Enfora Quad-Band SA-G+
AT Command Set

GSM1308AT001

Revision 1.01

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General

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1.0 Introduction

1.1. Document Scope

The following documentation pertains to the AT Command Set to be used in conjunction with the Enfora GSM/GPRS OEM module, the Enabler IIIG.

1.2. Platform Reference and Use

The Enabler IIIG will be referred to using various terms, to include: MS (Mobile Station), TA (Terminal Adapter), DCE (Data Communication Equipment), or ME (Mobile Equipment).

The Enabler IIIG can be controlled via the use of a DTE (Data Terminal Equipment) platform by issuing the AT commands via a serial interface.

1.1. Command Syntax

The attention or "AT" prefix is required prior to entering any command. All commands require a carriage return or <CR> following the entry of the desired command. All command responses are encapsulated by a carriage return and line feed or <CR><LF>. The ASCII display of these characters is suppressed with only the modem response being presented.

AT message concatenation can be done using the ; <semicolon> between commands.

The following examples demonstrate the potential usage of AT commands presented:

Type	Example	Description
Command Format Query	AT+GXXX=?	When entered will return the command format and value ranges.
Command Read	AT+GXXX?	When entered will return the current value assigned to the command.
Command Write	AT+GXXX=<value>,<value>,…	When entered will set the command to specified value(s).
Command Execution	AT+GXXX	When entered will execute the specified command.
Command Concatenation	AT+CRC=1;S0=1	When entered it will execute both the CRC and S0 command.

1.2. References

[GSM 07.05]   GTS 07.05: January 1998 (GSM 07.05 version 5.5.0) Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS), ETSI

[GSM 07.07]   ETS 300 916: February 1998 (GSM 07.07 version 5.5.0) AT command set for GSM Mobile Equipment (ME)

[T.32]   T.32 (08/95) Asynchronous facsimile DCE control - service class 2, ITU

[T V.25_TER]   (ITU-T V.25 ter, 1997) ITU-T Recommendation V.25 ter; Series V: data communication over the telephone network; Interfaces and voiceband modems; Serial asynchronous automatic dialing and control, ITU

2. Standard AT Commands

The following is the format in which all commands will be presented.

xx.xx (Command Number) Atx(Command) Xxxxx(Command Description)

Command Function	(Description of the command function)
Command Functional Group	(Functional group identification)
Command Format Query Response	ATx=? **ATx: (parameter1 name 1 – 15), (parameter2 name 1-10),…**
Write Format Response	ATx=**<value>,<value>[,<optional value>],…** **OK** or **ERROR**
Read Format Response	ATx? **<value>,<value>,…**
Execution Format Response	ATx **OK**, **ERROR**, or **<value>**
Parameter Values	**<value1>,<value2>** ATx: (1-15),(1-10)
Reference	(Applicable standard reference)
Standard Scope	Mandatory or Optional
Enfora Implementation Scope	Full, Partial, or Not Supported
Notes	(Additional command notes)

Please note that, where applicable, the <value> responses provided for the READ and EXECUTION formats are modem default values. All efforts will be made by Enfora, Inc. to keep these values current in the documentation but will not be responsible for any differences that may occur as a result subsequent software builds and version enhancements.

2.1. Commands Specified by GSM Rec. 07.07

2.1.1. General Commands

2.1.1.1.   AT+CGMI   Request Manufacturer Identification

Command Function	This command is used to obtain the manufacturer identification information.
Command Functional Group	Equipment Information
Command Format Query Response	AT+CGMI=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CGMI Enfora, Inc. OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 5.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Return value is manufacturer specific.

2.1.1.2.   AT+CGMM   Request Manufacturer Model Identification

Command Function	This command is used to obtain the manufacturer model identification information.
Command Functional Group	Equipment Information
Command Format Query Response	AT+CGMM=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CGMM Enabler IIIG Modem OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 5.2
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Return value is manufacturer specific.

2.1.1.3.   AT+CGMR   Request Revision Identification

Command Function	This command is used to obtain the manufacturer embedded firmware revision information.
Command Functional Group	Equipment Information
Command Format Query Response	AT+CGMR=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CGMR **<revision>** OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 5.3
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Return value is manufacturer specific.

2.1.1.4. AT+CGSN   Request IMEI

Command Function	This command is used to obtain the manufacturer International Mobile Equipment Identity (IMEI).
Command Functional Group	Equipment Information
Command Format Query Response	AT+CGSN=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CGSN 0044008824900101 OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 5.4
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Return value is manufacturer specific. The TA returns the International Mobile station Equipment Identifier (IMEI).

2.1.1.5.	AT+CSCS	Select TE Character Set

Command Function	This command is used to select the terminal equipment character set.

Command Functional Group	State Control

Command Format Query Response	AT+CSCS=? +CSCS: **<"GSM", "IRA" , "PCCP437" , "PCDN" , "8859-1" , "HEX" , "UCS2">** OK

Write Format Response	AT+CSCS=**<chset>** OK

Read Format Response	AT+CSCS? +CSCS: "PCCP437" OK

Execution Format Response	N/A N/A

Parameter Values

<chset>	**"GSM"** **"IRA"** **"PCCP437"** **"PCDN"** **"8859-1"** **"HEX"** **"UCS2"**

Reference	GSM Ref. 07.07 Chapter 5.5

Standard Scope	Mandatory

Enfora Implementation Scope	Partial

Notes	Values are based on character set support.

2.1.1.6.   AT+CIMI   Request IMSI

Command Function	This command is used to obtain the International Mobile Subscriber Identity (IMSI) value assigned to the SIM.
Command Functional Group	Equipment Information
Command Format Query Response	AT+CIMI=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CIMI 310260101xxxxx OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 5.6
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Return value is manufacturer specific. The TA returns the International Mobile Subscriber Identity (IMSI).

2.1.1.7.   AT+WS46   Select Wireless Network

Command Function	This command is used to select the wireless network to operate with the TA.
Command Functional Group	Network
Command Format Query Response	AT+WS46=? +WS46: <12> OK
Write Format Response	AT+WS46=**<n>** OK
Read Format Response	AT+WS46? +WS46: 12 OK
Execution Format Response	N/A N/A
Parameter Values	
<n>	**12** (GSM Digital Cellular)
Reference	GSM Ref. 07.07 Chapter 5.9
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	Will provide available network interface support selection.

2.1.2. Call Control Commands

2.1.2.1. AT+CSTA   Select Type of Address

Command Function	This command is used to select the type of number to be used for further dialing commands.
Command Functional Group	Call Control
Command Format Query Response	AT+CSTA=? +CSTA: <129 or 145> OK
Write Format Response	AT+CSTA=**\<n>** OK
Read Format Response	AT+CSTA? +CSTA: 129 OK
Execution Format Response	N/A N/A
Parameter Values	
\<n>	**129** (Dialing string without International Access Code character "+") **145** (Dialing string with International Access Code character "+")
Reference	GSM Ref. 07.07 Chapter 6.1
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.1.2.2.   ATD   Dial command

Command Function	This command is used to setup an outbound voice or data call.
Command Functional Group	Call Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATD1234567I; NO DIALTONE or NO CARRIER or CONNECT **<value>** or BUSY or OK

Parameter Values

<n>	V.25ter Dialing Digits = **0 – 9, *, #, +, A, B, C** V.25ter Dialing Modifiers = **, (comma), T, P, !, @, W**
<cmod>	GSM Modifier Characters **I** = Restrict CLI, **i** = Allow CLI
<;>	Semicolon after dialing string or modifier indicates voice call and forces TA into command mode after successful completion.

2.1.2.2.   ATD   Dial command
                                      (continued)

Reference   GSM Ref. 07.07 Chapter 6.2

Standard Scope   Mandatory

Enfora Implementation Scope   Full

Notes

Modem Responses

NO DIALTONE   if no dial tone is detected

NO CARRIER   if call cannot be set up

CONNECT <value>   when connected in a non-voice call (data
                                     mode) **<value>** dependent on ATX setting

BUSY   if dialed number is busy

OK   when successful voice call or TA ends
                                     current call and returns to command mode

Example:

ATD5551212I

The TA will dial the number 5551212 and will block the CLI when made.

2.1.2.3. ATD>   Originate Call Using Phonebook Memory

Command Function	This command is used to setup an outbound voice or data call from a specific phonebook location.
Command Functional Group	Call Control
Command Format Query Response	ATD? ATD**<storage><n><cmod><;>**
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATD>SD12I; NO DIALTONE or NO CARRIER or CONNECT **<value>** or BUSY or OK
Parameter Values	
<storage>	Phonebook Location
<n>	Storage location number in selected phonebook
<cmod>	GSM Modifier Characters **I** = Restrict CLI, **i** = Allow CLI
<;>	Semicolon after dialing string or modifier forces TA into command mode after successful completion.
Reference	GSM Ref. 07.07 Chapter 6.3
Standard Scope	Mandatory
Enfora Implementation Scope	Full

2.1.2.3. ATD>   Originate Call Using Phonebook Memory (continued)

Notes

Phonebook Location Values

"EN"	SIM (or ME) emergency number
"FD"	SIM fixed-dialing-phonebook
"LD"	SIM last-dialing-phonebook
"BD"	SIM barred-dialing phonebook
"SD"	SIM service numbers
"LR"	Last received numbers (nonstandard)
"AD"	Abbreviated dialing numbers (nonstandard)
"LM"	Last missed numbers (nonstandard)
"AF"	comb. of fixed and abbrev. dialing phonebook (nonstandard)
"SM"	comb. of fixed and abbrev. dialing phonebook (nonstandard)
"UD"	User defined

Modem Responses

NO DIALTONE	if no dial tone is detected
NO CARRIER	if call cannot be set up
CONNECT <value>	when connected in a non-voice call (data mode) **<value>** dependent on ATX setting
BUSY	if dialed number is busy
OK	when successful voice call or TA ends current call and returns to command mode

Example:

ATD>FD2I

The TA will dial the number stored in memory location 2 the fixed-dialing phonebook. The call will block the CLI when made.

2.1.2.4. AT+CMOD   Call mode

Command Function	This command is used to select the type of call mode desired for following dial (D) and/or answer (A) commands.
Command Functional Group	Call Control
Command Format Query Response	AT+CMOD=? +CMOD: (0-3) OK
Write Format Response	AT+CMOD=**<mode>** OK
Read Format Response	AT+CMOD? +CMOD: 0 OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	Single service
	1	Alternating voice/fax (teleservice 61)
	2	Alternating voice/data (bearer service 61)
	3	Voice followed by data (bearer service 81)

Reference	GSM Ref. 07.07 Chapter 6.4
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Default value will be 0. AT&F, restore factory defaults will reset this value to 0.

2.1.2.5. AT+CHUP   Hangup call

Command Function	This command is used to end all active calls.
Command Functional Group	Call Control
Command Format Query Response	AT+CHUP=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CHUP OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.5
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Default value will be 0. AT&F, restore factory defaults will reset this value to 0.

2.1.2.6. AT+CBST Select Bearer service type

Command Function	This command is used to select the bearer service with data rate and the connection element to be used when data calls are originated.
Command Functional Group	Call Control
Command Format Query Response	AT+CBST=? +CBST: (0-7, 12, 14, 65, 66, 68, 70, 71,75), (0-1), (0-3)
Write Format Response	AT+CBST=\<baud rate\>,\<name\>,\<ce\> OK/ERROR
Read Format Response	AT+CBST? +CBST: 7,0,1
Execution Format Response	N/A N/A

Parameter Values

\<baud rate\>	**0**	autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)
	1	300 bps (V.21)
	2	1200 bps (V.22)
	3	1200/75 bps (V.23)
	4	2400 bps (V.22bis)
	5	2400 bps (V.26ter)
	6	4800 bps (V.32)
	7	9600 bps (V.32)
	12	9600 bps (V.34)
	14	14400 bps (V.32)
	65	300 bps (V.110)

2.1.2.6.   AT+CBST   **Select Bearer service type (continued)**

66	1200 bps (V.110)
68	2400 bps (V.110 or X.31 flag stuffing)
70	4800 bps (V.110 or X.31 flag stuffing)
71	9600 bps (V.110 or X.31 flag stuffing)
75	14400 bps (V.110 or X.31 flag stuffing)

<name>	**0**	data circuit asynchronous (UDI or 3.1 kHz modem)
	1	data circuit synchronous (UDI or 3.1 kHZ modem)

<ce>	**0**	transparent
	1	non-transparent
	2	both, transparent preferred
	3	both, non-transparent preferred

Reference   GSM Ref. 07.07 Chapter 6.7
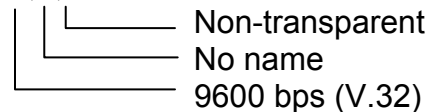
Standard Scope   Mandatory

Enfora Implementation Scope Partial

Notes   N/A

Example:

AT+CBST=7,0,1

                                Non-transparent
                         No name
                   9600 bps (V.32)

2.1.2.7. AT+CRLP   Radio link protocol parameters

Command Function	This command is used to select the radio link protocol parameters.
Command Functional Group	Call Control
Command Format Query Response	AT+CRLP=? +CRLP: (0-61), (0-61), (39-255), (1-255) OK
Write Format Response	AT+CRLP=<iws>,<mws>,<T1>,<N2> OK/ERROR
Read Format Response	AT+CRLP? +CRLP: 61, 61, 48, 6 OK
Execution Format Response	N/A N/A

Parameter Values

<iws>	IWF to MS window size values = **0 to 61** (61 recommended)
<mws>	MS to IWF window size values = **0 to 61** (61 recommended)

<T1>	Acknowledgement timer
	 values = halfrate **>380ms**
	       (480 recommended)
	       fullrate **>600ms**
	       (780 recommended)

<N2>	Retransmission attempts values = **>0** (6 recommended)
Reference	GSM Ref. 07.07 Chapter 6.8
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	N/A

2.1.2.8. AT+CR   **Service Reporting Control**

Command Function	This command is used to control the display of intermediate result code (+CR **<serv>**) status.
Command Functional Group	Response Control
Command Format Query Response	AT+CR=? +CR: (0,1) OK
Write Format Response	AT+CR=**<mode>** OK
Read Format Response	AT+CR? +CR: 0 OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	disable
	1	enable
<serv>	**ASYNC**	asynchronous transparent
	SYNC	synchronous transparent
	REL ASYNC	asynchronous non-transparent
	REL SYNC	synchronous non-transparent

Reference	GSM Ref. 07.07 Chapter 6.9
Standard Scope	Mandatory
Enfora Implementation Scope	Full

2.1.2.8. AT+CR   **Service Reporting Control (continued)**

Notes   If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted.

2.1.2.9.   AT+CEER   Extended Error Reporting

Command Function	This command is used to control the display of extended result codes for last unsuccessful call setup, in-call modification, last call release, last short message, or last GPRS session.
Command Functional Group	Call Control
Command Format Query Response	AT+CEER=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CEER +CEER**: < DEFBY >, <ORIGSIDE>, <ORIGIN_ENTITY>, <VALUE>[,ERROR DESCRIPTION]** OK

Parameter Values

<DEFBY> (defined by)

  0 - Standard
  1 - Enfora

<ORIGSIDE> (originating side)

  0 - Network
  1 - MS

<ORIGIN_ENTITY>:

  0 - SIM
  1 - ACI
  2 - RLP
  3 - RR
  4 - MM
  5 - CC
  6 - SS

2.1.2.9. AT+CEER

Extended Error Reporting (continued)

7 - SMSCP
8 - SMSRP
9 - SMSTP
10 - GMM
11 - SM
12 - FAD
13 - T30
14 - GRR
15 - PPP
16 - LLC
17 - SNDCP
18 - PKTIO
19 - PSI

<VALUE>	See AT+CEER Table in Appendix B
<ERROR DESCRIPTION>	Optional extended error description
Reference	GSM Ref. 07.07 Chapter 6.10, Enfora Specific responses
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.2.10.   AT+CRC   Cellular Result Codes

Command Function	This command is used to control the display of extended incoming call information.
Command Functional Group	Response Control
Command Format Query Response	AT+CRC=? +CRC: (0,1) OK
Write Format Response	AT+CRC=**<mode>** OK
Read Format Response	AT+CRC? +CRC: 0 OK
Execution Format Response	N/A N/A

2.1.2.10.   AT+CRC   Cellular Result Codes (continued)

Parameter Values

<mode>	**0**	disable
	1	enable

<type>	**ASYNC**	asynchronous transparent
	SYNC	synchronous transparent
	REL ASYNC	asynchronous non-transparent
	REL SYNC	synchronous non-transparent
	FAX	facsimile (TS 62)
	VOICE	normal voice (TS 11)
	VOICE/ XXX	voice followed by data (BS 81) (XXX is ASYNC, SYNC, REL ASYNC or REL SYNC)
	ALT VOICE/ XXX	alternating voice/data, voice first (BS 61)
	ALT XXX/VOICE	alternating voice/data, data first (BS 61)
	ALT VOICE/FAX	alternating voice/fax, voice first (TS 61)
	ALT FAX/VOICE	alternating voice/fax, fax first (TS 61)

Reference	GSM Ref. 07.07 Chapter 6.11
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	When enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: **<type>** instead of the normal RING.

2.1.2.11.   AT+CSNS   Single Numbering Scheme

Command Function	This command selects the bearer or teleservice to be used when mobile terminated single numbering scheme call is established. Parameter values set with +CBST command shall be used when **\<mode\>** equals to a data service. If +CBST parameter is set to a value that is not applicable to single numbering calls, ME/TA shall map the value to the closest valid one. E.g. if user has set **\<speed\>**=71, **\<name\>**=0 and \<**ce**\>=1 (non-transparent asynchronous 9600 bps V.110 ISDN connection) for mobile originated calls, ME/TA shall map the values into non-transparent asynchronous 9600 bps V.32 modem connection when single numbering scheme call is answered.
Command Functional Group	Call Control
Command Format Query Response	AT+CSNS=? +CSNS: (0-7) OK
Write Format Response	AT+CSNS = **\<mode\>** OK
Read Format Response	AT+CSNS? +CSNS: 0 OK
Execution Format Response	N/A N/A

2.1.2.11.   AT+CSNS   Single Numbering Scheme (continued)

Parameter Values

<mode>	**0**	voice
	1	alternating voice/fax, voice first (TS 61)
	2	fax (TS 62)
	3	alternating voice/data, voice first (BS 61)
	4	data
	5	alternating voice/fax, fax first (TS 61)
	6	alternating voice/data, data first (BS 61)
	7	voice followed by data (BS 81)

Reference   GSM Ref. 07.07 Chapter 6.17

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   Fax not supported

2.1.3. Network Service Related Commands

2.1.3.1.   AT+CNUM   Subscriber Number

Command Function	This command is used to obtain the MSISDNs related to the subscriber.
Command Functional Group	Network Information
Command Format Query Response	AT+CNUM=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CNUM +CNUM: "Line1", "1 719 xxx xxxx", 145 OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 7.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Not all SIMs are received from the provider with the number stored on the SIM.

2.1.3.2. AT+CREG   Network Registration Info

Command Function	Write command controls the presentation of an unsolicited result code **+CREG: <stat>** .
	Read command returns the status of result code, which shows whether the network has currently indicated the registration of the ME.
Command Functional Group	Network Information
Command Format Query Response	AT+CREG=? +CREG: (0,2) OK
Write Format Response	AT+CREG=**[<n>]** OK
Read Format Response	AT+CREG? +CREG: **<n>,<stat>[,<lac>,<ci>]** OK
Execution Format Response	N/A N/A

2.1.3.2.   AT+CREG   Network Registration Info
                                (continued)

Parameter Values

<n>	**0**	disable network registration unsolicited result code
	1	enable network registration unsolicited result code **+CREG: <stat>**
	2	enable network registration and location information unsolicited result code +CREG: **<stat>[,<lac>,<ci>]**

<stat>	**0**	not registered, ME is not currently searching a new operator to register to
	1	registered, home network
	2	not registered, but ME is currently searching a new operator to register to
	3	registration denied
	4	unknown
	5	registered, roaming

<lac>	string type; two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string type; two-byte cell ID in hexadecimal format

Reference	GSM Ref. 07.07 Chapter 7.2
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	N/A

2.1.3.3.　AT+COPS　Operator Selection

Command Function

Write command forces an attempt to select and register the GSM network operator. **<mode>** is used to select whether the selection is done automatically by the ME or is forced by this command to operator **<oper>** (it shall be given in format **<format>**). If the selected operator is not available, no other operator shall be selected (except **<mode> = 4**). The selected operator name format shall apply to further read commands **(+COPS?)** also. **<mode>=2** forces an attempt to deregister from the network. The selected mode affects to all further registration (e.g. after **<mode>=2**, ME shall be unregistered until **<mode>=0 or 1** is selected).

Read command returns the current mode and the currently selected operator. If no operator is selected, **<format>** and **<oper>** are omitted.

Test command returns a list of quadruplets, each representing an operator present in the network. 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. Any of the formats may be unavailable and will then be an empty field (,,). The list of operators comes in the following order: Home network, networks referenced in SIM, and other networks.

