table shows the &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&Y1

OK

4.1.13 +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 G620 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	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 infor- mation parameters and response data.
Test	AT+CRSM=?	+CRSM:	The test command returns the

		(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>	possible ranges of CRSM Parameters.

The following table shows the +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.
<P1>,<P2>,<P3>	Integer type. Parameters passed on by the ME to the SIM. These parameters are man-datory for every command, except GET RESPONSE and STATUS. READ BINARY <P1> Offset high (0...255) <P2> Offset low (0...255) <P3> Length (0...255) READ BINARY <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) GET RESPONSE

<table>
<tr><td></td><td>
<P1> "00"
<P2> "00"
<P3> Length (0...255)
UPDATE BINARY
<P1> Offset high (0...255)
<P2> Offset low (0...255)
<P3> Length (0...255)
UPDATE RECORD
<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)
STATUS
<P1> "00"
<P2> "00"
<P3> Length (0...255)
</td></tr>
<tr><td><data></td><td>Information which shall be written to the SIM (hexadecimal character format). Man-datory for UPDATE BINARY and UPDATE RECORD.</td></tr>
<tr><td><sw1> <sw2></td><td>
Integer character format. Information, from the SIM, about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command.
Responses to commands which are correctly executed:
<table>
<tr><th><sw1></th><th><sw2></th><th>Description</th></tr>
<tr><td>144</td><td>0</td><td>Normal ending of the command</td></tr>
<tr><td>145</td><td>XX</td><td>Normal ending of the command, with extra information from the proactive SIM, containing a command for the ME.
Length 'XX' of the response data.</td></tr>
<tr><td>158</td><td>XX</td><td>Length 'XX' of the response data given in case of a SIM data download error.</td></tr>
<tr><td>159</td><td>XX</td><td>Length 'XX' of the response data.</td></tr>
</table>
Responses to commands which are postponed:
</td></tr>
</table>

<sw1>	<sw2>	Error Description
147	0	SIM Application Toolkit is busy. Command cannot be executed at present, further normal commands are allowed.
146	0X	Command successful but after using an internal update retry routine 'X' times.
146	64	Memory problem.
148	0	No EF selected.
148	2	Out of range (invalid address).
148	4	• File ID not found. • Pattern not found.
148	8	File is inconsistent with the command
152	2	No CHV initialized
152	4	• Access condition not fulfilled. • Unsuccessful CHV verification, at least one attempt left. • Unsuccessful UNBLOCK CHV verification, at least one attempt left. • Authentication failed.
152	8	In contradiction with CHV status.
152	16	In contradiction with invalidation status.
152	64	• Unsuccessful CHV verification, no attempt left. • Unsuccessful UNBLOCK CHV verification, no attempt left. • CHV blocked. • UNBLOCK CHV blocked.

<table>
<tr><td></td><td>
<table>
<tr><th><sw 1></th><th><sw 2></th><th>Error Description</th></tr>
<tr><td>152</td><td>80</td><td>Increase cannot be performed, Max value reached.</td></tr>
<tr><td>103</td><td>XX</td><td>Incorrect parameter P3
(Note: 'XX' gives the correct length or states that no additional information is given ('XX' = '00').</td></tr>
<tr><td>107</td><td>XX</td><td>Incorrect parameter P1 or P2.</td></tr>
<tr><td>109</td><td>XX</td><td>Unknown instruction code given in the command.</td></tr>
<tr><td>110</td><td>XX</td><td>Wrong instruction class given in the command.</td></tr>
<tr><td>111</td><td>XX</td><td>Technical problem with no diagnostic given.</td></tr>
</table>
</td></tr>
<tr><td><response></td><td>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.</td></tr>
</table>

Example:

AT+CRSM=176,28478,0,0,20

+CRSM: 103,4,"9F0F00003F00010000009000020000900056341 2"

OK

AT+CRSM=192,12258

+CRSM: 144,0,"0000000A2FE2040004FF4401020000"

OK

AT+CRSM=?

+CRSM: (176,178,192,214,220,242),(12037-28599),(0-255),(0-255),(0-255)

OK

4.1.14 +CCID

This command returns the card identification number in SIM (SIM file EFICCID, see GSM 11.11 Chap.10.1.1) as string type.

Command	Syntax	Response/Action
Set	AT+CCID	+CCID: <ID> OK or: +CME ERROR: <err>
Read	AT+CCID?	Same as above
Test	AT+CCID=?	OK

Example:

AT+CCID
+CCID: 89860018190839008096
OK
AT+CCID=?
OK
AT+CCID?
+CCID: 89860018190839008096
OK

4.2 Sleep Mode Commands

When the G620 is connected using UART connection to external device, a sleep mechanism is available. In order to improve the power consumption, the G620 supports a low-power consumption mode, called "Sleep mode". The G620 has internal decision conditions for entering and exiting sleep mode. As the terminal and the G620 operate in a combined system, and as the communication between the G620 and the terminal must be reliable, there should be a mechanism agreed upon by both the G620 and the terminal to coordinate their separate sleep mode entering and exiting sequences. The G620 will not enter sleep mode unless the terminal enables the G620 by AT commands.

The following are the Sleep mode AT commands:

- ATS24: Activates/deactivates Sleep mode.

The G620 receives a request to activate or deactivate Sleep mode.

The G620 receives a request to define the behavior of the CTS line when the G620 is in Sleep mode. It enables or disables activation of the CTS line after wakeup.

4.2.1 S24, Set Number of Seconds Delay Before G620 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 G620 enters sleep mode in 5 seconds. If terminal has some indication of the CTS pin activity, it can see.

Command	Syntax	Response/Action	Remarks
Set	ATS24=[<value>]	OK	The Set command sets the amount of time, in seconds, the G620 should wait before entering Sleep mode.
Read	ATS24?	<value> OK	The Read command returns the current value.

The following table shows the S24 parameters.

<Parameter>	Description
<value>	Number of seconds (0 <= n <= 255) 0 Disable Sleep mode >0 Enable Sleep mode The default value is 000.

Example:

ATS24?
000
OK
ATS24=5
OK //The G620 enter Sleep Mode at once
ATS24?
005
OK
(If there are no radio and UART activities, the G620 will enter sleep mode in 5 seconds)

4.3 Error Handling Commands

4.3.1 +CMEE, Report Mobile Equipment Error

The Set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the G620. When enabled, G620-related errors cause a +CME ERROR: <err> final result code instead of the regular ERROR final result code. Usually, ERROR is returned when the

error is related to syntax, invalid parameters or terminal functionality.

For all Accessory AT commands besides SMS commands, the +CMEE set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the G620. When enabled, G620 related errors cause a +CME ERROR: <err> final result code instead of the regular ERROR result code.

For all SMS AT commands that are derived from GSM 07.05, the +CMEE Set command disables or enables the use of result code +CMS ERROR: <err> as an indication of an error relating to the functionality of the G620. When enabled, G620-related errors cause a +CMS ERROR: <err> final result code instead of the regular ERROR final result.

Command	Syntax	Response/Action	Remarks
Set	AT+CMEE=[<n>]	OK or: +CME ERROR: <err>	The Set command enables or disables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the G620.
Read	AT+CMEE?	+CMEE: <n> OK	The Read command returns the current setting format of the result code.
Test	AT+CMEE=?	+CMEE: (list of supported <n>s) OK	The Test command returns values supported by the terminal as a compound value.

The following table shows the +CMEE parameters.

<Parameter>	Description
<n>	0 Disable the +CME ERROR: <err> result code and use ERROR. 1 Enable the +CME ERROR: <err> or +CMS ERROR: <err> result codes and use numeric <err> values or +STK ERROR: <err> result codes and use numeric <err> values. 2 Enable the +CME ERROR: <err> or +CMS ERROR: <err> result codes and use verbose <err> values or +STK ERROR: <err> result codes and use numeric <err> values. The default value is 0.

Example:

```
AT+CMEE=0     //+CME ERROR is not used
OK
AT+VTD
ERROR
AT+CMEE=1     //Use numeric <err>
OK
```

AT+VTD

+CME ERROR: 1

AT+CMEE=2 //Use verbose <err>

OK

AT+VTD

+CME ERROR: operation not supported

4.3.2 +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	Syntax	Response/Action
Execute	AT+CEER	+CEER: <report> OK
Test	AT+CEER=?	OK

5 Call Control

5.1 Managing a CSD (Data) Call

The G620 working modes can be divided into two modes of operation.

- Data Mode: In this mode, once the G620 has established a link with the remote modem, it does not respond to any data passing through it (except for the Escape Sequence search). The G620 becomes a transparent link, connecting the terminal with the remote side.
- Command Mode: In this mode, the G620 responds to the AT commands issued by the terminal. This is the default working mode.

Note:

- It is possible to switch between the operating modes.
- The operating modes can operate simultaneously using the Mux.

5.1.1 Simple Dialing

In order to instruct the modem to dial a remote modem from an ordinary tone-dialing telephone line, enter the Dial command followed by the phone number. For example, type the following command:

ATD 876-5555 <Enter>

Note: If you receive characters which were sent, you can disable this with using the Echo command (ATE0 <Enter>).

After issuing the Dial command, and if the remote modem answers the call, the two modems send high-pitched carrier tones to one another which establish the transmission speed and other parameters for the data connection. This process is called negotiation.

After the negotiation process, the message, "OK" followed by the connection speed, is received. If the other phone line is busy, the message "NO CARRIER" is received.

If the other modem does not answer, the message "NO CARRIER" is received.

Once a connection has been established, the modem is ready to immediately begin 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.

5.1.2 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 G620 and not by the remote side. The remote side stays in the Data mode.

5.1.3 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 G620 responds with "OK", the dial connection is closed.

5.2 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".

5.3 Call Control AT Commands

5.3.1 D, Dial Command

This command places a FAX/DATA call on the current network.

The default call type is a data call (CSD). If the +FCLASS command was used to set the call type to be FAX, then the outgoing call is a fax call.

If a DATA/FAX call was originated and answered by the remote side, a "OK" notification is sent to the terminal from the G620, and it moves to the online Data/Fax state (respectively).

For more information about call failure, should use the AT+CEER command.

Command	Response/Action
ATD<number>[;]	DATA/FAX: One response only - Data/Fax call connected CONNECT 9600 When MO call fails: 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 D parameters.

<Parameter>	Description
<number>	Valid phone digits are: 0 1 2 3 4 5 6 7 8 9 * # + The following characters are ignored: A B C D - () / and <space>.
semicolon (;)	When given after <number string>, a data call is originated.

The control of supplementary services through the Dial command is not supported as these are controlled through the specific supplementary service commands (CCFC, CLCK, and so on.)

Initiating a GPRS connection is done through ATD*99#, as described in "D*99.

Example:

atd44345678 //DATA/ FAX call (without semicolon)

CONNECT 9600 //Move to online Data state

5.3.2 D>, Direct Dialing from Phone Books

This command places a FAX/DATA call on the current network by dialing directly from the G620 phone book.

Note:

- "+CME ERROR: not found" is returned when no match is found in an existing phone book.
- FD phone book supports the (?) wild card character. Telephone numbers containing this character cannot be dialed directly from the phone book.
- "+CME ERROR: Invalid index" is returned when entry <n> is out of the requested Phonebook range.
- When SM phonebook is searched and the given entry value is of the ME phonebook, ME phonebook will be searched as well (result code would be the same as if MT phonebook was searched).

The following table shows a detailed description for the D> commands.

Command	Detailed Description
D><alpha>[;]	Originates a call to a phone number with the corresponding alphanumeric field <alpha>. The Current Phone Book (Set by +CPBS) is searched for the entry that begins with the alphanumeric pattern <alpha>.
D>mem<n>[;]	Originates a call to a phone number in memory (phone book) mem and stored in entry location <n>.
D><n>[;]	Originates a call to a phone number from entry location <n> in the Current Phone Book (Set by +CPBS).

Note: Current used memory (phone book) set/read is done through the memory command +CPBS=/+CPBS? respectively.

The following table shows the D> parameters.

<Parameter>	Description
<"alpha">	String type value, which should be equal to an alphanumeric field in a phone book entry. The used character set should be the one selected with Select Terminal Character Set +CSCS. <alpha> is case-sensitive, and should be placed in quotes ("alpha").
<n>	This parameter is also called "speed dial location". It is an integer type memory location. <n> should be in the range of locations available in the memory used.
<mem>	This parameter is not case-sensitive.

Example:

AT+CPBS="SM"
OK
AT+CSCS="IRA"
OK
AT+CPBW=1,"035659090",129,"CSDMail"
OK
AT+CPBR=1
+CPBR: 001,"035659090",129," CSDMail"
OK
atd>" CSDMail" //Phonebook by name
CONNECT 9600

5.3.3 H, Hang-up Call

This command hangs up a call. The G620 terminates the call 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/fax call while call is placed: Any character sent from the terminal to the G620 causes the Data/Fax call termination, and NO CARRIER is sent from the G620 to the terminal.

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

Call State	Response/Action
IDLE	Error ("operation not allowed")
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 (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:

Example - Hanging up a data call:

atd035659260

CONNECT//Data call connected - Online Data mode

…

+++ //ESC Sequence is sent from the terminal to the G620

OK //The G620 is in Command mode

ath //Terminate Data call

NO CARRIER

OK

5.3.4 A, Answer Incoming Call

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

If the incoming call is answered (connected), the G620 sends a CONNECT notification to the terminal.

If the MT call fails, the possible notifications are:

- NO CARRIER - Connection Failure
- ERROR - General Failure

Example:

Example - Answering a data call:

+CRING: REL ASYNC

+CRING: REL ASYNC

ata

... //Connecting (dots are not displayed)

OK //DATA call connected - G620 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).

5.3.5 +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 G620 to the terminal when the G620 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	Syntax	Response/Action	Remarks
Set	+CRC=<n>	OK	The Set command enables/disables the extended format of an incoming call indication. When enabled, an incoming call is indicated to the terminal with an unsolicited result code +CRING: <type> instead of the normal RING.
Read	+CRC?	+CRC: <n> OK	The Read command queries the current settings for the cellular result code.
Test	+CRC=?	+CRC: (list of supported <n>s)	The Test command returns the possible <n> values.

RING/+CRING Indication

+CRING: <type> or:

RING

The following table shows the +CRC parameters.

<Parameter>	Description
<n>	0 Extended format disabled 1 Extended format enabled The default value is 0.
<type> ASYNCCSD REL ASYNCCSD FAX	Type of incoming call: asynchronous transparent asynchronous non-transparent Fax class 1

VOICE	Normal voice
ALT	Fax/voice

Example:

AT+CRC?
+CRC: 0
OK
AT+CRC=?
+CRC: (0-1)
OK

Example - RING/+CRING indication

(..Incoming Data Call..)
RING
RING
RING
AT+CRC=1 //Enable extended ring format
OK
+CRING: REL ASYNC
+CRING: REL ASYNC
ath
AT+CRC=1
OK //Mobile fax call terminated (multi-numbered scheme) from PSTN fax machine
+CRING: ALT Voice/Fax
NO CARRIER
OK

5.3.6 +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 G620.

This command allows the user to query the provisioning status of the CLI by the network and by the G620. The command also allows the user to enable/disable the CLI presentation by the G620 to the terminal.

The +CLIP indication information varies depending on what is provided by the network and what information is stored in the G620 phone book.

Command	Syntax	Response/Action	Remarks
Set	AT+CLIP=[<n>]	OK or: +CME ERROR: <err>	The Set command enables or disables the presentation of the CLI indication from the G620 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 G620 as well as in the network provisioning state of the CLI presentation.
Test			The Test command returns the Set command options (0,1).

5.3.7 +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	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 G620 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.

<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 G620 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

5.3.8 O, Return to Online Data State

This command returns the G620 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 S 12-register.

Command	Syntax	Response/Action
Execute	ATO	CONNECT +CME ERROR: <err> If phone is not in Data Call NO CARRIER: If connection is not successfully resumed.

Example:

```
ATD035684072    //Calling a remote modem - data call
CONNECT      //G620 is in Data mode
//Escaping back to Command mode using the +++ sequence
OK
AT            //G620 is in Command mode
OK
ATO            //Returning to Data mode
CONNECT
```

5.3.9 +CHUP, Hang Up Call

This command causes the G620 to hang up the current GSM call.

Command	Syntax	Response/Action	Remarks
Set	+CHUP	OK or: +CME ERROR <err>	The Set command hangs up the current GSM call.

5.3.10 +MHUP, G620 Hung UP call

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

Command	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.

The following table shows the +MHUP parameters.

<Parameter>	Description
<cause>	Cause description, send to the NW in the "disconnect" message. 1 "Unassigned (unallocated) number" 16 "Normal call clearing" 17 "User busy" 18 "No user responding" 27 "Destination out of order" 31 "Normal, unspecified"
<call_id>	Index of the call id (same as <idx> in +CLCC command) 0 All calls (default). 1-7 Specific call id.

Example:

```
AT+MHUP=?
+MHUP: (1,16,17,18,27,31),(0-7)
OK
AT+MHUP = 16,3        //Hung up call #3, and send cause "Normal call clearing"
OK
AT+MHUP = 17          //Hung up all calls, and send cause "User busy"
OK
AT+MHUP = 17,0        //Hung up all calls, and send cause "User busy"
OK
```

6 Phone and Date Books and Clock

6.1 Directory Access Commands - Phone Book

This set of commands enables read/write access to the phone book contained within the G620, including both the numeric and the alpha information contained in the location. The presentation is according to GSM 07.07.

In some cases, it may be possible to use these commands to access the dialed and received call stacks. However, as these phone books cannot be edited, the +CPBW command does not work on them.

6.1.1 +CPBS, Select Phone Book Memory

This command handles the selection of the memory to be used for reading and writing entries in the G620's phone books' memory.

Command	Syntax	Response/Action	Remarks
Set	AT+CPBS=<storage>[,<pin2>] <pin2>is optional while <storage> = "FD" only	OK or: +CME ERROR: <err>	The Set command selects the phone book memory storage which is to be used by other phone book commands.
Read	+CPBS?	+CPBS: <storage>[,<used>,<total>] OK	The Read command returns the currently selected phone book memory, number of used entries and total number of entries in the phone book memory.
Test	+CPBS=?	+CPBS: (list of supported<storage>s) OK	Test command returns the supported storages as a compound value.

Note: Read format of +CPBS joins RC and MC, therefore the united list will be prompted.

The following table shows the +CPBS parameters.

<Parameter>	Description
<storage>	List of supported phone books and their storage IDs FD: SIM Fixed dialing phone book.
	ON: Own numbers (MSISDNs) list (reading this storage is also available through +CNUM). SM: SIM phone book.

	LD: SIM last-dialing phonebook The default phone book is SM.
<used>	Integer type value indicating the number of used locations in the selected memory.
<total>	Integer type value indicating the total number of entries in the selected phone book memory.
<pin2>	String type. PIN2 password 4 - 8 digits.

Example:

AT+CPBS="SM"
OK
AT+CPBR=?
+CPBS: ("SM","FD","LD","ON")
OK
AT+CPBR=1
OK
AT+CPBR=1,3 //There is nothing written in entry 1,2,3
OK
AT+CPBS="FD","<correct pin2>"
OK // +CPBW pin2 unlocked
AT+CPBW=1,"034546565",129,"xyz"// Write into FD storage
OK
AT+CPBS="FD","<wrong pin2>"
+CME ERROR: incorrect password
AT+CPBS="FD","<pin2 longer then 8 chars>"
+CME ERROR: text string too long

6.1.2 +CPBR, Read Phone Book Entries

This command recalls phone book entries from a specific entry number or from a range of entries. If only one entry is specified, and that entry is empty, OK is returned. If a range of entries is requested, all entries that contain data within that range are returned. If a listing fails in a G620 error, +CME ERROR: <err> is returned.

This command can also be used to obtain information about the number of entries and the maximum size of a phone number and alpha tag fields in the phone book.

This command acts on the currently active phone book, as selected with the +CPBS command.

Command	Syntax	Response/Action	Remarks
Set	+CPBR=<index1>[,<index2>]	[+CPBR: <index1>,<number>,<type>,<text>[<CR><LF> +CPBR: <index2>,<number>,<type>,<text>]] OK or: +CME ERROR: <err>	The Set command returns phone book entries.
Test	+CPBR=?	+CPBR: (list of supported<index>s)[,<nlength>], [<tlength>] OK	The Test command returns the entry range supported by the current storage as a compound value and the maximum lengths of the <number> and <text> fields.

The following table shows the +CPBR parameters.