Command Functional Group

Network Information

2.1.3.3. AT+COPS

Operator Selection
(continued)

Command Format Query	AT+COPS=?
Response	+COPS: (2, " ", " ", "31022"), (3, " ", " ", "310380") OK
Write Format	AT+COPS=**<mode>**
Response	**[, <format> [, oper>]]** OK or +CME ERROR: **<err>**
Read Format	AT+COPS?
Response	+COPS: 0 OK
Execution Format	N/A
Response	N/A

2.1.3.3. AT+COPS

**Operator Selection
(continued)**

Parameter Values

<mode>	**0**	automatic (**<oper>** field is ignored)
	1	manual (**<oper>** field shall be present)
	2	deregister from network
	3	set only **<format>** (for read command **+COPS?**), do not attempt registration/deregistration (**<oper>** field is ignored); this value is not applicable in read command response
	4	manual/automatic (**<oper>** field shall be present); if manual selection fails, automatic mode (**<mode=0**) is entered
	.	
<format>	**0**	long format alphanumeric **<oper>**
	1	short format alphanumeric **<oper>**
	2	numeric **<oper>**; GSM Location Area Identification Number
<oper>		operator in format as in per **<format>**
<stat>	**0**	Unknown
	1	Available
	2	Current
	3	Forbidden

Reference   GSM Ref. 07.07 Chapter 7.3

Standard Scope   Optional

Enfora Implementation Scope Partial

Notes

2.1.3.3.   AT+COPS   Operator Selection (continued)

Example:

To manually register the modem on a known PLMN:

AT+COPS=1,2,"xxxxx"
                              PLMN
                              Numeric format
                              Manually register

To read operator information:

AT+COPS=?
+COPS: (2,"Voicestream","Vstream","31022")
                                           PLMN
                                           Short format
                                           Long format
                                           State (current)

2.1.3.4.   AT+CLCK   Facility Lock

Command Function	This command is used to lock, unlock or interrogate a ME or a network facility **<fac>**. When querying the status of a network service (**<mode>**=2) the response line for a "not active" case (**<status=0>**) should be returned only if service is not active for any **<class>**. Is should be possible to abort the command when network facilities are set or interrogated.
Command Functional Group	Supplemental Services
Command Format Query Response	AT+CLCK=? +CLCK: ("SC", "AO", "OI", "OX", "AI", "IR", "AB", "AG", "AC", "FD", "PC","PP", "PS", "PN", "PU", "PF","AL") OK
Write Format	AT+CLCK=**<fac>, <mode> [,<passwd> [, <class>]]**
Response	If **<mode><>** 2 and command is successful then OK
	If **<mode>**=2 and command is successful then +CLCK:**<status>,[,<class1>[<CR><LF>** +CLCK: **<status>, class2…]]** **OK**
Read Format	N/A
Response	N/A
Execution Format	N/A
Response	N/A

2.1.3.4. AT+CLCK Facility Lock (continued)

Parameter Values

<fac>	**"SC"** (SIM PIN 1)
	"AO" (Barr All Outgoing Calls)
	"OI" (Barr Outgoing International Calls)
	"OX" (Barr Outgoing International Calls except Home Country)
	"AI" (Barr All Incoming Calls)
	"IR" (Barr Incoming Calls when Roaming outside the Home Country)
	"AB" (All Barring Services)
	"AG" (All Outgoing Barring)
	"AC" (All incoming Barring)
	"FD" (SIM Fixed Dialing Feature)
	"PC" (Corporate Personalization, allows personalization to custom corporate group settings)
	"PP" (Provider Personalization, allows for personalization to custom service provider defined groups)
	"PS" PH-SIM (lock PHone to SIM card) (ME asks password when other than current SIM card inserted; ME may remember certain amount of previously used cards thus not requiring password when they are inserted)
	"PF" lock Phone to the very First inserted SIM card (also referred in the present document as PH-FSIM) (ME asks password when other than the first SIM card is inserted)
	"PN" Network Personalisation (refer GSM 02.22 [33])
	"PU" network sUbset Personalisation (refer GSM 02.22 [33])
	"AL" alternating Line service (PIN2)

2.1.3.4.   AT+CLCK   Facility Lock
                             (continued)

<mode>	0	Unlock
	1	Lock
	2	Query Status

<password>	"password"

<class>	1	voice
	2	data
	4	fax (fax not supported)
	7	all classes **(default)**
	8	short message service

<status>	0	off
	1	on

Reference	GSM Ref. 07.07 Chapter 7.4

Standard Scope	Optional

Enfora Implementation Scope	Partial

Notes

Example:

To set Network Personalisation on first SIM inserted:

AT+CLCK="PF",1,"password",,"PN"
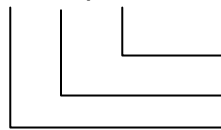
                                    Password
                                    Lock
                                    Lock module to very first SIM
                                    inserted

To enable SIM PIN:

AT+CLCK="SC",1,"xxxx"
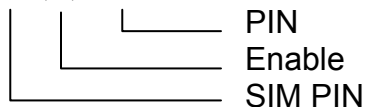
                        PIN
                        Enable
                        SIM PIN

2.1.3.5.   AT+CPWD   Change Password

Command Function	This command is used to set a new password for the facility lock function defined by command Facility Lock +CLCK.
Command Functional Group	Supplemental Services
Command Format Query Response	AT+CPWD=? +CPWD: ("SC", "AD", "OI", "OX", "AI", "IR", "AB", "AG", "AC", "P2", "PC", "PP", "PS", "PN", "PU", "PF") OK
Write Format	AT+CPWD = **<fac>, [<oldpwd>], <newpwd>**
Response	OK or +CME ERROR: **<err>**
Read Format	N/A
Response	N/A
Execution Format	N/A
Response	N/A

2.1.3.5.   AT+CPWD

**Change Password
(continued)**

Parameter Values

<fac>	**"SC"**	(SIM PIN 1)
	"AO"	(Barr All Outgoing Calls)
	"OI"	(Barr Outgoing International Calls)
	"OX"	(Barr Outgoing International Calls except Home Country)
	"AI"	(Barr All Incoming Calls)
	"IR"	(Barr Incoming Calls when Roaming outside the Home Country)
	"AB"	(All Barring Services)
	"AG"	(All Outgoing Barring)
	"AC"	(All incoming Barring)
	"P2"	(SIM PIN 2)
	"PC"	(Corporate Personalization, allows personalization to custom corporate group settings)
	"PP"	(Provider Personalization, allows for personalization to custom service provider defined groups)
	"PS"	PH-SIM (lock PHone to SIM card) (ME asks password when other than current SIM card inserted; ME may remember certain amount of previously used cards thus not requiring password when they are inserted)
	"PF"	lock Phone to the very First inserted SIM card (also referred in the present document as PH-FSIM) (ME asks password when other than the first SIM card is inserted)
	"PN"	Network Personalisation (refer GSM 02.22 [33])
	"PU"	network sUbset Personalisation (refer GSM 02.22 [33])

2.1.3.5. AT+CPWD   Change Password
                            (continued)

\<oldpwd\>	Password specified for the facility. If an old password has not yet been set, **\<oldpwd\>** is not entered
\<newpwd\>	"new password"
Reference	GSM Ref. 07.07 Chapter 7.5
Standard Scope	Optional
Enfora Implementation Scope	Partial

Notes	In order to change the password, the applicable facility must be enabled. See AT+CLCK.
	The length of the personalization password ("PC" to "PU") is 8-16 digits.
	The password can be changed only if the facility is unlocked.

Example:

Enter first password for Network Personalisation:

AT+CPWD="PN",,"xxxx"

Password for Network Personalisation
Network Personalisation

To change SIM PIN:

AT+CPWD="SC","xxxx","yyyy"

New password
Old password
SIM PIN

2.1.3.6. AT+CLIP   Calling Line Identification Presentation

Command Function	This command refers to the GSM supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the Calling Line Identity (CLI) of the calling party when receiving a mobile terminated call. The write command enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CLIP=? +CLIP: (0, 1) OK
Write Format Response	AT+CLIP=**<n>** +CLIP: **<n>** or OK or +CME ERROR: **<err>**
Read Format Response	AT+CLIP? +CLIP: **<n>, <m>** OK
Execution Format Response	N/A N/A

2.1.3.6. AT+CLIP	**Calling Line Identification Presentation (continued)**

Unsolicited Result Code

When CLIP is enabled at the TE (and is permitted by the calling subscriber), an unsolicited result code is returned after the first RING (or +CRING: **<type>**) at a mobile terminating call

Voice call response format:
+CLIP: <number>, <type>,,,,<CLI validity>

Data/FAX call response format:
+CLIP: <number>, <type>

Parameter Values

<n>	**0**	suppress unsolicited results codes
	1	display unsolicited result codes
<m>	**0**	CLIP not enabled
	1	CLIP enabled
	2	Unknown

<number>   string type phone number of calling address in format specified by **<type>**

<type>   type of address octet in integer format: **145** when dialing string includes international access code character "+", otherwise **129**

<CLI validity>	**0**	CLI valid
	1	CLI has been withheld by the originator
	3	CLI is not available due to inter-working problems or limitations of originating network. **<number>** shall be an empty string ("") and **<type>** value will not be significant.

2.1.3.6.   AT+CLIP   **Calling Line Identification**
                                Presentation (continued)

Reference   GSM Ref. 07.07 Chapter 7.6

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   N/A

2.1.3.7.   AT+CLIR   Calling Line Identification Restriction

Command Function	This command allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.
	The write command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all outgoing calls. This adjustment can be revoked by using the opposite command. This command, when used by a subscriber, without provision of CLIR in permanent mode the network will act according GSM 02.81 [3].
	The read command gives the default adjustment for all outgoing calls (given in **<n>**), and also triggers and interrogation of the provision status of the CLIR service (given in **<m>**).
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CLIR=? +CLIR: (0, 1, 2) OK
Write Format Response	AT+CLIR=[**<n>**] N/A
Read Format Response	AT+CLIR? +CLIR: **<n>, <m>** OK
Execution Format Response	N/A N/A

2.1.3.7. AT+CLIR   Calling Line Identification Restriction (continued)

Parameter Values

\<n>	(parameter sets the adjustment for outgoing calls)

     0   presentation indicator is used according to the subscription of the CLIR service
     1   CLIR Invocation
     2   CLIR suppression

\<m>	(parameter shows the subscriber CLIR service status in the network)

     0   CLIR not enabled
     1   CLIR enabled in permanent mode
     2   Unknown (e.g. no network, etc.)
     3   CLIR temporary mode presentation restricted
     4   CLIR temporary mode presentation allowed

Reference   GSM Ref. 07.07 Chapter 7.7

Standard Scope   Optional

Enfora Implementation Scope   Fully

Notes   N/A

2.1.3.8.   AT+COLP

Connected Line Identification Presentation

Command Function	This command is enables a calling subscriber to get the Connected Line Identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+COLP=? +COLP: (0, 1) OK
Write Format Response	AT+COLP= [**<n>**] OK
Read Format Response	AT+COLP? +COLP: **<n>, <m>** OK
Execution Format Response	N/A N/A

2.1.3.8. AT+COLP

Connected Line Identification Presentation (continued)

Parameter Values

<n>	(parameter sets/shows the result code presentation status in the TA)

      0   disable
      1   enable

<m>   (parameter shows the subscriber COLP

      0   COLP not enabled
      1   COLP enabled
      2   Unknown (e.g. no network, etc.)

Reference   GSM Ref. 07.07 Chapter 7.8

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   N/A

2.1.3.9.   AT+CCUG   Closed User Group

Command Function	This command allows control of the Closed User Group supplementary service.
	Write command with **<n>**=1 enables to control the CUG information on the air interface as a default adjustment for all following outgoing calls.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CCUG=? +CCUG: (0, 1), (0,-10), (0-3) OK
Write Format Response	AT+CCUG= **[<n> [,<index> [,<info>]]]** N/A
Read Format Response	AT+CCUG? +CCUG: 0, 0, 0 OK
Execution Format Response	N/A N/A

Parameter Values

<n>	**0**	disable CUG temporary mode
	1	enable CUG temporary mode
<index>	**0-9**	CUG index
	10	no index preferred CUG taken from subscriber data)
<info>	**0**	no information
	1	suppress OA
	2	suppress preferential CUG
	3	suppress OA and preferential CUG

2.1.3.9.   AT+CCUG   Closed User Group
                               (continued)

Reference   GSM Ref. 07.07 Chapter 7.9

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   N/A

2.1.3.10. AT+CCFC   Call Forwarding Number and Condition

Command Function	This command allows control of the call forwarding supplementary service. Registration erasure, activation, deactivation, and status query are supported. When querying the status of a network service (**<mode> = 2**), the response line for "not active" (**<status> = 0**) should be returned only if service is not active for any **<class>**.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CCFC=? +CCFC: (0-5) OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format	AT+CCFC=**<reas>, <mode>** [, **<number>**[,**<type>** [, **<class>** [,**<time>**]]]]
Response	If **<mode> <> 2** and command successful **OK** If **<mode> = 2** and command successful (only in connection with **<reason> 03**) **+CCFC: <status>, <class1>[,<number>,<type>[,<time>]] [<CR><LF>+CCFC: ….] OK** If error is related to ME functionality: +CME ERROR: **<err>**

2.1.3.10.   AT+CCFC   **Call Forwarding Number and**
                                 Conditions (continued)

Parameter Values

<reas>	**0**	unconditional
	1	mobile busy
	2	no reply
	3	not reachable
	4	all call forwarding
	5	all conditional call forwarding

<mode>	**0**	disable
	1	enable
	2	query status
	3	registration
	4	erasure

<number>   string type phone number of forwarding
                      address in format specified by **<type>**

<type>   type of address in integer format; default
                      145 when dialing string includes
                      international access code character "+",
                      otherwise 129

<class>

	1	voice
	2	data
	4	fax (fax not supported)
	8	short message service
	16	data circuit sync
	32	data circuit async

<**subaddr**>   string type subaddress of format specified
                      by <satype>

<satype>   type of subaddress octet in integer format
                      (refer GSM 04.08 [8] subclause 10.5.4.8);
                      default 128

2.1.3.10.   AT+CCFC   **Call Forwarding Number and
                                Conditions (continued)**

<time>   time to wait before call is forwarded,
                                rounded to a multiple of 5 sec
                                Default is 20.
                                1…20..30 (only for **<reas>**=no reply)

<status>   **0**   not active
                                1   active

Reference   GSM Ref. 07.07 Chapter 7.10

Standard Scope   Optional

Enfora Implementation Scope Full

Notes

Example:

To call forward all voice calls, no reply after five seconds:

AT+CCFC=2,1,"+1719xxxxxx",145,1,,,5

```
                                    |___ Forward after 5 seconds
                                    |___ All Voice calls
                                    |___ International number type
                                    |___ Forward to this number
                                    |___ Enable forwarding
                                    |___ No reply
```
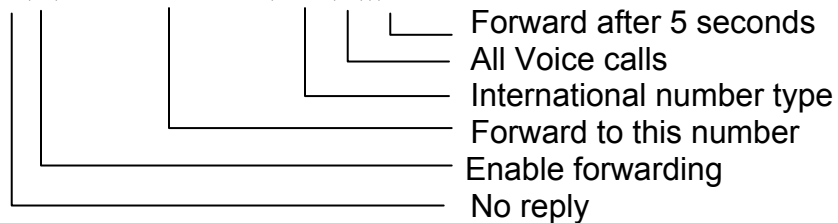
2.1.3.11.   AT+CCWA   Call Waiting

Command Function	This command allows control of the Call Waiting supplementary service. Activation and deactivation are supported.
Command Functional Group	Results
Command Format Query Response	AT+CCWA=? +CCWA: (0,1) OK
Write Format Response	AT+CCWA=**\<n\>,\<mode\>,\<class\>** OK
Read Format Response	AT+CCWA? +CCWA: 0 OK
Execution Format Response	N/A N/A

Parameter Values

\<n\>   Sets/shows results code presentation in TA

0	Disable
1	Enable

\<mode\>

0	Disable
1	Enable
2	Query status

\<class\>

1	Voice
2	Data
4	Fax (fax not supported)

Reference	GSM Ref. 07.07 Chapter 7.11
Standard Scope	Optional
Enfora Implementation Scope	Partial

2.1.3.11.   AT+CCWA   Call Waiting
                                          (continued)

Notes   Not all networks support call waiting for
                                       data and fax. Please contact service
                                       provider for details.

Example:

AT+CCWA=1,1,1
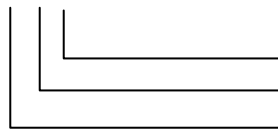
           Voice
           Enable Call Waiting
           Enable Result Codes

2.1.3.12.   AT+CHLD   Call Hold and Multiparty

Command Function	This command controls the supplementary services Call Hold, MultiParty and Explicit Call Transfer. Calls can be put on hold, recovered, released, added to conversation and transferred.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CHLD=? +CHLD: (0, 1, 1x, 2, 2x, 3, 4**)** OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CHLD=**<n>** OK

2.1.3.12. AT+CHLD   **Call Hold and Multiparty (continued)**

Parameter Values

\<n\>	**0**	Terminate all held calls; or set UDUB (User Determined User Busy) for a waiting call, i.e. reject the waiting call.
	1	Terminate all active calls (if any) and accept the other call (waiting call or held call)
	1X	Terminate the active call X (X= 1-7)
	2	Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call
	2X	Place all active calls except call X (X= 1-7) on hold
	3	Add the held call to the active calls
	4	Connects the two calls and disconnects the subscriber from both calls (ECT).

Reference   GSM Ref. 07.07 Chapter 7.12

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   Call Hold, MultiParty and Explicit Call Transfer are only applicable to teleservice 11(Speech Telephony).

2.1.3.13.   AT+CUSD   Unstructured Supplementary Service

Command Function	This command allows control of the Unstructured Supplementary Service Data (USSD)]. Both network and mobile initiated operations are supported. Parameter **<n>** is used to disable/enable the presentation of an unsolicited result code (network initiated operation) to the TE.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CUSD=? +CUSD: (0, 1, 2) OK
Write Format Response	+CUSD=[<n>[,<str>[,<dcs>]]] OK
Read Format Response	AT+CUSD? +CUSD: 0 OK
Execution Format Response	N/A N/A

Parameter Values

<n>	**0**	disable the result code presentation
	1	enable the result code presentation
	2	cancel session

(when <str> parameter is not given, network is not interrogated)

<str>	actual USSD string in "quotes"
<dcs>	language parameter see GSM 03.38 - Default 15 (Language unspecified)
Reference	GSM Ref. 07.07 Chapter 7.14 GSM Ref. 03.38 Chapter 5

2.1.3.13.   AT+CUSD   Unstructured Supplementary Service (continued)

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes

Example

AT+CUSD=1,"*201*35#",15
OK
+CUSD: 0,"*201*35#",15   (network response)

USSD stings can also be sent using the ATD command.

ATD*201*35#
OK
+CUSD: 0,"*201*35#",15   (network response)

2.1.3.14.   AT+CAOC   Advice of Charge

Command Function	This refers to Advice of Charge supplementary service that enables subscriber to get information about the cost of calls. With **<mode>**=0, the execute command returns the current call meter value from the ME.
Command Functional Group	Supplementary Services
Command Format Query Response	AT+CAOC=? +CAOC: (0-2) OK
Write Format Response	AT+CAOC=**<mode>**
Read Format Response	AT+CAOC? +CAOC: 1 OK
Execution Format Response	AT+CAOC +CAOC: "000000" OK
Parameter Values	
<mode>	**0** Query CCM value **1** Deactivate **2** Activate
Reference	GSM Ref. 07.07 Chapter 7.15
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	When <mode>=0, execution command will return the current call meter value.

2.1.3.15. AT+CSSN   Supplementary Service Notifications

Command Function   This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When **<n>**=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: **<code1>[,<index>]** is sent to TE before any other MO call setup result codes are presented. When several different **<code1>**s are received from the network, each of them shall have its own +CSSI result code.

When **<m>**=1 and a supplementary service notification is received during a mobile terminated call setup or during a call; or when a forward check supplementary service notification is received, unsolicited result code +CSSU: **<code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]]** is sent to TE. In case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP"). When several different **<code2>**s are received from the network, each of them shall have its own +CSSU result code.

2.1.3.15. AT+CSSN	**Supplementary Service Notifications (continued)**

Command Functional Group	Supplementary Services
Command Format Query Response	AT+CSSN=? +CSSN: (0, 1), (0, 1) OK
Write Format Response	AT+CSSN=**<n>, <m>** OK
Read Format Response	AT+CSSN? +CSSN: **<n>, <m>** OK
Execution Format Response	N/A N/A

Parameter Values

<n>	(parameter sets/shows the +CSSI result code presentation status in the TA): **0**　　disable **1**　　enable
<m>	(parameter sets/shows the +CSSU result code presentation status in the TA): **0**　　disable **1**　　enable
<code1>	**0**　　unconditional call forwarding is active **1**　　some of the conditional call forwardings are active **2**　　call has been forwarded **3**　　call is waiting **4**　　this is a CUG call (also <index> present) **5**　　outgoing calls are barred **6**　　incoming calls are barred **7**　　CLIR suppression rejected **8**　　call has been deflected

2.1.3.15.   AT+CSSN   Supplementary Service Notifications (continued)

<index>	refer "Closed user group +CCUG"

<code2>	**0**	this is a forwarded call (MT call setup)
	1	this is a CUG call (also <index> present) (MT call setup)
	2	call has been put on hold (during a voice call)
	3	call has been retrieved (during a voice call)
	4	multiparty call entered (during a voice call)
	5	call on hold has been released (this is not a SS notification) (during a voice call)
	6	forward check SS message received (can be received whenever)
	7	call is being connected (alerting) with the remote party in alerting state in explicit call transfer operation (during a voice call)
	8	call has been connected with the other remote party in explicit call transfer operation (also number and subaddress parameters may be present) (during a voice call or MT call setup)
	9	this is a deflected call (MT call setup)

<number>	string type phone number of format specified by **<type>**
<type>	type of address octet in integer format
<subaddr>	string type subaddress of format specified by **<satype>**
<satype>	type of subaddress octet in integer format

2.1.3.15.　AT+CSSN　　　Supplementary Service Notifications (continued)

Reference	GSM Ref. 07.07 Chapter 7.16
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.3.16.   AT+CLCC   List current calls

Command Function	Returns list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE.
Command Functional Group	Call Control
Command Format Query Response	AT+CLCC=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CLCC **[+CLCC: <id1>,<dir>,<stat>, <mode>,<mpty>[,<number>, <type>[,<alpha>]]** **[<CR><LF>+CLCC: <id2>,<dir>, <stat>,<mode>,<mpty> [,<number>,<type>[,<alpha>]] [...]]]** OK

Parameter Values

<id*x*>	integer type; call identification number as described in GSM 02.30 [19] subclause 4.5.5.1; this number can be used in +CHLD command operations
<dir>	**0** mobile originated (MO) call **1** mobile terminated (MT) call

2.1.3.16. AT+CLCC — List current calls (continued)

\<stat\>	(state of the call):
	0 active
	1 held
	2 dialling (MO call)
	3 alerting (MO call)
	4 incoming (MT call)
	5 waiting (MT call)
\<mode\>	(bearer/teleservice):
	0 voice
	1 data
	2 fax (fax not supported)
	3 voice followed by data, voice mode
	4 alternating voice/data, voice mode
	5 alternating voice/fax, voice mode
	6 voice followed by data, data mode
	7 alternating voice/data, data mode
	8 alternating voice/fax, fax mode
	9 unknown
\<mpty\>	**0** call is not one of multiparty (conference) call parties
	1 call is one of multiparty (conference) call parties
\<number\>	string type phone number in format specified by **\<type\>**
\<type\>	type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7)
\<alpha\>	string type alphanumeric representation of \<number\> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS

2.1.3.16.   AT+CLCC   List current calls
                             (continued)

Reference   GSM Ref. 07.07 Chapter 7.17

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   N/A

2.1.3.17.   AT+CPOL   Preferred Operator list

Command Function	This command is used to list and edit the SIM preferred list of networks.
Command Functional Group	Network
Command Format Query Response	AT+CPOL=? +CPOL: (1-*n*), (0-2) OK
Write Format Response	AT CPOL**=[<index>][, <format>[,<oper>]]** OK
Read Format Response	AT+CPOL? +CPOL: **<index1>,<format>,<oper1>…** **<index10>,<format>,<oper10>** OK
Execution Format Response	N/A N/A

Parameter Values

<index*n*>:	integer type; the order number of operator in the SIM preferred operator list
<format>:	

0	long format alphanumeric **<oper>**
1	short format alphanumeric **<oper>**
2	numeric **<oper>**

<oper*n*>:	string type; **<format>** indicates if the format is alphanumeric or numeric (see +COPS)
Reference	GSM Ref. 07.07 Chapter 7.18
Standard Scope	Optional
Enfora Implementation Scope	Full

2.1.3.17.   AT+CPOL   Preferred Operator list
                                  (continued)

Notes   This command is used to edit the SIM
                                  preferred list of networks. Execute
                                  command writes an entry in the SIM list of
                                  preferred operators (EF$_{PLMNsel}$). 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.

2.1.3.18.   AT+COPN   Read Operator Names

Command Function	Execute command returns the list of operator names from the ME.
Command Functional Group	Network
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+COPN +COPN: **<numeric1>,<alpha1> [<CR><LF>+COPN: <numeric2>, <alpha2>[...]]** OK

Parameter Values

<numeric*n*>	string type; operator in numeric format (see +COPS)
<alpha*n*>	string type; operator in long alphanumeric format (see +COPS)
Reference	GSM Ref. 07.07 Chapter 7.19
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4. ME Control and Status Commands

2.1.4.1. AT+CPAS   Phone Activity Status

Command Function	Execution command returns the activity status **<pas>** of the ME. It can be used to interrogate the ME before requesting action from the phone. Test command returns values supported by the ME as a compound value.
Command Functional Group	Phone Control
Command Format Query Response	AT+CPAS=? +CPAS: (0-5) or +CME ERROR: <err> OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CPAS AT+CPAS: **<pas>** OK

2.1.4.1.   AT+CPAS   Phone Activity Status
(continued)

Parameter Values

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

Reference	GSM Ref. 07.07 Chapter 8.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4.2. AT+CFUN   Set Phone Functionality

Command Function	Set command selects the level of functionality <fun> in the ME. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn.
Command Functional Group	Phone Control
Command Format Query Response	AT+CFUN=? +CFUN: (0,1,4), (0) OK
Write Format Response	AT+CFUN=**<fun>,<rst>** OK
Read Format Response	AT+CFUN? +CFUN: 1 OK
Execution Format Response	N/A N/A

Parameter Values

<fun>	**0**	Minimum functionality
	1	Full functionality
	4	disable phone both transmit and receive RF circuits
<rst>	**0**	Do not reset ME

Reference	GSM Ref. 07.07 Chapter 8.2
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	Once the modem has left the minimum functionality state, it will respond to AT+CFUN? with +CFUN: 1 regardless of whether the modem has reached full functionality yet.

2.1.4.3.   AT+CPIN   Enter PIN

Command Function	Set command sends to the ME a password that is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If no PIN request is pending, no action is taken towards ME and an error message, +CME ERROR, is returned to TE. If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, **<newpin>**, issued to replace the old pin in the SIM.
Command Functional Group	Phone Control
Command Format Query Response	AT+CPIN=? OK
Write Format Response	AT+CPIN=**<"pin">,[<"newpin">]**
Read Format Response	AT+CPIN? +CPIN: **<code>** OK **or** +CME ERROR: **<err>**
Execution Format Response	N/A N/A

Parameter Values

<code>	**READY**	ME is not pending for any password
	SIM PIN	ME is waiting SIM PIN to be given
	SIM PUK	ME is waiting SIM PUK to be given
	PH-SIM PIN	ME is waiting phone-to-SIM card password to be given

2.1.4.3.   AT+CPIN   Enter PIN
(continued)

PH-FSIM PIN
ME is waiting phone-to-very first SIM card password to be given

PH-FSIM PUK
ME is waiting phone-to-very first SIM card unblocking password to be given

SIM PIN2   ME is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that ME does not block its operation)

SIM PUK2   ME is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that ME does not block its operation)

PH-NET PIN
ME is waiting network personalization password to be given

2.1.4.3.   AT+CPIN   Enter PIN
                            (continued)

PH-NET PUK

ME is waiting network
personalization unblocking
password to be given

PH-NETSUB PIN

ME is waiting network subset
personalization password to
be given

PH-NETSUB PUK

ME is waiting network subset
personalization unblocking
password to be given

PH-SP PIN

ME is waiting service provider
personalization password to
be given

PH-SP PUK

ME is waiting service provider
personalization unblocking
password to be given

PH-CORP PIN

ME is waiting corporate
personalization password to
be given

PH-CORP PUK

ME is waiting corporate
personalization unblocking
password to be given

2.1.4.3. AT+CPIN   Enter PIN
                                            (continued)

Reference   GSM Ref. 07.07 Chapter 8.3

Standard Scope   Optional

Enfora Implementation Scope Full

Notes Commands which interact with ME
that are accepted when ME is pending SIM
PIN,SIM PUK, or PH-SIM are: +CGMI,
+CGMM, +CGMR, +CGSN, D112;
(emergency call),+CPAS, +CFUN, +CPIN,
After power on the modem needs 20-25
seconds to initialize and completely read
the SIM.

*** If AT$AREG=1, and PIN is enabled, the
modem will not complete the auto
registration process until after the PIN
has been entered (AT+CPIN).**

2.1.4.4.   AT+CSQ   Signal Quality and Bit Error Rate

Command Function	Execution command returns received signal strength indication **\<rssi\>** and channel bit error rate **\<ber\>** from the ME.
Command Functional Group	Phone Control
Command Format Query Response	AT+CSQ=? +CSQ: (2-31,99),(99) OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CSQ +CSQ: **\<rssi\>**, **\<ber\>** OK

Parameter Values

\<rssi\>		
	0	-113 dBm or less
	1	-111 dBm
	2-30	-109... -53 dBm
	31	-51 dBm or greater
	99	not known or not detectable

\<ber\>	(in percent)		
		0-7	as RXQUAL values in the table in GSM 05.08 [20] subclause 8.2.4
		99	not known or not detectable

Reference	GSM Ref. 07.07 Chapter 8.5
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	N/A

2.1.4.5.   AT+CPBS   Select Phonebook Memory Storage

Command Function	Set command enables or disables sending of unsolicited result codes from TA to TE in the case of key pressings, display changes, and indicator state changes.
Command Functional Group	Phonebook Control
Command Format Query Response	AT+CPBS=? +CPBS: ("EN","BD","FD","DC","LD","RC","LR","MT", "AD","SM","SD","MC","LM","ON","UD") OK
Write Format Response	AT+CPBS=**\<storage\>** OK
Read Format Response	AT+CPBS? +CPBS: **\<storage\>**, **\<used\>**, **\<total\>** OK
Execution Format Response	N/A N/A

2.1.4.5.   AT+CPBS   Select Phonebook Memory Storage (continued)

Parameter Values

<storage>

"EN"	SIM (or ME) emergency number
"FD"	SIM fixed-dialing-phonebook
"LD"	SIM last-dialing-phonebook
"BD"	SIM barred-dialing phonebook
"SD"	SIM service numbers
"DC"	MT dialed calls list
"RC"	MT received calls list
"LR"	Last received numbers (nonstandard)
"MT"	combined MT and SIM/UICC phonebook
"AD"	Abbreviated dialing numbers (nonstandard)
"LM"	Last missed numbers (nonstandard)
"MC"	MT missed (unanswered received) calls list
"SM"	comb. of fixed and abbrev. dialing phonebook (nonstandard)
"ON"	active application in the UICC (GSM or USIM) or SIM card (or MT) own numbers (MSISDNs) list
"UD"	User defined

<used>   integer type value indicating the number of used locations in selected memory

<total>   integer type value indicating the total number of locations in selected memory

Reference   GSM Ref. 07.07 Chapter 8.11

Standard Scope   Optional

Enfora Implementation Scope Partial

Notes   To read the storage facilities, the correct storage must be written to first and then read.

2.1.4.5. AT+CPBS   Select Phonebook Memory Storage (continued)

Example:

AT+CPBS="EN"
└──────── Enable Emergency number storage

AT+CPBS?
+CPBS: "EN", 5,5
│   └─ Total Number of locations in selected memory
│   Number of used locations in selected memory
└──────────── Emergency number storage enabled

2.1.4.6.   AT+CPBR   Read Phonebook Entries

Command Function	Execution command returns phonebook entries in location number range **<index1>... <index2>** from the current phonebook memory storage selected with +CPBS. If **<index2>** is left out, only location **<index1>** is returned.
Command Functional Group	Phonebook Control
Command Format Query Response	AT+CPBR=? +CPBR: (1-250), 44,16 OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CPBR**=<index1>,<index2>,…** **+CPBR: <index1>,<number>,** **<type>,<text>** **OK**

2.1.4.6.   AT+CPBR   Read Phonebook Entries (continued)

Parameter Values

<index1>, <index2>, <index>	integer type values in the range of location numbers of phonebook memory
<number>	string type phone number of format **<type>**
<type>	type of address octet in integer format
<text>	string type field of maximum length **<tlength>**; character set as specified by command Select TE Character Set +CSCS
<nlength>	integer type value indicating the maximum length of field **<number>**
<tlength>	integer type value indicating the maximum length of field **<text>**
Reference	GSM Ref. 07.07 Chapter 8.12
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command will read the storage facility that is set with AT+CPBS.

2.1.4.7.   AT+CPBF   Find Phonebook Entries

Command Function	Execution command returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field start with string **<findtext>**.
Command Functional Group	Phonebook Control
Command Format Query Response	AT+CPBF=? +CPBF: **<nlength>, <tlength>** OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CPBF=**<"findtext">** +CPBF: **<index1>, <number>, <type>,<text><CR><LF>+CBPF: <index2>,<number>,<type>,<text>…** **OK**

2.1.4.7. AT+CPBF   Find Phonebook Entries (continued)

Parameter Values

<index1>, <index2>	integer type values in the range of location numbers of phonebook memory
<number>	string type phone number of format **<type>**
<type>	type of address octet in integer format
<findtext>, <text>	string type field of maximum length **<tlength>**; character set as specified by command Select TE Character Set +CSCS
<nlength>	integer type value indicating the maximum length of field **<number>**
<tlength>	integer type value indicating the maximum length of field **<text>**

Reference	GSM Ref. 07.07 Chapter 8.13
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command will find an entry within the storage facility that is set with AT+CPBS.

Example:

AT+CPBF="office"

+CPBF: 10,"19725551212",129,"office"

2.1.4.8. AT+CPBW   Write Phonebook Entries

Command Function	Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.
Command Functional Group	Phonebook Control
Command Format Query Response	AT+CPBW=? +CPBW: (1-250), 44, (128-201), 16 OK
Write Format Response	N/A N/A
Read Format Response	AT+CPBW? +CPBW: **<index>, [<nlength>], <types>, [<tlength>]** OK
Execution Format Response	AT+CPBW=**<index>,<number>,<type>** **<text>** **OK/+CME ERROR: <err>**

2.1.4.8.   AT+CPBW   Write Phonebook Entries (continued)

Parameter Values

\<index\>	integer type values in the range of location numbers of phonebook memory
\<number\>	string type phone number of format **\<type\>**
\<type\>	type of address octet in integer format; default 145 when dialling string includes international access code character "+", otherwise 129
\<text\>	string type field of maximum length **\<tlength\>**; character set as specified by command Select TE Character Set +CSCS
\<nlength\>	integer type value indicating the maximum length of field **\<number\>**
\<tlength\>	integer type value indicating the maximum length of field **\<text\>**
Reference	GSM Ref. 07.07 Chapter 8.14
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command will write to the storage facility that is set with AT+CPBS.

Example:

 AT+CPBW=10,"17192326602",129,"Toms Office"

2.1.4.9.   AT+CMUT   Mute Control

Command Function	This command is used to enable and disable the uplink voice muting during a voice call.
Command Functional Group	Phone Control
Command Format Query Response	AT+CMUT=? +CMUT: (0,1) OK
Write Format Response	AT+CMUT=**\<value\>** OK
Read Format Response	AT+CMUT? +CMUT: 0 OK
Execution Format Response	N/A N/A
Parameter Values	
\<value\>	**0** mute off **1** mute on
Reference	GSM Ref. 07.07 Chapter 8.24
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4.10.   AT+CACM   Accumulated Call Meter

Command Function	Set command resets the Advice of Charge related accumulated call meter value in SIM file EF$_{ACM}$. ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is usually required to reset the value.
Command Functional Group	Phone Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	AT+CACM? +CACM: "000000" OK
Execution Format Response	AT+CACM=**\<passwd\>** OK
Parameter Values	**\<passwd\>:** string type; SIM PIN2
Reference	GSM Ref. 07.07 Chapter 8.25
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Used in conjunction with AT+CAOC and AT+CAMM

Example:

AT+CACM="1234"
            └──────── Password

2.1.4.11.　AT+CAMM　　Accumulated Call Meter Maximum

Command Function	Set command sets the Advice of Charge related accumulated call meter maximum value in SIM file EF$_{ACMmax}$. ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. When ACM (refer +CACM) reaches ACMmax calls are prohibited (see also GSM 02.24 [26]). SIM PIN2 is usually required to set the value.
Command Functional Group	Phone Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CAMM**=<acmmax>,<passwd>** OK
Parameter Values	
<acmmax>	string type; accumulated call meter maximum value similarly coded as <ccm> under +CAOC; value zero disables ACMmax feature
<passwd>	string type; SIM PIN2
Reference	GSM Ref. 07.07 Chapter 8.26
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Used in conjunction with AT+CACM and AT+CAOC.

2.1.4.12.   AT+CPUC   **Price Per Unit and Currency Table**

Command Function	Set command sets the parameters of Advice of Charge related price per unit and currency table in SIM file EF$_{PUCT}$.
Command Functional Group	Phone Control
Command Format Query Response	N/A N/A
Write Format **Response**	AT+CPUC=**<currency>**,**<ppu>**, **<passwd>** OK
Read Format **Response**	AT+CPUC? AT+CPUC: " ", " " OK
Execution Format Response	N/A N/A
Parameter Values	
<currency>	string type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set +CSCS
<ppu>	string type; price per unit; dot is used as a decimal separator (e.g. "2.66")
<passwd>	string type; SIM PIN2
Reference	GSM Ref. 07.07 Chapter 8.27
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4.13.   AT+CCWE   Call Meter Maximum Event

Command Function	Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command.
Command Functional Group	Phone Control
Command Format Query Response	AT+CCWE=? +CCWE: (0,1) OK
Write Format Response	AT+CCWE=**<mode>** OK
Read Format Response	AT+CCWE? +CCWE: 0 OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	Disables the call meter warning event
	1	Enable the call meter warning event

Reference	GSM Ref. 07.07 Chapter 8.28
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Used in conjunction with AT+CACM, AT+CAOC and AT+CAMM

2.1.4.14.   AT+CSVM   Set Voicemail Number

Command Function	The number to the voice mail server is set with this command. The parameters <number> and <type> can be left out if the parameter <mode> is set to 0.
Command Functional Group	Phone Control
Command Format Query Response	AT+CSVM=? +CSVM: (0,1), (129, 145, 161) OK
Write Format Response	AT+CSVM=**<mode>, <number>, <type>** OK
Read Format Response	AT+CSVM? +CSVM: 0, " ", 129 OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	Disable the voice mail number
	1	Enable the voice mail number

<number>   string type;Character string <0..9,+>

<type>   integer type; Type of address octet

129	ISDN / telephony numbering plan, national / international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number

Reference   GSM Ref. 07.07 Chapter 8.30

2.1.4.14.　　AT+CSVM　　　　　Set Voicemail Number
(continued)

Standard Scope　　　　　　　Optional

Enfora Implementation Scope　Full

Notes　　　　　　　　　　The voicemail number is set in the SIM by the service provider. Care should be taken when entering this command. If the voicemail number is lost or des not work, contact your service provider for the correct voicemail number.

2.1.4.15.   AT+CLAE   Set Language Event

Command Function	This command is used to enable/disable unsolicited result code +CLAV: **<code>**.
Command Functional Group	Phone Control
Command Format Query Response	AT+CLAE=? +CLAE: (0,1) OK
Write Format Response	AT+CLAE=**<mode>** OK
Read Format Response	AT+CLAE? +CLAE: 0 OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	Disable
	1	Enable

Reference	GSM Ref. 07.07 Chapter 8.31
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4.16.   AT+CLAN   Set Language

Command Function	This command sets the language in the ME. The set-command must confirm the selected language with the MMI-module in the ME. If setting fails, a ME error, +CME ERROR: **<err>** is returned. Refer subclause 9.2 for **<err>** values.

Command Functional Group   Phone Control

Command Format Query Response

AT+CLAN=?
+CLAN: en, fr, de, it, es, pt, no, el, pl, in, cs, zh, ar
OK

Write Format Response

AT+CLAN=**<code>**
OK

Read Format Response

AT+CLAN?
+CLAN: en
OK

Execution Format Response

N/A
N/A

Parameter Values

<code>

"en"	English
"fr"	French
"de"	German
"it"	Italian
"es"	Spanish
"pt"	Porteguese
"no"	Norwiegen
"el"	Greek
"pl"	Polish
"in"	Indonesian
"cs"	Czech
"zh"	Chinese
"ar"	Arabic

2.1.4.16. AT+CLAN Set Language (continued)

Reference	GSM Ref. 07.07 Chapter 8.33
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4.17.   AT+CMUX   Set Multiplexing mode

Command Function	This command is used to enable/disable the GSM 07.10 multiplexing protocol control channel. Refer to subclause 9.2 for possible <err> values. The AT command sets parameters for the Control Channel. If the parameters are left out, the default value is used.

Command Functional Group   Phone Control

Command Format Query   AT+CMUX=?

Response: +CMUX: (list of supported <mode>s),(list of supported <subset>s),(list of supported <port_speed>s),(list of supported <N1>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <T2>s),(list of supported <T3>s),(list of supported <k>s)

+CMUX: (1),(0),(1-7),(10-100),(1-255),(0-100),(2-255),(1-255),(1-7)

OK

Write Format   **A**T+CMUX=**<mode>,[<subset>], <port_speed>,<N1>,<T1>, <N2>,<T2>, <T3>[,<k>]**

Response   OK

Read Format   AT+CMUX?
Response   If not in CMUX it will return the default settings
If in CMUX it will return the current settings

Execution Format   N/A
Response   N/A

2.1.4.17.   AT+CMUX   Set Multiplexing Mode
(continued)

Parameter Values	\<operation/mode\> (multiplexer Transparency Mechanism) 1 Advanced option
\<subset\>	This parameter defines the way in which the multiplexer **control channel** is set up. A virtual channel may subsequently be set up differently but in the absence of any negotiation for the settings of a virtual channel, the virtual channel shall be set up according to the control channel \<subset\> setting. 0 UIH frames used only
\<port_speed\>	(transmission rate): 1 9 600 bit/s 2 19 200 bit/s 3 38 400 bit/s 4 57 600 bit/s 5 115 200 bit/s (default port_speed) 6 230 400 bit/s 7 460 800 bit/s
\<N1\>	(maximum frame size): 10- 100
\<T1\>	(acknowledgement timer in units of ten milliseconds): 1-255,
\<N2\>	(maximum number of re-transmissions): 10-100

2.1.4.17.   AT+CMUX   Set Multiplexing Mode
                                   (continued)

<T2>   (response timer for the multiplexer control
                                   channel in units of ten milliseconds):

                                   2-255

                                   NOTE: T2 must be longer than T1.

<T3>   (wake up response timer in seconds):

                                   1-255, where 10 is default

<k>   (window size, for Advanced operation with
                                   Error Recovery options):

                                   1-7

Reference   GSM Ref. 07.07 Chapter 5.7

Standard Scope   Mandatory if GSM 7.10 is used

Enfora Implementation Scope   Full

Notes   N/A

ME Errors

2.1.4.18.   AT+CMEE   Report Mobile Equipment Errors

Command Function	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 ME. When enabled, ME related errors cause +CME ERROR: **<err>** final result codes to be returned, instead of the default ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.
Command Functional Group	Response Control
Command Format Query Response	AT+CMEE=? +CMEE: (0-2) OK
Write Format Response	AT+CMEE=**<n>** OK
Read Format Response	AT+CMEE? +CMEE: 0 OK
Execution Format Response	N/A N/A

2.1.4.18.   AT+CMEE   Report Mobile Equipment Errors (continued)

Parameter Values

<n>	**0**	Disable +CME ERROR
	1	Enable +CME result code and username values
	2	Enable +CME result code and ME verbose values

Reference   GSM Ref. 07.07 Chapter 9.1

Standard Scope   Mandatory

Enfora Implementation Scope   Full

Notes   See Appendix B for error code descriptions.

2.1.5. Commands from TIA IS-101

2.1.5.1.   AT+FCLASS   GSM Class of Service

Command Function	Select Mode
Command Functional Group	This command puts the TA into a particular mode of operation (data, voice etc.). This causes the TA to process information in a manner suitable for that type of information (rather than for other types of information).
Command Format Query Response	AT+FCLASS=? 0, 8 OK
Write Format Response	AT+FCLASS=**<mode>** OK
Read Format Response	AT+FCLASS? 0 OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	Data
	8	Voice

Reference	GSM Ref. 07.07 Chapter C.1
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	N/A

2.1.5.2.   AT+VTS   DTMF and Tone Generation

Command Function	This command allows the transmission of DTMF tones and arbitrary tones (see note). These tones may be used (for example) when announcing the start of a recording period. The command is write only. In this profile of commands, this command does not operate in data mode of operation
Command Functional Group	Audio Functions
Command Format Query Response	AT+VTS=? +VTS: (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, #, *) OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+VTS=**<DTMF>** OK

2.1.5.2   AT+VTS   DTMF and Tone Generation
                                        (continued)

Parameter Values

<DTMF>	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	A
	B
	C
	#
	*

Reference	GSM Ref. 07.07 Chapter C.11
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	In GSM this operates only in voice mode. Fixed tone duration.

2.1.5.3. AT+STTONE Start or Stop Generating a Tone

Command Function	This command allows the user to start generating a tone or stop generating a tone.
Command Functional Group	Enfora Specific
Command Format Query Response	AT+STTONE=? +STTONE: (0-1), (1-8,16-18), (0-15300000) OK
Write Format **Response**	AT+STTONE=<**mode**>[, <**tone**>[,<**duration**>]] OK
Read Format	N/A
Response	N/A
Execution Format	N/A
Response	N/A

Parameter Values

< mode >	**0**=> Stop generating a tone. For stop generating a tone, the AT command is AT+STTONE=0, <tone>. **1**=> Start generating a tone.
< tone >	The value of tone is as follows: **1** => Dial Tone **2** => Called Subscriber Busy **3** => Congestion **4** => Radio Path Acknowledge **5** => Radio path not Available/Call Dropped **6** => Error/Special Information **7** => Call Waiting Tone **8** => Ring Tone **16**=> General Beep **17**=> Positive Acknowledgement tone **18**=> Negative Acknowledgement or Error Tone When the optional tone is not present, default value is 16, which is a general Beep.

2.1.5.3   AT+STTONE   Start or Stop Generating a Tone (continued)

< duration >	0-15300000 in milliseconds. When the optional duration is not present, default value is 500ms. When the duration is 0, it plays once. When the duration is 0, all other tones play once except 2 => called subscriber busy, which plays 4 times.
Reference	Reference 3GPP TS 22.001 F.2.5 Comfort tones.
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	All tones generated by audio speaker. The tones need to be stopped before originating calls.

Examples

AT+STTONE=1,7,5000	Generate Call Waiting tone for 5 seconds.
AT+STTONE=0,7	Stop Call Waiting tone.

2.2. Commands Specified by GSM Rec. 07.05

2.2.1. General Configuration Commands

2.2.1.1.   AT+CSMS   Select Message Service

Command Function	Set command selects messaging service **<service>**. It returns the types of messages supported by the ME: **<mt>** for mobile terminated messages, **<mo>** for mobile originated messages and **<bm>** for broadcast type messages.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CSMS=? +CSMS: (0,1) OK
Write Format Response	AT+CSMS=**<service>** +CSMS: 0,1,1,1 OK
Read Format Response	AT+CSMS? +CSMS: 0,1,1,1 OK
Execution Format Response	N/A N/A
Parameter Values	
<service>	**0** Phase 2 version **1** Phase 2+ version
Reference	GSM Ref. 07.05 Chapter 3.2.1
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.2.1.2.   AT+CPMS   Preferred Message Storage

Command Function	Set command selects memory storages **<mem1>**, **<mem2>** and **<mem3>** to be used for reading, writing, etc.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CPMS=? +CPMS: ("ME", "SM"), ("ME", "SM"), ("ME", "SM") OK
Write Format Response	AT+CPMS=**<mem1>,<mem2>,<mem3>** +CPMS: 0, 25, 0, 25, 0, 25 OK
Read Format Response	AT+CPMS? +CPMS: "SM", 0, 25, "SM", 0, 25, "SM", 0, 25 OK
Execution Format Response	N/A N/A

Parameter Values

<mem1>	String type; memory from which messages are read and deleted (commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD); defined values: "ME" ME message storage "SM" SIM message storage
<mem2>	String type; memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW)); refer to <mem1> for defined values

2.2.1.2. AT+CPMS	Preferred Message Storage (continued)

<mem3>	String type; memory to which received messages are preferred to be stored (unless class of message defines a specific storage location; refer to command New Message Indications +CNMI); refer to<mem1> for defined values
Reference	GSM Ref. 07.05 Chapter 3.2.2
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	ME can only store up to three (3) short messages.

2.2.1.3. AT+CMGF   SMS Format

Command Function	Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters).
Command Functional Group	Short Message Services
Command Format Query Response	AT+CMGF=? AT+CMGF: (0,1) OK
Write Format Response	AT+CMGF=**<mode>** OK
Read Format Response	AT+CMGF? +CMGF: 1 OK
Execution Format Response	N/A N/A
Parameter Values	
<mode>	**0** PDU mode **1** Text mode
Reference	GSM Ref. 07.05 Chapter 3.2.3
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	Use of PDU mode requires an in depth understanding of PDU message and header formats.

2.2.2. Message Configuration Commands

2.2.2.1. AT+CSCA   Service Center Address

Command Function	Set command updates the SMSC address, through which mobile originated SMs are transmitted.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CSCA=? OK
Write Format Response	AT+CSCA=**<"sca">,<tosca>** +CSCA: **<"sca">,<tosca>** OK
Read Format Response	AT+CSCA? +CSCA="12063130004", 145 OK
Execution Format Response	N/A N/A
Parameter Values	
<"sca">	SMSC Address
<tosca>	SC address Type-of-Address
Reference	GSM Ref. 07.05 Chapter 3.3.1
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	The service center address must be present to complete delivery of SMS. Most SIMs are delivered from the service provider with a service center already programmed into the SIM. A "+" should be entered in front of the smsaddress, but is not required by all operators.