<Parameter>	Description
<index1> <index2>	Index for a given phone book entry
<number>	Phone number of a given entry
<type>	The address type of a phone number 129 Use for local call 145 Use "+" for international access code 128 Unknown "128" is used to represent an email address or a mailing list. In this case, <ph_type> can be used to further differentiate between the two.
<text>	Text identifier for a phone book entry, according to the character set as specified by command +CSCS.
<nlength>	The maximum number of digits in the <number>.
<tlength>	The maximum number of characters in the <text> entry

Note: The MC and RC have the same memory storage area, therefore there are only 10 entries in total. Some of the entries are listed if the MC phone book is selected, and others are listed if the RC phone book is selected. The phone book selection is done using the AT+CPBS command.

Example:

AT+CPBS="SM"

OK

AT+CPBR=?

+CPBR: (1-250),20,14

OK

At+CPBR=1

OK

AT+CPBR=1,3 //There is nothing written in entry 1,2,3

OK

AT+CPBR=4

+CPBR: 4,"18888888",129,"Tom"

OK

6.1.3 +CPBF, Find Phone Book Entries

This execution command enables the user to search for a particular entry, by name, in the currently active phone book. If no matching entry is found, the command returns OK. If multiple matches are found, all are returned.

Command	Syntax	Response/Action
Set	+CPBF=<findtext>	[+CPBF: <index1>,<number>,<type>,<text>[[...] <CR><LF> +CBPF: <index2>,<number>,<type>,<text>]] OK or: +CME ERROR: <err>
Test	AT+CPBF=?	+CPBF: [<nlength>][,<tlength>] OK

The following table shows the +CPBF parameters.

<Parameter>	Description
<findtext>	Case-sensitive text substring to search for, according to the character set specified by the +CSCS command.
<index1> <index2>	Index for a given phone book entry

<number>	Phone number of a given entry
<type>	The address type of a phone number 129 Use for local call 145 Use "+" for international access code 128 Unknown Note: "128" is used to represent an email address or a mailing list. In this case, <ph_type> can be used to further differentiate between the two.
<text>	Text identifier for a phone book entry that starts with the substring <findtext>,according to the character set as specified by command +CSCS.

Example:

```
AT+CPBS="SM"    //Selecting phone book
OK
AT+CPBF="Lin"
+CPBF: 1,"18888888",129,"Linzhao"
OK
AT+CPBF="Voice"    //Searching for string "Voice" and finding Voice Mail
+CPBF: 2,"+8613800138000",145,"Voicemail"
OK
AT+CPBF=""    //Searching for everything in phone book, and finding all entries
+CPBF: 1,"18888888",129,"Linzhao"
+CPBF: 2,"+8613800138000",145,"Voicemail"
+CPBF: 3,"18888888",129,"???"
OK
```

6.1.4 +CPBW, Write Phone Book Entry

This command enables the user to store a new entry in the phone book, or edit/delete an existing entry from the phone book. A particular entry in the phone book can be stored, or the next available entry is used.

This command writes the entry in the currently active phone book, selected with the +CPBS command (Refer to "+CPBS, Select Phone Book Memory"). The entry is selected by <index>, the phone number is entered into the <number> field and text associated with the number is entered into the <text> field. If these fields are omitted, the phone book entry is deleted. If the <index> field is omitted, but a number is entered in the <number> field, the phone number is entered into the first available entry in the phone book. If the writing fails in a G620 error, +CME ERROR: <err> is returned.

The phone book and date book are share dynamic memory storage. If the writing fail in a G620 error in case of "full memory" error while the memory is not full by 'used' field of +CPBS command (Refer to "+CPBS,

Select Phone Book Memory").

Note: The "FD" phone book supports single wild card characters (?) and prefixes of a number in the telephone number field. In cases of fixed dialing, these entries in the "FD" phone book define a group of permitted numbers.

Call indications related to a fixed dialing entry containing wild cards or only a prefix of a number do not display any <alpha> identifier.

Command	Syntax	Response/Action	Remarks
Set	AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]	OK or: +CME ERROR: <err>	
Test	AT+CPBW=?	+CPBW: (list of supported<index>s)[,<nlength>],(list of supported<type>s)[,<tlength>] OK	This command queries the allowable command field and sizes.

The following table shows the +CPBW parameters.

<Parameter>	Description
<index>	Index for a given phone book entry
<number>	Phone number of a given entry
<type>	The address type of a phone number 129 Use for local call 145 Use "+" for international access code 128 Unknown Note: "128" is used to represent an email address or a mailing list. In this case, <ph_type> can be used to further differentiate between the two.
<text>	Text identifier for a phone book entry, according to the character set as specified by command +CSCS.
<nlength>	The maximum size of a phone number, in digits. There is a limited number of PB records that can be stored with this length. The number of "long" PB records depends on the size of the SIM card EXT1 extension file. If the extension file is full, an attempt to store a new record with more than 20 digits returns an error.
<tlength>	The maximum number of characters in the <text> entry. This applies to GSM standard characters only. Non-GSM standard character sets and extended GSM characters require additional space in storage. In some cases, when using such characters the text cannot be stored. In this case, the G620 returns a "text string too long"error.

6.2 System Date and Time Access Commands

6.2.1 +CCLK, Read/Set System Date and Time

This command reads and sets the G620 current date, time and time zone.

Command	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	The Test command returns valid parameters for the +CCLK Set command.

The following table shows the +CCLK parameters.

<Parameter>	Description
<time>	ASCII string of format: yy/MM/dd,hh: mm: ss±zz or yy/MM/dd,hh: mm: ss or yy/MM/dd,hh: mm yy - 2-digit year [2000-2069] MM - 2-digit month [01-12] dd - 2-digit day of month [00-31] hh - 2-digit hour [00-23] mm - 2-digit minute [00-59] ss - 2-digit seconds [00-59] zz - (optional) time zone offset from GMT, in quarter-hours [-47...+48]. If this value is not specified, the time zone offset will be 0.

Example:

AT+CCLK=?
+CCLK: "88/12/31, 23: 59: 59, (-47-+48)"
OK
AT+CCLK="01/01/01, 01: 01: 01-08"
OK
AT+CCLK?
+CCLK: "01/01/01, 01 : 01 : 01-08"
OK
AT+CCLK="02/02/02, 02: 02: 02"
OK
Power cycling…
AT+CCLK?
+CCLK: "02/02/02, 02: 02: 02+00"
OK

7 SMS

7.1 SMS Commands

G620 supports SMS PDU and SMS TEXT mode according to ETSI specifications 07.05 & 3.40.

7.1.1 +CSMS, Select Message Service.

This command handles the selection of the messaging service. It returns the types of messages that are supported by the G620.

Command	Syntax	Response/Action	Remarks
Set	+CSMS=<service>	+CSMS: <mt>,<mo>,<bm> OK or: +CMS ERROR: <err>	The Set command sets the type of service and returns the types of messages supported by the G620.
Read	+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm> OK	The Read command returns the supported message types along with the current service setting.
Test	+CSMS=?	+CSMS: <service> OK	The Test command returns a list of all the services supported by the terminal.

The following table shows the +CSMS parameters.

<Parameter>	Description
<service>	Integer that defines the type of service 0:SMS AT command grammar is compatible with GSM Phase 2 1:SMS AT command grammar is compatible with GSM Phase 2+ 2...127:reserve 128:manufacturer reserve
<mt>	Mobile terminated messages 0 Not supported by the G620 1 Supported by the G620
<mo>	Mobile originated messages 0 Not supported by the G620 1 Supported by the G620
<bm>	Broadcast type messages

	0	Not supported by the G620
	1	Supported by the G620

Note: The 128 (manufacturer-specific) messaging services is supported by the G620. The service is supported for all messaging types (mobile terminated, mobile originated and broadcast).

Example:

AT+CSMS?

+CSMS: 1,1,1,1

OK

7.1.2 +CPMS, Preferred Message Storage

This command handles the selection of the preferred message storage area. The message storage area is divided into three parts, mem1, mem2 and mem3.

Command	Syntax	Response/Action	Remarks
Set	+CPMS=<mem1>[,<mem2>[,<mem3>]]	+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK or: +CMS ERROR: <err>	The Set command sets the memory storage.
Read	+CPMS?	+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK or: +CMS ERROR: <err>	The Read command displays the selected memory storage type for the three memory areas.
Test	+CPMS=?	+CPMS: (list of supported<mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) OK or: +CMS ERROR: <err>	The Test command lists the supported memory storage for <mem1>, <mem2> and <mem3>.

The following table shows the +CPMS parameters.

<Parameter>	Description
<mem1>	memory from which messages are read and deleted. Supported values are: "SM","BM". The default value at power-up is "SM".
<mem2>	memory to which writing operation is made. Supported value is: "SM" The default value at power-up is "SM".
<mem3>	memory to which received SMS are stored (unless forwarded directly to TE). Supported value is: "SM". The default value at power-up is "SM".
"BM"	Broadcast message storage
"SM"	SIM message storage

Example:

AT+CPMS="SM"
+CPMS: 5,50,5,50,5,50
OK
AT+CPMS?
+CPMS: "SM",5,50,"SM",5,50,"SM",5,50
OK

7.1.3 +CMGF, Message Format

This command is a basic command. The Set command handles the selection of the message format used with send, list, read and write commands, as well as the format of unsolicited result codes resulting from message receipts. The G620 supports both PDU mode (where entire TP data units are used) and text mode (where the body of the message and its headers are given as separate parameters).

Command	Syntax	Response/Action	Remarks
Set	+CMGF=<mode>	OK or: +CMS ERROR: <err>	The Set command sets the message format to use.
Read	+CMGF?	+CMGF: <mode> OK	The Read command displays the current message format.
Test	+CMGF=?	+CMGF: (list of supported mode>s)	The Test command lists all the supported message formats.

		OK	

The following table shows the +CMGF parameters.

<Parameter>	Description
<mode>	Message format: 0 PDU mode (default) 1 Text mode

Example:

AT+CMGF=1
OK
AT+CMGF?
+CMGF: 1
OK
AT+CMGF=?
+CMGF: (0,1)
OK

7.1.4 +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	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> OK	Read command displays <sca> and <tosca> stored in SIM*EF-SMSp).
Test			The Test command for +CSCA is not defined by ETSI.

The following table shows the +CSCA parameters.

<Parameter>	Description
<sca>	Service Center Address“ ”"+" character prefix of <sca> indicates <tosca> of 145. Minimum 1 and up to 20 characters, where each character is represented by semi octets (excluding ‘+’ character). 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".
<tosca>	Type of service center address. <tosca> of 129 is mostly use for local number and 145 for International. <tosca> of 129 is default value. <tosca> values are in range of 0-255. Valid values are defined according to: GSM03.40 v7.4.0 section 9.1.2.5 as follow: Bit 7 is 1 Bits 6,5–4 - Present Type of number as follow: Bits 6 5 4 0 0 0 Unknown 0 0 1 International number 0 1 0 National number 0 1 1 Network specific number 1 0 0 Subscriber number 1 0 1 Alphanumeric, (coded according to GSM TS 03.38 7-bit default alphabet) 1 1 0 Abbreviated number 1 1 1 Reserved for extension Numbering-plan-identification (applies for Type-of-number = 000,001,010) Bits 3 2 1 0 0 0 0 0 Unknown 0 0 0 1 ISDN/telephone numbering plan (E.164/E.163) 0 0 1 1 Data numbering plan (X.121) 0 1 0 0 Telex numbering plan 1 0 0 0 National numbering plan 1 0 0 1 Private numbering plan 1 0 1 0 ERMES numbering plan (ETSI DE/PS 3 01-3) 1 1 1 1 Reserved for extension. All other values are reserved.

+CSCA <SCA> parameters.

Following table describes +CSCA <SCA> valid parameters including the conversion when using stored <SCA> in SMS PDU mode (editing SMS via +CMGW or +CMGS without SCA). This is according to 24.008V031000P Table 10.5.118/GSM 24.008V031000P: Called party BCD number:

<SCA> Character in SMS (Text mode)	Mapped character for SMS PDU mode
Digits: 0-9	Digits: 0-9
'+'	0x91
'*'	'A'
'#'	'B'
'A'	'C'
'B'	'D'
'C'	'E'

Example:

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

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

AT+CSCA?
+CSCA: "*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?

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

OK

AT+CSCA?

+CSCA: "*A"C#",129

OK

AT+CMGW=

> 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

OK

AT+CMGR=17

+CMGR: 2,,13

0381AB1211640A8150224902450000A700 // SCA is set correctly only for current SMS but +CSCA setting didn't changed

OK

AT+CSCA?

+CSCA: "*A"C#",129 /SCA didn't change in storage

OK

7.1.5 +CSMP, Set Text Mode Parameters

This command is a basic command and is used to select values for additional parameters needed when SM is sent to the network or placed in storage when TEXT mode is selected.

Command	Syntax	Response/Action	Remarks
Set	+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	OK or: +CMS ERROR: <err>	The set command selects values for additional parameters needed when SM is sent to the network or placed in storage when text format message mode is

			selected.
Read	AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcs> OK	The read command returns the current parameters value.
Test	AT+ CSMP =?	OK	The test command just returns OK.

The following table shows the +CSMP parameters.

<Parameter>	Description
<fo>	first octet of GSM 03.40. in integer format. For details see +CMGW definitions. The default value at power-up is 17. (Message type is: SMS-SUBMIT and relative VP format).
<vp>	Validity Period. depending on SMS-SUBMIT <fo>, TP-Validity-Period-Format bits setting. If there is no correlation between the VPF and the VP value. an error message will be returned. Either in integer format (see Table) or in time-string format ("yy/MM/dd,hh:mm:ss±zz").
<pid>	Protocol-Identifier. The one octet information element by which the SM-TL either refers to the higher layer protocol being used, or indicates interworking with a certain type of telematic device. "0 - no interworking, SME-to-SME protocol (default) "Any value between 0-255 will be accepted. The SC may reject messages with a TP-Protocol-Identifier containing a reserved value or one, which is not supported.
<dcs>	One octet of Data Coding Scheme, indicates the data coding scheme of the DATA, and may indicate a message class. Note: For DCS expanded information, see section "DCS handling". default alphabet: 00xx00xx, 111 100xx, 1 101xxxx 8 bit data: 00xx01xx, 111101xx UCS2: 00xx10xx, 1110xxxx reserved: 00xx11xx, 0100xxxx-1011xxxx The default value at power-up is 0 - Default alphabet.

<Parameter>	Description
0 to 143	(TP-VP + 1) x 5 minutes (i.e. 5 minutes intervals up to 12 hours)
144 to 167	12 hours + ((TP-VP - 143) x 30 minutes)
168 to 196	(TP-VP - 166) x 1 day
197 to 255	(TP-VP - 192) x 1 week

Example:

AT+CSMP?
+CSMP: 17,167,0,0 (default values for SMS-SUBMIT)
OK
AT+CSMP= 1,256,0,0
+CMS ERROR: numeric parameter out of bounds
AT+CSMP=?
OK
AT+CSDH=1
OK
AT+CMGF=1
OK
AT+CMGW="15820447141"
> ABC (^Z)
+CMGW: 6
OK
AT+CMGR=6
+CMGR: "STO UNSENT","15820447141","",129,17,0,0,167,"+8613800755500",145,3
ABC
OK

7.1.6 +CSDH, Show Text Mode Parameters

This command controls whether detailed header information is shown in text mode result codes.

Command	Syntax	Response/Action	Remarks
Set	+CSDH=[<show>]	OK or: +CMS ERROR: <err>	The set command controls whether detailed header information is shown in text mode result codes.
Read	AT+CSDH?	+CSDH: (<show>)	The read command returns the current

		OK	<show> parameter value.
Test	AT+CSDH=?	+CSDH: (list of supported <show>s) OK	

The following table shows the +CSDH parameters.

<Parameter>	Description
<show>	0 - Means do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) 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

7.1.7 +CNMI, New Message Indications to Terminal

This command handles enabling of unsolicited notifications to the terminal when an SM is received by the G620.

After sending an unsolicited response to the TE, the G620 will expect a +CNMA (new message acknowl ment) from the TE within a predefined timeout of 60 seconds. The G620 will not send another unsolicited

response to the TE before the previous one is acknowl d. If acknowl d within the timeout, the new SM is not saved in the message storage. If not, the new SM is saved in the message storage and +CNMI parameters are set to 0.

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

The following table shows the +CNMI parameters.

<Parameter>		Description
<mode>	0	buffer unsolicited result codes in the TA; if the TA buffer is full, the oldest indication may be discarded and replaced with the new received indications (ring buffer).
	1	discard indication and reject new received message unsolicited result codes when TA-TE link is reserved; otherwise forward them directly to the terminal.
	2	buffer unsolicited result codes in the TA when the serial link is busy (e.g. data-transfer); otherwise forward them directly to the terminal.
	3	Forward unsolicited result codes directly to the terminal. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode; dies value is not support.
<mt>	0	No SMS-DELIVER indications are routed to the terminal (default)
	1	If SMS-DELIVER is stored in the G620, the memory location indication is routed to the terminal using the unsolicited result code: +CMTI: <mem>,<index>

	2	SMS-DELIVER (except class2 SMS) are routed directly to the TE using the unsolicited result code: +CMT: [<alpha],<length><CR><LF><pdu> (in PDU mode) or +CMT: <oa> [,<alpha>] ,<scts>[,<tooa>,<fo>,<pid>,<dcs>, <sca> ,<tosca> ,<length>]<CR><LF> If ME has its own display device then class 0 SMS and SMS in the message waiting indication group (discard message) may be copied to both ME display and to terminal. In this case ME shall send the acknowl ment to the network. Class 2 SMSs and messages in the message waiting indication group (storage message) result in indication as defined in <mt>=1
	3	Class 3 SMS-DELIVERs are routed directly to terminal using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.
<bm>	0	No CBM indications are routed to the terminal (default)
	1	if CBM is stored in RAM/NVRAM by ATC/DR, an indication of memory location is routed to DTE unsolicited result code +CBMI: <mem>,<index>
	2	new CBMs are routed directly to the terminal using unsolicited result code: +CBM: <length><CR><LF><pdu (when PDU-mode enabled> or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>
	3	Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1.
<ds>	0	No SMS-STATUS-REPORT indications are routed to the terminal (default)
	1	SMS-STATUS-REPORT is routed directly to the terminal
	2	If SMS-STATUS-REPORT is stored in the G620, the memory locationindication is routed to the terminal using the unsolicited result code: +CDSI: <mem>,<index>
<bfr>	0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes).
	1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1. ..3 is entered.

Example:

AT+CNMI=?

+CNMI: (0-3),(0-3),(0-3),(0-2),(0-1)

```
OK
AT+CNMI?
+CNMI: 0,0,0,0
OK
AT+CNMI=3,1
OK
AT+CMSS=142,"0544565034"    // send to myself
+CMSS: 72
OK
+CMTI: "SM",15
AT+CNMI=1,2
OK
AT+CSDH=1
OK
AT+CMSS=142,"054565034"     // send to myself
+CMSS: 73
OK
+CMT: "+972544565034",,"04/11/04,09: 48: 36+08",145,4,0,0,"+97254120032",145,3
ABC
AT+CSMP=49,167       /*Set first octet to status report - see status report parameters in CMGW*/
OK
AT+CSMP?
+CSMP: 49,167,0,0
OK
AT+CNMI=1,,,1
OK
AT+CNMI?
+CNMI: 1,0,0,1,0
OK
AT+CNMI=1,0,0,1,0
OK
AT+CMGS="0524680592"
> HELLO
+CMGS: 168
OK
+CDS: 6,168,"+972524680592",145,"05/08/02,15: 20: 12+08","05/08/02,15: 20: 14+08",0
AT+CNMI=1,0,0,2
OK
```

AT+CMSS=296

+CMSS: 185

OK

+CDSI: "SM",6

7.1.8 +CNMA, New Message Acknowledgment

This command acknowl s the receipt of a +CMT and +CDS response from the terminal to the G620. A +CMT response receipt confirms the correct reception of a new SMS-DELIVER message, which was routed directly to the terminal. A +CDS response receipt confirms the correct reception of a new SMS-STATUS-REPORT message, which was routed directly to the terminal.

When the G620 sends a +CDS response to the terminal, it waits a predefined timeout of 60 seconds for the +CNMA acknowledgment. The G620 will not send another +CDS result code to the terminal before the previous one is acknowl d, or the timeout expires.

When the G620 sends a +CMT response to the terminal, it waits a predefined timeout of 60 seconds for the +CNMA acknowledgment. The G620 will not send another +CMT result code to the terminal before the previous one is acknowl d, or the timeout expires.

Upon receipt of the +CNMA command, the G620 sends RP-ACK to the network. The acknowl d SM will not be saved in message storage.

If the G620 does not receive acknowledgment within the required time, it sends RP-ERROR to the network. The G620 automatically disables routing to the terminal by setting both <mt> and <ds> values of +CNMI to zero. The unacknowl d SM is saved in message storage.

If the command is executed but no acknowledgment is expected, or some other G620 related error occurs, the final result code +CMS ERROR: <err> is returned.

Note: AT+CNMA send acknowledgment to nework , Two conditions must be met AT+CSMS=1 command set <service> to 1, AT+CNMI=,2 command set <mt> to 2 or AT+CNMI=,,1 command set <ds> to 1. After the two conditions are met ,If AT+CNMA don't send acknowliagement to network after receiver a SMS, AT+CNMI command's parameters will be reset to zero,and receive SMS will be problem.

Command	Syntax	Response/Action	Remarks
Set	AT+CNMA	OK or: +CMS ERROR: <err>	
Read			The Read command for +CNMA is not defined by ETSI, and therefore is not supported by the G620. The G620 returns an error.
Test			The Test command for +CNMA is not defined by ETSI, and therefore is not supported by the G620. The G620 returns an error.

Example:

AT+CNMI=3,2

OK

AT+CMSS=142,"054565132" // send to myself

+CMSS: 74

OK

+CMT: "+97254565132",,"03/04/09,17: 14: 33+08"

new message text

AT+CNMA

OK

AT+CNMI?

+CNMI: 3,2,0,0

OK

AT+CNMI=1,0,0,1

OK

AT+CSMP=49,167

OK

AT+CSMP?

+CSMP: 49,167,0,0

OK

AT+CNMI?

+CNMI: 1,0,0,1,0

OK

AT+CMSS=295

+CMSS: 184

OK

+CDS: 6,184,"+972524680592",145,"05/08/02,17: 19: 23+08","05/08/02,17: 19: 24+08",0

AT+CNMA

OK

AT+CNMI?

+CNMI: 1,0,0,1,0

OK

7.1.9 +CMTI, Unsolicited Response (New SMS-DELIVER Receipt Indication)

The +CMTI unsolicited response is sent to the TE upon receipt of a new SMS-DELIVER SM, if the +CNMI parameter <mt> is set to 1. Refer to "+CNMI, New Message Indications to Terminal".

This unsolicited message indicates that a new SMS-DELIVER message was received, and is stored in location <index>:

+CMTI: <mem>,<index>

The following table shows the +CMTI parameters.

<Parameter>	Description
<mem>	Message memory space. "SM" - SIM memory storage.
<index>	Location of the new message.

Example:

AT+CNMI=3,1
OK
AT+CMGS=1 8 //send to my self
> 07917952120100951100 0c91795242865029 0004AA0441424344
+CMGS: 69
OK
+CMTI: "SM",4

7.1.10 +CMT, Unsolicited Response (New SMS-DELIVER Receipt)

The +CMT unsolicited response is sent to the TE upon receipt of a new SMS-DELIVER SM if the +CNMI parameter <mt> is set to 2. Refer to "+CNMI, New Message Indications to Terminal".

This unsolicited message displays the received SMS-DELIVER message:

In text mode: (+CMGF=1):

+CMT: <oa>,<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>] <CR><LF><data>

(about parameters in italics, refer command Show Text Mode Parameters +CSDH).

In PDU mode: (+CMGF=0):

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

The following table shows the +CMT parameters.

<Parameter>	Description
<oa>	Message origination address.

<scts>	Service center time stamp.
<toda>	Type of origination address
<fo>	First octet of the SM
<pid>	Protocol Identifier
<dcs>	Data Coding Scheme
<sca>	Service Center Address
<tosca>	Type of Service Center Address
<data>	Message contents.
<alpha>	Alpha ID of message.
<length>	In PDU mode: Size of message, in octets, excluding SMSC data. In TEXT mode: number of characters included in the <data>
<pdu>	Message header and contents in PDU mode format. See description in "+CMGR, Read Message".

After sending a +CMT unsolicited response to the TE, the G620 will expect a +CNMA (new message acknowl ment) from the TE within a predefined timeout of 60 seconds. The G620 will not send another +CMT unsolicited response to the TE before the previous one is acknowl d. If the +CMT is acknowl d within the timeout, the new SM is not saved in the message storage. If the +CMT is not acknowl d and the timeout has expired, the new SM is saved in the message storage and +CNMI parameter <mt> is set to 0.

Example:

AT+CNMI=1,2
OK AT+CSDH=1
OK
AT+CMSS=142,"054565034" // send to myself
+CMSS: 74
OK
+CMT: "+972544565034",,"04/11/04,09: 48: 36+08",145,4,0,0,"+97254120032",145,3
ABC
AT+CNMA
OK
AT+CMGF=0
OK
AT+CMGS=18 // send to myself
> 07917952120100951100 0c91795244650543000 4AA0441424344
+CMGS: 70
OK

+CMT: ,23

07917952120100950 40C91795244650543000450203211543080044142 4344

7.1.11 +CBM, Unsolicited Response (New CB Message Receipt)

The +CBM unsolicited response is sent to the TE upon receipt of a new cell broadcast message if +CNMI parameter <bm> is set to 2. Refer to "+CNMI, New Message Indications to Terminal".

This unsolicited message displays the received CB message. The displayed CBM is not saved in message storage.

Unsolicited Response

In text mode: (+CMGF=1):

+CBM: <sn>,<mid>,<dcs>,<page>,<page><CR><LF><data>

In PDU mode: (+CMGF=0):

+CBM: <length><CR><LF><pdu>

The following table shows the +CBM parameters.

<Parameter>	Description
<sn>	Message serial number.
<mid>	Message ID.
<page>	Current page number.
<pages>	Total number of pages.
<data>	Message contents in text mode.
<length>	Size of message in PDU mode format, in octets.
<pdu>	Message header and contents in PDU mode format. See description in "+CMGR,, Read Message".

7.1.12 +CDSI, Unsolicited Response (New SMS-STATUS-REPORT Indication)

The +CDSI unsolicited response is sent to the TE upon receipt of a new SMS-STATUS-REPORT SM, if the +CNMI parameter <ds> is set to '2'.

This unsolicited message indicates that a new SMS-STATUS-REPORT message was received, and is stored in location <index>.

Unsolicited Response

+CDSI: <mem>,<index>

The following table shows the +CDSI parameters.

<Parameter>	Description
<mem>	Message memory space. "SM" - SIM memory storage.
<index>	Location of the new message.

Example:

```
AT+CMGF=1
OK
AT+CSMP=49,165    /*Set Message type to Status Report, see +CMGW*/
OK
AT+CSMP?
+CSMP: 49,167,0,0
OK
AT+CNMI=1,0,0,2
OK
AT+CMGS="052468000"
> Hello
+CMGS: 188
OK
+CDSI: "SM",14
```

7.1.13 +CDS, Unsolicited Response (New SMS-STATUS-REPORT Receipt)

The +CDS unsolicited response is sent to the TE upon receipt of a new mobile-terminated SM if the +CNMI parameter <ds> is set to '1'.

This unsolicited message displays the received SMS-DELIVER message.

Unsolicited Response

In text mode: (+CMGF=1):

+CDS: <fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st><CR><LF>

In PDU mode: (+CMGF=0):

+CDS: <length><CR><LF><pdu>

The following table shows the +CDS parameters.

<Parameter>	Description
<fo>	First octet of the SM
<mr>	Message Reference

<ra>	Message Recipient address
<tora>	Type of Recipient address
<scts>	Service center time stamp
<dt>	Discharge-Time
<st>	Status

After sending a +CDS unsolicited response to the TE, the G620 will expect a +CNMA (new message acknowl ment) from the TE within a predefined timeout of 60 seconds. The G620 will not send another +CDS unsolicited response to the TE before the previous one is acknowl d. If the +CDS is acknowl d within the timeout, the new SM is not saved in the message storage. If the +CDS is not acknowl d and the timeout has expired, the new SM is saved in the message storage and +CNMI parameter <ds> is set to '0'.

Example:

AT+CMGF=1
OK
AT+CSMP=49,167
OK
AT+CSMP?
+CSMP: 49,167,0,0
OK
AT+CNMI=1,0,0,1
OK
AT+CMGS="052468000"
> Hello
+CMGS: 187
OK
+CDS: 6,187,"+97252468000",145,"05/08/03,08: 56: 34+08","05/08/03,08: 56: 34+08",70
AT+CNMA
OK

7.1.14 +CMGL, +MMGL, List Messages

These commands display a list of all SMs with the status value <stat>, from the G620 message storage <mem1> (selected using the +CPMS command). The command returns a series of responses, one per message, each containing the message index, status, and data. If the status of a message is "RECEIVED UNREAD", execution of the +CMGL command changes the status of the message to "RECEIVED READ".

The +MMGL command does not change the message status. In addition, +MMGL includes a <stat>

selection that can be used to query the G620 for a list of message headers without attendant message data.

Command	Syntax	Response/Action	Remarks
Set	+CMGL[=<stat>] or +MMGL[=<stat>]	If text mode (+CMGF=1) command execution is successful and SMS-SUBMITs and/or SMS-DELIVERs: +CMGL: <index>,<stat>,<oa/da>[,<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>[,,<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]] The parameters <tooa/toda>,<length> refer command shows the Text Mode Parameters +CSDH and will be shown according to +CSDH settings. If text mode (+CMGF=1) command execution is successful and SMS-COMMANDs: +CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<ct>[...]] If text mode (+CMGF=1), command execution is successful and CBM storage: +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]] If text mode (+CMGF=1) command execution is successful and SMS-STATUS_REPORTs: +CMGL: <index>,<stat>,<fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st>[...]] In PDU mode (+CMGF=0): +CMGL: <index>,<stat>[,<alpha>],<length><CR><LF><pdu>[<CR><LF>	

		+CMGL: <index>,<stat>[,<alpha>],<length><CR><LF><pdu>[…]] Or +CMS ERROR: <err>	
Test	+CMGL=? +MMGL=?	+CMGL: (list of supported <stat>s) +MMGL: (list of supported <stat>s)	The Test command lists all the supported <stats>

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

<Parameter>	Description
<index>	1-352 Index of message in storage.
<stat>	Status of message in memory: 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) For fault tolerance,Two mode can be trade off
<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, Read Message".
<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
<scts>	Service center time stamp
<ct>	Command type
<sn>	Message serial number
<mid>	Message ID
<page>	Current page number

<pages>	Total number of pages
<dt>	Discharge-Time
<st>	Status

Example:

AT+CMGL=?
+CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL")
OK
AT+MMGL=?
+MMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL","HEADER ONLY")
OK
AT+CPMS="SM" // read messages from SIM.
+CPMS: 2,20,11,61,2,20
OK
AT+MMGL // read "rec-unread" messages without changing message stat
+MMGL: 1,"REC UNREAD","+972544565034",,"05/01/01,09: 21 : 22+08"
message text
OK
AT+CMGL // read "rec-unread" messages with changing message stat
+CMGL: 1,"REC UNREAD","+972544565034",,"05/01/01,09: 21 : 22+08"
message text
OK
AT+CMGL
OK // the message stat was changed. No "rec-unread" messages.
AT+CPMS="ME"
+CPMS: 11,61,11,61,2,20
OK
AT+CMGL="sto sent"
+CMGL: 142,"STO SENT","054565034",,
message text
OK
AT+CSDH=1
OK
AT+CMGL="STO SENT"
+CMGL: 142,"STO SENT","054565034",,,81,<message length>
message text

OK

AT+CMGS=18 //send to myself

> 07917952120100951100 0c91795244650543000 4AA0441424344

+CMGS: 68

OK

AT+CPMS="sm" // change to SIM to read the incoming messages

+CPMS: 2,20,11,61,2,20

OK

AT+MMGL

+MMGL: 2,0,,23

07917952120100950 40C91795244650543000450203211434080044142 4344

OK

7.1.15 +CMGR, Read Message

These commands handle the reading of SMs. The command displays the message in location <index> of the preferred message storage <mem1> (selected using the +CPMS command). If the status of the message is "RECEIVED UNREAD", the +CMGR command changes the status to "RECEIVED READ".

Command	Syntax	Response/Action	Remarks
Set	+CMGR=<index>	If text mode (+CMGF=1) command execution is successful and SMS-DELIVER: +CMGR: <stat>,<oa>[,<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<lengt h>]<CR><LF><data> If text mode (+CMGF=1) command execution is successful and SMS-SUBMIT: +CMGR: <stat>,<da>[,<alpha>][,<toda>,<fo>,<pid>,<dcs>[,<vp>],<sca>,<tosca>,<length>]<CR><LF><data> If text mode (+CMGF=1) command execution is successful and SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>[,<pid>[,<mn>][,<da>][,<toda>],<length><CR><LF><cdata>] If text mode (+CMGF=1) command execution is successful and CBM storage: +CMGR:	The Set command reads the SM located at <index> in the G620 message storage and displays it

		<stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> If text mode (+CMGF=1) command execution is successful and SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st> If PDU mode (+CMGF=0) and command execution is successful: +CMGR: <stat>[,<alpha>],<length><CR><LF><pdu> otherwise: +CMS ERROR: <err>	

The following table shows the +CMGR parameters.

<Parameter>	Description
<index>	1-352 Index in storage of the message. to be retrieved.
<stat>	Status of message in memory: PDU mode / Text mode / Description 0 / "REC UNREAD" / Received unread messages 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 table 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 Identifer
<dcs>	Data Coding Scheme
<sca>	Service Center Address
<tosca>	Type of Service Center Address

<vp>	Validity Period. Either in integer format or in time-string format ("yy/MM/dd,hh: mm: ss±zz")
<mr>	Message reference
<scts>	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

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.	1 BYTE
<TP-OA>	Originating 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-SCTS>	The TP-Service-Center-Time- Stamp field is given in semi-octet	7 BYTE

	representation, and represents the local time as described in GSM03.40	
<TP-UDL>	User data length	1 BYTE
<TP-UD>	User data	0-140 BYTES

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

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

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.	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 fieldis given in semi-octet representation, and represents the local time as described in GSM03.40	7 BYTE
<TP-DT>	Mandatory: Discharge-Time of <TP-ST>, is given in semioctet representation, and represents the local time as described in GSM03.40	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.	1 BYTE
<TP-PID>	Optional: Protocol-Identifier. Values between 0-255.	1 BYTE
<TP-DCS>	Optional: Data Coding Scheme. Values between 0-255.	1 BYTE
<TP-UDL>	Optional: User data length	1 BYTE
<TP-UD>	Optional: User data	131 BYTES

Note:

- Any unused bits will be set to zero by the sending entity and will be ignored by the receiving entity.
- The maximum guaranteed length of TP-UD is 131 octets. In order to achieve the maximum octet of 143, the TP-RA field must have a length of two octets and TP-PID and TP-DCS must not be present.
- TP-PI is Mandatory if any of the optional parameters following TP-PI is present, otherwise optional.

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

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.

Example:

AT+CPMS?

+CPMS: "SM",13,50,"SM",13,50,"SM",13,50

OK

AT+CMGR=1

+CMS ERROR: invalid index

AT+CMGR=142

+CMGR: "STO SENT","054565034",

message text

OK

AT+CSDH=1

OK

AT+CMGR=142

+CMGR: "STO SENT","054565034",,129,25,0,0,"05/04/03,21 : 22: 23+08","+ 97254120032",145,<message length>

message text

OK

AT+CMGW=18

> 07917952120100951100 0c91795242865029000 4AA0441424344

+CMGW: 143

OK

AT+CMGR=143

+CMGR: 2,,23

07917952120100950 40C91795242865029000450203211020180044 1424344

OK

AT+CPMS="SM" // change to SM to read SMS-DELIVER messages.

+CPMS: 2,20,11,61,2,20

OK

AT+CMGR=1

+CMGR: "REC READ","+972544565034",,"05/02/23,11 : 20: 10+08",145,4,0,4,"+97254120032",145,4 41424344

OK

AT+CMGF=0

OK

AT+CMGR=1

+CMGR: 0,,23

0791 07917952140230F2040C91795244650543000450203211020180044 1424344

OK

AT+CMGR=14

+CMGR: 0,,25

07917952120100950 6BC0B917952428600F0508030807512805080308075128046

// SMS-STATUS-REPORT message in PDU mode

OK

AT+CMGF=1

OK

AT+CMGR=14 // SMS-STATUS-REPORT message in Text mode

+CMGR: "REC READ",6,188,"+97252468000",145,"05/08/03,08: 57: 21+08","05/08/03,08: 57: 21+08",70

OK

7.1.16 +CMSS, Send Message From Storage

This command sends a pre-stored message, written previously using the +CMGW command. The <da>, <toda> parameters are optional. If a DA is given, the message is sent to that address. Otherwise the message is sent to the DA it was stored with (if any was entered). If no DA is found, an error occurs.

When the given index is an incoming message index the header settings will be as follows:

- <first-octet> will be SMS-SUBMIT and VPF - relative.
- The TP-RP and TP-UDHI settings will be taken from the incoming message's first octet.
- <vp> - will be set to the default value -167 - as defined in 03.40.
- <sca>,<tosca>, <pid> and <dcs> will be set according the incoming message parameters.
- If <da> and/or <toda> are not given by the command, the <oa> and <tooa> will be set instead.

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

The following table shows the +CMSS parameters.

<Parameter>	Description
<index>	1-352 Index in storage of the message to be sent.
<da>	Destination address in quoted string. This field contains a single phone number.
<toda>	Type of DA. Value between 128-255 (according to GSM 03.40, 9.1.2.5). If this field is not given and first character of <da> is '+' , <toda> 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 G620 before G620 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 G620. If after aborting AT+CMSS command execution and before result of operation was reported by G620, a second AT+CMSS command is executed, then the result of the second AT+CMSS operation only will be reported by G620.

7.1.17 +CMGW, Write Message to Memory

This command is used to write and save a message to <mem2>. The message is saved in memory, and the message index is displayed to the user.

By default, messages are saved with the status of "STO UNSENT", but status "STO SENT" can be applied using the <stat> parameter.

In TEXT mode, the header parameters will be set according to CSMP settings.

Command	Syntax	Response/Action	Remarks
Set	If text mode (+CMGF=1): +CMGW[=<da>[,<toda>[,<stat>]]]<CR>text is entered<ctrl-Z/ESC> if PDU mode (+CMGF=0): +CMGW=<length>[,<stat>]<CR> PDU is given<ctrl-Z/ESC>	+CMGW: <index> or: +CMS ERROR: <err>	The Set command writes a message and stores it.

The following table shows the +CMGW parameters. Layout of SMS-SUBMIT in PDU Mode: (according to GSM03.40)

<Parameter>	Description
<da>	Destination address in quoted string. This field contains a single phone number.
<toda>	Type of DA. Value between 128-255 (according to GSM 03.40, 9.1.2.5). If this field is not given and first character of <da> is '+' , <toda> will be 145, otherwise 129.
<stat>	Status of new message In text mode: “STO UNSENT” (default) or “STO SENT” In PDU mode: 2 (default)

	or 3
<length>	Size of message in PDU mode format, in octects, excluding SMSC data.
<index>	1-352 Index in storage of the stored message.
<PDU>	Message header and contents in PDU mode format. See description in the tables below.

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

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.	1 BYTE
<TP-MR>	Message Reference. An integer representation of a reference number of the SM submitted to the SC by the MS.	1 BYTE

	Values between 0-255.	
<TP-PID>	Protocol-Identifier. Values between 0-255.	1 BYTE
<TP-CT>	Command Type	1 BYTE
<TP-MN>	Message Number	1 BYTE
<TP-DA>	Destination address formatted according to the formatting rules of address fields.	2-12 BYTES

Reference	Description	Length
<TP-CDL>	Command data length	1 BYTE
<TP-CD>	Command data	0-156 BYTES

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 MS-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

Bit/s	Reference	Description
0-1	Message-Type-Indicator	Parameter describing the message type. 1 0 SMS-COMMAND (in the direction MS to SC)
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

Note: Any unused bits will be set to 0.

If AT+CSCS="HEX" , the DATA saved by CMGW is not that was entered.