2.2.2.2. AT+CSMP   Set Text Mode Parameters

Command Function	Selects additional values needed when the SIM is sent to the network or placed in storage.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CSMP=? OK
Write Format Response	AT+CSMP=**<fo>,<vp>,<pid>,<dcs>** OK
Read Format Response	AT+CSMP? +CSMP: 17, 167, 0, 0 OK
Execution Format Response	N/A N/A

Parameter Values

<fo>	depending on the command or result code: first octet of GSM 03.40 SMS- DELIVER, SMS-SUBMIT (default 17), or SMS-COMMAND (de-fault 2) in integer format
<vp>	depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167)), in time-string format (refer **<dt>**), or if is supported, in enhanced format (hexadecimal coded string with quotes)
<pid>	Protocol-Identifier in integer format (default 0), refer GSM 03.40
<dcs>	SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format depending on the command or result code: GSM 03.38

2.2.2.2. AT+CSMP   **Set Text Mode Parameters**
                                (continued)

Reference   GSM Ref. 07.05 Chapter 3.3.2

Standard Scope   Mandatory

Enfora Implementation Scope Full

Notes   N/A

2.2.2.3.   AT+CSDH   Show Text Mode Parameters

Command Function	Determines if detail information is shown in result codes.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CSDH=? +CSDH=(0,1) OK
Write Format Response	AT+CSDH=**<show>** OK
Read Format Response	AT+CSDH? +CSDH: 1 OK
Execution Format Response	N/A N/A

Parameter Values

<show>	**0**	Do not show header values
	1	Show the values in result codes

Reference	GSM Ref. 07.05 Chapter 3.3.3
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.2.2.4. AT+CSCB   Select Cell Broadcast Message Types

Command Function	Select which types of CBm's are to be received by the ME.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CSCB=? +CSCB: (0,1) OK
Write Format Response	AT+CSCB=**<mode>** OK
Read Format Response	AT+CSCB? +CSCB: 0," **<mids>** ", "**<dcss>** " OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	Message types specified in <MIDS> and <DCCS> are accepted
	1	Message types specified in <MIDS> and <DCCS> are not accepted

<mids>	string type; all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. "0,1,5,320-478,922"
<dcss>	string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5"
Reference	GSM Ref. 07.05 Chapter 3.3.4
Standard Scope	Optional

2.2.2.4. AT+CSCB   Select Cell Broadcast Message Types (continued)

Enfora Implementation Scope   Partial

Notes   An understanding of CBM message identifiers and CBM loading schemes is required to properly implement this command. Used in conjunction with AT+CNMI.

2.2.2.5. AT+CSAS   Save Settings

Command Function	Saves active message service commands into non-volatile memory.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CSAS=? +CSAS: (0) OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CSAS OK
Parameter Values	N/A
Reference	GSM Ref. 07.05 Chapter 3.3.5
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT+CRES retrieves stored profiles. Settings specified in commands Service Center Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB are saved.

2.2.2.6. AT+CRES   Restore Settings

Command Function	Restores message service settings from non-volatile memory to active memory.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CRES=? +CRES: (0) OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CRES OK
Parameter Values	N/A
Reference	GSM Ref. 07.05 Chapter 3.3.6
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Retrieves profiles stored using AT+CSAS.

2.2.3. Message Receiving and Reading Commands

2.2.3.1.   AT+CNMI   New Message Indication to TE

Command Function	Selects how incoming messages from the network are indicated to the TE when the TE is active.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CNMI=? +CNMI: (0-2), (0-3), (0,2), (0,1), (0,1) OK
Write Format **Response**	AT+CNMI=**<mode>, <mt>, <bm>,<ds>,<bfr>** OK
Read Format **Response**	AT+CNMI? +CNMI: 1,1,0,0,0 OK
Execution Format **Response**	N/A N/A

Parameter Values

<mode>	**0**	Buffer unsolicited result codes in the TA
	1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved
	2	Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation

2.2.3.1. AT+CNMI New Message Indication to TE (continued)

<mt>

<mt>	Receiving procedure for different message data coding schemes (refer GSM 03.38 [2])
0	no class: as in GSM 03.38, but use <mem3> as preferred memory class 0: as in GSM 03.38, but use <mem3> as preferred memory if message is tried to be stored class 1: as in GSM 03.38, but use <mem3> as preferred memory class 2: as in GSM 03.38 class 3: as in GSM 03.38, but use <mem3> as preferred memory message waiting indication group (discard message): as in GSM 03.38, but use <mem3> as preferred memory if message is tried to be stored message waiting indication group (store message): as in GSM 03.38, but use <mem3> as preferred memory
1	as <mt>=0 but send indication if message stored successfully
2	no class: route message to TE class 0: as in GSM 03.38, but also route message to TE and do not try to store it in memory class 1: route message to TE class 2: as <mt>=1 class 3: route message to TE message waiting indication group (discard message): as in GSM 03.38, but also route message to TE and do not try to store it in memory message waiting indication group (store message): as <mt>=1
3	class 3: route message to TE others: as <mt>=1

<bm>	**0**	No CBM indications are routed to the TE
	1	If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index>
	2	New CBMs are routed directly to the TE using unsolicited result code

2.2.3.1. AT+CNMI   **New Message Indication to TE (continued)**

	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_REPORTs are routed to the TE
	1	SMS-STATUS-REPORTs are routed to the TE using unsolicited result code
<bfr>	**0**	TA buffer of unsolicited result codes defined within this command is flushed to the TE when **<mode>** 1...2 is entered.
	1	**T**A buffer of unsolicited result codes defined within this command is cleared when **<mode>** 1...2 is entered.

Reference	GSM Ref. 07.05 Chapter 3.4.1
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	N/A

2.2.3.2.   AT+CMGL   List Messages

Command Function	List messages from storage.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CMGL=? +CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL") OK
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT+CMGL =**<stat>** +CMGL: **<index>, <stat>, <da/oa>, [<alpha>, <scts>, <tooa/toda>, <length>] <CR><LF> data** OK
Parameter Values	See Notes
<index>	Memory location integer
<stat>	Status of message **"REC UNREAD"** **"REC READ"** **"STO UNREAD"** **"STO READ"** **"ALL"**
<da/oa>	destination address
<alpha>	alphanumeric representation of **<da>** or **<oa>** corresponding to the entry found in MT phonebook
<scts>	Service center time stamp
<tooa/toda>	Address Type-of-Address octet in integer format
<length>	Length of message in octets

2.2.3.2. AT+CMGL	List Messages (continued)

Reference   GSM Ref. 07.05 Chapter 3.4.2

Standard Scope   Optional

Enfora Implementation Scope   Partial

Notes   Above settings for <stat> assume
                                                    AT+CMGF=1 (text mode). For
                                                    AT+CMGF=0 (PDU mode), the following
                                                    <stat> values are supported: 0,1,2,3,4.
                                                    Parameters in [] may or may not be
                                                    reported dependent upon the setting
                                                    of AT+CMGF.

:

0	"Rec Unread"
1	"Rec Read"
2	"Sto Unsent"
3	"Sto Sent"
4	"ALL"

2.2.3.3. AT+CMGR   Read Message

Command Function	Read stored messages.
Command Functional Group	Short Message Services
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CMGR=**<index>** +CMGR: **<stat>, <oa>, <scts>, [<tooa>, <fo>, <pid>, <sca>, <tosca>, <length>]<CR><LF><data>** OK

Parameter Values

<stat>	Status of message (Rec Read, Rec Unread, Sto Unsent, Sto Sent)
<oa>	Originating address
<scts>	Service center time stamp
<tooa>	Originating address – type of address
<fo>	First octet
<pid>	Protocol identifier
<sca>	Service center address
<tosca>	Type of address
<length>	Length of message in octets
Reference	GSM Ref. 07.05 Chapter 3.4.3

2.2.3.3.   AT+CMGR   Read Message
(continued)

Standard Scope   Optional

Enfora Implementation Scope Partial

Notes   The above parameters are for text mode.

2.2.4. Message Sending and Writing Commands

2.2.4.1. AT+CMGS   Send Message

Command Function	Sends message from the TE to the network.
Command Functional Group	Short Message Services
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CMGS**="<da>",[<toda>]** **Enter text <cntl Z>** +CMGS **<mr>** OK

Parameter Values

<da>	Destination address
<mr>	Message reference
Reference	GSM Ref. 07.05 Chapter 3.5.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	The example provided is for text mode (AT+CMGF=1). An in depth understanding of PDU messages is required for PDU mode.

2.2.4.2. AT+CMSS   Send Message from Storage

Command Function	Sends message (with location value) from preferred message storage.
Command Functional Group	Short Message Services
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CMSS=**<index>** +CMSS: **<mr>** OK

Parameter Values

<index>	Integer value of location number supported by associated memory
<mr>	Message reference
Reference	GSM Ref. 07.05 Chapter 3.5.2
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	The above is for text mode only.

2.2.4.3. AT+CMGW   Write Message to Memory

Command Function	Writes message to preferred storage location.
Command Functional Group	Short Message Services
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CMGW=**<"da">**<CR><LF>**Text is entered<cntlZ>** +CMGW: **<index>** OK

Parameter Values

<da>	Destination Address
<index>	Integer value of memory location of the stored message
Reference	GSM Ref. 07.05 Chapter 3.5.3
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	The above is for text mode only.

2.2.4.4. AT+CMGD   Delete Message

Command Function	Deletes message from preferred storage location.
Command Functional Group	Short Message Services
Command Format Query Response	AT+CMGD=? +CMGD:(0-255),(0-4)
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CMGD=**<index>,<status>** OK

Parameter Values

<index>	Integer value of memory location.

<status>	**0**	Delete the messages specified by the index
	1	Ignore the index and delete all the read messages
	2	Ignore the index and delete all the read and sent messages
	3	Ignore the index and delete all the read, sent and unsent messages.
	4	Ignore the index and delete all the messages whatever the status is

Reference	GSM Ref. 07.05 Chapter 3.5.4
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If there is no message stored in the selected index, an error will be returned.

2.2.4.5. AT+CMGC   Send Command

Command Function	Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of PDU is done similarly as specified in command Send Message +CMGS. Message reference value **<mr>** is returned to the TE on successful message delivery
Command Functional Group	Short Message Services
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CMGC=**<length>** *PDU is given***<ctrl-Z** +CMGC: **<mr>[,<ackpdu>]** OK

Parameter Values

<length>	length of PDU message in octets
<mr>	Message reference
<ackpdu>	data element of ack-pdu
Reference	GSM Ref. 07.05 Chapter 3.5.5
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command only applicable to pdu mode AT+CMGF=0.

2.3. Commands Specified by ITU-T Rec.V25ter as Referenced by GSM Rec. 07.07

2.3.1. Generic TA Control Commands

2.3.1.1. ATZ   Set All TA Parameters to Default Configuration

Command Function	Set All TA Parameters to Default Configuration.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATZ OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.1
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.2. AT&F   Set All TA Parameters to Factory Defined Configuration

Command Function	Set All TA Parameters to Factory Defined Configuration
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT&F OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.2
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	The OK response is returned PRIOR to this command being executed on the module to allow the response to be seen at the current baud rate in case the factory default changes this (back to autobaud). Allow 1 Second after the returned OK before issuing the next command. While under CMUX, AT&F will not cause the modem to revert back to the default baud rate.

2.3.1.3.   AT&V   Display Current Profile

Command Function	This command allows the user to view the settings in the current profile.
Command Functional Group	State control
Command Format Query	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT&V
Response	OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.4. AT&W   Save Current Settings

Command Function	This command allows the user to save the current settings in memory.
Command Functional Group	State control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT&W OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	To ensure successful completion of the command, do not issue additional commands until 'OK' is returned.

2.3.1.5. ATI

Manufacturer Information About TA

Command Function	List manufacturer.
Command Functional Group	Equipment Information
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATI Enfora, Inc. OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.3
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.6. AT+GMI   TA Manufacturer ID

Command Function	TA returns information about the manufacturer.
Command Functional Group	Equipment Information
Command Format Query **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT+GMI Enfora, Inc. OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.4
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.7. AT+GMM   TA Model ID

Command Function	TA returns manufacturer model identification.
Command Functional Group	Equipment Information
Command Format Query **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT+GMM Enabler IIIG Modem OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.5
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.8.   AT+GMR   TA Revision Number

Command Function	Returns software revision information.
Command Functional Group	Equipment Information
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+GMR **<revision>** OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.6
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.9.   AT+GSN   TA Serial Number

Command Function   This command is used to obtain the
                               manufacturer International Mobile
                               Equipment Identity (IMEI).

Command Functional   Equipment Information
Group

Command Format Query   AT+GSN=?
Response   OK

Write Format   N/A
Response   N/A

Read Format   N/A
Response   N/A

Execution Format   AT+GSN
Response   0044008824900101
                               OK

Parameter Values   N/A

Reference   GSM Ref. 07.07 Chapter 5.4

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   Return value is manufacturer specific.

                               The TA returns the International Mobile
                               station Equipment Identifier (IMEI).

2.3.1.10.   AT+GCAP   Request Overall Capabilities for TA

Command Function	TA returns a list of additional capabilities
Command Functional Group	Equipment Information
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+GCAP +GCAP: +CGSM,+FCLASS OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.9
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.11.   ATS3   Command Line Termination Character

Command Function	Determines the character recognized by the TA to terminate an incoming command line.
Command Functional Group	State Control
Command Format Query Response	ATS3=? S3(0-127) OK
Write Format Response	ATS3=**<n>** OK
Read Format Response	ATS3? 013 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	GSM Ref. 07.05 Chapter 6.2.1
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.12.   ATS4   Response Formatting Character

Command Function	Determines the character generated by the TA for result code and information text.
Command Functional Group	State Control
Command Format Query Response	ATS4=? S4(0-127) OK
Write Format Response	ATS4=**<n>** OK
Read Format Response	ATS4? 010 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.2.2
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.13. ATS5   Editing Character

Command Function	Determines the character recognized by the TA as a request to delete the preceding character form the command line.
Command Functional Group	State Control
Command Format Query Response	ATS5=? S5(0-127) OK
Write Format Response	ATS5=**<n>** OK
Read Format Response	ATS5? 008 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.2.3
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.14. ATE   Command Echo Mode

Command Function	Determines whether the TA echoes characters typed locally.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	ATE**<value>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<value>	**0** Do not echo characters locally **1** Echo characters locally
Reference	GSM Ref. 07.07 Chapter 6.2.4
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.15.   ATQ   Result Code Suppression

Command Function	Determines whether or not the TA transmits any result code to the TE.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	ATQ**<value>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<value>	**0** DCE transmits result codes **1** Result codes are suppressed and not transmitted
Reference	GSM Ref. 07.07 Chapter 6.2.5
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.16.   ATV   Response Format

Command Function	Determines the DCE response format, with or without header character, and the use of numerical results code.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	ATV**<value>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A

Parameter Values

<value>	**0**	DCE transmits limited headers and trailers and numeric result codes
	1	DCE transmits full headers and trailers and verbose response text

Reference	GSM Ref. 07.07 Chapter 6.2.6
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.1.17.   ATX   CONNECT Result

Command Function	Determines whether or not the TA transmits particular result codes.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	ATX**<value>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<value>	**0** Short result code format **1** Long result code format
Reference	GSM Ref. 07.07 Chapter 6.2.7
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	For UDP and TCP PAD operation, setting of ATX1 will display the network assigned IP after the CONNECT or LISTEN message.

2.3.1.18.   AT&C   DCD Usage

Command Function	Controls the Data Carrier Detect signal.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	AT&C**<value>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<value>	**0** DCD always on **1** DCD matches the state of the remote modem's data carrier
Reference	GSM Ref. 07.05 Chapter 6.2.8
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	N/A

2.3.1.19.   AT&D   DTR Usage

Command Function	This command controls the Data Terminal Ready signal.
Command Functional Group	State Control
Command Format Query Response	N/A N/A
Write Format Response	AT&D**<value>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	

<value>	**0**	Ignore DTR
	1	Modem switches from DATA to COMMAND mode when DTR switches to off
	2	When DTR switches to off, disconnect the call. Automatic answer of voice and CSD call is disabled while DTR remains off"

Reference	GSM 07.05 and ITU-T v.25ter Section 6.2.9
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	N/A

| 2.3.1.20. | **AT+IPR** | **Fixed TE-TA Data Rate** |

| **Command Function** | Determines the data rate of the TA serial interface. |

| **Command Functional Group** | State Control |

| **Command Format Query Response** | AT+IPR=?
+IPR: (0, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200),(300,600,230400,460800, 921600)
OK |

| **Write Format Response** | AT+IPR=**<rate>**
OK |

| **Read Format Response** | AT+IPR?
+IPR: 19200
OK |

| **Execution Format Response** | N/A
N/A |

Parameter Values

| **<rate>** | 0, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200,300,600,230400,460800,   921600 |

| **Reference** | GSM Ref. 07.05 Chapter 6.2.10 |

| **Standard Scope** | Mandatory |

| **Enfora Implementation Scope** | Partial |

2.3.1.20.   AT+IPR   Fixed TE-TA Data Rate
(continued)

Notes   When changing the value of AT+IPR, the
new baud rate is effective immediately. In
order to properly save the new setting and
communicate with the modem, the user
must change the baud rate of the
communicating device to the new baud rate
before any more communication with the
modem can be accomplished.

**Auto Baud is now supported and is set
by setting AT+IPR=0.** This is the factory
default setting. The modem will buffer
unsolicited responses, until the baud rate is
determined by receiving the first "A" or "a"
character over the primary serial port. Auto
baud only supports settings 1200 to
115200.

- **To avoid problems caused by an
undetermined or mis-matched bit
rate, it is strongly recommended that
auto- bauding only be used if needed
for initial configuration. Your
application initialization script
should then set your desired fixed bit
rate rather than auto-bauding.**

- **Do not use AT$AREG=2 with
autobauding of the serial port and
PAD functions. The serial port will
not respond to at commands if the
modem establishes a connect state
before the baud rate has been
determined for the serial port.**

While under CMUX, AT+IPR will not
change the modem's baud rate.

| 2.3.1.21. | **AT+ICF** | **TE-TA Character Framing** |

Command Function

This command determines the number of data/stop/parity bits that will be used by the TA serial interface.

Command Functional Group

State Control

Command Format Query Response

AT+ICF=?
+ICF: (1-6), (0-3)
OK

Write Format Response

AT+ICF=**<format>,<parity>**
OK

Read Format Response

AT+ICF?
+ICF: 3
OK

Execution Format Response

N/A
N/A

Parameter Values

<format>

1	8 data, 2 stop, no parity
2	8 data, 1 stop,1 parity
3	8 data, 1 stop, no parity
4	7 data, 2 stop, no parity
5	7 data, 1 stop, 1 parity
6	7 data, 1 stop, no parity

<parity>

0	odd
1	even
2	mark
3	space

Reference

GSM Ref. 07.0 Chapter 6.2.11

Standard Scope

Mandatory

Enfora Implementation Scope

Partial

Notes

If no parity is specified in **<format>**, then **<parity>** is ignored.

2.3.1.22.   AT+IFC   TE-TA Local Flow Control

Command Function   This command determines the TE/TA flow
                                control interface.

Command Functional   State Control
Group

Command Format Query   AT+IFC=?
Response   +IFC: (0-2), (0-2)
                                OK

Write Format   AT+IFC=**<DCE_by_DTE>,
                                <DTE_by_DCE>**
Response   OK

Read Format   AT+IFC?
Response   +IFC: 2,2
                                OK

Execution Format   N/A
Response   N/A

Parameter Values

<DCE_by_DTE>   **0**   None
                                1   Xon/Xoff (not supported)
                                2   RTS

<DTE_by_DCE>   **0**   None
                                1   Xon/Xoff (not supported)
                                2   CTS

Reference   GSM Ref. 07.05 Chapter 6.2.12

Standard Scope   Mandatory

Enfora Implementation Scope Partial

Notes   N/A

2.3.1.23.   AT$IFC   Default Value for AT+IFC

Command Function	This command allows the user to choose a different default value for AT+IFC. AT+IFC will be set to default value after issuing AT&F command.
Command Functional Group	Enfora Specific
Command Format Query	AT$IFC=?
Response	$IFC: (0-1)
Write Format	AT$IFC= DIFCvalue
Response	OK
Read Format	AT$IFC?
Response	$IFC: DIFCvalue
Execution Format	N/A
Response	N/A

Parameter Values

<CSD RI Mode>	0	Next AT&F will set AT+IFC to 2,2
	1	Next AT&F will set AT+IFC to 0,0

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes:	DIFCvalue itself would not be affected by AT&F command.

2.3.1.24.   AT+ILRR   TE-TA Local Rate Reporting

Command Function	State Control
Command Functional Group	Results
Command Format Query Response	AT+ILRR=? +ILRR: (0,1) OK
Write Format Response	AT+ILRR=**<value>** OK
Read Format Response	AT+ILRR? +ILRR: 0 OK
Execution Format Response	N/A N/A

Parameter Values

<value>	**0**	Disable reporting of local port rate
	1	Enable reporting of local port rate

Reference	GSM Ref. 07.05 Chapter 6.2.13
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.3.2. Call Control Commands

2.3.2.1.   T   Tone Dialing

Command Function	Select tone dialing.
Command Functional Group	Call Control
Command Format Query **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	ATT OK
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.2
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	This command has no effect on GSM.

2.3.2.2.   P   Pulse Dialing

Command Function	Select pulse dialing.
Command Functional Group	Call Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATP OK
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.3
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	This command has no affect on GSM.

2.3.2.3. A   Answer a Call

Command Function	Answers an incoming call.
Command Functional Group	Call Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATA
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.5
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Auto answer can be enabled using ATS0.

2.3.2.4. H Hook Control

Command Function	Disconnect an existing call.
Command Functional Group	Call Control
Command Format Query **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	ATH OK
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.6
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	If data call or session is active, +++ (escape sequence) must be entered to go to command mode prior to sending ATH command.

2.3.2.5.   O   Return to Data State

Command Function	This command issued to return to online mode from command mode when a circuit-switched data call is active.
Command Functional Group	Call Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	ATO OK
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.7
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

2.3.2.6.　+++　　　　　　　　Escape Sequence

Command Function	This command allows a user to escape out of data mode to command mode in a CSD call or from connect or listen mode to command mode in a GPRS call
Command Functional Group	Call Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	+++ OK or no carrier
Parameter Values	N/A
Reference	N/A
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	**The escape sequence requires a guard period of 1 second before and after entering +++. Other wise the +++ will be considered data and forwarded as data.** For CSD, to end the call ATH or AT+CHUP must be entered. To return to data mode issue ATO command.

| 2.3.2.7. | S0 | **Rings Before Automatic Answer** |

| **Command Function** | Sets the number of rings before automatically answering a call for GSM and enables automatic answer to a network request for PDP activation. |

| **Command Functional Group** | Call Control |

| **Command Format Query Response** | ATS0=?
S0(0-255)
OK |

| **Write Format Response** | ATS0=**\<value\>**
OK |

| **Read Format Response** | ATS0?
\<value\>
OK |

| **Execution Format Response** | N/A
N/A |

| **Parameter Values** | N/A |

| **Reference** | ITU-T Ref. V.25ter Chapter 6.3.8 |

| **Standard Scope** | Mandatory |

| **Enfora Implementation Scope** | Full |

| **Notes** | ATS0=000 will disable auto answer for GSM. If AT+CGAUTO is = to 2 or 3 (default), the MT shall attempt to perform a GPRS attach if it is not already attached, when the 'S0=n' (n>0) command is received. |
| | **With default settings, if ATS0=(>0) is sent immediately after power up, an error will be returned because the MT will attempt to do an attach before the AT+CREG state has changed to 1.** |

2.3.2.8.	S6	Pause Before Blind Dialing

Command Function	Sets the number of seconds to wait after dialtone detection before dialing. This is a dummy command and does not affect functionality.
Command Functional Group	Call Control
Command Format Query Response	ATS6=? S6(2-10) OK
Write Format Response	ATS6=**<value>** OK
Read Format Response	ATS6? 002 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.9
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Does not affect GSM functionality.