Example:

AT+CMGF=1
OK
AT+CMGW="5124335432"
>This is the message body <CTRL+Z> //<CTRL+Z> ends the prompt text mode and returns to regular AT command mode
+CMGW: 126
OK
AT+CMGW
> TEST <CTRL+Z>
+CMGW: 195
OK

AT+CMGF=0

OK

AT+CMGW=24

>07917952120100951 1FF0B917962543940F20008001400410042004300440045 <CTRL+Z>

+CMGW: 128

OK

AT+CMGR=128

+CMGR: 2,,24

07917952120100951 1FF0B917962543940F20008001400410042004300440045

OK

AT+CMGF=1

OK

AT+CSDH=1

OK

AT+CMGR=128

+CMGR: "STO UNSENT", "+97264593042",,145,17,0,8,0,"+972521100059",145,5

0041004200430044 0045

OK

AT+CSMP=25,"05/03/15,21 : 22: 23+08",0,0

OK

AT+CMGW="0544565034"

A<CTRL+Z>

+CMGW: 129

OK

AT+CMGR=129

+CMGR: "STO UNSENT", "0544565034",,129,25,0,0,"05/03/15,21 : 22: 23+08""+972521100059",145,1

OK

AT+CMGF=0

OK

AT+CMGR=129

+CMGR: 2,,20

07917952120100951 9FF0A8150446505430000503051122232800141

AT+CMGW=18

> 0011000c917952428650290004AA0441424344 // SCA is not given

+CMGW: 130

OK

AT+CMGR=130

+CMGR: 2,,18

079179521201009511000C917952428650290004AA0441424344

OK

AT+CMGW=19

> 079179521201009511000c917952428650290004AA0441424344 //Invalid length (19)

+CMS ERROR: invalid PDU mode parameter

AT+CMGW=19

> 079179521201009511000c917952428650290004AA044142434477 //UDL is not equal to UD length

+CMS ERROR: invalid PDU mode parameter

AT+CMGW=17

> 079179521201009501000c9179524286502900040441424344 //No VP in PDU message

+CMGW: 131

OK

AT+CMGR=131

+CMGR: 2,,17

079179521201009501000C9179524286502900040441424344

OK

AT+CMGW=14

> 07917952140230F212000000000c9179524286502900 //SMS Command

+CMGW: 132

OK

AT+CMGR=132

+CMGR: 2,,14

07917952140230F212000000000C9179524286502900

OK

AT+CMGF=1

OK

AT+CMGR=132

+CMGR: "STO UNSENT",18,0,0,0,"+972524680592",145,0

OK

7.1.18 +CMGD, Delete Message

This command handles deletion of a single message from memory location <index>, or multiple messages according to <delflag>. If the optional parameter <delflag> is entered, and is greater than 0, the <index> parameter is practically ignored. If deletion fails, result code +CMS ERROR: <err> is returned.

Note: The deletion of multiple commands is a time-consuming process that may require more than 60 seconds completing.

Command	Syntax	Response/Action	Remarks
Set	+CMGD=<index>[,<delflag>]	OK or: +CMS ERROR: <err>	
Read			The Read command for +CMGD is not defined by ETSI, and therefore is not supported by the G620. The G620 returns an error.
Test	+CMGD=?	+CMGD: (list of valid<index>s), (list of valid<deflag>s)	The Test command displays the supported values of <n>.

The following table shows the +CMGD parameters.

<Parameter>	Description
<index>	1-352 Index in the SMS memory of the message to be deleted.
<delflag>	0 Deletes the message specified in <index> 1 Deletes all read messages 2 Deletes all read messages and sent MO messages 3 Deletes all read messages, sent and unsent MO messages 4 Deletes all messages

Example:

AT+CMGD=4

OK

AT+CMGD=1,3

OK

7.1.19 +CGSMS, Select Service for MO SMS Messages

This command handles the selection of the service or service preference used by the G620 to send mobile-originated SMS messages.

Note: The Set command selects the service or service preference used to send SMS messages. The value that is set is retained after a power cycle.

Command	Syntax	Response/Action	Remarks
Set	+CGSMS=[<service>]	OK +CME ERROR: <err>	The Set command selects the service or service preference used to send SMS messages. The value that is set is

			retained after a power cycle.
Read	+CGSMS?	+CGSMS: <service> OK	The Read command displays the current SMS service preference setting.
Test	+CGSMS=?	+CGSMS: (list of currently available <service>s) OK	The Test command displays a list of currently available <service>s on the network.

The following table shows the +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

7.1.20 +CMGS, Send SM to Network

This command sends an SM from the G620 to the network. The message reference value <mr> is returned to the G620 upon successful delivery of the message.

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

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

Command	Syntax	Response/Action	Remarks
Set	If text mode (+CMGF=1): +CMGS=<da>[,<toda>]<CR>text is	+CMGS: <mr> OK	The Set command validates the input parameters, sends the SM

	entered<ctrl-Z/ESC> If PDU mode (+CMGF=0): +CMGS=<length><CR> PDU is entered<ctrl-Z/ESC>	or: +CMGS ERROR: <err>	to network and reports the result of the operation to the G620.

The following table shows the +CMGS parameters.

<Parameter>	Description
<da>	Destination address in quoted string. This field contains a single MIN number.
<toda>	Type of DA. Value between 128-255 (according to GSM 03.40, 9.1.2.5). If this field is not given and first character of <da> is '+' , <toda> will be 145, otherwise 129.
<length>	Size of message in PDU mode format, in octets, excluding SMSC data.
<mr>	Sent message reference number.
PDU	Message header and contents in PDU mode format. See description in "+CMGW, Write Message to Memory".

Example:

AT+CMGS="064593042",129

>This is the message body <CTRL+Z> //<CTRL+Z> ends the prompt text mode and returns to regular AT command mode

OK

AT+CMGF=0

OK

AT+CMGS=24

>07917952120100951 1FF0B917962543940F20008001400410042004300440045 <CTRL+Z>

+CMGS: 128

OK

Note:

- Any character sent by TE to G620 before G620 has reported a result of AT+CMGS operation, will abort AT+CMGS command execution. However, if SMS was already sent to network and sending operation was successful, the result of operation "+CMGS <mr>" will be reported by G620.
- A flex dependant enhancement enables the reporting of numeric error code to TE, in case the sending operation has failed. The numeric error code will be reported in format: "+CMGS ERROR: <err>".
- If after aborting AT+CMGS command execution and before result of operation was reported by G620,

a second AT+CMGS command is executed, then the result of the second AT+CMGS operation only will be reported by G620.

- If AT+CSCS="HEX" , the SMS cannot be sent (CMGS).

7.1.21 +CSCB, Cell Broadcast Messages

This command handles the selection of cell broadcast message types and data coding schemes received by the G620.

Command	Syntax	Response/Action	Remarks
Set	+CSCB=[<mode>[,<mids>[,<dcss>]]]	If mode=0 and <mids>is not specified, then no channels are accepted, and the G620 channel/mid list is cleared. OK or: +CME ERROE: <err>	The Set command sets the cell broadcast message type and data coding scheme.
Read	+CSCB?	+CSCB: <mode>,<mids>,<dcss> OK	The Read command displays the current MID and DCS settings.
Test	+CSCB=?	+CSCB: (list of supported <mode>s) OK	The Test command displays the supported values of <mode>.

Note:

- The Channel and DCS list is saved to the SIM card.
- The maximum number of active channels is SIM dependent.
- The AT+CSCB set command is not available when the phone is either in "Emergency Only" or "No Service" status.

The following table shows the AT+CSCB parameters.

<Parameter>	Description
<mode>	The current broadcast message mode: 0 MIDs and DCSs accepted 1 MIDs and DCSs not accepted
<mids>	Cell broadcast message identifiers 0-65534
<dcss>	Cell broadcast message data coding schemes 0-255

Note:

- A combination of discrete values or intervals can be entered for <mids> and <dcss>, for example, "0,1,5,320-324,922".
- The default value for missing <mode> is 1.
- 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.
- The dcss specified refers to all incoming messages, and not only to mids specified in the same AT command.

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

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

OK

AT+CSCB?

+CSCB: 1,"4,6""","1"

OK

8 Access and security

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, for example, accessing phone book entries. However, the phone is still capable of sending asynchronous message events via AT responses, for example, incoming call notification.

8.1.1 A/, Repeat Last Command

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

Note: Only "AT" will not be repeated.

Command	Syntax	Response/Action
Execute	A/	Repeats last command Command "AT" will ignore

Example:

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

8.1.2 AT, Check AT Communication

This command only returns OK.

Command	Syntax	Response/Action
Execute	AT	OK

Example:

AT
OK

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

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.

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	Syntax	Response/Action	Remarks
Set	AT+CPIN=[<puk> or <pin>][,<new pin>]	OK or: +CME ERROR: <err>	The Set command sends the password to the G620 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 G620, 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	

The following table shows the +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

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

8.1.4 +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 (unblock CHV1) and PUK2 (unblock 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	Syntax	Response/Action	Remarks
Read	AT+TPIN?	+TPIN: <chv1>,	

		<unb1_chv1>,<chv2>,<unb1_chv2> or: +CME ERROR: <err>	

The following table shows the +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

8.1.5 +CPWD, Change Password

This command sets a new password for the facility lock. The password can only be changed once the required facility is enabled by the +CLCK command.

A password can be changed only if the provided password <oldpwd> has been verified. The entered password <newpwd> must also comply to the password rules. The facility value <fac> is not case-sensitive. In the password value, letters are not allowed.

Command	Syntax	Response/Action	Remarks
Set	AT+CPWD=<fac>,<oldpwd>,<newpwd>	OK or: +CME ERROR: <err>	The Set command sets a new password for the facility lock function, defined by the +CLCK command.
Read	AT+CPWD?	+CME ERROR: <err>	
Test	AT+CPWD=?	+CPWD: list of Supported (<fac>,<pwdlength>)s OK	The Test command returns a list of pairs which represent the available facilities, and the maximum length of their passwords.

		or: +CME ERROR: <err>	

The following table shows the +CPWD parameters.

<Parameter>	Description
<fac>	List of supported facilities. All the facility messages, except for SC and P2, are sent to the network. (The facilities are not case-sensitive.) SC SIM (lock SIM card) The SIM requests the password during G620 power-up and when this command is issued. 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) P2 SIM PIN2
<oldpwd>	String type, 4-8 character password specified for the facility from the G620 user interface.
<newpwd>	String type, 4-8 character new password specified by the user.
<pwd length>	Maximum length of the facmility password. Integer type.

Example:

AT+CPWD =?

+CPWD: ("SC",8),("AO",8),("OI",8),("OX",8),("AI",8),("IR",8),("AB",8),("AG",8), ("AC",8),("P2",8)

OK

AT+CPWD?

+CME ERROR: operation not supported

AT+CLCK="sc",1,"current pin password"

OK

AT+CPWD="sc","incorrect old password","new password"

+CME ERROR: incorrect password

AT+CLCK="sc",2

+CLCK: 0

OK

AT+CPWD="sc","old password","new password"

+CME ERROR: operation not allowed

AT+CLCK="fd",1,"current pin2 password"

AT+CPWD="p2","old password","new password"

OK

AT+CLCK="ai",2

+CLCK: 0,1

+CLCK: 0,2

+CLCK: 0,4

OK

AT+CLCK="ai",1,"correct password"

OK

AT+CLCK="ai",2

+CLCK: 1,1

+CLCK: 1,2

+CLCK: 1,4

OK

AT+CPWD="ai","old password","new password"

OK

8.1.6 +CLCK, Facility Lock

This command locks, unlocks or interrogates a G620 or a network facility <fac> (any kind of call barring program). A password is mandatory for performing locking and unlocking actions, but not for querying. The features of the G620 that are affected by this are the keypad power-up operation and fixed dialing list. When querying the status of a single call barring program <mode>=2, the <status> for each call type will be returned.

For <fac>="SC", SIM Card PIN setting and for <fac>="FD", SIM Fixed Dialing memory setting, the <class> is irrelevant (For more information about <class>, refer to the following table shows the +CLCK parameters.). The <passwd> for "SC" is SIM PIN, and for "FD" it is SIM PIN2.

Command	Syntax	Response/Action	Remarks
Set	+CLCK=<fac>,<mode>[,<passwd>[,<classx>]]	For <fac> where <class> is irrelevant(SC, FD): +CLCK=<fac>,2 +CLCK: <status> For <fac> with several supported	The Set command performs the specified <mode> action on the specified <fac>.

		<class>es: +CLCK=<fac>,2 +CLCK: <status>,<class1> [<CR><LF> +CLCK: <status>,<class2> […]] OK	
Read	+CLCK?	+CLCK: ERROR	
Test	+CLCK=?	+CLCK: (list of supported <fac>s)	The Test command returns the list of supported facilities.

The following table shows the +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 Personalisation
	PU	Network Subset Personalisation
	PP	Service Provider Personalisation
	PC	Corporate Personalisation
	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) 4 Fax (facsimile services) 8 SMS (Short Message Services) The default value is 7.
<status>	0 Inactive 1 Active

Example:

AT+CLCK=?

+CLCK: ("SC","AO","OI","OX","AI","IR","AB","AG","AC","FD")

OK

AT+CLCK="SC",2

+CLCK: 0

OK

AT+CLCK="SC",1

+CME ERROR: operation not allowed

AT+CLCK="SC",1,"incorrect password

+CME ERROR: incorrect password

AT+CLCK="SC",1,"correct password"

OK

(From now SIM Card is locked and PIN is requested on power up)

AT+CLCK="AB",0,"incorrect password"

+CME ERROR: incorrect password

AT+CLCK="IR",2

+CLCK: 0,1

+CLCK: 0,2

+CLCK: 0,4

+CLCK: 0,8

OK

AT+CLCK="IR",1,"correct password" //<classx> is defaulted to 7 when not specified

OK

AT+CLCK="IR",2

+CLCK: 1,1

+CLCK: 1,2

+CLCK: 1,4

+CLCK: 0,8

OK

AT+CLCK="OI",1,"correct password",3

OK

(Voice and data international calls barred, fax and SMS not barred.)

AT+CLCK="OI",2

+CLCK: 1,1

+CLCK: 1,2

+CLCK: 0,4

+CLCK: 0,8

OK

9 Network

9.1 Network Commands

9.1.1 +CSQ, Signal Strength

This command displays the received signal strength indication <rssi> and channel bit error rate <ber> from the G620.

Command	Syntax	Response/Action
Execute/Read	AT+CSQ AT+CSQ?	+CSQ: <rssi>,<ber> OK
Test	AT+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported <ber>s) OK

The following table shows the +CSQ parameters.

<Parameter>	Description
<rssi>	0 through 31- covers the range of -113 dbm (or less) to -5 1dbm (or greater) 99 Unknown or not detectable
<ber>	Channel bit error rate (in percent) 0-7 RXQUAL values in the GSM 05.08 table 99 Unknown or not detectable

Example:

AT+CSQ
+CSQ: 23,99
OK
AT+CSQ=?
+CSQ: (0-31,99),(0-7,99)
OK

9.1.2 +CRLP, Radio Link Protocol

This command displays the Radio Link Protocol parameters that are used when non-transparent data calls are originated.

Command	Syntax	Response/Action	Remarks
Set	+CRLP=[<iws>[,<mws>[,<T1>[,<N2>]]]]	OK or: +CME ERROR: <err>	The Set command enables you to change the RLP parameters.
Read	+CRLP?	+CRLP=<iws>,<mws>,<T1>,<N2> OK	
Test	+CRLP=?	+CRLP= (list of supported <iws>s),(list of supported <mws>s), (list of supported <T1>s), (list of supported<N2>s) OK	

The following table shows the +CRLP parameters.

<Parameter>	Description
<iws>	IWF to MS window size. 10-61. The default value is 61.
<mws>	MS to IWF window size. 10-61. The default value is 61.
<T1>	Acknowl ment timer T1. 39-255. The default value is 48.
<N2>	Retransmission attempts N2 in integer format (refer to GSM 04.22 [18] subclause5.4.3) The default value is 6.

Example:

AT+CRLP=?

+CRLP: (10-61),(10-61),(39-255),(1-255)

OK

AT+CRLP?

+CRLP: 61,61,48,6

OK

9.1.3 +CREG, Network Registration Status

Command	Syntax	Response/Action	Remarks
Set	AT+CREG=[<n>]	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	The Read command returns the status of the result code presentation and shows whether the network has currently indicated the registration of the G620. Location information elements <lac> and <ci> are returned only when <n>=2 and the G620 is registered in the network.
Test	AT+CREG=?	+CREG: (list of supported <n>s) OK	

The following table shows the +CREG parameters.

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

Example:

AT+CREG=?

+CREG: (0-2)

OK

AT+CREG?

+CREG: 0,1

OK

AT+CREG=2

OK

AT+CREG?

+CREG: 2,1,"27A0","0DE1"

OK

AT+CREG=1

OK

AT+CREG?

+CREG: 1,1

OK

AT+CREG=0

OK

9.1.4 +CGREG, GPRS Network Registration

Command	Syntax	Response/Action	Remarks
Set	AT+CGREG =<n>	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	The Read command returns the status of the result code presentation and shows whether the network has currently indicated the GPRS registration of the G620. Location information elements <lac> and <ci> are returned only when <n>=2 and the G620 is registered in the network.
Test	AT+CGREG =?	+CGREG: (list of supported <n>s) OK	The Test command displays the supported values of <n>.

The following table shows the +CGREG parameters.

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

Example:

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

9.1.5 +COPS, Operator Selection

This command enables accessories to access the network registration information, and the selection and registration of the GSM network operator. The G620 is registered in the Home network.

The Enhanced Operator Name String (EONS) feature enables the G620 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.

Command	Syntax	Response/Action	Remarks
Set	AT+COPS=[<mo de>[,<format> [,<oper>]]]	OK or: +CME ERROR: <err>	The Set command can force an attempt to select and register a specific GSM network operator. The <mode> selects whether this is done automatically by the G620, or whether the selection is forced to an operator <oper> (given in format <format>). If the selected operator is not available, no other operator is selected (except when the <mode> is set to 4). <mode>=2 forces an attempt to deregister from the network. <mode>=3 sets the operator format to all further Read commands (+COPS?) as well. The selected mode applies to future network registrations, for example, once you deregister from the network, the G620 remains unregistered until you select <mode>=0, <mode>=1, or <mode>=4
Read	AT+COPS?	+COPS: <mode>[,<format>,<oper>] OK or: +CME ERROR: <err>	The Read command returns the current mode and the currently selected operator.

Test	AT+COPS=?	+COPS: [list of supported (<stat>, long alpha numeric <oper>,short alphanumeric<oper>, numeric<oper>)] [,list of supported <mode>s,(list of supported<format>s)] OK	The Test command returns a list of quadruplets, each representing an operator present in the network. A quadruplet consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. If any of the formats are unavailable, there is an empty field. The list of operators is in the following order: home network, networks referenced in SIM or active application in the UICC (GSM or USIM) in the following order: HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks. After the operator list, the G30 returns lists of the supported <mode>s and <format>s. These lists are separated from the operator list by two commas.

The following table shows the +COPS parameters.

<Parameter>	Description
<format>	The operator format type: 0 Long alphanumeric 1 Short alphanumeric 2 Numeric The default value is 0.
<mode>	Determines whether what is displayed is defined by <oper>, or is done automatically by the G620. 0 Automatic (<oper> field is ignored) 1 Manual (<oper> field is present) 2 De-register from network 3 Set only <format> (<oper> field is ignored); used for Read command only, do not attempt registration/deregistration 4 Manual/automatic (<oper> field is present; if manual selection fails, use automatic mode) The default value is 0.

<stat>	0 Unknown 1 Available 2 Current 3 Forbidden
<oper>	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: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit2)(network code digit 1)

Example:

```
AT+COPS=?
+COPS: (2,"CHINA    MOBILE","CMCC","46000"),(3,"CHINA UNICOM","CHINA UNICOM","46001")
OK
 AT+COPS?
+COPS: 0,0,"CHINA    MOBILE"
OK
AT+COPS?
+COPS: 0,2,"46000"                    //Specific provider number
OK
AT+COPS=2
OK
AT+CREG=2
OK
AT+COPS=1,2,"46001"
ERROR
+CREG: 3
AT+COPS=4,2,"46001"
+CREG: 3
+CREG: 2
+CREG: 1,"27A0","0DEB"
```

OK

AT+COPS?

+COPS: 0,2,"46000"

OK

9.1.6 +CPOL, Preferred Operators

This command is used to edit the PLMN selector lists in the SIM card or active application in the UICC (GSM or USIM).

If no list has been previously selected, the EFPLMNwAcT - user controlled PLMN selector with Access Technology list, is the one accessed by default.

Command	Syntax	Response/Action	Remarks
Set	AT+CPOL=[<index>][,<format>[,<oper>]]	OK or: +CME ERROR: <err>	Note: In case the index already exists in the list, the new entry will erase the old one and replace it in the list. The G620 may also update this list automatically when new networks are selected.
Read	AT+CPOL?	+CPOL: <index1>,<format>,<oper1>[<CR><LF> +CPOL: <index2>,<format>,<oper2>[...]] OK or: +CME ERROR: <err>	
Test	AT+CPOL=?	+CPOL: (list of supported<index>s),(list of supported<format>s) OK or: +CME ERROR: <err> * Index range is SIM dependent	The Test command displays the entire index range supported by the SIM.

The following table shows the +CPOL parameters.

<Parameter>	Description
<indexn>	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
<oper>	Name of the network operator

Note1:

- 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.

Note2:

- 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 G620 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 G620 replaces the last entry with the new item.

Note3:

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

Note4:

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.

Note5:

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 G620 device not using this bits to get the best PLMN.

Example:

AT+CPOL=?

+CPOL: (001-032),(000-002)

OK

AT+CPOL?

+CPOL: 000,002,"42501"

OK

AT+CPOL=,0

OK

AT+CPOL?

+CPOL: 000,000,"IL ORANGE"

OK

AT+CPOL=?

+CPOL: (001-032),(000-002)

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

9.1.7 +CBAND, Change Radio Band

This command allows to switch from automatic band selection to selection of one or more (up to four) bands from the following:

- 850 MHz
- 900 MHz
- 1800 MHz
- 1900 MHz

Command	Syntax	Response/Action
Set	AT+CBAND=[<band_1>[,<band_2>[,<band_3>[,<band_4>]]]]	OK or CME ERROR: <err>

Read	AT+CBAND?	+CBAND: [<band_1>[,<band_2>[,<band_3>[,<band_4>]]]] OK
Test	AT+CBAND=?	+CBAND: (list of supported bands) OK

The following table shows the +CBAND parameters.

<Parameter>	Description	
<band_1> or <band_2> or <band_3> or <band_4>	0	Automatic band selection(entering every time possible,display improbable)
	850	Selection of 850 MHz band
	900	Selection of 900 MHz band
	1800	Selection of 1800 MHz band
	1900	Selection of 1900 MHz band

Example:

AT+CBAND?
+CBAND: 900,1800
OK
AT+CBAND=?
+CBAND: (0,900,1800)
OK
AT+CBAND=900
OK
AT+CBAND?
+CBAND: 900
OK

9.1.8 +MCELL, G620 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	Syntax	Response/Action	Remarks
Set	+MCELL=<mo	OK	The Set command will return "OK"

	de>, <screen_num>	or: +CME ERROR: <err>	only. The relevant <screen_info> will return back with +MCELL format few senconds later.
Read	+MCELL?	OK	The Read command just returns OK and does nothing.
Test	+MCELL=?	+MCELL: (list of supported <mode>s), (list of supported <screen_num>s) OK	The Test command returns the possible <mode> & <screen_num> values.

The following table shows the +MCELL parameters.

<Parameter>	Description
<mode>	0 One shot requested.
<screen_num>	The requested screen number - An integer number. 1 Serving Idle Information screen 2 Circuit Switched Serving Cell Information screen 3 Miscellaneous Information screen 4 Uplink Data Transfer screen 5 Downlink Data Transfer screen 6 Neighbor 1 Cell Information screen 7 Neighbor 2 Cell Information screen 8 Neighbor 3 Cell Information screen 9 Neighbor 4 Cell Information screen 10 Neighbor 5 Cell Information screen 11 Neighbor 6 Cell Information screen 12 Neighbor Cells Summary screen 13 Re-selection screen 14 Hopping Information screen 15 PDP1 Context Information screen 16 PDP2 Context Information screen 17 PDP3 Context Information screen 18 PDP4 Context Information screen 19 Serving Cell paging parameters 20 Optional SYSINFOs

9.1.9 +MCELL Indication

After AT+MCELL command, the information about the Cellular Network will return back by this +MCELL indication format few senconds later.

+MCELL: <screen_title><CR><LF><screen_info><CR><LF>

The following table shows the +MCELL parameters.

<Parameter>	Description
<screen_title>	The requested screen title is written on the first line of each screen.
<screen_info>	The requested screen information.

<screen title>	Description	<screen num>
Serving Idle/PI	Idle/Packet Idle mode; Serving Cell Information screen.	1
Serving CS/TBF	Circuit Switched mode; Serving Cell Information screen.	2
Serving Misc	Idle/Packet Idle mode; Miscellaneous Information screen.	3
Uplink Transfer	Dedicated/TBF modes; Uplink Data Transfer screen.	4
Downlink Transfer	Dedicated/TBF modes; Downlink Data Transfer screen.	5
Adjacent Cell x	Neighbor Cell Information screen. x - index cell.	6-11
Neighbors	Neighbor Cells Summary screen.	12
Reselection	Re-selection screen.	13
Hopping Info	Dedicated/TBF modes; Hopping Information screen.	14
PDP Context	PDP Context Information screen	15-18
GPRS-Parameters	Idle/Packet Idle mode; GPRS parameters.	19
SysInfos	Idle/Packet Idle mode; Optional SYSINFO.	20

Example:

AT+MCELL?

OK

AT+MCELL=?

+MCELL: 0,(1-20)

OK

AT+MCELL=0,3

OK

+MCELL:Serving Misc
(P)BCCH ARFCN:00536,BSIC:056,RxLev:037,Cell ID:03583,(PD)TCH
ARFCN:INVALID_ARFCN,Timeslot:00,CBA:000,CBQ:000,T3314:00

AT+MCELL=0,19
OK
+MCELL: GPRS-Parameters:
(P)BCCH ARFCN:00536,BSIC:056,RxLev:039,Cell ID:03583,(PD)TCH
ARFCN:INVALID_ARFCN,Timeslot:00,BS_PA_MFRMS:02,BS_AG_BLK_RES:01,BS_PAG_BLK_RES:
0,BS_PBCCH_BLOCKS:1

9.1.10 +MCI, G620 Cell Information

This command returns neighbor cell information. The command returns ARFCN, BSIC and RX level of serving and adjacent cells. In case G620 is registered, adjacent cells are from registered PLMN. In case G620 is in Emergency Mode, adjacent cells are physical neighbors. BSIC is displayed only in case SCH (Synchronization Channel) is decoded.

The parameter <enable_TA> determines whether <TA> will be reported by +MCI command. <TA> is defined for serving cell only. This value will be displayed only in Dedicated mode. The command output is <Filter>dependent. In case the command output should be filtered to include just cells of a specific GSM band (one or more) the filter parameter should be set accordingly. The filtering will apply to the neighbor's cells only – the serving cell info will always be returned.

Using the set command without a parameter will return output according to the currently set <Filter> value.

Command	Syntax	Response/Action	Remarks
Set Execute	AT+MCI=<Filter>[,<enable_TA>] or: AT+MCI	OK or: +CME ERROR: <err>	This command will return "OK" only. The neighbor cell information will return back with +MCI format few senconds later.
Read	AT+MCI?	+MCI: <Filter>, <enable_TA> OK	The Read command returns the current set <Filter> and <enable_TA> values.
Test	AT+MCI=?	+MCI: (List of supported <Filter>s), (Range of supported <enable TA>s)	The Test command returns the ranges of <Filter>'s supported values and <enable TA> supported values.

		OK	

The following table shows the +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.
<enable TA>	This parameter defines whether <TA> will be reported by +MCI command. Defined values: 0 - Do not report <TA> value. 1 - Report <TA> value. The default value is 0.

9.1.11 +MCI Indication

After AT+MCI command, the neighbor cell information will return back by this +MCI indication format few senconds later.

+MCI: <serving cell ARFCN>,<serving cell BSIC>,<signal strength>[,<TA>][,<neighbor 1ARFCN>[,<neighbor 1 BSIC>],<signal strength>[,<neighbor 2 ARFCN>[,<neighbor 2 BSIC>],<signal strength>[,<neighbor 3 ARFCN>[,<neighbor 3 BSIC>],<signal strength>[,<neighbor 4 ARFCN>[,<neighbor 4 BSIC>],<signal strength>[,<neighbor 5 ARFCN>[,<neighbor 5 BSIC>],<signal strength>[,<neighbor 6 ARFCN>[,<neighbor 6 BSIC>],<signal strength>]]]]]]

The following table shows the +MCI parameters.

<Parameter>	Description
<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: • 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.
<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.

9.1.12 +CA Indication

After AT+MCI command, the available ARFCN of cell allocation will return back by this +CA indication format few seconds later.

+CA: <Cell allocation 1>,<Cell allocation 2>,<Cell allocation 3>…

The following table shows the +CA parameters.

<Parameter>	Description
<Cell allocation 1>,<Cell allocation 2>,<Cell allocation 3>	Absolute Radio Frequency Channel Number Range: [1-124], [128-251], [512-885], [975-1023].

Example:

AT+MCI // Get the current serving and neighbour's info.

OK

+MCI: 58,48,-71, ,72,29,-70,522,47,-76,84,24,-77,68,42,-81,88,17,-82,86,42,-85

+CA: 7,12,29,37,41,44,47,58,73

10 Fax Class 2

The G620 supports the fax class2. It can be refer to related document.

11 Hardware Information

11.1 Hardware Information Commands

11.1.1 +CBC, Battery Charger Connection

This command enables a user to query the battery power level.

Command	Syntax	Response/Action
Read	+CBC	+CBC: <bcs>,<bcl> OK

The following table shows the +CBC parameters.

<Parameter>	Description
<bcs>	Battery status values 0 Battery powered 1 Externally powered - not implemented in G620 Note: The G620 input power source is connected via the battery pins only, so it is always battery powered.
<bcl>	VBAT voltage value, A decimal value represents the returned digital value. The input level multiplied by 1000.

Note: The G620 does not allow the detection of battery use. The power supply of the G620 is connected via the battery pins. However, users can use this command to verify the level of the G620 input power source.

Example:

AT+CBC

+CBC: 0,3802

OK

11.1.2 +CBAUD, Baud Rate Regulation

This command sets the uniquely UART baud rate. The baud rate of the G620 is changed/set to the request value <rate> written in the command.

Specifying a value of 0 or 9 allows operation only at rates automatically detectable by the G620. The specified rate takes effect following the issuing of any result code(s) associated with the current command line.

Note:

- ATZ command sets the G620 to default baud rate - Auto baud rate.
- After sent any AT command, the module will lock on single baud rate. Read command can feedback the currently baud rate.
- The module can not re-auto baud without send AT+CBAUD=0 or 9 command or re-power up.
- The parameter cann't saved after power up.

Command	Syntax	Response/Action
Set	+CBAUD=<n> +CBAUD=<rate>	OK or: +CME ERROR: <err>
Read	+CBAUD?	+CBAUD: <rate> OK
Test	+CBAUD=?	+CBAUD: (list of supported <n>s, list of supported <rate>s) OK

The following table shows the +CBAUD parameters.

<Parameter>	Description	
<n> <rate>	0	Auto baud rate
	2	1200
	3	2400
	4	4800
	5	9600
	6	19200
	7	38400
	8	57600
	9	Auto baud rate
	10	115200
	12	230400
	The default value is auto-baud rate.	

11.1.3 +IPR, Local Terminal Serial Port Rate

This command is responsible for setting and saving the request baud rate. This numeric extended-format parameter specifies the data rate at which the G620 accepts commands. Specifying a value of 9 disables the function and allows operation only at rates automatically detectable by the G620. The specified rate

takes effect following the issuing of any result code(s) associated with the current command line.

The <rate> value specified is the rate in bits per second at which the terminal-G620 interface operates, for example, 19200 or 115200. The rates supported by the G620 are manufacturer-specific. However, the +IPR parameter permits setting any rate supported by the G620 during online operation.

The UART is configured to rates of 1200, 4800, 9600, 19200, 38400, 57600, 115200, 230400 bits per second according to the parameters of the +IPR command.

Using AT+IPR=<rate> with a <rate> value other than 9 and 0 disables the auto baud rate detection feature. The entered baud rate is stored in the G620 and is restored after power up. The G620 supports up to 57600 auto baud.

Note:

- +IPR is similar to +CBAUD, but with the ability to save.
- The baud rate after ATZ(or AT&F) is the last baud rate that was set by +IPR, or +CBAUD.

Command	Syntax	Response/Action
Set	+IPR=<n> +IPR=<rate>	OK or: +CME ERROR: <err>
Read	+IPR?	+IPR: <rate> OK
Test	+IPR=?	+IPR: (list of supported <rate>s), OK

Note: Read mode returns the current baud rate snd not the value that was set by Set Mode.

The following table shows the +IPR parameters.

<Parameter>	Description	
<n> <rate>	0	Auto baud rate
	1	600
	2	1200
	3	2400
	4	4800
	5	9600
	6	19200
	7	38400
	8	57600
	9	Auto baud rate
	10	115200

	11	300
	12	230400
	13	460800
	14	921600
	15	14400
	16	28800
	The default value is auto-baud rate.	

Example:

AT+IPR=6

OK

AT+IPR?

+IPR: 19200

OK

AT+IPR=?

+IPR: (0-16,300,600,1200,2400,4800,9600,14400,19200,28800,38400,57600,115200,

230400,460800,921600)

OK

11.1.4 +GCAP, Request Overall Capabilities

This command indicates the major capability areas of the G620. The support of different areas is presented in the response of the +GCAP command. Each area may be presented by the selection command name of a specific capability area.

Command	Response/Action
AT+GCAP Note: get the list of capabilities	+GCAP: +FCLASS, +CGSM OK or CME ERROR: unknown
Read command: AT+GCAP?	same as above
Test command : AT+GCAP=?	OK

11.1.5 &K, RTS/CTS Flow Control

This command configures the flow control. The RTS (Request To Send) is an input line. The RTS signal is

received from the terminal and a low condition indicates that the G620 can send more data. The CTS (Clear To Send) is an output line. The CTS signal is sent to the terminal and a low state indicates that more data can be sent to the G620.

The RTS and CTS together make up what is called RTS/CTS or "hardware" flow control. Both lines are used when "hardware flow control" is enabled in both the terminal and the G620 devices. When the terminal is ready and able to receive data, it puts the RTS line in an active (low) condition to indicate this to the G620. If the terminal is not able to receive data (typically because its receive buffer is almost full), it puts the RTS line in an inactive (high) condition as a signal to the G620 to stop sending data. When the terminal is ready to receive more data (for example, after data has been removed from its receive buffer), it places this line back in the active condition. The RTS line complements the CTS line. The G620 puts the CTS line in an active condition to tell the terminal that it is ready to receive the data. Likewise, if the G620 is unable to receive data, it places the CTS line in an inactive condition.

Command	Syntax	Response/Action
Set	AT&K<param>	OK or: +CME ERROR: <err>
Read	AT&K?	&K: <param> OK
Test	AT&K=?	&K: (list of supported <param>s) OK

The following table shows the &K parameters.

<Parameter>	Description
<param>	0 Disable all terminal/G620 flow control 3 Enable CTS/RTS terminal/G620 flow control 6 Enable CTS/RTS terminal/G620 flow control The default value is 0.

11.1.6 +IFC, RTS/CTS Flow Control

This parameter controls the operation of the local flow control between the terminal and the G620 during the data state when V.42 error control is used, or when fallback to non-error control mode is specified to include buffering and flow control. It accepts two numeric subparameters:

- <DCE_by_DTE>: Specifies the method to be used by the terminal to control the flow of received data from the G620.
- <DTE_by_DCE>: Specifies the method to be used by the G620 to control the flow of transmitted data from the terminal.

Command	Syntax	Response/Action
Set	AT+IFC=[<DCE_by_DTE>[, DTE_by_DCE]]	OK or: ERROR
Read	AT+IFC?	+IFC: <rate> OK
Test	AT+IFC=?	+IFC: (list of supported < DCE_by_DTE >s, list of supported < DTE_by_DCE >s) OK

The following table shows <DCE_by_DTE> and <DTE_by_DCE> parameters.

<Parameter>	Description
<DCE_by_DTE>	0 None 2 Circuit 133 (RTS)
<DTE_by_DCE>	0 None 2 Circuit 106 (CTS)

Example:

AT+IFC?
+IFC: 0,0
OK

AT+IFC=2,2
OK

11.1.7 &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 G620 (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 ON when +MDLC command has been launched.

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).

Note: If &C is set to 2 when a CSD call is set, DCD will always remain OFF.

Command	Syntax	Response/Action
Set	AT&C<param>	OK
Read	AT&C?	&C: <param>
Test	AT&C=?	&C: (list of supported <param>s)

The following table shows the &C parameters.

<Parameter>	Description
<param>	DCD signal ON 0 DCD is forced ON at all times. 1 DCD is set to ON when: a A CSD carrier is detected. b A GPRS external session is being established: G620 enters PPP mode TE is about to send an LCP configure-request to the G620 (GPRS connection is not yet established). DCD is set to OFF when: a No CSD carrier is detected. This can happen when a CSD call As been disconnected or when G620 enters CSD online command mode (switch operation). b The G620 has lost its GPRS connection with the network (PDP context was deactivated and the IP address is cancelled). 2 DCD is set to ON when G620 establishes a GPRS connection with the network(PDP context is activated and the IP address is received from the network). DCD is set to OFF when G620 has lost its GPRS connection with the network(PDP context was deactivated and the IP address is cancelled).

	The default value is 1.

11.1.8 &D, Circuit 108 Behavior

This command determines how the G620 responds when the DTR (Data Terminal Ready) status is changed from ON to OFF during the online data state. The DTR is an input line that indicates that the terminal is ready.

The DTR line must be active (low) in order for the G620 to recognize the terminal. This signal is raised by the terminal when a process activates the serial port. If the DTR is not used by the application, it should connect this line to ground (DTR active). The default value is active (low).

In case of local link during initial PPP retries, DTR change will be ignored.

Command	Syntax	Response/Action
Set	AT&D<param>	OK
Read	AT&D?	&D: <param>
Test	AT&D=?	&D: (list of supported <param>s)

The following table shows the &D parameters.

<Parameter>	Description
<param>	The G620's reaction when the DTR status is changed from ON to OFF. In CSD calls: 0,4 Ignores DTR changes 1 Switches the CSD call to asynchronous command mode (the call remains connected) 2,3 Disconnects the call and returns to the command mode In GPRS calls: 0,4 Ignores DTR changes 1 Switches the GPRS session to asynchronous command mode (the session remains connected) 2,3 Deactivates the GPRS and returns to command mode In MUX and MUX_INIT state: 0-3 Ignores DTE changes 4 Drops the MUX application and returns to PRE_MUX state The default value is 2.

11.1.9 +CFUN, Shut Down Phone Functionality

It's important to define the module's status in works.

This command shuts down the phone functionality of smart phones and PDAs with phone capabilities in order to prevent interference from a nearby environment. This enables other functionality to continue to be used in environments where phone use is either impractical or not permitted. For example, on airplanes the use of cellular phones is forbidden during the entire flight, but the use of computers is allowed during much of the flight. This command enables other functionality to continue while preventing use of phone functionality.

Command	Syntax	Response/Action	Remarks
Set	+CFUN=<fun>	OK +CME ERROR: <err>	The Set command selects the level of functionality <fun> in the smart phone or PDA incorporating the G620.
Read	+CFUN?	+CFUN: <fun>, <STK_mode> OK	The Read command displays the current level of functionality.
Test	+CFUN=?	+CFUN: (list of supported <fun>s) OK	The Test command displays the list of supported functionality settings.

The following table shows the AT+CFUN parameters.

<Parameter>	Description
<fun>	Functionality levels: 0 Turn off (With logging out network). 1 Full functionality meaning start up MS(from offline mode) 4 Disables phone transmit & receive RF circuits. It need re-power up. 6 Enables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card. 7 Disables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card. 8 Disable fetching of proactive commands by SIM-APPL from the SIM-card. 15 Hardware reset. (Need re-turen on the module)
<STK_mode>	0 Inactive state 6 Enables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card. 7 Disables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card. 8 Disable fetching of proactive commands by SIM-APPL from the SIM-card.

Example:

AT+CFUN=?
+CFUN: (0,1,4,6,7,8,15)
OK
AT+CFUN?
+CFUN: 1,0
OK
AT+CFUN=4 //Disable phone transmit and receive RF circuits
OK
AT+CFUN?
+CFUN: 4
Power cycling…
AT+CFUN?
+CFUN: 4,0
AT+COPS?
+COPS: 2
OK
AT+CFUN=1 // Enable phone transmit and receive RF circuits through '1' OK
OK
AT+CFUN?
+CFUN: 1,0
OK
AT+COPS?
+COPS: 0,0,"CHINA MOBILE"
OK

11.1.10 +ICF, DTE-DCE Character Framing

This command determines the local serial port start/stop (asynchronous) character framing used by the DCE when accepting DTE commands and transmitting information text and result codes, whenever these are not done automatically. Auto detect framing is not supported.

Command	Syntax	Response/Action	Remarks
Set	+ICF=[<format>[,<parity>]]	OK +CME ERROR: <err>	The Set command determines the local serial port start/stop character framing.
Read	+ICF?	+ICF: <format>,<parity>	The Read command displays the

		+CME ERROR: <err>	currently selected character framing.
Test	+ICF=?	+ICF:(list of supported <format> values),(list of supported <parity> values) +CME ERROR: <err>	The Test command displays a list of supported <format> and <parity> values.