2.3.2.9.   S7   Wait for Completion

Command Function	This command sets the number of seconds to wait after dial tone detection before dialing a number. This is a dummy command that will display a value that has been set, but does not affect functionality.
Command Functional Group	Call Control
Command Format Query Response	ATS7=? S7(1-255) OK
Write Format Response	ATS7=**\<value\>** OK
Read Format Response	ATS7? 060 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.10
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Does not affect GSM functionality.

2.3.2.10.   S8   Dial Pause

Command Function	This command sets the number of seconds to wait for the comma dial modifier in the ATD dial string. This is a dummy command that will display a value that has been set, but does not affect functionality.
Command Functional Group	Call Control
Command Format Query Response	ATS8=? S8(0-255) OK
Write Format Response	ATS8=**<value>** OK
Read Format Response	ATS8? 002 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.11
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Does not affect GSM functionality.

2.3.2.11.   S10   Hang Up Delay

Command Function	This command sets the length of time, in tenths of seconds, to wait before disconnecting after the carrier is lost. This is a dummy command that will display a value that has been set, but does not affect functionality.
Command Functional Group	Call Control
Command Format Query Response	ATS10=? S10(1-254) OK
Write Format Response	ATS10=**<value>** OK
Read Format Response	ATS10? 001 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	ITU-T Ref. V.25ter Chapter 6.3.12
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	Does not affect GSM functionality.

3. Standardized GPRS AT Commands

3.1 Commands Specified by GSM Rec. 07.07

3.1.1 +CGDCONT   Define PDP Context

Command Function	Specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, **<cid>**.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGDCONT=? +CGDCONT: (1-2),"IP",,,(0,1),(0,1) OK
Write Format Response	AT+CGDCONT=**<cid>,<PDP_ Type>, <APN>,<PDP_ADDR>,<d_comp>, <h_comp>** OK
Read Format Response	AT+CGDCONT? +CGDCONT: **<cid>,<PDP Type>,<"APN">,<"PDP_ADDR">, <d_comp>,<h_comp>** OK
Execution Format Response	N/A N/A

3.1.1.   +CGDCONT   **Define PDP Context**
(continued)

Parameter Values

<cid>	PDP Context Identifier
<PDP_type>	"IP"
<"APN">	"Access Point Name"
<"PDP_addr">	" Identifies the MT in the address space"

<d_comp>	**0**	off
	1	on
<h_comp>	**0**	off
	1	on

Reference	GSM Ref. 07.07 Chapter 10.1.1
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	AT+CGDCONT must be entered before Context activation.

AT+CGDCONT=1,"IP","","",0,0 may be entered for networks that dynamically assign the APN. Contact your service provider for correct APN information.

If AT$AREG=2, and the device has already started to negotiate a context activation, the modem will return error. AT$AREG must =1 to enter the command. If AT$AREG=2 and the device has a current context activation, AT$AREG=1 must be entered and the device shall return no carrier before AT+CGDCONT can be entered. It is not recommended entering AT&F while the device has a current context activation to deactivate the device.

3.1.2   +CGQREQ   Quality of Service Profile (Requested)

Command Function	Allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGQREQ=? +CGQREQ: "IP",(1-3),(1-4),(1-5),(1-9),(1-18,31) OK
Write Format Response	AT+CGQREQ=**<cid>,<precedence>, <delay>, <reliability.>, <peak>,<mean>** OK
Read Format Response	AT+CGQREQ? +CGQREQ: 1,0,0,0,0,0 OK
Execution Format Response	N/A N/A

Parameter Values

<cid>	numeric value of PDP context activation
<precedence class>	**1-3**
<delay class>	**1-4**
<reliability class>	**1-5**
<peak throughput>	**1-9**
<mean throughput>	**1-18,31**

* For any parameter where network subscribed is desired, enter 0.

3.1.2.   +CGQREQ   Quality of Service Profile (Requested) (continued)

Reference   GSM Ref. 07.07 Chapter 10.1.2

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   A special form of the set command, +CGQREQ=,… or +CGQMIN=,… provide a set of the default values of Quality of Service Profile for new PDP context definitions. AT+CGDCONT must be entered into the modem prior to entering AT+CGQREQ command.

3.1.3 +CGQMIN

Quality of Service Profile (Minimum Acceptable)

Command Function	Allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGQMIN=? +CGQMIN: "IP",(1-3),(1-4),(1-5),(1-9),(1-18,31) OK
Write Format Response	AT=CGQMIN=**<cid>, <precedence>, <delay>,<reliability>, <peak>, <mean>**
Read Format Response	AT+CGQMIN? +CGQMIN: 1,0,0,0,0,0 OK
Execution Format Response	N/A N/A

3.1.3.	+CGQMIN	**Quality of Service Profile (Minimum Acceptable)** **(continued)**

Parameter Values

<cid>	**>**	numeric value of PDP context activation
<precedence class>	**1-3**	
<delay class>	**1-4**	
<reliability class>	**1-5**	
<peak throughput>	**1-9**	
<mean throughput>	**1-18,31**	

* For any parameter where network subscribed is desired, enter 0.

Reference	GSM Ref. 07.07 Chapter 10.1.3
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	A special form of the set command, +CGQREQ=,… or +CGQMIN=,… provide a set of the default values of Quality of Service Profile for new PDP context definitions. AT+CGDCONT must be entered prior to entering AT+CGQMIN command.

3.1.4   +CGATT   GPRS Attach or Detach

Command Function	The execution command is used to attach the MT to, or detach the MT from GPRS service.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGATT=? +CGATT: (0,1) OK
Write Format Response	AT+CGATT=**<state>** OK
Read Format Response	AT+CGATT? +GCATT: 0 OK
Execution Format Response	N/A N/A
Parameter Values	
<state>	**0** detached **1** attached
Reference	GSM Ref. 07.07 Chapter 10.1.4
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If parameter **<state>** is omitted the GPRS attach state will be changed.

3.1.5   +CGACT   PDP Context Activate or Deactivate

Command Function	The execution command is used to activate or deactivate the specified PDP context (s).
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGACT=? +:CGACT: (0,1) OK
Write Format Response	AT+CGACT=**<state>,<cid>** OK
Read Format Response	AT+CGACT? +CGACT: 1,0 OK
Execution Format Response	N/A N/A

Parameter Values

<state>	**0**	deactivated
	1	activated
<cid>	numeric value of PDP context activation	

Reference	GSM Ref. 07.07 Chapter 10.1.5
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	It is not possible to omit the parameter **<state>**. AT+CGDCONT command must be entered prior to context activation. Activating a PDP Context through AT+CGACT will not allow for the modem to be used in a DUN connection. To use the modem in a DUN connection, use the AT$AREG=2 command instead.

3.1.6 +CGDATA

Enter Data State

Command Function	The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more GPRS PDP types.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGDATA=? +CGDATA: "PPP" OK
Write Format Response	AT+CGDATA=**<L2P>,<cid>** CONNECT
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<L2P>	**"PPP"**
<cid>	numeric value of PDP context activation
Reference	GSM Ref. 07.07 Chapter 10.1.6
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Supported value for **<L2P>**: "PPP".

3.1.7   +CGPADDR   Show PDP Address

Command Function	The execution command returns a list of PDP addresses for the specified context identifiers.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGPADDR=? +:CGPADDR: (1) OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CGPADDR=**\<cid\>** +CGPADDR: 1 OK
Parameter Values	
\<cid\>	numeric value of PDP context activation
Reference	GSM Ref. 07.07 Chapter 10.1.7
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

3.1.8   +CGAUTO

Automatic Response to a Network Request for PDP Context Activation

Command Function	The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGAUTO=? +CGAUTO: (0-3) OK
Write Format Response	AT+CGAUTO=**\<n\>** OK
Read Format Response	AT+CGAUTO? +CGAUTO: 3 OK
Execution Format Response	N/A N/A

Parameter Values

\<n\>	**0**	turn off automatic response for GPRS only
	1	turn on automatic response for GPRS only
	2	modem compatibility mode, GPRS only
	3	modem compatibility mode, GPRS and circuit switched calls (default)

3.1.8   +CGAUTO   Automatic Response to a Network Request for PDP Context Activation (continued)

Reference   GSM Ref. 07.07 Chapter 10.1.8

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   If parameter **<n>** is omitted it is assumed to be 3 (modem compatibility mode, GPRS and circuit switched calls).

3.1.9   +CGANS   Manual Response to a Network Request for PDP Context Activation

Command Function	The execution command requests the MT to respond to a network request for GPRS PDP context activation which has been signaled to the TE by the RING or +CRING: unsolicited result code.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGANS=? +CGANS: (0,1),"PPP" OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+CGANS+**<response>,<L2P>** OK
Parameter Values	
<response>	**0** request is rejected **1** request is accepted
<L2P>	**"PPP"**
Reference	GSM Ref. 07.07 Chapter 10.1.9
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Supported value for **<L2P>**: "PPP".

3.1.10   +CGCLASS   **GPRS Mobile Station Class**

Command Function	Sets the MT to operate to a specified GPRS mobile class.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGCLASS=? +CGCLASS: ("B","CG","CC") OK
Write Format Response	AT+CGCLASS=**<class>** OK
Read Format Response	AT+CGCLASS? +CGCLASS: "B" OK
Execution Format Response	N/A N/A
Parameter Values	
<class>	**"B"** class B **"CG"** class C in GPRS only mode **"CC"** class C in circuit switched only mode (lowest)
Reference	GSM Ref. 07.07 Chapter 10.1.10
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If parameter **<class>** is omitted, a detached mobile attaches with the last class or the default class ("B").

3.1.11   +CGEREP   GPRS Event Reporting

Command Function	Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the GPRS MT or the network.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGEREP=? +:CGEREP: (0-2),(0,1) OK
Write Format Response	AT+CGEREP=**<mode>,<bfr>** OK
Read Format Response	AT+CGEREP? +CGEREP: 0,0 OK
Execution Format Response	N/A N/A

3.1.11.   +CGEREP   GPRS Event Reporting (continued)

Parameter Values

<mode>	**0**	buffer unsolicited result codes in the MT
	1	discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE
	2	buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE
<bfr>	**0**	MT buffer of unsolicited result codes defined within this command is cleared when **<mode>** 1 or 2 is entered
	1	MT buffer of unsolicited result codes defined within this command is flushed to the TE when **<mode>** 1 or 2 is entered (OK response shall be given before flushing the codes)

Reference	GSM Ref. 07.07 Chapter 10.1.12
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If parameter **<mode>** is omitted it is assumed to be the value of the last command execution or the default value (0). If parameter **<bfr>** is omitted it is assumed to be the value of the last command execution or the default value (0).

3.1.12 +CGREG   GPRS Network Registration Status

Command Function	Controls the presentation of an unsolicited result code +CGREG.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGREG=? +CGREG: (0,2) OK
Write Format Response	AT+CGREG=1 OK
Read Format Response	AT+CGREG? +CREG: **<n>,<stat>[,<lac>,<ci>]** OK
Execution Format Response	N/A N/A

Parameters

<n>	0	disable network registration unsolicited result code
	1	enable network registration unsolicited result code +CGREG: **<stat>**
	2	enable network registration and location information unsolicited result code +CGREG: **<stat>[,<lac>,<ci>]**
<stat>	0	not registered, ME is not currently searching a new operator to register to
	1	registered, home network
	2	not registered, but ME is currently searching a new operator to register to
	3	registration denied
	4	unknown
	5	registered, roaming

3.1.12 +CGREG GPRS Network Registration Status (continued)

<lac>	string type; two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string type; two-byte cell ID in hexadecimal format

Reference	GSM Ref. 07.07 Chapter 10.1.13
Standard Scope	Optional
Enfora Implementation Scope	Partial
Notes	If parameter **<n>** is omitted the command does nothing.

3.1.13 +CGSMS	**Select Service for MO SMS Messages**

Command Function	The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.
Command Functional Group	GPRS Commands
Command Format Query Response	AT+CGSMS=? +CGSMS: (0-3) OK
Write Format Response	AT+CGSMS=**<service>** OK
Read Format Response	AT+CGSMS? :+CGSMS: 3 OK
Execution Format Response	N/A N/A

Parameter Values

<service>	**0**	GPRS
	1	circuit switched
	2	GPRS preferred (use circuit switched if GPRS not available)
	3	circuit switched preferred (use GPRS if circuit switched not available)

Reference	GSM Ref. 07.07 Chapter 10.1.14
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If parameter **<service>** is omitted the command does nothing. SMS over GPRS has not been fully tested.

3.1.14   D   Request GPRS Service

Command Function	This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN
Command Functional Group	Modem Compatibility Command
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	D**<GPRS_SC> <CID>#** Connect
Parameter Values	
<GPRS_SC>	***99**
<CID>	*****1** *****2**
Reference	GSM Ref. 07.07 Chapter 10.2.1.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	**ATD*99***1#** - Dials GPRS call for context activation 1. See +CGDCONT for context activation definition.

3.1.15   S0   Automatic Response to a Network Request for PDP Context Activation

Command Function	The V.25ter 'S0=n' (Automatic answer) command may be used to turn off (n=0) and on (n>0) the automatic response to a network request for a PDP context activation.
Command Functional Group	Modem Compatibility Command
Command Format Query Response	ATS0=? s0(0-255) OK
Write Format Response	ATS0=**<n>** OK
Read Format Response	ATS0? 000 OK
Execution Format Response	N/A N/A
Parameter Values	
<n>	**0** do not answer **n>0** establish data session
Reference	GSM Ref. 07.07 Chapter 10.2.2.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

3.1.16   A

Manual Acceptance of a Network Request for PDP Context Activation

Command Function	The V.25ter 'A' (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING.
Command Functional Group	Modem Compatibility Command
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	A Connect
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 10.2.2.2
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

3.1.17   H   Manual Rejection of a Network Request for PDP Context Activation

Command Function   The V.25ter 'H' or 'H0' (On-hook) command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING.

Command Functional Group   Modem Compatibility Command

Command Format Query   N/A
Response   N/A

Write Format   N/A
Response   N/A

Read Format   N/A
Response   N/A

Execution Format   H
Response   OK

Parameter Values   N/A

Reference   GSM Ref. 07.07 Chapter 10.2.2.3

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   N/A

3.1.18   +CIND   Indicator Control

Command Function	Set command is used to set the values of MT indicators.

Read command returns the status of MT indicators. If MT is not currently reachable, +CME ERROR: <err> is returned. Refer subclause 9.2 for <err> values.

Test command returns pairs, where string value <descr> is a maximum 16 character description of the indicator and compound value is the allowed values for the indicator. If MT is not currently reachable, +CME ERROR: <err> is returned. Refer subclause 9.2 for <err> values.

Command Functional Group

Command Format Query **Response**	AT+CIND=? +CIND: ("signal",(0-5)),("smsfull",(0-1)) OK
Write Format **Response**	AT+CIND=<signal>,<smsfull> *OK*
Read Format **Response**	AT+CIND? +CIND: <signal>,<smsfull> OK
Execution Format **Response**	N/A N/A

Parameter Values .

<signal>	signal quality (0-5)
<smsfull>	A short message memory storage in the MT has become full and a short message has been rejected (2), has become full(1), or memory locations are available (0).

3.1.18   +CIND   Indicator Control
                                    (continued)

Reference   3GPP TS 27.GSM027 rel99 8.9

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   N/A

3.1.19 +CMER   Mobile Termination Event Reporting

Command Function   Set command enables or disables sending
of unsolicited result codes from TA to TE in
the case of key pressings, display changes,
and indicator state changes. <mode>
controls the processing of unsolicited result
codes specified within this command. <bfr>
controls the effect on buffered codes when
<mode> 1, 2 or 3 is entered. If setting is not
supported by the MT, +CME ERROR: <err>
is returned. Refer subclause 9.2 for <err>
values.

Test command returns the modes
supported as compound values.

Command Functional Group

Command Format Query   AT+CMER=?
Response   **+CMER: (0-2), (0-2), (0), (0-2), (0,1)**

Write Format   AT+CMER=[<mode>[,<keyp>[,<disp>
[,<ind>[,<bfr>]]]]]
Response   OK

Read Format   AT+CMER?
Response   +CMER:<mode>,<keyp>,
<disp>,<ind>,<bfr>

Execution Format   N/A
Response   N/A

Parameter Values

<mode>

0   buffer unsolicited result codes in the
TA; if TA result code buffer is full,
codes can be buffered in some other
place or the oldest ones can be
discarded

3.1.19   +CMER   Mobile Termination Event Reporting (continued)

1	discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE
2	buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE
3	forward unsolicited result codes directly to the TE; TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode

<keyp>

0	no keypad event reporting
1	keypad event reporting using result code +CKEV: <key>,<press>. <key> indicates the key (refer IRA values defined in table in subclause "Keypad control +CKPD") and <press> if the key is pressed or released (1 for pressing and 0 for releasing). Only those key pressings, which are not caused by +CKPD shall be indicated by the TA to the TE.

NOTE 1:   When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

3.1.19   +CMER

Mobile Termination Event Reporting (continued)

| 2 | keypad event reporting using result code +CKEV: <key>,<press>. All key pressings shall be directed from TA to TE. |

NOTE 2:   When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

<disp>

| 0 | no display event reporting |

| 1 | display event reporting using result code +CDEV: <elem>,<text>. <elem> indicates the element order number (as specified for +CDIS) and <text> is the new value of text element. Only those display events, which are not caused by +CDIS shall be indicated by the TA to the TE. Character set used in <text> is as specified by command Select TE Character Set +CSCS |

| 2 | display event reporting using result code +CDEV: <elem>,<text>. All display events shall be directed from TA to TE. Character set used in <text> is as specified by command Select TE Character Set +CSCS |

<ind>

| 0 | no indicator event reporting |

3.1.19   +CMER   Mobile Termination Event Reporting (continued)

1   indicator event reporting using result code +CIEV: <ind>,<value>. <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE

2   indicator event reporting using result code +CIEV: <ind>,<value>. All indicator events shall be directed from TA to TE

<bfr>

0   TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered

1   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)

Reference	3GPP TS 27.GSM027 rel99 8.10
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	N/A

4. Enfora Specific Commands

4.1. SIM Toolkit Commands

4.1.1. %SATC   SET SIM Application Toolkit Configuration

Command Function	This command sets the configuration for SIM application toolkit download mechanism.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%SATC=? SATC: (**<n>**(0,1)),(**<prflLen>**(24)) OK
Write Format Response	AT%SATC=**<n>,<satPrfl>** OK
Read Format Response	AT%SATC? SATC: **=<n>,<satPrfl >** OK
Execution Format Response	N/A N/A
Parameter Values	
<n>	**0** disable presentation of unsolicited notifications result codes from the TA to the TE
	1 enable presentation of unsolicited notifications result codes from the TA to the TE
<prflLen>	Length in Bytes of the current **<satPrfl>**
<satPrfl>	String type: SIM application toolkit profile, starting with the first byte of the profile.

4.1.1. %SATC

SET SIM Application Toolkit Configuration
(continued)

Reference   GSM 11.14

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   Associated commands
                                      AT%SATT,AT%SATE, AT%SATR.
                                      Associate results codes %SATE, %SATA,
                                      %SATN and %SATI. String types in
                                      Hexadecimal format (refer to AT+CSCS)

4.1.2. %SATE   Send SAT Envelope Command

Command Function	This command sends a SAT command to the SIM, using the envelope mechanism of SIM application toolkit.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	AT%SATE=**\<satCmd\>** %SATE: **\<satRsp\>** OK
Read Format Response	AT%SATE? OK
Execution Format Response	N/A N/A
Parameter Values	
\<satCmd\>	String type: SIM application toolkit command, starting with command tag
\<satRsp\>	String type: SIM application toolkit response, starting with first bye of response data
Reference	GSM 11.14
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Associated commands AT%SATT,AT%SATC, AT%SATR. Associate results codes %SATE, %SATA, %SATN and %SATI. String types in Hexadecimal format (refer to AT+CSCS)

4.1.3. %SATR   Send SAT Command Response

Command Function	This command sends a SAT response to a previously received SAT command.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	AT%SATR=**<satRsp>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<satRsp>	String type: SIM application toolkit response, starting with first bye of response data.
Reference	GSM 11.14
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Associated commands AT%SATT,AT%SATC, AT%SATE. Associate results codes %SATE, %SATA, %SATN and %SATI. String types in Hexadecimal format (refer to AT+CSCS)

4.1.4. %SATT   Terminate SAT Command or Session

Command Function	This command is used to terminate a SIM application toolkit command or session
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	AT%SATT=**<cs>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<cs>	**0** user stop redialing **1** end of redialing reached **2** user ends session
Reference	GSM 11.14
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Associated commands AT%SATR,AT%SATC, AT%SATE. Associate results codes %SATE, %SATA, %SATN and %SATI. String types in Hexadecimal format (refer to AT+CSCS)

4.2.   Basic Audio Commands

4.2.1. $VGR   Microphone Receiver Gain

Command Function	This command sets the receive level gain for the microphone input.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$VGR=? $VGR: (0-24) OK
Write Format **Response**	AT$VGR**=\<rxgain\>** $VGR: **\<rxgain\>** OK
Read Format **Response**	AT$VGR? $VGR: **\<rxgain\>** OK
Execution Format **Response**	N/A N/A

Parameter Values

\<rxgain\>	**0**	-12 dB
	1	-11 dB
	2	-10 dB
	…	…
	24	+12 dB

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	N/A
Notes	Receiver gain settings are in 1 dB steps from –12 to +12 dB.

4.2.2. $VGT   Speaker Transmit Gain

Command Function	This command is used to set the coarse speaker transmit gain
Command Functional Group	Enfora Specific
Command Format Query Response	AT$VGT=? $VGT: (0-12) OK
Write Format **Response**	AT$VGT**=\<txgain>** $VGT: **\<txgain>** OK
Read Format **Response**	AT$VGT? $VGT: **\<txgain>** OK
Execution Format **Response**	N/A N/A

Parameter Values

\<txgain>	**0**	-6 dB
	1	-5 dB
	2	-4 dB
	3	-3 dB
	…	**…**
	12	+6 dB

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Tx gain settings in 1 dB steps from –6 to +6 dB.

4.2.3. $VLVL   Speaker Volume

Command Function	This command is used to set the speaker volume
Command Functional Group	Enfora Specific
Command Format Query Response	AT$VLVL=? $VLVL: (0-5) OK
Write Format Response	AT$VLVL**=<volume>** OK
Read Format Response	AT$VLVL? $VLVL: **<volume>** OK
Execution Format Response	N/A N/A

Parameter Values

<volume>	**0**	Mute
	1	-24 dB
	2	-18 dB
	3	-12 dB
	4	-6 dB
	5	0 dB

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.2.4. $VST   Sidetone Volume

Command Function	This command is used to set the sidetone volume
Command Functional Group	Enfora Specific
Command Format Query Response	AT$VST=? $VST: (0-9) OK
Write Format Response	AT$VST**=<sidetone level>** OK
Read Format Response	AT$VST $VST: **=<sidetone level>** OK
Execution Format Response	N/A N/A

Parameter Values

<sidetone level>		
	0	mute
	1	-23
	2	-20 dB
	3	-17 dB
	4	-14 dB
	5	-11 dB
	6	-8 dB
	7	-5 dB
	8	-2 dB
	9	+1 Db

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.2.5. $VEAR   EAR Gain

Command Function	This command is used to set the EAR gain
Command Functional Group	Enfora Specific
Command Format Query Response	AT$VEAR=? $VEAR: (0-1) OK
Write Format Response	AT$VEAR**=\<gain>** OK
Read Format Response	AT$VEAR? $VEAR: **\<gain>** OK
Execution Format Response	N/A N/A
Parameter Values	
\<gain>	**0** -11 dB **1** 1 dB
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Only effective for $VSELECT values of 0 or 3

4.3. Advanced Audio Commands

4.3.1. $DFIR   Configure Downlink FIR Coefficients

Command Function	This command allows the user to set the downlink FIR filter coefficients to improve voice quality.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$DFIR=? $DFIR: 0-ffff,0-ffff, ... 0-ffff (32 entries) OK
Write Format Response	AT$DFIR =**\<coeff1\>**,**\<coeff2\>**, … **\<coeff31\>**,**\<coeff32\>** OK

Read Format Response	AT$DFIR?
	$DFIR: **\<coeff1\>**, **\<coeff2\>**, … (12)
	          \<coeff13\>, **\<coeff14\>**, … (12)
	          \<coeff25\>, **\<coeff26\>**, … (8)

Execution Format Response	N/A N/A
Parameter Values	
< coeff1 >	**0-ffff**=> 2.14 fixed point number.
< coeff2 >	**0-ffff**=> 2.14 fixed point number.
…	
< coeff31 >	**0-ffff**=> 2.14 fixed point number.
< coeff32 >	**0-ffff**=> 2.14 fixed point number.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.3.1. $DFIR   Configure Downlink FIR Coefficients
                                  (continued)

Notes   Only 31 coefficients are required for the hw
                                  but programs being used to generate the
                                  coefficients output 32. The less
                                  modifications needed to the output the
                                  better.