The following table shows the +ICF parameters.

<Parameter>	Description
<format>	Determines the number of bits in the data bits, the presence (or absence) of a parity bit, and the number of stop bits in the start/stop frame. 1 8 Data, 2 St–p - can be set only with <parity> 4 2 8 Data, 1 Parity, 1 St–p - can be set with <parity> of 0 or 1 3 8 Data, 1 Stop (defaul–) - can be set only with <parity> 4 7 8 Data, 1 Parity, 2 St–p - can be set with <parity> of 0 or 1
<parity>	Determines how the parity bit is generated and checked (if present). 0 Odd 1 Even 4 No parity (default)

Example:

AT+ICF?

+ICF: 3,4

OK

AT+ICF=?

+ICF: (1-3,7),(0,1,4)

OK

AT+ICF=3,1

OK

11.1.11 +MRST, Perform Hardware power down

The +MRST command enables customer software to perform a hardware power down to the G620 unit. This command provides a software power-off without network logging off.

Command	Syntax	Response/Action	Remarks
Set	+MRST	OK	The Set command performs a graceful hardware powerdown to the G620 module. Note: The Read and Test commands are not

			permitted for the +MRST command.

Example:

AT+MRST

OK

// Result - G620 module performs a power down

11.1.12 +MTSM, Temperature Sensor Measurement

This command measures the current temperature sensor value in Celsius degrees.

This temperature is taken from a Thermistor internally in Egold.

All the parameters are saved on the NVM, and used after power up.

All the parameter values should be 0 (zero) in first operation of the module.

Note: In case AT parameters are set and executed, and a reset or a power-cycle occurs, the G620 continues with the execution of the AT command using the saved parameters, until the user changes the settings.

Command	Syntax	Response/Action	Remarks
Set	+MTSM=<Report>[,<Rate>][,<Low>,<High>]	For <Report>=0 OK For <Report>=1 +MTSM: <Temp> OK For <Report>=2 or 3 OK +MTSM: <Temp> … +MTSM: <Temp> or: ERROR: <error code>	Read the temperature.
Read	+MTSM?	+MTSM=<Report>,<Rate>,<Low>,<High> OK	Read the setting parameters.
Test	+MTSM=?	+MTSM: (range of <Report>),(range of <Rate>),(range	

		of <Low>/<High>) OK	

The following table shows the +MTSM parameters.

<Parameter>	Description
<Temp>	-40 - 125; Temperature measurements in Celsius degrees.
<Report>	0; Deactivate unsolicited report. 1; Report once the current temperature. 2; Activate unsolicited report. 3; Activate unsolicited report only for out-off boundaries events.
<Rate>	1-255; Select the time interval in seconds between the unsolicited reports. (Default value = 1 Second).
<Low>	(-)–0 - 125; The lowest boundary level of the temperature value for unsolicited report. (Default value = 0 Celsius). Setting corresponding <Low> and <High> temperature boundaries for <Report>=3 only.
<High>	(-)–0 - 125; The Highest boundary level of the temperature value for unsolicited report. (Default value = 0 Celsius). Setting corresponding <Low> and <High> temperature boundaries for <Report>=3 only.

Example:

```
AT+MTSM=?                    // Test the range of the parameters.
+MTSM: (0-3),(1-255),(-40-125)
OK

AT+MTSM=1                    // Set to read for once the current temperature measurement.
+MTSM: 35            // Current temperature is +35 Celsius degree.
OK

AT+MTSM=2,5                  // Set to unsolicited temperature reports to TE for every 5 seconds.
OK
+MTSM: -10                   // Current temperature measure report -10 Celsius.
+MTSM: -5            // Unsolicited temperature report -5 Celsius after 5 seconds.
```

+MTSM: 7 / Unsolicited temperature measure report +7 Celsius after 10 seconds.

+MTSM: 20 // Unsolicited temperature measure report +20 Celsius after 15 seconds.

…

+MTSM: 50 // Unsolicited temperature measure report +50 Celsius after Nx5 seconds.

AT+MTSM=0 // Set to stop the unsolicited report.

OK

AT+MTSM=3,30,-10,40 // Set to out-off boundary (-10 to +40 Celsius) unsolicited reports for every 30 seconds.

OK

+MTSM: -20 // Unsolicited current report out-off the Low boundary.

+MTSM: -12 // Unsolicited report out-off the Low boundary after 30 seconds.

+MTSM: 47 // Unsolicited report out-off the High boundary after Nx30 seconds

AT+MTSM? // Read the current setting.

+MTSM: 3,30,-10,40

OK

AT+MTSM=0 // Set to stop the unsolicited report.

OK

AT+MTSM? // Read the current setting.

+MTSM: 0

OK

11.1.13 +WRIM, RI signal width setting

In IDLE Mode, G620's RI pin is High voltage level. When G620 receive a SMS or Call, This pin can output a Low voltage pulse. This command defines the width of pulse can be set.

Command	Syntax	Response/Action	Remarks
Set	+WRIM=<type>,<width>	OK or: ERROR	Set width
Read	+WRIM?	+WRIM: <type>,<width> OK or: ERROR	The read command returns the current parameter of RI pin.

Test	+WRIM=?	+WRIM: <type>,<width> OK or ERROR	The test command displays the list of supported <type> and <width> values.

The following table shows the +WRIM parameters.

<Parameter>	Description
< type >	0: make effective on Call 1: make effective on SMS
<width>	0: default value. // (0,1000) and (1,150) 1～2000: 1～2000ms

Example:

AT+WRIM=?

+WRIM: (0-1),(0-2000)

OK

AT+WRIM=1,1000

OK

AT+WRIM?

+WRIM: 0,1000

+WRIM: 1,1000

OK

12 Multiplexer Feature

The MUX provides multiple logical communication channels between the DTE and G620 over one physical RS232 connection. This service enables the DTE device to run multiple applications (such as GPRS, CSD, and SMS) while communicating simultaneously with the G620.

The G620 can be supports the multiplexing protocol control channel as defined in GSM07.10 and only basic mode.

Note: The TCP/IP stack AT command didn't support in MUX mode.

12.1 +CMUX, MUX Startup Command

This command is used to enable/disable the GSM MUX multiplexing protocol stack. When the G620 received a valid +CMUX command, it returns OK and changes its state to MUX-Init. If the parameters are left out, the default value is used.

Command	Syntax	Response/Action	Remarks
Set	+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]	+CME ERROR: <err>	The Set command requests the G620 to open the MUX stack with various parameters. This command works only in PREMUX state.
Read	+CMUX?	+CMUX: <mode>, [<subset>], <port_speed>,<N1>, <T1>, <N2>, <T2>, <T3>+CME ERROR: <err>	The Read command displays the current mode and settings. This command works only in MUX state.
Test	+CMUX=?	+CMUX: (list of supported <mode>s),(list of supported<subset>s),(list of supported <port_speed>s),(list ofsupported <N1>s),(list of supported <T1>s),(list ofsupported <N2>s),(list of supported <T2>s),(list ofsupported <T3>s),(list of supported <k>s)	The Test Command displays a list of supported modes and parameters. This command works in both PREMUX and MUX states.

The following table shows the +CMUX parameters.

<Parameter>	Description
<mode>	MUX mode: 0 Basic
<subset>	Defines how the MUX control channel is set up. The virtual channel is set up according to this setting. 0 UIH frames used only
<port_speed>	Transmission rate: 1 9600 bit/sec 2 19200 bit/sec 3 38400 bit/sec 4 57600 bit/sec 5 115200 bit/sec 6 230400 bit/sec
<N1>	Maximum frame size: 1—1509; The default value is 31 in Basic mode.
<T1>	Acknowl ment timer (in units of 10 ms). 1-255 The default value is 10 (100 ms)
<N2>	Maximum number of retransmissions. 0-5 The default value is 3.
<T2>	Response timer for the DLC0 (in unit of 10 ms). <T2> must be longer than <T1>. 2-255 The default value is 30 (300 ms).
<T3>	Wake up response timer (in seconds). 1-255 The default value is 10.
<k>	Reserve for Advanced operation with Error Recovery options.

13 GPRS

13.1 GPRS Functionality

GSM 07.07 defines commands that a TE may use to control a GPRS ME via a non-multiplexed character-stream interface. This places certain limitations on the functionality of the interface. For example, it is not possible for the ME to send control information to the TE or for the TE to send commands to the ME whilst the interface is in the online data state, unless the layer 2 protocol itself supports this feature (GSM 07.60-12). However, G620-specific escape mechanism (DTR) is provided to enable the TE to switch the G620 into limited online command state.

The use of a multiplexed interface, (GSM 07.10), is not considered here (See "RS232 Multiplexer Feature"). The G620-specific escape mechanism use DTR as an escape signal (following &D parameters) and designed for limited non network related commands. This specific mechanism purpose is to give the user a way to retrieve the signal strength. The time limit of consecutive DTR toggles is a minimum of 90 seconds. The G620-specific is not designed to support online command and data states both at the same time, therefore any wrong or extreme usage can cause unexpected behaviors. The basic GPRS concept is be "always connected" and there is no charge for being connected (only per real data transferred).

13.2 GPRS Commands

This section defines commands that a terminal may use to control a GPRS ME. GPRS MTs vary widely in functionality. A class A ME might support multiple PDP-types as well as circuit-switched data, and use multiple external networks QoS profiles. At the other extreme, a class C ME might support only a single PDP-type using a single external network, and rely on the HLR to contain the PDP context definition. A comprehensive set of GPRS-specific commands is defined below to provide the flexibility needed by the more complex ME. The commands are designed to be expandable to accommodate new PDP types and interface protocols, merely by defining new values for many of the parameters. Multiple contexts may be activated if the interface link-layer protocol is able to support them. The commands use the extended information and error message capabilities described in this specification. For MTs of intermediate complexity, most commands have simplified forms where certain parameters may be omitted. For the simplest MTs, and for backwards compatibility with existing communications software, it is possible to control access to the GPRS using existing modem-compatible commands. This "modem compatible" mode of operation is described below.

13.2.1 +CGCLASS, GPRS Mobile Station Class

This command is used to set the G620 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	Syntax	Response/Action	Remarks
Set	AT +CGCLASS=<class>	OK or: +CME ERROR: <err>	Set GPRS mobile class

Read	AT +CGCLASS?	+CGCLASS: <class> OK	The Read command returns the current GPRS mobile class.
Test	AT +CGCLASS=?	+CGCLASS: (list of supported <class>s) OK	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, G620 is equipped with a protection mechanism that confirms GPRS signal strength before issuing GPRS network-related commands.

The following table shows the +CGCLASS parameters.

<Parameter>	Description
<class>	String parameter that indicates the GPRS mobile class: B meaning mobile class B CC meaning mobile class CC,shut down GPRS function CG meaning mobile class CG shut down GSM function

Example:

AT+CGCLASS=?

+CGCLASS: (“B”,”CC”,”CG”)

OK

Note: If a SIM card without GPRS allowance is used:

AT+CGCLASS=?

+CGCLASS: (CC) //Note that CC is a not supported value.

13.2.2 +CGDCONT, Define PDP Context

This command specifies the PDP (Packet Data Protocol) context.

Command	Syntax	Response/Action	Remarks
Set	AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]]]	OK or: +CME ERROR: <err>	The Set command specifies the context identification parameter values for a PDP context. A special form of the Set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.

Read	AT+CGDCONT?	+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>[<CR><LF> +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp> OK	The read command returns the current settings for each defined context. It will be read only "OK" without any set command.
Test	AT+CGDCONT=?	+CGDCONT: (range of supported <cid>s), <PDP_type>, , , (list of supported <d_comp>s), (list of supported <h_comp>s) OK	The Test command returns the values supported as a compound value. If the ME supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

The following table shows the +CGDCONT parameters.

<Parameter>	Description
<cid>	Numeric parameter specifying a particular PDP context definition (PDP Context Identifier). The parameter is local to the Terminal-Mobile Terminal interface and is used in other PDP context-related commands. The Test command returns the range of permitted values (minimum value=1).
<"PDP_type"> (Packet data protocol type)	String parameter (in quotation marks) specifying the type of packet data protocol: IP
<"APN"> (Access Point Name)	String parameter (in quotation marks), which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, the subscription value is requested.
<"PDP_address">	String parameter (in quotation marks), which identifies the ME in the address space applicable to the PDP. If the value is null or omitted, a value may be provided by the terminal during the PDP startup procedure or, failing that, a dynamic address is requested. The Read form of the command continues to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.

	The default value is 0.
<d_comp>	Numeric parameter that controls PDP data compression. 0 OFF Other values are reserved. The default value is 0.
<h_comp>	Numeric parameter that controls the PDP header compression. 0 OFF 1 ON Other values are reserved. Note: Currently, only one data compression algorithm (V.42bis) is provided in SNDCP. If and when other algorithms become available, a command will be provided to select one or more data compression algorithms. The default value is 0.

Note: The IP address may be entered without double quotes (" ").

Example:

AT+CGDCONT?
OK // Only without any set command.
AT+CGDCONT=1,"IP","CMNET"
OK
AT+CGDCONT=2,"IP","CMWAP"
OK
AT+CGDCONT?
+CGDCONT: 1,"IP","CMWAP","0.0.0.0",0,0
+CGDCONT: 2,"IP","CMNET","0.0.0.0",0,0
OK

AT+CGACT=1
OK
AT+CGDCONT?
+CGDCONT: 1,"IP","CMWAP","10.230.50.116",0,0
+CGDCONT: 2,"IP","CMNET","10.3.97.156",0,0
OK

AT+CGDCONT=?

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

OK

13.2.3 +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.

Command	Syntax	Response/Action	Remarks
Set	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.
Read	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.
Test	AT+CGQMIN=?	+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s)	The Test command returns the parameter value ranges for each <PDP_type>

		OK or: +CME ERROR: <err>	

The following table shows the +CGQMIN 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+CGQMIN=?

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

OK

AT+CGQMIN?

+CGQMIN: 1,2,4,3,9,10

+CGQMIN: 2,2,4,3,9,10

OK

13.2.4 +CGQREQ, Quality of Service Profile (Requested)

This command enables the terminal to specify a Quality of Service Profile that is used when the ME sends an Activate PDP Context Request message to the network.

Command	Syntax	Response/Action	Remarks
Set	AT+CGQREQ=<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 +CGQREQ 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. A special form of the Set command, +CGQREQ= <cid>, causes the requested profile for context number <cid> to become undefined.
Read	AT+CGQREQ?	+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>, <mean> OK	The Read command returns the current settings for each defined context.
Test	AT+CGQREQ=?	+CGQREQ: <PDP_type>,(list of supported<precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s) OK	The Test command returns values supported as a compound value. If the ME supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

The following table shows the +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),(1-18,31)

OK

AT+CGQREQ?

+CGQREQ: 1,2,4,3,9,10

+CGQREQ: 2,2,4,3,9,10

OK

AT+CGQREQ=1,0,,0,0,10

OK

AT+CGQREQ?

+CGQREQ: 1,0,4,0,0,10

+CGQREQ: 2,2,4,3,9,10

OK

13.2.5 +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.

Command	Syntax	Response/Action	Remarks
Set	AT+CGATT= <state>	OK or: +CME ERROR: <err>	The Set command attaches/detaches the ME to/from the GPRS service.
Read	AT+CGATT?	+CGATT: <state> OK	The Read command returns the current GPRS service state.
Test	AT+CGATT=?	+CGATT: (list of supported <state>s) OK	The Test command requests information on the supported GPRS service states.

Note: This command has the characteristics of both the V.25ter action and parameter commands. Therefore, it has the Read form in addition to the Execution/Set and Test forms.

The following table shows the +CGATT parameters.

<Parameter>	Description
<state>	Indicates the state of the GPRS attachment: 0 Detached. 1 Attached.

Example:

AT+CGATT=?

+CGATT: (0,1)

OK

AT+CGATT?

+CGATT: 0

OK

AT+CGATT=0

OK

13.2.6 D*99, Request GPRS Service "D"

This command enables the ME to perform the actions necessary for establishing communication between the terminal and the external Packet Data Network (PDN).

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 knowl, 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.

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

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

	[*[<cid>]]]]#	ERROR

The following table shows the D*99 parameters.

<Parameter>	Description
<GPRS_SC> (GPRS Service Code)	Digit string (value 99) which identifies a request to use GPRS.
called_addres s>	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". 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.
<L2P>	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: 0 NULL 1 PPP 2 PAD 3 X25 9 yyyy M-xxxx 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.
<cid>:	Digit string which specifies a particular PDP context definition (See "+CGDCONT,Define PDP Context").

Example:

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

13.2.7 +CGACT, PDP Context Activate or Deactivate

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

Command	Syntax	Response/Action	Remarks
Set	AT+CGACT=[<state>[,<cid>[,<cid>[,]]]]	OK or: NO CARRIER or: +CME ERROR: <err>	The Set command activates/deactivates the specified PDP context(s). When the command is completed, the ME remains in V.25 command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. If the ME is not GPRS-attached when the activation form of the command is executed, the ME first performs a GPRS attach and then attempts to activate the specified contexts. If the attach fails, the ME responds with an ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.
Read	AT+CGACT?	+CGACT: <cid>,<state><CR><LF> +CGACT: <cid>,<state><CR><LF> +CGACT: <cid>,<state> OK	The Read command returns the current activation states for all the defined PDP contexts.
Test	AT+CGACT=?	+CGACT: (list of	The Test command requests information on the supported PDP

		supported <state>s) OK	context activation states.

The following table shows the +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+CGACT=?
+CGACT: (0,1)
OK
AT+CGACT?
OK
AT+CGACT=1
ERROR //GPRS network not present.

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

13.2.8 +CGPADDR, GPRS ADDResses

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

Command	Syntax	Response/Action	Remarks
Set	AT+CGPADDR=[<cid>[,<cid>[,]]]	+CGPADDR: <cid>,<PDP_addr>[<CR><LF> +CGPADDR: <cid>,<PDP_addr>[…]] OK	The Set command returns a list of PDP addresses for the specified context identifiers.

		or: +CME ERROR: <err	
Test	AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s) OK	The Test command returns the list of defined <cid>s.

The following table shows the +CGPADDR parameters.

<Parameter>	Description
<cid>	A numeric parameter that specifies a particular PDP context definition. If no <cid> is specified, the addresses for all defined context are returned.
<PDP_address>	A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available.

Example:

AT+CGPADDR=?
+CGPADDR: (1,2)
OK
AT+CGPADDR=1
+CGPADDR: 1,"0.0.0.0"
OK

13.2.9 +MGAUTH, Set type of authentication

This command allows to enter the type of authentication for a user-name (using a password) for the specified PDP context

Command	Syntax	Response/Action
Set	AT+MGAUTH=<cid>,<auth>,<name>,<pwd>	OK or: +CME ERROR: <err>
Read	AT+MGAUTH?	+MGAUTH: <cid>,<auth> … OK
Test	AT+MGAUTH=?	+MGAUTH: (1-2),(0-2),31,31

		OK

The following table shows the +MGAUTH parameters.

Parameter	Description
cid	PDP context identifier, must be defined by AT+CGDCONT firstly. Range from 1-2.
auth	Authentication may be: 0 -- Meaning authentication protocol not used (NONE) 1 -- Meaning personal authentication protocol (PAP) 2 -- Meaning handshake authentication protocol (CHAP)
name	User name as string with length
pwd	Password as string with maximum length

Example:

at+mgauth=1,1,"gsm"",""1234"
OK
at+mgauth?
+MGAUTH: 1,1
OK

14 TCP/IP

14.1 Basic Mode

14.1.1 +MIPCALL, Create a Wireless Link

This command sets up a PPP (Point to Point Protocol) connection with the GGSN (Gate GPRS Support Node), and returns a valid dynamic IP for the G620.

Note: G620 cann't support TCP/IP stack AT command mixed with another AT command which can be actived the PPP or GPRS in parallel.

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

Notes:

- 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
- Activating a context can take up to 150 seconds. Deactivating a context can take up to 40 seconds.
- If use AT+MIPCALL=1 to activate PDP. The APN must be set by AT+CGDCONT command.

The following table shows the +MIPCALL parameters.

<Parameter>	Description
operation	0 - disconnect a link 1 - establish GPRS link

<status>	0 Disconnect 1 Connected
"APN"	APN of service provider (in quotation marks). Contact your service provider fordetails.
"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.