                                  These coefficients are 2.14 fixed point
                                  values input in hexadecimal.

Examples

AT$DFIR =4000,0,0,…,0,0   4000 followed by all zeros is unity (pass
                                  through mode).

4.3.2. $UFIR   Configure Uplink FIR Coefficients

Command Function	This command allows the user to set the uplink FIR filter coefficients to improve voice quality.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$UFIR=? $UFIR: 0-ffff,0-ffff, ... 0-ffff (32 entries) OK
Write Format Response	AT$UFIR =<**coeff1**>,<**coeff2**>, … <**coeff31**>,<**coeff32**> OK
Read Format Response	AT$UFIR? $UFIR: <**coeff1**>, <**coeff2**>, … (12) <**coeff13**>, <**coeff14**>, … (12) <**coeff25**>, <**coeff26**>, … (8)
Execution Format Response	N/A N/A
Parameter Values	
< coeff1 >	**0-ffff**=> 2.14 fixed point number.
< coeff2 >	**0-ffff**=> 2.14 fixed point number.
…	
< coeff31 >	**0-ffff**=> 2.14 fixed point number.
< coeff32 >	**0-ffff**=> 2.14 fixed point number.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.3.2. $UFIR   Configure Uplink FIR Coefficients (continued)

Notes

Only 31 coefficients are required for the hw but programs being used to generate the coefficients output 32. The less modifications needed to the output the better.

These coefficients are 2.14 fixed point values input in hexadecimal.

Examples

AT$UFIR =4000,0,0,…,0,0

4000 followed by all zeros is unity (pass through mode).

4.3.3. $PREAMP   Set Uplink Voice Parameters

Command Function	This command allows the user to enter uplink voice specific parameters for the current voice mode (see $vselect).
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PREAMP=? $PREAMP: (0-1), (0-24), (0,1) OK
Write Format Response	AT+PREAMP=<**bias**>, <**gain**>,<**extra gain**> OK
Read Format Response	AT$PREAMP? $PREAMP: <**bias**>,<**gain**>,<**extra gain**>
Execution Format Response	N/A N/A

Parameter Values

< bias >	**0**=> 2v. **1**=> 2.5v.
< gain >	The value of the gain follows: **0** => -12 dB **1** => -11 dB **2** => -10 dB **3** => -9 dB **. . .** **21** => 9 dB **22 =**> 10 dB **23** => 11 dB **24** => 12 dB
< extra gain >	**0** => 28.2 dB. **1** => 4.6 dB.

4.3.3. $PREAMP

Set Uplink Voice Parameters (continued)

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Change in bias may or may not have an affect, depending on hardware. Extra gain is not supported in headset mode. Changing the value in headset mode will have no affect on the module configuration.

Examples

AT$PREAMP =1,12,0	Max volume from the microphone.

4.3.4. $SPKCFG   Set Downlink Voice Parameters

Command Function	This command allows the user to configure the downlink voice path parameters for the current voice mode (see $vselect).
Command Functional Group	Enfora Specific
Command Format Query Response	AT$SPKCFG=? $SPKCFG: (0-12), (0-5), (0,1), (0,1), (0-1) OK
Write Format **Response**	AT$SPKCFG=**\<gain>,\<volume>,\<filter>, \<highpass filter>,\<headset Ov Mid>,\<voice mode>** OK

Note: The current \<headsetOvMid> and current \<voice mode> settings are assumed if not entered when writing this command.

Read Format **Response**	AT$SPKCFG? $SPKCFG: **\<gain>,\<volume>,\<filter>,\<highpass filter>,\<headset Ov Mid>,\<voice mode>**
Execution Format **Response**	N/A N/A

Parameter Values

< gain >	**0**=> -6 dB. **1**=> -5 db. **2**=> -4 db. **3**=> -3 db. **4**=> -2 db. **5**=> -1 db. **6**=> 0 db. **7**=> 0 db. **8**=> 2 db. **9**=> 3 db. **10**=> 3 db. **11**=> 5 db. **12**=> 6 db.

4.3.4. $SPKCFG   Set Downlink Voice Parameters (continued)

< volume >	The value of volume is as follows: **0** => Mute **1** => -24 dB **2** => -18 dB **3** => -12 dB **4** => -6 db **5** => 0 dB
< filter >	**0** - on **1** - off

    Enable/disable voice filter. Filter coefficients set by $DFIR/$UFIR commands

<highpass filter >	**0** – on **1** – off
<headset Ov Mid>	**0** - no pseudo ground is provided on terminal HSOVMID (Pin 61) **1** - a pseudo ground is provided on terminal HSOVMID (Pin 61)

    Note: Please refer to the Integration Guide for proper use of the HSOVMID (headset output common mode feature.)

<voice mode>	**0** - Selects handset for voice **1** - Selects headset for voice
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.3.5. $VSELECT   Voice Select

Command Function	This command selects the voice mode of the device. Only valid options applicable to the hardware will be allowed. All applicable constants and settings are loaded when the mode is changed and at power up.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$VSELECT=? $VSELECT: (0,1,3) OK
Write Format Response	AT$VSELECT= <mode> OK
Read Format Response	AT$VSELECT? $VSELECT: 0
Execution Format Response	AT$VSELECT $VSELECT **: <reset state>** OK
Parameter Values	
<Mode>	**0** Selects handset for voice **1** Selects headset for voice **3** Automatic mode
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.3.5. $VSELECT   Voice Select (continued)

Notes

In Automatic mode ($VSELECT=3), the device will default to handset mode. If a headset is plugged into the headset jack, the device will automatically switch to headset mode. When the headset is removed, the device will switch back to handset mode. AT$VSELECT=3 must be entered prior to plugging in the headset, to switch between modes properly.

Examples

To set the voice mode to Headset:

AT$VSELECT=1

OK

4.3.6. $MICANR   Ambient Noise Reduction Control

Command Function	This command allows the user to configure the ambient noise reduction settings for the current voice mode (see $vselect)
Command Functional Group	Enfora Specific
Command Format Query Response	AT$MICANR=? $MICANR: (0-2),(0-1,3),(0-2),(0-20),(0-2) OK
Write Format **Response**	AT$MICANR=<**control**>, <**mode**> ,<**noise level**>,<**tone thresh**>, <**tone count**> OK
Read Format **Response**	AT$MICANR? $MICANR: < **control** >,< **mode** >, <**noise level** >,< **tone thresh** >,< **tone count** > OK
Execution Format **Response**	N/A N/A
Parameter Values	
< control >	**0** => stop. **1** => start. **2** => update.
< mode >	**0** => ANR disabled. **1** => ANR and tone detector enabled. **3** => ANR enabled, tone detect disabled
< noise level >	**0** => noise attenuation based on incoming SNR **1 =**> 6 dB noise attenuation **2 =**> 12 dB noise attenuation
< tone thresh >	**0-20** => 7 = 21dB (recommended).

4.3.6. $MICANR   Ambient Noise Reduction Control
                                          (continued)

< tone count >	**0** => no tone detection **1 =>** single tone detection **2 =>** dual tone detection (DTMF)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	
Examples	
AT$MICANR=1,1,1,7,1	Start ANR, ANR+Tone enabled, 6 dB attenuation, threshold 21 dB, single tone detection.

4.3.7. $MICES   Echo suppression Control

Command Function	This command allows the user to enable the echo suppressor and select the behavior for the current voice mode (see $vselect)
Command Functional Group	Enfora Specific
Command Format Query Response	AT$MICES=? $MICES: (0-1), (0-6) OK
Write Format Response	AT$MICES=<**control**>, <**behavior**> OK
Read Format Response	AT$MICES? $MICES: <**control**>,< **behavior type**> OK
Execution Format Response	N/A N/A
Parameter Values	
< control >	**0**=> disable echo suppression. **1**=> enable echo suppression.
< behavior >	**0** => Behavior 1 **1** => Behavior 1a **2** => Behavior 2a **3** => Behavior 2b **4** => Behavior 2c **5** => Behavior 2c_idle **6** => custom
Reference	N/A
Standard Scope	Optional

4.3.7. $MICES   Echo Suppression Control
                            (continued)

Enfora Implementation Scope Full

Notes   When < behavior > 6 (custorm) is selected,
                                the user must configure the parameters set
                                by the $MICESC.
                                Behaviors are defined in ITU-T P.340.

Examples

AT$MICES=1,3   Enable echo suppression configured with
                                predefined behavior 2b parameters.

4.3.8. $MICAEC   Echo Cancellation

Command Function	This command allows the user to configure the echo cancellation settings for the current voice mode (see $vselect)
Command Functional Group	Enfora Specific
Command Format Query Response	AT$MICAEC=? $MICAEC: (0-2), (3,7), (0,1),(0,3), (0-3), (0-24) ,(3275-32767) OK
Write Format **Response**	AT$MICAEC=<control>, <mode >, <cont filter>,<uplink scaling>, <downlink scaling >,< max level >, <smoothing coef> OK
Read Format **Response**	AT$MICAEC? $MICAEC: < control >,< mode >,<cont filter>,<uplink scaling>,<downlink scaling>, <max level > , < smoothing coef > OK
Execution Format **Response**	N/A N/A

4.3.8. $MICAEC   Echo Cancellation (continued)

Parameter Values

< control >	**0** => stop.
	1 => start.
	2 => update
< mode >	**3** => divergence control disabled
	7 => divergence control enabled
< cont filter >	**0** => disable
	1 => enable
< uplink scaling >	**0**=> disable.
	3=> enable.
< downlink scaling >	**0** => enable
	3 => disable
< max level >	**0** => -24 dB **…**
	24 => 0 dB
< smoothing coef >	**3275** => ???? **…**
	32767 => ????

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes

Examples

AT$MICAEC=1,3,1,3,0,12,3275   Start AEC with divergence control enabled, continuous filtering, uplink scaling, no downlink scaling, max level = -12 dB, smoothing coef = 3275.

4.4. Input/Output Commands

4.4.1. $IOCFG   GPIO Configuration

Command Function:	This command is used to set or query the GPIO direction setting (input or output).
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IOCFG=? $IOCFG: (20 0s - 20 1s) OK
Write Format Response	AT$IOCFG**=<mode>** OK
Read Format Response	AT$IOCFG? $IOCFG: **<current setting>, <configured setting>** OK
Execution Format Response	N/A N/A

Parameter Values

<mode>	**0**	OUTPUT
	1	INPUT

* User can enter all 20 settings at once or enter just the first 8 GPIO (GPIO 9 –20 will not be effected)

4.4.1 $IOCFG GPIO Configuration (continued)

Reference N/A

Standard Scope Optional

Enfora Implementation Scope Full

Notes 20 Digits where left bit represents GPIO 1 and right most bit represents GPIO 20.

Only GPIO 1 and GPIO 2 are controlled by this command.

*User may enter all 20 settings at once or enter just the first 8 GPIO (GPIO 3 – 20 will not be effected).

Example: Output format for read command

AT$IOCFG?
$IOCFG: 11xxxxxxxxxxxxxxxxxx 10xxxxxxxxxxxxxxxxxx

Configured I/O settings where I/O OK pin 1 is an input and pin 2 is an output.

Current I/O settings where I/O pin 2 has been changed to an input line.

4.4.2. $IOBLKS   GPIO Block Configuration

Command Function:	This command is used to set the current functionality of dual purpose blocks of GPIO. This will include MCSI, SPI and Keyboard
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IOBLKS=? $IOBLKS:(0-3),(0-1) OK
Write Format Response	AT$IOBLKS**=<block>,<mode>** OK
Read Format Response	AT$IOBLKS? $IOBLKS: **<current mode of MCSI>,** **<current mode of SPI>,** **<current mode of Keyboard>** **<current mode of TX Indicator>** OK
Execution Format Response	N/A N/A

Parameter Values

<block>	**0**	MCSI
	1	SPI
	2	Keyboard
	3	TX Indicator
<mode>	**0**	General Purpose IO
	1	Specific functions (i.e SPI)

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.4.2 $IOBLKS   GPIO Block Configuration
                                        (continued)

Notes   Several of the GPIO share functionality with
                                        other buses. These blocks of GPIO can
                                        only be enabled to function as either the
                                        defined bus or as GPIO.

                                        MCSI shares GPIO 9-12
                                        SPI shares GPIO 13-18
                                        Keyboard shares GPIO 19-26

                                        **currently ONLY GPIO 1-20 are enabled
                                        for use.**

The "at$IOBLKS=0,1" command will fail if an event has already been added
that uses 1 of the MCSI block GPIOs (Input: 62-65; Output: 54-57, 66-69, 78-
81, 90-93, 102-105).

The "at$IOBLKS=1,1" command will fail if an event has already been added
that uses 1 of the SPI block GPIOs (Input: 66-71; Output: 58-63, 70-75, 82-
87, 94-99, 106-111).

The "at$IOBLKS=2,1" command will fail if an event has already been added
that uses 1 of the Keyboard block GPIOs (Input: 72-73; Output: 64-65, 76-77,
88-89, 100-101, 112-113).

The "at$IOBLKS=3,1" command will fail if an event has already been added
that uses 1 of the TX Indicator block GPIO (Input: 3; Output: 3,11,19,27,35).

4.4.2 $IOBLKS   **GPIO Block Configuration**
                               (continued)

Examples:

at$ioblks=0,1 => MCSI block set to function as MSCI
at$ ioblks =0,0 => MCSI block set to function as GPIOs and available via the event engine
at$ ioblks =1,1 => SPI block set to function as SPI
at$ ioblks =1,0 => SPI block set to function as GPIOs and available via the event engine
at$ ioblks =2,1 => Keyboard block set to function as keyboard
at$ ioblks =2,0 => Keyboard block set to function as GPIOs and available via the event engine
at$ ioblks =3,1 => TX Indicator block set to function as TX Indicator
at$ ioblks =3,0 => TX Indicator block set to function as GPIO4 and available via the event engine

4.4.3. $IOGP(x)   GPIO Bit Control

Command Function:	This command allows the user to set the state of the specified GPIO bit. The GPIO being written to must have previously been set to an output. (See AT$IOCFG) .
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IOGP(**x**)=? $IOGP(x): (0-1) OK
Write Format Response	AT$IOGP(**x**)=**<mode>** OK
Read Format Response	AT$IOGP(**x**)? $IOGP(x): **<current setting> <configured setting>** OK
Execution Format Response	N/A N/A

Parameter Values

(**x**)	**1, 2 or 8**	GPIO bit
<mode>	**0**	off
	1	on

4.4.3 $IOGP(x)   GPIO Bit Control
                                        (continued)

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   GPIO3 - GPIO7 are reserved.

Example: Output format for read command
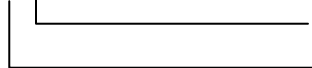
AT$IOGP2?
$IOGP2: 1,0
                                        Output pin was configured off
OK   Output pin is currently on

4.4.4. $IOGPA   GPIO Byte Control

Command Function:	This command allows the user to set the state of all GPIO bits simultaneously. Only GPIO pins previously configured as outputs will be effected. (See AT$IOCFG)
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IOGPA=? $IOGPA: (20 0s - 20 1s) OK
Write Format Response	AT$IOGPA=**\<mode\>** OK
Read Format Response	AT$IOGPA? $IOGPA: **\<current setting\>** **\<configured setting\>** OK
Execution Format Response	N/A N/A
Parameter Values	
\<mode\>	**0** off **1** on

4.**4.4** **$IOGPA** **GPIO Byte Control**
(continued)

Reference N/A

Standard Scope Optional

Enfora Implementation Scope Full

Notes 20 Digits where left bit represents GPIO 1
and right most bit represents GPIO 20. A
User can choose to only enter the first 8
GPIO, as in the example below.

Example:

at$iogpa=11111111
OK

at$iogpa?
$IOGPA: 11111111000000000000 11111111000000000000

OK
at$iogpa=10101010101010101010
OK
at$iogpa?
$IOGPA: 10101010101010101010 10101010101010101010

OK

4.4.5. $IOPULEN   GPIO Pullup Enable

Command Function	This command allows the user to enable the built-in pullup / pulldown capability of the modem for each GPIO signal. The pullup / pulldown direction is determined by the $IOPULUP command.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IOPULEN=? $IOPULEN: 20 0s – 20 1s OK
Write Format Response	AT$IOPULEN=<**enable**> OK
Read Format Response	AT$ IOPULEN? $ IOPULEN: < **enable** > OK
Execution Format Response	N/A N/A
Parameter Values	
< enable >	**0** => Pull-up Disabled. **1** => Pull-up Enabled.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	20 Digits where left bit represents GPIO 1 and right most bit represents GPIO 20. GPIO_2 (2nd bit from the left) does not support pullup feature and will always be displayed as 'x' on a query.

4.4.5 $IOPULEN   GPIO Pullup Enable
                                       (continued)

Examples

AT$ IOPULEN =11111111000000000000

           Enable pullup feature on GPIOs 1 and 3-8 and disable on GPIOs 9-20.

AT$ IOPULEN?
$IOPULEN: 0x000000111111111111

           GPIOs 1 and 3-8 have the pullup feature disabled. GPIOs 9-20 have it enabled.

4.4.6. $IOPULUP   GPIO Pullup Settings

Command Function	This command allows the user to set the 20 GPIOs pullup state
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IOPULUP=? $ IOPULUP: (20 0s – 20 1s) OK
Write Format Response	AT$ IOPULUP =<**pullup_state**> OK
Read Format Response	AT$ IOPULUP? $ IOPULUP: < **pullup_state** > OK
Execution Format Response	N/A N/A
Parameter Values	
< pullup_state >	**0** => pulldown. **1** => pullup.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	20 Digits where left bit represents GPIO 1 and right most bit represents GPIO 20. GPIO 2 does not support the pullup feature and will always be displayed as 'x' on a query. GPIOs 3,13,14,15 can only be used as pulldowns. GPIOs 9,10,11,12, and 18 are pullups only. GPIOs 1,4,5,6, 7,8,16,17,19, and 20 can function as either pullups or pulldowns.

4.4.6 $IOPULUP   GPIO Pullup Settings
                                        (continued)

Examples

        AT$IOPULUP?
        $IOPULUP: 1x011111111100011111

                                        GPIOs 3,13,14,15 have been set to
                                        pulldonws and 1,4,5,6,7,8,9,10,11,12,
                                        16,17,18,19,20 are set to pull-ups
        AT$IOPULUP=11111111111100011111
        ERROR

                                        This command returns an ERROR because
                                        it attempts to configure GPIO 3 as a pullup.

4.4.7. $IOADC1   Read Analog to Digital Converter

Command Function:	This command returns the value of the last reading on the Analog to Digital Converter in millivolts.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$IOADC1 $IOADC1: **\<value\>** OK

Parameter Values

\<value\>	decimal value in millivolts
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	See Enabler III Integration Guide for pinout definitions. If the modem is not registered or attached, the modem may take up to a minute to update the digital output to reflect a change on the analog input. 0 – 1.75 Vdc range. 1.709 mV resolution. 10 bit.

4.5. UDP API Commands

4.5.1. $UDPAPI   Modem API Address

Command Function	This command allows the user to query/set the API IP address and port number. Any UDP packet received from a local host and addressed to the modem API IP and port will be intercepted and processed as a modem API request. Any UDP packet received from a remote server and addressed to the modem API port will be intercepted and processed as a modem API request.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$UDPAPI=? $UDPAPI: "(0-255).(0-255).(0-255).(0-255)",(0-65535) OK
Write Format Response	AT$UDPAPI="**<API IP>**",**<API port>** OK
Read Format Response	AT$UDPAPI? $UDPAPI: "**<APIIP>**", **<API port>**
Execution Format Response	N/A N/A
Parameter Values	
<API IP>	IP address for local API access
<API port >	Udp port number for local and remote API access
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.5.2. $APIPWD   API Password

Command Function	This command allows the user to query/set the API password. A non-friend remote user must gain password access before being allowed API access.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$APIPWD=? $APIPWD: ("PASSWORD") OK
Write Format Response	AT$APIPWD="\<**API password**\>" OK
Read Format Response	AT$APIPWD? $APIPWD: "\<**API password**\>"
Execution Format Response	N/A N/A
Parameter Values	
\<API password\>	8 character string. A NULL password indicates ALL remote users are allowed API access.
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	See *Enfora GSM-GPRS Family UDP-API Reference GSM0102PB002MAN* for further details regarding the use of the API Password.

4.5.3. $APIOPT   Enable API Optional Header Fields

Command Function	This command allows the user to enable specific Optional Header Fields to be included in the UDPAPI and TCPAPIs' API Optional Header. See Enfora GSM/GPRS Family API Reference (GSM0308UG001) for details.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$APIOPT=? $APIOPT: (0-1),(0-1),(0-4) OK
Write Format	AT$APIOPT=[<MDMID>], [<Msg Event Format>], [<Event Seq Num>]
Response	OK
Read Format	AT$APIOPT?
Response	$APIOPT=<MDMID>,<Msg Event Format>,<Event Seq Num>
Execution Format	N/A
Response	N/A

Parameter Values

<MDMID>	0	Disable sending of MDMID value in TCPAPI or UDPAPI Header
	1	Enable sending of MDMID value in TCPAPI or UDPAPI Header
<Msg Event Format>	0	Disable sending of Output Message Event Format value in TCPAPI or UDPAPI Header
	1	Enable sending of Output Message Event Format in TCPAPI or UDPAPI Header
<Event Seq Num>	0	Disable sending of Event Sequence Number value in TCPAPI or UDPAPI Header

4.5.3. $APIOPT   Enable API Optional Header Fields (continued)

1   Enable sending of the least significant byte of the Event Sequence Number in TCPAPI or UDPAPI Header

2   Enable sending of the two least significant bytes of the Event Sequence Number in TCPAPI or UDPAPI Header

3   Enable sending of the three least significant bytes of the Event Sequence Number in TCPAPI or UDPAPI Header

4   Enable sending of the full four bytes of the Event Sequence Number in TCPAPI or UDPAPI Header

Reference   Enfora GSM/GPRS Family API Reference (GSM0308UG001)

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   N/A

4.5.3. $APIOPT   Enable API Optional Header Fields (continued)

Example:

This example will disable the sending of the MDMID, enable the Msg Event Format and enable the full Event Sequence Number.

AT$APIOPT=0,1,4

This example will enable the sending of the MDMID and the least two significant bytes of the Event Sequence Number. The state of the Enable Msg Event Format will remain unchanged

AT$APIOPT=1,,2

This example will enable the sending of the MDMID and disable the Msg Event Format. The state of the Event Seq Num will remain unchanged

AT$APIOPT=1,0

4.6. TCP API Commands

4.6.1. $TCPAPI   TCP API Control

Command Function	This command allows the user to initiate and terminate and query the status of the TCP API connection. *Please note that the TCP API can only be used over the air.*
Command Functional Group	Enfora Specific
Command Format Query Response	AT$TCPAPI=? $TCPAPI: (0-1) OK
Write Format Response	AT$TCPAPI=**\<Status\>** OK
Read Format Response	AT$TCPAPI? $TCPAPI: **\<Status\>** (M-**\<Mgr Task\>**,R-**\<Rec Task\>**,T-**\<Trans Task\>**,Idx **\<Friend Index\>**)
Execution Format Response	N/A N/A
Parameter Values	
\<Status\>	TCP API connection status 0=Disabled 1=Enabled
\<Mgr Task \>	TCP API Manager Task 0 = None 1 = Init 2 = Idle 3 = Connecting 4 = Connected 5 = Disconnecting

4.6.1. $TCPAPI   TCP API Control (continued)

<Rec Task >   TCP API Receive Task

0 = None
1 = Init
2 = Idle
3 = Connecting
4 = Waiting for Header
5 = Waiting for Frame

<Trans Task >   TCP API Transmit Task

0 = None
1 = Init
2 = Idle
3 = Connected
4 = Sending

<Friend Index >   Friend Index (1 – 10)

Reference

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   N/A

4.6.2. $TCPSRC   TCP API Source Ports

Command Function	Specifies the TCP API source port range used when making a TCPAPI connection.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$TCPSRC=? $TCPSRC: (1024-65535),(1024-65535) OK
Write Format Response	AT$TCPSRC=**<Start Port Number>, [<End Port Number>]** OK
Read Format Response	AT$TCPSRC? $TCPSRC: **<Start Port Number>, <End Port Number>**
Execution Format Response	N/A N/A
Parameter Values	
<Start Port Number>	TCP API starting port number
<End Port Number >	TCP API ending port number
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full

Notes

▪ Each connection attempt uses the next port number in sequence until the end port is passed. When this happens the port is set to the start port number.

▪ This current port number in use is retained over a power cycle.

▪ If only the start port number is provided, the end port number will be start port number + 49 (range of 50)

4.6.3. $TCPRETRYTO   TCP API Retry Timeout

Command Function	Specifies the number of seconds without receiving a TCP level ACK that will cause the connection to be closed.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$TCPRETRYTO=? $TCPRETRYTO: (120-65535) OK
Write Format	AT$TCPRETRYTO=**<Timeout>** OK
Read Format **Response**	AT$TCPRETRYTO? $TCPRETRYTO: **<Timeout>**
Execution Format **Response**	N/A N/A
Parameter Values	
<Timeout>	TCP API retry timeout value
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	After closing the connection, the device will attempt to reconnect using the FRIEND list. The purpose of this command is to provide an abort to the TCP stack level retries. Currently, the number of retries is 10 and the amount of time varies based on calculated round trip time. The minimum time allowed is 120 seconds. Attempts to set the retry timeout to a value less than 120 or more than 65535 will result in an error.

4.6.4. $TCPIDLETO   TCP API Idle Timeout

Command Function	Specifies the number of seconds without data traffic, in either direction, before closing the connection.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$TCPIDLETO=? $TCPIDLETO: (0-65535) OK
Write Format	AT$TCPIDLETO=**<Timeout>** OK
Read Format Response	AT$TCPIDLETO? $TCPIDLETO: **<Timeout>**
Execution Format Response	N/A N/A
Parameter Values	
<Timeout>	TCP API idle timeout value
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	After closing the connection, the device will attempt to reconnect using the FRIEND list.

4.6.5. $TCPSTATS   TCP API Statistics

Command Function	Displays bytes transmitted and received since last reset or last AT$TCPSTATS=0 command.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$TCPSTATS=? $TCPSTATS: (0) OK
Write Format Response	AT$TCPSTATS=**<Status>** OK
Read Format Response	AT$TCPSTATS? $TCPSTATS: Rx **<Rx Bytes>,** Tx **<Tx Bytes>**, M **<Mode Change>**,D **<GPRS Deactivate>**,R **<Restarts>,** C **<Connection Timeout>**, I **<Idle Timeout>,** S **<Socket Errors>**
Execution Format Response	N/A N/A
Parameter Values	
<Rx Bytes>	TCP API bytes received
<Tx Bytes>	TCP API bytes transmitted
<Mode Changes>	Mode change (AT$TCPAPI=0)
<GPRS Deactivate>	GPRS deactivate
<Restarts>	TCP API restarts (AT$TCPRESTRT)
<Connection Timeout>	TCP API connection timeout
<Idle Timeout>	TCP API idle timeout
<Socket Errors>	TCP API socket errors

4.6.5. $TCPSTATS   TCP API Statistics (continued)

Reference

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   AT$TCPSTATS=0 will clear all TCP API statistics.

4.6.6. $TCPRESTRT   TCP API Restart

Command Function	If a connection exists, it is dropped and a new connection is attempted starting at the beginning of the Friend list.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$TCPRESTRT=? OK
Write Format	AT$TCPRESTRT OK
Read Format **Response**	N/A N/A
Execution Format **Response**	N/A N/A
Parameter Values	N/A
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.7. Dynamic IP/Wakeup-Keep Alive Commands

4.7.1. $WAKEUP   Modem to Server Wakeup/Keep Alive

Command Function	This command allows the user to configure the modem wakeup/keep alive parameters. These parameters control how the modem initiates contact with its server friends. Parameters can be selected so that a wakeup message sequence is executed every time the modem receives a new IP, and/or after a requested period has passed since the previous wakeup sequence has completed. A wakeup message sequence consists of sending <max retry> messages to each server friend in sequence (i.e. server 2 is contacted after all retries for server 1 is complete) and is complete when each server friend has received <max retry> messages, or upon receipt of an acknowledge message from a server.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$WAKEUP=? $WAKEUP: (0-2),(0-10080) OK
Write Format Response	AT$WAKEUP=<**wakeup mode**>,<**retry period**> OK
Read Format Response	AT$WAKEUP? $WAKEUP: <**wakeup mode**>, <**retry period**>
Execution Format Response	N/A N/A

4.7.1. $WAKEUP

Modem to Server Wakeup/Keep Alive (continued)

Parameter Values

<wakeup mode>	0 = No wakeup messages sent
	1 = Send one message upon receipt of new IP and every **<retry period>** minutes
	2 = send acknowledgement message using at$acktm parameters upon receipt of new IP and every <retry period> minutes message
<retry period >	The number of minutes for keep alive period. Zero indicates no retries.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

Notes

- When this command is used, it will generate event group 0 events in the event table when the AT$EVENT? command is issued.
- The <retry period> parameter of this command populates the event timer value when the AT$EVTIM4? command is issued. The AT$EVTIM value will be in seconds. The parameter will also generate additional event group 0 entries.
- If AT$EVDEL=0 is issued or any entry for group 0 is deleted, this command MUST be re-entered for proper functionality. If a read command is issued, it will not reflect the true state of the AT$WAKEUP setting.
- Wakeup messages are sent to the IPs specified in AT$FRIEND and to the port specified in AT$UDPAPI command.

4.7.2. $ACKTM

Acknowledgment Message Period & Retry Number

Command Function	This command allows the user to configure the modem msg acknowledge behavior. If server acknowledgement is selected for a message, the message will be re-sent every <retry period> number of seconds until the acknowledge message sequence is complete, or until an acknowledge message is received from a server. An acknowledge message sequence consists of sending <max retry> messages to each server friend in sequence (i.e. server 2 is contacted after all retries for server 1 is complete) and is complete when each server friend has received <max retry> messages, or upon receipt of an acknowledge message from a server.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$ACKTM=? $ACKTM: (0-255),(0-3600),(0,1) OK
Write Format Response	AT$ACKTM=**<max retry>**,**<retry period>****<IP reselect>** OK
Read Format Response	AT$ACKTM? $ACKTM: **<max retry>**, **<retry period >**, **<IP reselect>**
Execution Format Response	N/A

4.7.2. $ACKTM

**Acknowledgment Message Period &
Retry Number (continued)**

Parameter Values

<max retry>

The maximum number of times an acknowledge message is re-sent to a single friend server. After all retries to the friend server are exhausted, the modem will move on to the next friend server if one exists. If there are no more friend servers available, the modem will start PDP activation recovery if the recovery option is selected; otherwise, the message will be discarded.

In the case of the default acknowledge wakeup message: The maximum number of wakeup messages the modem will send to each server friend upon receipt of a new IP, or upon expiration of each keep-alive period.   Zero indicates no wakeup message should be sent

<retry period >

The number of seconds between successive message retries. Zero indicates no retries.

<IP reselect >

0   IP reselection is OFF.

1   If an acknowledge message has not been received after all friend servers and retries for the message are exhausted, assume a problem with round-trip communication and initiate IP re-selection.

Reference

Standard Scope   Optional

Enfora Implementation Scope   Full

4.7.2. $ACKTM   Acknowledgment Message Period & Retry Number (continued)

Notes   This command is used in conjunction with the AT$WAKEUP command.

AT$WAKEUP time between AT$ACKTM sequence

| 5 sec | 5 sec | 5 sec | 5 sec | 5 sec |

AT$ACKTM sending 5 messages, 5 seconds apart
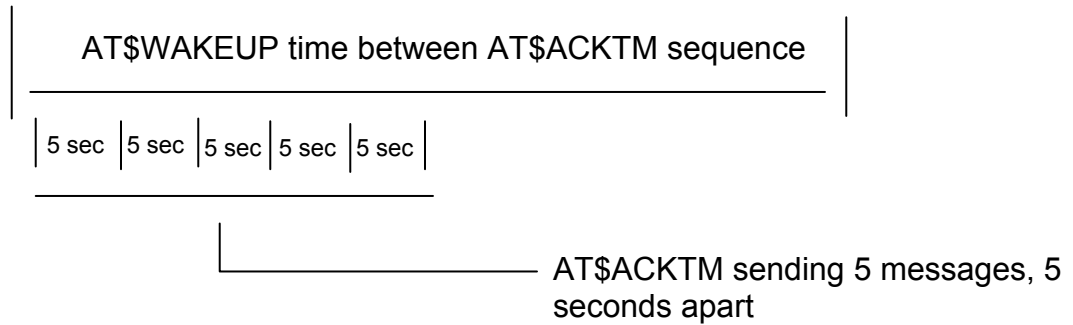
Example:

AT$ACKTM=5,5,1 —————— Perform IP reselect if no ACK from FRIENDS
Transmit messages every 5 seconds
Transmit 5 messages total

4.7.3. $MDMID   Modem ID

Command Function	This command allows the user to query/set the modem ID. The modem ID is copied into each wakeup message sent from the modem. (see AT$WAKEUP)
Command Functional Group	Enfora Specific
Command Format Query Response	AT$MDMID=? $MDMID: ("MODEM ID") OK
Write Format Response	AT$MDMID ="<modem ID >" OK
Read Format Response	AT$MDMID? $MDMID: "<modem ID >"
Execution Format Response	N/A N/A
Parameter Values	
<modem ID >	0-20 character string in ASCII format.
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.7.4. $FRIEND   Modem Friends

Command Function	This command allows the user to configure the modem friend/server list. A friend is always allowed remote API access. Friend servers can be configured to receive WAKEUP messages whenever the modem receives a new IP, or after a certain period has elapsed. (see AT$WAKEUP)
Command Functional Group	Enfora Specific
Command Format Query Response	$FRIEND=? $FRIEND: (1-10),(0,1),"(0-255).(0-255).(0-255).(0-255)" ,(0-65535),(0-3) OK
Write Format Response	AT$FRIEND =<friend number>, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage> OK
Read Format Response	AT$FRIEND? $FRIEND: =01, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage> $FRIEND: =02, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage> $FRIEND: =03, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage> $FRIEND: =04, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage> $FRIEND: =05, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage> $FRIEND: =06, <server indication>,"<friend IP> or <DNS name>", <destination port>, <usage>

4.7.4. $FRIEND

Set/Query API Friends (continued)

$FRIEND: =07, **<server indication>**,"**<friend IP>** or **<DNS name>**", **<destination port>**, **<usage>**
$FRIEND: =08, **<server indication>**,"**<friend IP>** or **<DNS name>**", **<destination port>**, **<usage>**
$FRIEND: =09, **<server indication>**,"**<friend IP>** or **<DNS name>**", **<destination port>**, **<usage>**
$FRIEND: =10, **<server indication>**,"**<friend IP>** or **<DNS name>**", **<destination port>**, **<usage>**

Execution Format	N/A
Response	N/A

Parameter Values

<friend number>	friend identification (1-10).
<server indication>	0 = Friend is not a server. 1 = Friend is a server.
<friend IP>	friend IP value.
OR	
<DNS name>	friend DNS name
<destination port>	friend destination port (TCP API only).
<usage>	0 = Unspecified (treated as UDPAPI) 1 = TCPAPI 2 = UDPAPI 3 = TCPAPI and/or UDPAPI

4.7.4. $FRIEND   Set/Query API Friends
                                    (continued)

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   If destination port and usage are not
                                    resent in the command, it is assumed to be
                                    a UDPAPI friend with the destination port
                                    filled in with the UDPAPI port number and
                                    usage = 0.

                                    You will use either the Friend IP address or
                                    the Friend DNS name, but not both.

4.8. PAD Commands

4.8.1. $PADDST   PAD Destination IP/Port

Command Function	This command allows the user to query/set the PAD destination IP and port address.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADDST=? $PADDST: "(0-255),(0-255),(0-255),(0-255)",(0-65535) OK
Write Format Response	AT$PADDST ="<**PAD destination IP>** or <**PAD destination DNS name>**",<**PAD destination port>** OK
Read Format Response	AT$PADDST? $PADDST: ="<**PAD destination IP>** or <**PAD destination DNS name>**",<**PAD destination port>**
Execution Format Response	N/A N/A
Parameter Values	
<PAD destination IP >	Destination IP for PAD data. PAD data is sent to and received from this IP. A destination IP address of 0 will allow PAD access from any IP destination, and will cause all locally generated PAD data to be sent to the IP address associated with the last remotely received PAD data.

OR

<PAD destination DNS name>	Destination DNS name for PAD data.

4.8.1 $PADDST

PAD Destination IP/Port
(continued)

<PAD destination port >

Destination port for PAD data. PAD data is sent to and received from this port. A destination port of 0 will allow PAD access from any port, and will cause all locally generated PAD data to be sent to the port associated with the last remotely received PAD data.

Reference

N/A

Standard Scope

Optional

Enfora Implementation Scope

Full

Notes

A value of 0 will allow any IP/port access to the TCP PAD. If populated and in passive, server mode (AT$ACTIVE=0) the TCP PAD will limit access to the IP/port defined.

You will use either the PAD Destination IP Address, or the PAD Destination DNS Name, but not both.

4.8.2. $PADSRC PAD Source Port

Command Function	This command allows the user to query/set the API PAD source port. Remote data received from a valid destination address to this source port will be processed as incoming PAD data. This port is also used as the source port for all data sent to the PAD destination. This value must be different than the UDPAPI port.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADSRC=? $PADSRC: (0-65535) OK
Write Format Response	AT$PADSRC = **\<PAD source port\>** OK
Read Format Response	AT$PADSRC? $PADSRC: **\<PAD source port\>**
Execution Format Response	N/A N/A
Parameter Values	
\<PAD source port \>	PAD source port is used as the source port in all outgoing PAD data messages. The remote host must use this port number as the destination port for PAD data sent to the device.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.8.3. $ACTIVE   TCP PAD State

Command Function	This command determines the active or passive state of the TCP PAD connection.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$ACTIVE=? $ACTIVE: (0-2) OK
Write Format Response	AT$ACTIVE =<**state** > OK
Read Format Response	AT$ACTIVE? $ACTIVE: <**state**>
Execution Format Response	N/A N/A
Parameter Values	
<state>	**0** TCP PAD passive/server mode **1** TCP PAD active/client mode **2** Sets the modem in TCP server mode and waits for an incoming client connection on a port number specified by AT$PADSRC.
Reference	N/A

4.8.3. $ACTIVE

TCP PAD State
(continued)

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   If passive is chosen, the PAD will be in
                                     server mode and listen for inbound TCP
                                     connection requests. If active is chosen,
                                     the PAD will be in client mode and will
                                     initiate a connection based on the ATDT
                                     command, or if atd*99# is used to initiate a
                                     GPRS connection, the values populated in
                                     AT$PADDST. A value of 0 indicates
                                     passive, server mode of operation. A value
                                     of 1 indicates active, client mode of
                                     operation. ATDT will be used to initiate the
                                     passive, server mode functionality. If
                                     ATDTxxx.xxx.xxx.xxx/xxxx is used, it will
                                     override the passive mode and replace the
                                     AT$PADDST parameters as it does in UDP
                                     PAD mode.

4.8.4. $PADBLK   PAD Block Size

Command Function	This command allows the user to query/set the PAD block size.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADBLK=? PADBLK: (3-1472) OK
Write Format Response	AT$PADBLK =<**block size** > OK
Read Format Response	AT$PADBLK? $PADBLK: <**block size**>
Execution Format Response	N/A N/A
Parameter Values	
<**block size** >	PAD data will be created at the requested PAD block size (number of bytes) unless an enabled forward character or PAD timeout forces the data to be sent out at a smaller block size. Block size does NOT include the IP or TCP/UDP header size. Block size values over 1460 are truncated to 1460 for TCP PAD. Values over 1460 are only applicable to UDP PAD.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	The AT$PADBLK sets the buffer size for accumulating the chars received on the serial port by the modem. However, the modem uses a fixed 500 char buffer for sending data over-the-air, so when the

$PADBLK is set to a value >500, the data is sent over the air in 500 char blocks.

4.8.5. $PADBS   PAD Backspace Character

Command Function	This command allows the user to query/set the PAD backspace character. If PAD edit is enabled via AT$PADCMD, this character will cause the previous character to be deleted from the PAD output buffer. If the previous character has already been forwarded due to a PAD timeout or receipt of an enabled forward character, receipt of the PAD edit character will have no affect.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADBS =? $PADBS: (0-ff) OK
Write Format Response	AT$PADBS =\<**backspace character**\> OK
Read Format Response	AT$PADBS? $PADBS: \<**backspace character**\>
Execution Format Response	N/A N/A
Parameter Values	
\<**backspace character** \>	Hex representation of user selected backspace character. Normal backspace character is 08.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.8.6. $PADFWD   PAD Forward Character

Command Function	This command allows the user to query/set the PAD forward character. If PAD forward is enabled via AT$PADCMD, receipt of this character will immediately forward all currently buffered PAD data.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADFWD =? $PADFWD: (0-ff) OK
Write Format Response	AT$PADFWD =<**forward character**> OK
Read Format Response	AT$PADFWD? $PADFWD: <**forward character**>
Execution Format Response	N/A N/A
Parameter Values	
<backspace character >	Hex representation of user selected forward character. Default forward character is 0D (Carriage return).
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.8.7. $PADTO   PAD Timeout Value

Command Function	This command allows the user to query/set the PAD timeout value. Data will be forwarded to the PAD destination even if the PAD block size has not been reached if <pad timeout> period has elapsed since the last PAD character was received from the local host.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADTO $PADTO: (0-65535) OK
Write Format Response	AT$PADTO = **<PAD timeout>** OK
Read Format Response	AT$PADTO $PADTO: **<PAD timeout>**
Execution Format Response	N/A N/A
Parameter Values	
<PAD timeout>	The number of tenths of seconds to wait for the receipt of more PAD data before forwarding the currently accumulated PAD buffer to the PAD destination. A value of zero disables the PAD timeout feature. If the PAD timeout feature is disabled, no data will be forwarded to the destination until either an enabled forward character is received, or the selected PAD buffer size is reached. (50 = 5 seconds)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.8.8. $PADCMD   PAD Command Features

Command Function	This command allows the user to set/query PAD configuration options.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADCMD=? $PADCMD: (00-FFFF) OK
Write Format Response	AT$PADCMD =<**pad feature select** > OK
Read Format Response	AT$PADCMD? $PADCMD: "<**pad feature select** >"
Execution Format Response	N/A N/A
Parameter Values	
<**pad feature select** >	**AND selected HEX options into a single 16 bit word.** 0001=Enable forwarding on special char 0002=Forward special char with data 0008=Enable backspace 0400=Enable escape character to treat next character as data
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	A +++ is an escape sequence to exit PAD mode. Disabling of the escape sequence is not supported, however the escape is only applicable when there is a 1 second guard time before and after the +++. If the guard period is not met before and after the escape sequence, it will be forwarded as data.

4.8.9. $CONNTO   TCP PAD Connection Timeout

Command Function	This command is used to indicate the amount of time, in seconds, to spend attempting to make a TCP connection.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$CONNTO=? $CONNTO: (0, 10-3600) OK
Write Format Response	AT$CONNTO =<timeout> OK
Read Format Response	AT$CONNTO? $CONNTO: <timeout>
Execution Format Response	N/A N/A
Parameter Values	
<timeout>	0 = Infinite timeout value 10-3600 = timeout value in seconds
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	A value of 0 will indicate infinite connection wait time. This command pertains to client mode operation only.

4.8.10. $IDLETO   TCP PAD Idle Timeout

Command Function	This command sets the length of time, in seconds, a TCP session connection will remain active without the remote connection sending any data.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$IDLETO=? $IDLETO: (10-86400) OK
Write Format Response	AT$IDLETO =<timeout> OK
Read Format Response	AT$IDLETO? $IDLETO: <timeout>
Execution Format Response	N/A N/A
Parameter Values	
<timeout>	10-86400 = timeout value in seconds
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If no communication is received from the remote connection in the specified time, the modem will gracefully attempt to close the connection. T-Mobile and AT&T networks will shut down a TCP connection if the connection is idle.

4.8.11. DP   Dial Command for UDP PAD

Command Function	This command is used to invoke the UDP PAD via a dial command.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format	(Using IP Address) atdp**<IP_ADDRESS>/<UDP Port Number>** (Using DNS Name) atdp**"<PAD Destination DNS_Name>", <UDP Port Number>**
Response	Connect
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<IP_ADDRESS>	IP Address of the destination host. Or,
<PAD Destination DNS_Name>	DNS Name of the destination host.
<UDP Port Number>	UDP Port number. If no UDP port number is required, a value zero (0) should be specified here.
Reference	GSM 11.14
Standard Scope	Optional
Enfora Implementation Scope	Full

4.8.11. DP   **Dial Command for UDP PAD
                                    (continued)**

Notes   This command will override the
                                   AT$PADDST settings for the current
                                   connected session.

                                   DNS Name supported on software versions
                                   0.7.6 and higher

Example:

                                   atdp123.456.789.1/0
                                   atdp123.456.789.2/3000
                                   atdp"www.enfora.com",0
                                   atdp"www.enfora.com",3000

4.8.12. DT   Dial Command for TCP PAD

Command Function	This command is used to invoke the TCP PAD via a dial command.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format	(Using IP Address) atdt**<IP_ADDRESS>/<TCP Port Number>** (Using DNS Name) atdt**"<PAD Destination DNS_Name>", <TCP Port Number>**
Response	Connect
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<IP_ADDRESS>	IP Address of the destination host. Or,
<PAD Destination DNS_Name>	DNS Name of the destination host.
<TCP Port Number>	TCP Port number. If no TCP port number is required, a value zero (0) should be specified here.
Reference	GSM 11.14
Standard Scope	Optional
Enfora Implementation Scope	Full

4.8.12. DT   **Dial Command for TCP PAD**
                                        (continued)

Notes   This command will override the
                                        AT$PADDST settings for the current
                                        connected session.

                                        DNS Name supported on software versions
                                        0.7.6 and higher

Example: atdt123.456.789.1/0
                                        atdt123.456.789.2/3000
                                        atdt"www.enfora.com",0
                                        atdt"www.enfora.com",3000

4.8.13.$PADDISC PAD disconnect method selection

Command Function	This command sets the PAD '+++' disconnect method to Legacy or Enabler III (new). The new method emphasizes retaining the PDP context (and the "connection") for as long as possible; only client or server timeouts remove the connection. Also, ath and ato have roles in controlling the PAD connection when using this method.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADDISC=? $PADDISC: (0,1) OK
Write Format Response	AT$PADDISC =<**method**> OK
Read Format Response	AT$PADDISC? $PADDISC: <**method**> OK
Execution Format Response	N/A N/A
Parameter Values	
< method >	**0**=> Legacy method. **1**=> Enabler III method.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.8.13. $PADDISC   PAD disconnect method selection (continued)

Notes

Examples

AT$PADDISC =0   Enable Legacy PAD disconnect method.