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:

AT+MIPCALL=1,"internet","User1 ","Pswd" //Connecting the provider 'Orange' and getting an IP

OK

+MIPCALL: 1,123.145.167.230

AT+MIPCALL=0 //The terminal hangs up the link

OK

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

This command causes the G620 module to initialize a new socket that waits for a connection from a remote machine or opens a common or TCP connection with a remote side (according to received parameters). Each socket allocates an accumulating buffer whose size is 1372 bytes for TCP connection and 1024 bytes for UDP connection.

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

Command	Syntax	Response/Action	Remarks
Set	AT+MIPOPEN=<Socket_ID>,<Source_Port>,<Remote_IP>,<Remote_Port>,<Protocol>	OK or: +MIPOPEN: <Socket_ID>,<State>[,<Remote_IP>,<RemotePort>]	The Set command returns <Remote IP> and <Remote Port> parameters only for sockets opened in Listen mode.

		or: +MIPSTAT: <Socket_ID>,<Status> or: ERROR: <err>	
Read	AT+MIPOPEN?	+MIPOPEN: [<Socket_ID>] for each socket that can be opened OK or: +MIPOPEN: 0 OK 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) OK	

Example:

AT+MIPOPEN?
+MIPOPEN: 1 2 3 4 //All sockets closed
OK
AT+MIPOPEN?
+MIPOPEN: 1 3 4 //Socket 2 opened
OK

The following table shows the +MIPOPEN parameters.

<Parameter>	Description
Socket_ID	A unique number that identifies a connection. Valid socket numbers - 1,2,3 and 4
Source_Port	Port of source site. Port range: 1-65535 (decimal digits)
Remote_IP	IP: IP of the remote site in the format "AAA.BBB.CCC.DDD". The range of each octet is 0-255. Value can be written in 1, 2, or 3 digits. Host name: of remote site. The host-name convention should meet the rules as describe in RFC-1035 section: 2.3 Conventions. Syntax is not validated, except the maximum length (255 characters).
Remote_Port	Port of remote site. Port range: 1-65535 (decimal digits) for outgoing connection. Port 0 for incoming connection.
Protocol	Type of protocol stack. 0 TCP 1 UDP
State	0 Inactive 1 Active

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

Example:

AT+MIPOPEN=1,1200,"123.245.213.012",1234,0 //Opening socket 1, using TCP protocol, from port 1200, targeting 123.245.213.012 port 1234

AT+MIPOPEN=2,1300,"123.133.074.192",1242,1 //Opening socket 2, using UDP protocol, from port 1300, targeting 123.133.074.192 port 1242

AT+MIPOPEN=1,1222,"123.245.213.012",1234,0 //Opening socket 1, using TCP protocol, from port 1222, targeting 123.245.213.012 port 1234

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=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

+MIPOPEN: 1,1,122.221.32.64,1200 // Remote side connected to the listen socket.

AT+MIPOPEN=3,3212,"122.1.222.134",0,0 // Listen to any port at specific IP.

OK

+MIPOPEN: 3,1,122.1.222.134,1222 // Remote side connected to the listen socket.

OK

14.1.3 +MIPCLOSE, Close a Socket

This command causes the G620 to free the socket accumulating buffer and to close the socket.

Note: All data stored in the accumulating buffer will be lost.

Command	Syntax	Response/Action
Set	+MIPCLOSE=<Socket_ID>[,<Mode>]	OK +MIPCLOSE: <Socket_ID>[,<number_of_acknowledged_bytes>],<close_type> or: ERROR
Read	+MIPCLOSE?	+MIPCLOSE: [<socket_ID>] OK (for all ACTIVE sockets) or: +MIPCLOSE: 0 OK (if no active sockets)
Test	+MIPCLOSE=?	+MIPCLOSE: (1-4),(0-2) OK

The following table shows the +MIPCLOSE parameters.

<Parameter>	Description
<Socket_ID>	Unique number that identifies a connection. Valid socket numbers - 1, 2, 3 and 4
<number_of_acknowledged_bytes >	Total number of bytes that were acknowledged.
<close_type>	Connection close type: 0 - Connection was closed correctly. 1 - The remote side didn't reply, so connection closed by close timeout. 2 - Other (The remote side replied with RST, retransmission timeout occurred, etc.).

Example:

```
AT+MIPCLOSE=?
+MIPCLOSE: (1-4),(0-2)
OK
AT+MIPCLOSE?
+MIPCLOSE: 0              //No opened sockets
OK
AT+MIPCLOSE=1
OK
+MIPCLOSE: 1,0     // Socket 1 closed. The remote side replies with ACK. Need wait few seconds.
AT+MIPCLOSE=1,1
+MIPCLOSE: 1,2     // Socket 1 closed immediately. The <close type> indicate 2.
OK
AT+MIPCLOSE=3         //The terminal closes the opened socket
OK
+MIPCLOSE: 3,1024,2         //Socket 3 closed. Ack indication enabled - 1024 bytes were acked. The remote side did reply with RST.
AT+MIPCLOSE?         //Sockets 1 and 2 are opened
+MIPCLOSE: 1,2
OK
```

14.1.4 +MIPSETS, Set Size and Timeout for Automatic Push

This command causes the G620 to set a watermark in the accumulating buffer and set timeout. When the watermark is reached, data is pushed from the accumulating buffer into the protocol stack.

Timeout is used to define interval of time between MIPSEND command and time when data will be

automatically pushed from the accumulating buffer into the protocol stack.

Data chunks between the terminal and the G620 are limited to be smaller than 600 characters (1200 characters in coded form). In order to reduce the overhead of sending small amounts of data over the air, the G620 uses an accumulating buffer. The terminal can specify a watermark within the accumulating buffer size limits to indicate how much data should be accumulated. When the data in the accumulating buffer exceeds the watermark, only data equal to the watermark is sent. Data remaining in the buffer is sent with the next packet.

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

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

Command	Syntax	Response/Action	Remarks
Set	+MIPSETS=<Socket_ID>,<Size>[,<Timeout>]	OK or: ERROR +MIPSETS: <err>	Timeout is defined in milliseconds.
Read	+MIPSETS?	+MIPSETS: [<Socket_ID>,<Current Size Settings>,< Timeout>] OK For all ACTIVE sockets.	
Test	+MIPSETS=?	+MIPSETS: (1-4),(list of supported <size>s),),(list of supported <Timeout>s) OK	

The following table shows the +MIPSETS parameters.

<Parameter>	Description
Size	Size of the buffer 1< = size <= 2048 The default value is 1372.
Timeout	0 - 1000 mS 0 means no timeout is used (default).
Extended err	3 Operation not allowed

Example:

AT+MIPSETS=1,340 //Asks the G620 to accumulate 340 bytes on socket 1 prior to sending (socket should be activated by the +mipopen command)

+MIPSETS: 0

OK

AT+MIPSETS=2,400 //Asks the G620 to accumulate 400 bytes on socket 2 prior to sending

+MIPSETS: 0

OK

AT+MIPSETS=?

+MIPSETS: (1-4),(1-1372),(0-1000)

OK

AT+MIPSETS?

+MIPSETS: 1,200,0//Information provided only for active sockets

+MIPSETS: 2,400,0//Information provided only for active sockets

OK

AT+MIPSETS=1,200,50 //Asks the G620 to send all accumulated data after 50 msec of receiving data in mipsend command.

+MIPSETS: 0

OK

AT+MIPSETS?

+MIPSETS: 1,200,50

+MISETS: 2,400,0

OK

14.1.5 +MIPSEND, Send Data

This command causes the G620 to store the data that the terminal provides in the accumulating buffer, and then send this data using an existing protocol stack when the amount of data reaches the predefined amount (see "+MIPSETS, Set Size and Timeout for Automatic Push" on.Before sending data, a valid connection must be created using the +MIPCALL and +MIPOPEN commands.

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

Command	Syntax	Response/Action	Remarks
Set	+MIPSEND=<Socket_ID>,<Data>	ERROR +MIPSEND: <Socket_ID>,<Status>,<FreeSize>	Data in the +MIPSEND command is limited to 1024 characters (2048 in coded form). <Status>:

			0 - Success 1 - Socket is flowed off
Read	+MIPSEND?	+MIPSEND <Socket_ID>,<FreeSize>>[<Socket_ID>,FreeSize>]<CR><LF> OK For all ACTIVE sockets.	

The following table shows the +MIPSEND parameters.

<Parameter>	Description
<socket_ID>	1,2,3,4 Number of valid socket
<FreeSize>	Free space in current buffer. Free size is calculated from the 2048. 0< Free Size < 2048
<Data>	User data string is sent encoded with 0-F hexadecimal digits (String ends with a <CR>)

Example:

(Socket 4 was not opened using +MIPOPEN AT command)
AT+MIPSEND=4,"4444"
ERROR
AT+MIPSEND=1,"4444"
+MIPSEND: 1,0,2046 //2048- 2 chars 'DD' = 2046
OK
AT+MIPSEND=?
ERROR
AT+MIPSEND?
+MIPSEND: 1,2048
+MIPSEND: 2,2048 //Sockets 1 and 2 were opened using + MIPOPEN AT command
OK

14.1.6 +MIPPUSH, Push Data into Protocol Stack

This command causes the G620 to push the data accumulated in its accumulating buffers into the protocol stack. It is assumed that before using this command, some data should exist due to previous +MIPSEND commands.

Command	Syntax	Response/Action	Remarks

Set	+MIPPUSH=<Socket_ID>[,<"Destination_IP">,<Destination_Port>]	+MIPPUSH: <Socket_ID>,<Status>[,<accumulated_sent_length>] OK or: ERROR	Optional parameters are used only for UDP connections. If the Destination IP and Destination Port are not provided by the user, a datagram is sent to the last target (or the default target provided by the +MIPOPEN command). <accumulated_sent_length> - this parameter counts how many bytes were sent to the remote side by the G620 TCP/IP stack. When user open socket, <accumulated_sent_length> initialized to zero. 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>] OK	
Test	+MIPPUSH=?	MIPPUSH=<socket_ID>,<IP>,<Port> OK	

The following table shows the +MIPPUSH parameters.

<Parameter>	Description
Socket_ID	1,2,3,4Number of valid socket
Destination_IP	IP of destination site in the format AAA.BBB.CCC.DDD. The value can be written in1, 2 or 3 digits.
Destination_Port	0-65535Port of destination site. Written in decimal digits.

Example:

AT+MIPPUSH=1 //Terminal asks the G620 to flush the buffer in socket 1 (was opened using the +MIPOPEN command)

+MIPPUSH: 1,0

OK

14.1.7 +MIPFLUSH, Flush Data from Buffers

This command causes the G620 to flush (delete) data accumulated in its accumulating buffers.

Command	Syntax	Response/Action
Set	+MIPFLUSH = <Socket_ID>	+MIPFLUSH: <Socket_ID> OK or: ERROR
Read	+MIPFLUSH?	+MIPFLUSH: [<socket_ID>] OK
Test	+MIPFLUSH=?	+MIPFLUSH=(<Socket_ID>) OK

The following table shows the +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

14.1.8 +MIPRUDP, Receive Data from UDP Protocol Stack

This unsolicited event is sent by the G620 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 hows the +MIPRUDP parameters.

<Parameter>	Description

Source_IP	IP of the source
Source_Port	Port of the source
Socket_ID	1,2,3,4 - Number of valid sockets.
Left	Size of received Data still left in protocol stack.
Data	Data string received with 0-F hexadecimal digits. String ends with a <CR>.

Example:

+MIPRUDP: 172.16.3.135,222,2,0,44444444

14.1.9 +MIPRTCP, Receive Data from TCP Protocol Stack

This unsolicited event is sent by the G620 to the terminal when data is received from the TCP protocol stack.

Set Command Event

+MIPRTCP: <socket_ID>,<Left>,<Data>

The following table shows the +MIPRTCP parameters.

<Parameter>	Description
Socket_ID	1,2,3,4 - Number of valid sockets.
Left	Size of received Data still left in protocol stack.
Data	Data string received with 0-F hexadecimal digits. String ends with a <CR>.

Example:

+MIPRTCP: 3,0,7171

14.1.10 +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.

Syntax

+MIPSTAT: <socket_ID>,<n>[,<number_of_acknowl d_bytes >]

The following table shows the +MIP STAT parameters.

<Parameter>	Description

<Socket_ID>	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_acknowl d_bytes>	Total number of bytes that were acknowl d

Example:

+MIPSTAT: 1,2

14.1.11 +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 before socket activation . Configuration values will be stored in G620/G620 until power circle.

This command must used under MIPCALL is enabled.

Command	Syntax	Response/Action	Remarks
Set	AT+MIPCONF=<socket_ID>[[,<retr_num>][,<min_TO>][,<max_TO>][,<max_close_delay>][,<is_nack_ind_req>]]	OK or: +CME ERROR: <err>	The Set updates TCP stack configuration parameters.
Read	+MIPCONF?	+MIPCONF: 1,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<is_nack_ind_req><CR><LF> +MIPCONF: 2,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<is_nack_ind_req><CR><LF> +MIPCONF: 3,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<is_nack_ind_req><CR><LF> +MIPCONF: 4,<retr_num>,<min_TO>,<max_TO>,<max_close_delay>,<is_nack_ind_req><CR><LF>	The read command returns current settings of TCP stack parameters.

		OK	
Test	+MIPCONF=?	+MIPCONF: (1-4),(1-12),(1-10),(10-600),(1-75),(0-2) OK	The Test command returns the possible parameters values. Time values can be inserted with resolution of 100 milliseconds.

Parameter	Description
<socket_ID>	Number of configured TCP socket (1 to 4)
<retr_num>	Number of retransmissions (1 to 12) Default: 12
<min_TO>	Bottom limit to retransmit timeout (100 ms to 1 sec.) Default: 5*100mS
<max_TO>	Upper limit to retransmit timeout (1 sec. to 60 sec.) Default: 60
<max_close_delay>	Closing delay required by RFC 793 (100 ms to 7500 ms) Default: 75*100mS
<is_nack_ind_req>	NACK/ACK TCP indication feature. Activating this parameter enables G620 to report the user, in case of losing a TCP connection, what data was received by the remote TCP layer. 0 - feature inactive. 1 - NACK indication active. 2 - ACK indication active. • Default value - 0 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,"474554202F20485454502F312E300D0A486F73743A207777772E676F6F676C652E63
6

F6D0D0A0D0A"

+MIPPUSH: 2,0,40

+MIPSEND: 2,0,1372

OK

+MIPXOFF: 2

AT+MIPSEND=2,"474554202F20485454502F312E300D0A486F73743A207777772E676F6F676C652E63
6

F6D0D0A0D0A"

+MIPSEND: 2,1,1372

OK

+MIPSTAT: 2,0,30

+MIPXON: 2

+MIPSTAT: 2,0,40

+MIPRTCP: 2,530,485454502F312E312033303220466F756E640D0A4C6F636174696F6E3A206874
74703A2F2F7777772E676F6F676C652E636F2E696C2F63786665723F633D505245462533443A544D25
334

43131313935

+MIPRTCP: 2,450,31343833323A5325334467384A637631426A5458472D30636A5926707265763D
2F0D0A5365742D436F6F6B69653A20505245463D49443D3639303762623837353138626632333373A4
3523D

313A544D3D

+MIPRTCP: 2,370,3131313935313438333323A4C4D3D3131313935313438333323A533D644F656476
7A6C34765F7059475A384A3B20657870697265733D53756E2C2031372D4A616E2D323033382031393
A31

343A30372047

+MIPRTCP:
2,290,4D543B20706174683D2F3B20646F6D61696E3D2E676F6F676C652E636F6D0D0A436F6E74656E
74

2D547970653A20746578742F68746D6C0D0A5365727665723A204757532F322E310D0A436F6E74656
E

+MIPRTCP:
2,210,742D4C656E6774683A203231370D0A446174653A205468752C203233204A756E203230303520

30383

+MIPRTCP:

2,130,484541443E3C5449544C453E333032204D6F7665643C2F5449544C453E3C2F484541443E3C424F44

593E0A3C48313E333032204D6F7665643C2F48313E0A54686520646F63756D656E7420686173206D

+MIPRTCP:

2,50,6F7665640A3C4120485245463D22687474703A2F2F7777772E676F6F676C652E636F2E696C2F63786

665723F633D505245462533443A544D25334431313139353134383332 3A5325334467384A637631

+MIPRTCP:

2,0,426A5458472D30636A5926616D703B707265763D2F223E686572653C2F413E2E0D0A3C2F424F44593

E3C2F48544D4C3E0D0A

+MIPSTAT: 2,1,40

14.1.12 +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 corresponding Echo Reply messages are displayed, along with round trip times.

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

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

Command	Syntax	Response/Action	Remarks
Set	+MPING=<mode>[,<"Destination_IP/hostname">[,<count>[,<size>[,<TTL>[,<TOS>[,<TimeOut>]]]]]]	OK or: +CME ERROR: <err>	The set command shall send a <count> Internet Control Message Protocol (ICMP) Echo Request messages to a target node defined by <"Destination IP/hostname"> parameter. If <mode> is equal 0, no parameters trailing <mode> parameter are allowed, otherwise ERROR message will be reported to DTE. If <mode> is equal 0, MS will abort sending Echo Request messages if ping request is in process, otherwise ERROR message will be reported to DTE.
Unsolicited		+MPING:	The receipt of corresponding ICMP

Response		<"Destination_IP">,<type>,<code> [,<RTT>]	Echo Reply messages will be displayed within unsolicited responses, along with round trip times.
Read	+MPING?	+MPING: <count>,<size>,<TTL>,<TOS>,<TimeOut> OK	The read command displays currently selected parameters values for +MPING set command. If ping sending procedure is currently in process then user selected parameters for AT+MPING command will be displayed, otherwise default parameter values will be displayed
Test	+MPING=?	+MPING: <count>,<size>,<TTL>,<TOS>,<TimeOut> OK	The test command displays all supported parameters values for +MPING set command.

The following table shows the +MPING command parameters.

<Parameter>	Description
<mode>	0 - Abort current ping request execution. 1 - Launch new ping request. There is no default value - appropriate ERROR will be displayed if parameter is not supplied.
<"Destination_IP/hostname">	Specifies the target machine (computer), which is identified either by IP address 4 octets long in dotted decimal notation or by host name of maximum 255 (not including double quotes) characters long in dotted notation. Each octet of IP address has valid value range of 0 to 255. Host names are not case sensitive and can contain alphabetic or numeric letters or the hyphen. There is no default value - appropriate ERROR will be displayed if parameter is not supplied.
<count>	Specifies a number of Internet Control Message Protocol (ICMP) Echo Request messages to send. Valid value range is from 1 to 255. The default value is 4.
<size>	Specifies the length, in bytes, of the Data field in the Echo Request messages sent. The minimum size is 0.The maximum size is 1372. The default value is 32.
<TTL>	Time To Live (TTL). Specifies number of hops (hop is one step, from one router to the next, on the path of a datagram on an IP network), which the Echo Request message may be routed over. The value is set by using TTL field in IP header. Valid value range is from 1 to 255. The default value is 64.

<TOS>	The Type Of Service (TO S) is for internet service quality selection. The type of service is specified along the abstract parameters precedence, delay, throughput, and reliability. These abstract parameters are to be mapped into the actual service parameters of the particular networks the datagram traverses. Minimum and maximum values for TOS are 0 and 255 respectively. Refer to RFC 791 and RFC 2474 which obsoletes RFC 791 for TOS defined values. The default value is 0.
<TimeOut>	Specifies the amount of time, in milliseconds, to wait for the Echo Reply message that corresponds to a sent Echo Request message, measured after Echo Request message was sent. If the Echo Reply message is not received within the time-out, +MPINGSTAT

The following table shows the +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 Requestmessage (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. Referto IETF RFC 792 for <type> valid values.
<code>	The reasons for the non-delivery of a packet are described by code field value of ICMP header. Every <type> has its own defined <code> values. Refer to IETF RFC 792 for <code> valid values.
<RTT>	Specifies Round Trip Time (RTT) measured in milliseconds. This parameter will be reported in command response only if Echo Reply message was received.

Note: Ping request is being executed from the moment the valid AT+MPING set command was received by G620 until +MPINGSTAT unsolicited report with <status> equal either to 0 or 2 is sent to DTE or ping request execution was aborted with AT+MPING=0 command. Refer to description of +MPINGSTAT unsolicited response for details.

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

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

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

14.1.13 +MPINGSTAT, Status Update for +MPING Execution

This is the unsolicited response that the G620 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	Syntax	Response/Action	Remarks
Unsolicited Response		+MPINGSTAT: <status>[,<"Destination_IP">,<SentMessages>,<ReceivedMessages>[,<AverageRTT>]]	The unsolicited response that the G620 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.

<Parameter>	Description
<status>	Specifies a status of ping request execution. Defined values: 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">	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.
<SentMessages>	Specifies a total number of sent Echo Request messages.
<ReceivedMessages>	Specifies a total number of received Echo Reply messages corresponding to Echo Request messages.
<AvarageRTT>	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.

Example:

AT+MIPCALL=1,"internet"
OK
+MIPCALL: 10.170.4.111
//Ping host www.sohu.com 3 times with <TTL>=255. All other parameters are default.
AT+MPING=1,"www.sohu.com",3,,255 OK
//ICMP Echo Reply message received, RTT is 522 ms.
+MPING: "121.14.0.17",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: "121.14.0.17",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," 121.14.0.17",3,2,580
//Ping host www.sohu.com 1 time with <TTL>=1 and <size>=1372.

AT+MPING=1,"www.sohu.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," 121.14.0.17",1,0

14.1.14 +MSDNS, Set DNS IP Address

This command set/read DNS (Domain Name Server) IP address (primary/secondary) for each socket. If the user doesn't specify DNS servers by AT+MSDNS, G620 will use default DNS from NW. The defined value(s) will be saved during disconnect PDP context (can be used in next PDP context), but will reset after power cycle.

Command	Syntax	Response/Action
Set	AT+MSDNS=[<Socket_ID>[,<Primary_DNS_server_IP>[,<Secondary_DNS_server_IP>]]]	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=?	+MSDNS: (List of supported <Socket_id>s),(<IP>),(<IP>) OK

The following table shows the +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 format "AAA.BBB.CCC.DDD". The range of each octant is 0-255. The value can be written in 1, 2, or 3 digits.

Example:

```
AT+MSDNS=?
+MSDNS: (1-5),(<IP>),(<IP>)
OK
AT+MSDNS?                    // read when MIPCALL is disconnected
+MSDNS: 1,"0.0.0.0","0.0.0.0"
+MSDNS: 2,"0.0.0.0","0.0.0.0"
+MSDNS: 3,"0.0.0.0","0.0.0.0"
+MSDNS: 4,"0.0.0.0","0.0.0.0"
+MSDNS: 5,"0.0.0.0","0.0.0.0"
OK
AT+MSDNS=2,"212.150.49.10","206.49.94.234"      //set socket 2 prim & sec DNS
OK
AT+MSDNS=4,"62.120.55.10"                       //set socket 4 prim DNS only
OK
AT+MSDNS=5,"212.150.49.10","206.49.94.234"      //set socket 5 prim & sec DNS
OK
AT+MSDNS?           // read when MIPCALL is disconnected
+MSDNS: 1,"0.0.0.0","0.0.0.0"
+MSDNS: 2,"212.150.49.10","206.49.94.234"
+MSDNS: 3,"0.0.0.0","0.0.0.0"
+MSDNS: 4,"62.120.55.10","0.0.0.0"
+MSDNS: 5,"212.150.49.10","206.49.94.234"
OK
```

14.1.15 +MIPKPAL, TCP heartbeat setting

This command causes the G620 enable or disables the heartbeat when TCP connection was established.

Note:

- This command should be set after TCP connection was established.
- After Socket_ID is released, the parameter will be restored to default value.

Command	Syntax	Response/Action	Remarks
Set	+MIPKPAL=<Socket_ID>,<Mode>,<Time>	OK or: ERROR	Enable and Disable command
Read	+MIPKPAL?	+MIPKPAL:<Socket_ID1>,< Mode >,<Time> +MIPKPAL:<Socket_ID2>,< Mode >,<Time> +MIPKPAL:<Socket_ID3>,< Mode >,<Time> +MIPKPAL:<Socket_ID4>,< Mode >,<Time> OK	The read command returns the current parameter for each Socket_ID.
Test	+MIPKPAL =?	+MIPKPAL:(list of <Socket_ID >),(list of <Mode>),(list of < Time >), OK	The test command displays the list of supported <Socket_ID>, <Mode> and <Time> values.

The following table shows the +MIPKPAL parameters.

<Parameter>	Description
< Socket_ID >	1-4
< Mode >	0: Disbale heartbeat for TCP connection 1: Enable heartbeat for TCP connection The default value is 0.
< Time >	1000-600000: The interval of heartbeat. (mS)

Example:

AT+MIPKPAL?

+MIPKPAL:1,0,0

+MIPKPAL:2,0,0

+MIPKPAL:3,0,0

+MIPKPAL:4,0,0

OK

AT+MIPKPAL=?

+MIPKPAL:(1-4),(0-1), (1000-600000)

OK

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

This command causes the G620 to initialize a new socket that waits for a connection from a remote machine or opens a common or TCP connection with a remote side (according to received parameters) and switch it to Online (raw data transfer) Data Mode and open a connection with a remote side.

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

Each socket allocates an accumulating buffer whose size is 1372 bytes. When the user sends amount of data, less then 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.

Command	Syntax	Response/Action	Remarks
Set	AT+MIPODM= <Socket_ID>, <Source Port>, <Remote IP>, <Remote Port>, <Protocol>, <Pseudo-Command Mode On/Off>	OK or: +MIPODM: <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+MIPODM?	+MIPODM:[<Socket_ID>] for each socket that can be opened or: +MIPODM 0,0 if there are no free sockets.	When a socket opens in Online Data Mode, the command returns actual Socket_ID value a'd''1' value (active). G620 will be in pseudo-command

			mode for receiving the command.
Test	AT+MIPODM=?	+MIPODM: (list of supported <socket_ID>s),(list of supported <source port>s),(list of support"d<"Destination"IP">s), (list of <destination port>s),(list of supported <protocol>s), (list of supported <Pseudo-Command Mode state>s)	

The following table shows the +MIPODM parameters.

<Parameter>	Description
Socket_ID	A unique number that identifies a connection. Valid socket numbe–s - 1,2,3 and 4
Source Port	Port of source site. Port range: 1-65535 (decimal digits)
Remote IP	IP of the remote site in the form"t "AAA.BBB.CCC."DD". The range of each octet is 0-255. The value can be written in 1, 2, or 3 digits. Host-name of remote site. The host-name convention should meet the rules as describe in RFC-1035 section: 2.3 Conventions. Syntax is not validated, except the maximum length (255 characters).
Remote Port	Port of remote site. Port range: 1-65535 (decimal digits) for outgoing connection. Port 0 for incoming connection.
Protocol	Type of protocol stack. 0 TCP 1 UDP
State	0 Inactive 1 Active
Pseudo-Command Mode On/Off	Optional parameter enables / disables Pseudo Command Mode when ODM executed and G620 is in PREMUX state. 0 Enable (default value, when G620 is in PREMUX state). 1 Disable.

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

Example:

Opening socket 1 in Online Data Mode, using TCP protocol, from port 1104, designation IP 123.245.213.012, designation port 1124:

AT+MIPODM=1,,"172.90.237.21",1124,0

OK

+MIPODM: 1,1

Enter invalid command format:

AT+MIPODM

ERROR

Check opened in Online Data Mode socket state when G620 is pseudo-command mode:

AT+MIPODM?

+MIPODM: 1,1

OK

Listen socket over TCP:

AT+MIPODM=1,1104,"0,0.0.0",0,0 // Source port must confirmed in TCP mode.

OK

+MIPODM: 1,1,122.221.32.64,1200 // Remote side connected to the listen socket.

14.1.17 +MIPXOFF, Flow Control - Xoff

This command is the unsolicited response that the G620 sends to the terminal to stop sending data when it does not have enough memory to process new +MIPSEND requests. The G620 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 G620 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.

14.1.18 +MIPXON, Flow Control - Xon

This command is the unsolicited event that the G620 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 G620 pushed the data into the protocol stack on socket 1 and is able to handle more data from the terminal.

14.2 HEX Mode

Base on the basic mode, G620 achieve the TCP/IP stack by AT command. In additional, G620 support another mechanism to complete the TCP/IP stack in HEX mode. The data will be send in HEX when we use +MIPSEND command.

14.2.1 +MIPSEND (Ctrl-Z)

Command	Syntax	Response/Action	Remarks
Set	+MIPSEND=<Socket_ID>	+MIPPUSH: <Socket_ID>,<Status> +MIPSEND: <Socket_ID>,<Status>,<FreeSize> or: ERROR	After command received, G620 will respond "><CR><LF>". Send any data in HEX. The data buffer range is 0<buffer<=1400 bytes. <CTRL+Z> ends the prompt HEX mode and returns to regular AT command mode.

Example:

Opening socket 2 already.

AT+MIPSEND=2
>>This is the data in HEX<CTRL+Z> //<CTRL+Z> ends the prompt HEX mode and returns to regular AT command mode
OK
+MIPPUSH: 2,0
+MIPSEND: 2,0,2048
OK

14.2.2 +MIPSEND (Timeout)

Command	Syntax	Response/Action	Remarks
Set	+MIPSEND=<Socket_ID>	+MIPPUSH: <Socket_ID>,<Status> +MIPSEND: <Socket_ID>,<Status>,<FreeSize> or: ERROR	After command received, G620 will respond "><CR><LF>". Send any data without incode. The data buffer range is 0<buffer<=1400 bytes. After timeout, the data will be push automatic and returns to regular AT command mode. The default timeout is 12s.

Example:

Opening socket 2 already.

AT+MIPSEND=2
>>This is the data in HEX<timeout>
OK
+MIPPUSH: 2,0
+MIPSEND: 2,0,2048
OK

14.2.3 +MIPSEND (Data length)

Command	Syntax	Response/Action	Remarks
Set	+MIPSEND=<Socket_ID>,<Data_len>	+MIPPUSH: <Socket_ID>,<Status> +MIPSEND: <Socket_ID>,<Status>,<FreeSize> or: ERROR	After command received, G620 will respond "><CR><LF>". Send any data in HEX. The data buffer range is 0<data_len<=1400 bytes. When G620 receive the corresponding length data, the data will be push

			automatic and returns to regular AT command mode. Notes: The redundant data will be lost.

Example:

Opening socket 2 already.

AT+MIPSEND=2,10
>0123456789abc // "abc" lost
OK
+MIPPUSH: 2,0
+MIPSEND: 2,0,2048
OK

14.2.4 +GTSET, HEX mode configuration

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

The following table shows the +GTSET parameters related HEX mode.

<Parameter>	Description
<future>	"SENDTIME" : Set the auto push timeout.
<value>	1-30 seconds The default value is 12.
<future>	"IPRFMT" : The format of reiceived data.
<value>	0: Reiceived data with "+MIPRTCP:" and the data is incode. 1: Reiceived data only and the data is without incode. In received character string, G620 don't accede to any <CR><LF> symbol. 2: Reiceived data with "+MIPRTCP:" and the data is without incode. In received character string, G620 will accede to <CR><LF> before "+MIPRTCP:". The default value is 0.

Example:

Opening socket 2 already.

AT+GTSET="IPRFMT",0
OK
AT+MIPSEND=2,10
>0123456789abc
OK
+MIPPUSH: 2,0
+MIPSEND: 2,0,2048
OK

<CR><LF>+MIPRTCP: 2,0,30313233343536373839<CR><LF> //Same as basic mode.

AT+GTSET="IPRFMT",1
OK
AT+MIPSEND=2,10
>0123456789abc
OK
+MIPPUSH: 2,0
+MIPSEND: 2,0,2048
OK

0123456789 //Only data without any information.

AT+GTSET="IPRFMT",2
OK
AT+MIPSEND=2,10
>0123456789abc
OK
+MIPPUSH: 2,0
+MIPSEND: 2,0,2048
OK

<CR><LF>+MIPRTCP: 2,10,0123456789

15 Error Code

15.1 CME Error

Parameter	Description
<Err>	1, "no connection to phone" 2, "phone-adaptor link reserved" 3, "operation not allowed" 4, "operation not supported" 5, "PH-SIM PIN required" 6, "PH-FSIM PIN required" 7, "PH-FSIM PUK required" 10, "SIM not inserted" 11, "SIM PIN required" 12, "SIM PUK required" 13, "SIM failure" 14, "SIM busy" 15, "SIM wrong" 16, "incorrect password" 17, "SIM PIN2 required" 18, "SIM PUK2 required" 19, "incorrect PUK1" 20, "memory full" 21, "invalid index" 22, "not found" 23, "memory failure" 24, "text string too long" 25, "invalid characters in text string" 26, "dial string too long" 27, "invalid characters in dial string" 30, "no network service" 31, "network timeout" 32, "network not allowed - emergency calls only"

	40, "network personalisation PIN required" 41, "network personalisation PUK required" 42, "network subset personalisation PIN required" 43, "network subset personalisation PUK required" 44, "service provider personalisation PIN required" 45, "service provider personalisation PUK required" 46, "corporate personalisation PIN required" 47, "corporate personalisation PUK required" 100, "unknown" 103, "Illegal MS" 106, "Illegal ME" 107, "GPRS services not allowed" 111, "PLMN not allowed" 112, "location area not allowed" 113, "roaming not allowed in this location area" 114, "GPRS services not allowed in this PLMN" 116, "MSC temporarily not reachable" 117, "Network failure" 132, "Service not supported" 133, "Service not subscribed" 134, "service option temporarily out of order" 135, "NS-api already used" 148, "Unspecified GPRS error" 149, "PDP authentication error" 150, "invalid mobile class" 244, "Attach failure" 257, "Invalid error mapping" 258, "APN not listed in APN Control List (ACL)" 701, "incorrect security code" 702, "max attempts reached" 1001, "Unassigned (unallocated) number" 1003, "No route to destination" 1006, "Channel unacceptable"

	1008, "Operator determined barring" 1016, "Normal call clearing" 1017, "User busy" 1018, "No user responding" 1019, "User alerting, no answer" 1021, "Call rejected" 1022, "Number changed" 1026, "Non selected user clearing" 1027, "Destination out of order" 1028, "Invalid number format (incomplete number)" 1029, "Facility rejected" 1030, "Response to STATUS ENQUIRY" 1031, "Normal, unspecified" 1034, "No circuit/channel available" 1038, "Network out of order" 1041, "Temporary failure" 1042, "Switching equipment congestion" 1043, "Access information discarded" 1044, "requested circuit/channel not available" 1047, "Resources unavailable, unspecified" 1049, "Quality of service unavailable" 1050, "Requested facility not subscribed" 1055, "Incoming calls barred within the CUG" 1057, "Bearer capability not authorized" 1058, "Bearer capability not presently available" 1063, "Service or option not available, unspecified" 1065, "Bearer service not implemented" 1068, "ACM equal to or greater than ACMmax" 1069, "Requested facility not implemented" 1070, "Only restr. digital information bearer capability" 1079, "Service or option not implemented, unspecified" 1081, "Invalid transaction identifier value" 1087, "User not member of CUG"

	1088, "Incompatible destination" 1091, "Invalid transit network selection" 1095, "Semantically incorrect message" 1096, "Invalid mandatory information" 1097, "Message type non-existent or not implemented" 1098, "Message type not compatible with protocol state" 1099, "Information element non-existent or not implemented" 1100, "Conditional IE error" 1101, "Message not compatible with protocol state" 1102, "Recovery on timer expiry" 1111, "Protocol error, unspecified" 1127, "Interworking, unspecified" 1279, "Number not allowed" 1283, "CCBS possible"

15.2 CMS Error

Parameter	Description
<Err>	1, "Unassigned (unallocated) number" 8, "Operator determined barring" 10, "Call barred" 17, "Network failure" 21, "Short message transfer rejected" 22, "Memory capacity exceeded" 27, "Destination out of service" 28, "Unidentified subscriber" 29, "Facility rejected" 30, "Unknown Subscriber" 38, "Network out of order" 41, "Temporary failure" 42, "Congestion" 47, "Resources unvailable, unspecified" 50, "Requested facility not subscribed" 69, "Requested facility not implemented"

	81, "Invalid short message reference value" 95, "Invalid message, unspecified" 96, "Invalid mandatory information" 97, "Message type non-existent or not implemented" 98, "Message not compatible with short message protocol state" 99, "Information element non-existent or not implemented" 111, "Protocol error, unspecified" 127, "Interworking unspecified" 128, "Telematic interworking not supported" 129, "Short message type 0 not supported" 130, "Cannot replace short message" 143, "Unspecified TP-PID error" 144, "Data coding scheme (alphabet) not supported" 145, "Message class not supported" 159, "Unspecified TP-DCS error" 160, "Command cannot be actioned" 161, "Command unsupported" 175, "Unspecified TP-Command error" 176, "TPDU not supported" 192, "SC busy" 193, "No SC subscription" 194, "SC system failure" 195, "Invalid SME address" 196, "Destination SME barred" 197, "SM Rejected-Duplicate SM" 198, "TP-VPF not supported" 199, "TP-VP not supported" 208, "SIM SMS storage full" 209, "No SMS storage capability in SIM" 210, "Error in MS" 211, "Memory Capacity Exceeded" 212, "SIM Application Toolkit Busy" 213, "SIM data download error"

	224, "TP_FCS_APPL_ERR_START" 254, "TP_FCS_APPL_ERR_STOP" 255, "TP_FCS_UNSPECIFIED" 300, "ME failure" 301, "SMS service of ME reserved" 302, "operation not allowed" 303, "operation not supported" 305, "invalid text mode parameter" 312, "PH-SIM PIN necessary" 310, "SIM not inserted" 311, "SIM PIN required" 312, "SIM PUK required" 313, "SIM failure" 314, "SIM busy" 315, "SIM wrong" 317, "SIM PIN2 required" 318, "SIM PUK2 required" 319, "incorrect PUK1" 320, "memory failure" 321, "invalid memory index" 322, "memory full" 330, "SMSC address unknown" 331, "no network service" 332, "network timeout" 340, "no +CNMA acknowledgement expected" 512, "MN_SMS_RP_ACK" 513, "MN_SMS_TIMER_EXPIRED" 514, "MN_SMS_FORW_AVAIL_FAILED" 515, "MN_SMS_FORW_AVAIL_ABORTED" 516, "MS invalid TP-Message-Type-Indicator" 517, "MS no TP-Status-Report in Phase 1" 518, "MS no TP-Reject-Duplicate in Phase 1" 519, "MS no TP-Reply-Path in Phase 1"

	520, "MS no TP-User-Data-Header in Phase 1" 521, "MS missing TP-Validity-Period" 522, "MS invalid TP-Service-Centre-Time-Stamp" 523, "MS missing TP-Destination-Address" 524, "MS invalid TP-Destination-Address" 525, "MS missing Service-Centre-Address" 526, "MS invalid Service-Centre-Address" 527, "MS invalid alphabet" 528, "MS invalid TP-User-Data-Length" 529, "MS missing TP-User-Data" 530, "MS TP-User-Data too long" 531, "MS no Command-Request in Phase 1" 532, "MS Cmd-Req invalid TP-Destination-Address" 533, "MS Cmd-Req invalid TP-User-Data-Length" 534, "MS Cmd-Req invalid TP-User-Data" 535, "MS Cmd-Req invalid TP-Command-Type" 536, "MN MNR creation failed" 537, "MS CMM creation failed" 538, "MS network connection lost" 539, "MS pending MO SM transfer" 540, "RP-Error OK" 541, "RP-Error OK no icon display" 542, "SMS-PP Unspecified" 543, "SMS rejected By SMS CONTROL"

15.3 TCP/IP Error

Parameter	Description
<Err>	2000, "TCPIP Param wrong " 2001, "TCPIP not supported in ppp mode" 2002, "TCPIP dns convert to ip fail" 2003, "TCPIP socket number limited" 2004, "TCPIP invalid operation" 2005, "TCPIP protol error" 2006, "TCPIP send data too long" 2007, "TCPIP send data memory failed" 2008, "TCPIP service not in correct state " 2009, "TCPIP pdp not defined " 2010, "TCPIP new socket failed" 2011, "TCPIP socket bind fail" 2012, "TCPIP socket connect fail" 2013, "TCPIP socket send fail " 2014, "TCPIP socket close fail" 2015, "TCPIP get socket receive buffer failed" 2016, "TCPIP receive data failed" 2017, "TCPIP socket used" 2018, "TCPIP get send buffer size failed" 2019, "TCPIP socket send data failed" 2020, "TCPIP socket send data size limited" 2021, "TCPIP socket set listening mode failed" 2022, "TCPIP socket listen fail" 2023, "TCPIP socket error" 2024, "TCPIP socket not opened " 2025, "TCPIP tcp stack confige failed" 2026, "TCPIP socket no data to send " 2027, "TCPIP socket send invalid data state" 2028, "TCPIP socket close client" 2029, "TCPIP ping error " 2030, "TCPIP ppp not connected "

	2031, "TCPIP mipcall not active" 2032, "TCPIP etcpip not active" 2033, "TCPIP not def4 "