4.8.14. $PADESC   PAD Escape Character

Command Function	This command allows the user to query / set the PAD escape character. If PAD escape is enabled via AT$PADCMD, receipt of this character will cause the following character to be treated as data. It is typically used to allow the forward, backspace or escape character to be processed as data rather then as a special character.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PADESC=? $PADESC:(0-ff) OK
Write Format Response	AT$PADESC=\<escape character\> OK
Read Format Response	AT$PADESC? $PADESC: \<escape character\>
Execution Format Response	N/A N/A
Parameter Values	
\<escape character\>	Hex representation of user selected escape character. Default escape character is 00
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.8.15. $PDPACT   PDP Activate

Command Function	This command allows the user to activate a PDP context separately from opening the TCP/UDP socket for UDP OR TCP PAD..
Command Functional Group	Enfora Specific
Command Format Query **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT$PADACT OK or ERROR
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	**User must set the following AT commands prior to using this command: AT$AREG=1 AT$PADDISC=1 AT$ACTIVE=1 AT$HOSTIF=1 or 2**

Used in conjunction with the AT$PDPDEACT command

Example	N/A

4.8.16. $PDPDEACT   PDP Deactivate

Command Function	This command will deactivate the PDP context that was activated with AT$PDPACT
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$PDPDEACT OK or ERROR
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Used in conjunction with the AT$PDPDEACT command
Example	N/A

4.9. Event Processing Commands

4.9.1. $EVENT   User Defined Input/Output

Command Function	This command allows the user to customize the modem's input and output capabilities. Any combination of input events can be monitored to trigger any combination of output events.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$EVENT=? $EVENT: (0-99),(0-3),(0-255),(-2147483647 - 2147483647),(-2147483647 - 2147483647)
Write Format Response	AT$EVENT=<**event group**>,<**event type**>,<**event category**>,<**parm1**>, <**parm2**> OK

Read Format
Response

AT$EVENT?

$EVENT:	evgp	evtyp	evcat	p1	p2
	1A	0	9	2	4
	1B	3	37	1	0
	2A	0	9	5	5
	2B	3	21	0	0
	3A	0	9	0	0
	3B	3	13	0	0
	4A	0	9	1	1
	4 B	3	21	0	0

Execution Format Response	N/A

4.9.1 $EVENT   User Defined Input/Output (continued)

Parameter Values
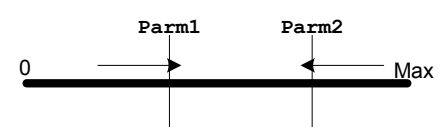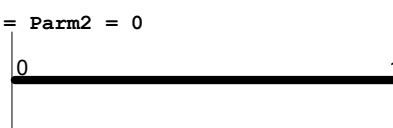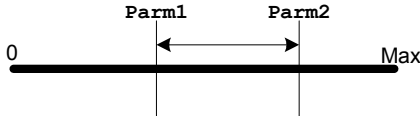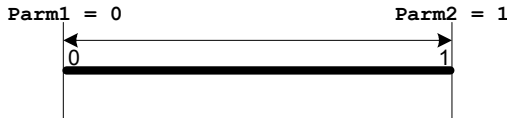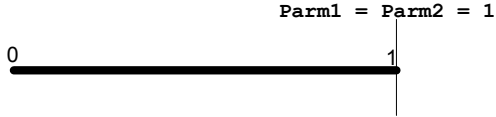
<event group>	This parameter defines the group number of a group of events and the order they are executed. Events are grouped together to control execution sequence. A group number has to have at least one input event and one output event. Multiple input events within a group number would be treated as a logical **AND** condition. Multiple output events within a group number would be executed individually in a sequential manner.
	Valid values for group number are: 1 thru 99.
<event type>	This parameter defines the type of event: Input or Output. An Input event can be defined as: Transition, Occurrence, or Input. The output event is executed when input event conditions are met.

Value	Type of event	Description
0	*Transition Trigger*	A transition Trigger is defined as an input condition, defined by **<event category>**, whose value was previously **<parm1>** or less is now greater than **<parm1>** and less than **<parm2> or** was greater or equal to **<parm2>** is now less than **<parm2>** but greater than **<parm1>**. The output event would be executed when an input **<event category>** requirements are satisfied or transition to the value set by **<parm1>** and **<parm2>** when they are equal. **<parm1>** should be the min value and **<parm2>** should be the max value. Example 1: **Figure 1.** An output event will be executed when the value of an input event exceeds **<Parm1>** (previously it was **<Parm1**> or less) or decreases to a value less than **<Parm2>** (previously it was <**Parm2>** or greater). Example 2: **Figure 2.** An output event will be executed when the value of an input event is 0 (previously it was anything else but 0) and **<Parm1>** along with **<Parm2>** is set to 0.

		Example 3: $$Parm1 = Parm2 = 1$$ **Figure 3.** An output event will be executed when the value of an input event is 1 (previously it was anything else but 1) and **<Parm1>** along with **<Parm2>** is set to 1.
1	*Occurrence Trigger*	An Occurrence Trigger is defined as an input condition, defined by **<event category>**, whose current value is greater than or equal to **<parm1>** and less than or equal to **<parm2>**. The output event would be executed when an input **<event category>** requirements are satisfied or transition to the value set by **<parm1>** and **<parm2>** when they are equal. **<parm1>** should be the min value and **<parm2>** should be the max value Example 4: **Figure 4.** An output event will be executed when the current value of an input event is between **<Parm1>** and **<Parm2>** including boundary conditions. Example 5: **Figure 5.** An output event will be executed when the value of the input event changes from 0 to 1 or vice-versa. Example 6: $$Parm1 = Parm2 = 1$$ **Figure 6.** An output event will be executed when the value of the input event is 1 and **<Parm1>** along with **<Parm2>** is set to 1.
2	*Input Trigger*	An Input Trigger is defined as an input condition, defined by **<event category>**, that should be used as a logical **AND** condition to another input condition defined as Transition Trigger or an Occurrence Trigger. An Output event is not triggered when Input Trigger condition is valid. The input event, defined as Input Trigger, is valid when within the event range defined by **<parm1>** and **<parm2>** or when **<parm1>** and **<parm2>** are equal.
3	*Output*	An Output event is executed when all input event conditions (defined as Transition Trigger, Occurrence Trigger, or Input Trigger) for that particular **<event group>** are met.

    <event category>,<parm1>,<parm2> These parameters defines the actual Input or Output Event number and their valid range for **<parm1>** and **<parm2>**.

4.9.1.1. Input Event Table

The following table defines the values for **<event category>**, **<parm1>** and **<parm2>** parameter for input events defined as a *Transition Trigger*, *Occurrence Trigger*, or *Input Trigger*.

Input Event Table			
Event Category	**Parm1**	**Parm2**	**Description**
0	0 or 1	0 or 1	GPIO1 – General purpose Input/Output #1 0 = Low 1 = High
1	0 or 1	0 or 1	GPIO2 – General purpose Input/Output #2
2	0 or 1	0 or 1	GPIO3 – General purpose Input/Output #3
3	0 or 1	0 or 1	GPIO4 – General purpose Input/Output #4
4	0 or 1	0 or 1	GPIO5 – General purpose Input/Output #5
5	0 or 1	0 or 1	GPIO6 – General purpose Input/Output #6
6	0 or 1	0 or 1	GPIO7 – General purpose Input/Output #7
7	0 or 1	0 or 1	GPIO8 – General purpose Input/Output #8
8	1	1	Modem power up indication
9	0 to 5	0 to 5	Modem GSM registration (see AT+CREG command description for GSM registration status information)
10	0 to 8	0 to 8	Modem GPRS registration (see AT%CGREG command description for GPRS registration status information)
11	0 or 1	0 or 1	Receipt of IP address. 0 = No IP address 1 = Valid IP address obtained
12	1	1	Timer 1 (set by AT$EVTIM1)
13	1	1	Timer 2 (set by AT$EVTIM2)
14	1	1	Timer 3 (set by AT$EVTIM3)
15	1	1	Timer 4 (set by AT$EVTIM4)
16-27	N/A	N/A	Reserved
28	1	1	**RTC Alarm Input
29-50	N/A	N/A	Reserved
51	0	0	**Input Event Counter. This event will occur when a counter reaches the maximum number of a selected Input event count.
52	0 or 1	0 or 1	New SMS indication. 0 = SMS message read from SIM 1 = New SMS message received
53	0 to -1	0 to –1	Current Input Event Counter count that can be used as an AND condition with other input events
54-59	N/A	N/A	Reserved
60	0 – 9999	0 – 9999	Number of Unsent Messages ($msglogrd count)
61	0 – 100	0 – 100	Memory full percentage ($msglogrd)
62-64	N/A	N/A	Reserved

<table>
<tr><th colspan="4">Input Event Table</th></tr>
<tr><th>Event Category</th><th>Parm1</th><th>Parm2</th><th>Description</th></tr>
<tr><td>65</td><td>1 to 5</td><td>1 to 5</td><td>Receipt of Incoming Call with Call Identifier matching one the numbers configured via the **$EVCID** command. <Parm1> and <Parm2> correspond to range **$EVCID** entries which will generate the input event.</td></tr>
<tr><td>66</td><td>1</td><td>1</td><td>Timer 5 (set by AT$EVTIM5)</td></tr>
<tr><td>67</td><td>1</td><td>1</td><td>Timer 6 (set by AT$EVTIM6)</td></tr>
<tr><td>68</td><td>1</td><td>1</td><td>Timer 7 (set by AT$EVTIM7)</td></tr>
<tr><td>69</td><td>1</td><td>1</td><td>Timer 8 (set by AT$EVTIM8)</td></tr>
<tr><td>70-99</td><td>N/A</td><td>N/A</td><td>Reserved</td></tr>
<tr><td>100</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 0</td></tr>
<tr><td>101</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 1</td></tr>
<tr><td>102</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 2</td></tr>
<tr><td>103</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 3</td></tr>
<tr><td>104</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 4</td></tr>
<tr><td>105</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 5</td></tr>
<tr><td>106</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 6</td></tr>
<tr><td>107</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 7</td></tr>
<tr><td>108</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 8</td></tr>
<tr><td>109</td><td>-2147483648 to 2147483647</td><td>-2147483648 to 2147483647</td><td>User variable 9</td></tr>
<tr><td>110</td><td>N/A</td><td>N/A</td><td>Reserved</td></tr>
<tr><td>111</td><td>0 or 1</td><td>0 or 1</td><td>GSM_JAMMING_STATE
Current state of the GSM jamming detection algorithm.
JAMMED = 1
CLEAR = 0</td></tr>
</table>

4.9.1.2. Output Event Table

The following table defines the values for **<event category>**, **<parm1>** and **<parm2>** parameter for output events defined as *Output*.

Output Event Table			
event category	Parm1	Parm2	Description
0	0	0	Changes GPIO #1 to Input (from Output)
1	0	0	Changes GPIO #2 to Input (from Output)
2	0	0	Changes GPIO #3 to Input (from Output)
3	0	0	Changes GPIO #4 to Input (from Output)
4	0	0	Changes GPIO #5 to Input (from Output)
5	0	0	Changes GPIO #6 to Input (from Output)
6	0	0	Changes GPIO #7 to Input (from Output)
7	0	0	Changes GPIO #8 to Input (from Output)
8	0	0	Set GPIO #1 configured as Output to Low (0)
9	0	0	Set GPIO #2 configured as Output to Low (0)
10	0	0	Set GPIO #3 configured as Output to Low (0)
11	0	0	Set GPIO #4 configured as Output to Low (0)
12	0	0	Set GPIO #5 configured as Output to Low (0)
13	0	0	Set GPIO #6 configured as Output to Low (0)
14	0	0	Set GPIO #7 configured as Output to Low (0)
15	0	0	Set GPIO #8 configured as Output to Low (0)
16	0	0	Set GPIO #1 configured as Output to High (1)
17	0	0	Set GPIO #2 configured as Output to High (1)
18	0	0	Set GPIO #3 configured as Output to High (1)
19	0	0	Set GPIO #4 configured as Output to High (1)
20	0	0	Set GPIO #5 configured as Output to High (1)
21	0	0	Set GPIO #6 configured as Output to High (1)
22	0	0	Set GPIO #7 configured as Output to High (1)
23	0	0	Set GPIO #8 configured as Output to High (1)
24	0	0	Toggle GPIO #1 configured as Output
25	0	0	Toggle GPIO #2 configured as Output
26	0	0	Toggle GPIO #3 configured as Output
27	0	0	Toggle GPIO #4 configured as Output
28	0	0	Toggle GPIO #5 configured as Output
29	0	0	Toggle GPIO #6 configured as Output
30	0	0	Toggle GPIO #7 configured as Output
31	0	0	Toggle GPIO #8 configured as Output
32			Flash GPIO #1 configured as Output
33			Flash GPIO #2 configured as Output
34			Flash GPIO #3 configured as Output
35	See **GPIO Flash Table** in		Flash GPIO #4 configured as Output
36	section 4.9.1.4		Flash GPIO #5 configured as Output
37			Flash GPIO #6 configured as Output
38			Flash GPIO #7 configured as Output
39			Flash GPIO #8 configured as Output

Output Event Table			
event category	Parm1	Parm2	Description
40	0 to –1	See **Bit- Field Table** in section 4.9.1.5	Generate and transmit one UDP Message to first IP address listed in **$FRIEND** command and port number listed in **$UDPAPI** command based on **Parm1** and **Parm2** values.
41	0 to –1	See **Bit- Field Table** in section 4.9.1.5	Generate and transmit a UDP message with Acknowledge. This message is controlled by **$ACKTM** command for number of retries sent. This message has to be acknowledged to avoid sending of retries.
42			Generate and transmit one UDP Message to all IP address listed in **$FRIEND** command and port number listed in **$UDPAPI** command based on **Parm1** and **Parm2** values
43	1 – 8	0	Resets the timer (Timer #1 – Timer #8) specified by **Parm1** to the time (in seconds) specified by **Parm2**. **Parm2**, when set to 0, resets the timer to the time last set by **$EVTIMx** command. A value other than 0 would set the timer to expire at the new specified interval (e.g. xx,3,43,1,180 would set timer 1 to expire in 180 seconds).
44	1 – 15	0	Execute AT command stored at index number of the **$STOATEV** command. **Parm1** identifies the index number.
45	0 to 2147483647	See **Bit- Field Table** in section 4.9.1.5	Sends data over SMS to All SMS destination addresses configured via **$SMSDA** command. (For select **$SMSDA** entries, see event categories 54-58)
46	N/A	N/A	Reserved
47	0	0 to –1	Input Event Counter
48	0	0 to –1	Input Event Counter reset to value stated by parm2
49	N/A	N/A	Reserved
50	0 – 57	0 to –1	Emulate AT$EVTEST command via event engine. **Parm1** is the input event number while **Parm2** is the value to emulate for the input event
51	N/A	N/A	Reserved
52	0 to –1	See **Bit- Field Table** in section 4.9.1.5	Generate and transmit one TCP/IP Message to IP address & port number listed by **$FRIEND** command based on **Parm1** and **Parm2** values
53	0 – 99	0 – 16	Sets periodic RTC alarm in minutes, hours, days, months, or years. Parm1 indicates the frequency with which to generate the message. Parm2 indicates the unit with which to generate the message. For example: Parm1 Parm2 Result 1 1 RTC Alarm occurs every minute 1 2 RTC Alarm occurs every hour 1 4 RTC Alarm occurs every day 1 8 RTC Alarm occurs every month
54	0 to 2147483647	See **Bit- Field Table** in section 4.9.1.5	Sends data over SMS to the first indexed SMS destination address configured via **$SMSDA** command
55	0 to 2147483647		Sends data over SMS to the second indexed SMS destination address configured via **$SMSDA** command
56	0 to 2147483647		Sends data over SMS to the third indexed SMS destination address configured via **$SMSDA** command

Output Event Table			
event category	**Parm1**	**Parm2**	**Description**
57	0 to 2147483647	See **Bit- Field Table** in section 4.9.1.5	Sends data over SMS to the fourth indexed SMS destination address configured via **$SMSDA** command
58	0 to 2147483647		Sends data over SMS to the fifth indexed SMS destination address configured via **$SMSDA** command
59	N/A	N/A	Reserved
60	0 to -1	See **Bit- Field Table** in section 4.9.1.5	Generate and transmit message to main serial port based on Parm1 and Parm2 values in ASCII format only.
61-124	N/A	N/A	Reserved
125	0 – 9	-2147483648 to 2147483647	Sets user variable indicated by parm1 to value of parm2 (for example, if parm1 is 7 and parm2 is 50, this output event would set user variable 7 to 50)
126	0 – 9	-2147483648 to 2147483647	Increments user variable indicated by parm1 by value of parm2 (for example, if parm1 is 4, parm2 is 100, and user variable 4 was 200 prior to this event, user variable 4 would be incremented to 300 by this event)
127	0 – 9	-2147483648 to 2147483647	Decrements user variable indicated by parm1 by value of parm2 (for example, if parm1 is 9, parm2 is 10, and user variable 9 was 50 prior to this event, user variable 9 would be decremented to 40 by this event)
128	0 – 9	-2147483648 to 2147483647	Copies value of a system variable into user variable indicated by parm1. Parm2 is used as an index to determine the system variable that will be copied (see User Variable Index Table in section 4.9.1.3).

4.9.1.3.   User Variable Index Table

This table is used only with *Output Event 128*.

Parm2	System Variable Copied to User Variable
	(For example, AT$EVENT=99,3,128,3,9 would copy value of Input Event 9 (GSM registration status) into User Variable 3). For Serving Cell and Neighbor Cell values, see *GSM0000GN012 – Engineering Mode Manual* for details of the %EM command.
-473	Copies Neighbor Cell 5 signal strength. Equivalent to AT%EM=2,3
-472	Copies Neighbor Cell 5 absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,3
-471	Copies Neighbor Cell 5 cell ID. Equivalent to AT%EM=2,3
-470	Copies Neighbor Cell 5 location area code. Equivalent to AT%EM=2,3
-469 to -464	Reserved
-463	Copies Neighbor Cell 4 signal strength. Equivalent to AT%EM=2,3
-462	Copies Neighbor Cell 4 absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,3
-461	Copies Neighbor Cell 4 cell ID. Equivalent to AT%EM=2,3
-460	Copies Neighbor Cell 4 location area code. Equivalent to AT%EM=2,3
-459 to -454	Reserved
-453	Copies Neighbor Cell 3 signal strength. Equivalent to AT%EM=2,3

Parm2	System Variable Copied to User Variable
-452	Copies Neighbor Cell 3 absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,3
-451	Copies Neighbor Cell 3 cell ID. Equivalent to AT%EM=2,3
-450	Copies Neighbor Cell 3 location area code. Equivalent to AT%EM=2,3
-449 to -444	Reserved
-443	Copies Neighbor Cell 2 signal strength. Equivalent to AT%EM=2,3
-442	Copies Neighbor Cell 2 absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,3
-441	Copies Neighbor Cell 2 cell ID. Equivalent to AT%EM=2,3
-440	Copies Neighbor Cell 2 location area code. Equivalent to AT%EM=2,3
-439 to -434	Reserved
-433	Copies Neighbor Cell 1 signal strength. Equivalent to AT%EM=2,3
-432	Copies Neighbor Cell 1 absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,3
-431	Copies Neighbor Cell 1 cell ID. Equivalent to AT%EM=2,3
-430	Copies Neighbor Cell 1 location area code. Equivalent to AT%EM=2,3
-429 to -424	Reserved
-423	Copies Neighbor Cell 0 signal strength. Equivalent to AT%EM=2,3
-422	Copies Neighbor Cell 0 absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,3
-421	Copies Neighbor Cell 0 cell ID. Equivalent to AT%EM=2,3
-420	Copies Neighbor Cell 0 location area code. Equivalent to AT%EM=2,3
-419 to -407	Reserved
-406	Copies Serving Cell timing advance. Equivalent to AT%EM=2,1
-405	Copies Serving Cell signal strength. Equivalent to AT%EM=2,1
-404	Copies Serving Cell absolute radio frequency channel number (ARFCN). Equivalent to AT%EM=2,1
-403	Copies Serving Cell cell ID. Equivalent to AT%EM=2,1
-402	Copies Serving Cell location area code. Equivalent to AT%EM=2,1
-401	Copies Serving Cell MNC (0x00MMNNCC, where MM, NN, and CC are the hex values of the ASCII representations of the MNC). Equivalent to AT%EM=2,4
-400	Copies Serving Cell MCC (0x00MMCCcc, where MM, CC, and cc are the hex values of the ASCII representations of the MCC) . Equivalent to AT%EM=2,4
-399 to -303	Reserved
-302	Copies Software version (for example, if version is 1.1.1.8, value would be 0x00001118)
-301	Copies product ID
-300	Copies $usrval value
-299 to -202	Reserved
-201	Copies battery temperature in Celsius
-200	Copies battery percentage
-199 to -42	Reserved
-41	Copies GPIO value status where LSB represents GPIO0. For example: 0x00165432 2=binary 0010 (so GPIO1=1; GPIO0, GPIO2, GPIO3=0) 3=binary 0011 (so GPIO4,GPIO5=1; GPIO6,GPIO7=0) 4=binary 0100 (so GPIO10=1; GPIO8,GPIO9,GPIO11=0) 5=binary 0101 (so GPIO12,GPIO14=1; GPIO13,GPIO15=0) 6=binary 0110 (so GPIO17,GPIO18=1; GPIO16,GPIO19=0) 1=binary 0001 (so GPIO20=1) **Note: GPIO numbers >8 are NOT supported on SAG+**

Parm2	System Variable Copied to User Variable
-40	Copies GPIO direction status where LSB represents GPIO0 (1=input,0-output). For example: 0x00165432 2=binary 0010 (so GPIO1=input; GPIO0, GPIO2, GPIO3=outputs) 3=binary 0011 (so GPIO4,GPIO5=inputs; GPIO6,GPIO7=outputs) 4=binary 0100 (so GPIO10=input; GPIO8,GPIO9,GPIO11=outputs) 5=binary 0101 (so GPIO12,GPIO14=inputs; GPIO13,GPIO15=outputs) 6=binary 0110 (so GPIO17,GPIO18=inputs; GPIO16,GPIO19=outputs) 1=binary 0001 (so GPIO20=input) **Note: GPIO numbers >8 are NOT supported on SAG+**
-39 to -22	Reserved
-21	Copies current RTC time: 0x00HHMMSS where HH = hour (0-23), MM = minute (0-59), SS = second (0-59)
-20	Copies current RTC date: 0x00YYMMDD where YY = last two digits of year (00-99), MM = month (1-12), DD = day of month (1-31)
-19 to -9	Reserved
-8	Copies current count of event timer 8 in seconds
-7	Copies current count of event timer 7 in seconds
-6	Copies current count of event timer 6 in seconds
-5	Copies current count of event timer 5 in seconds
-4	Copies current count of event timer 4 in seconds
-3	Copies current count of event timer 3 in seconds
-2	Copies current count of event timer 2 in seconds
-1	Copies current count of event timer 1 in seconds
0	Copies value of Input Event 0 (GPIO1). 0 = Low 1 = High
1	Copies value of Input Event 1 (GPIO2). 0 = Low 1 = High
2	Copies value of Input Event 2 (GPIO3). 0 = Low 1 = High
3	Copies value of Input Event 3 (GPIO4). 0 = Low 1 = High
4	Copies value of Input Event 4 (GPIO5). 0 = Low 1 = High
5	Copies value of Input Event 5 (GPIO6). 0 = Low 1 = High
6	Copies value of Input Event 6 (GPIO7). 0 = Low 1 = High
7	Copies value of Input Event 7 (GPIO8). 0 = Low 1 = High
8	Copies value of Input Event 8 (modem power up indication). Always 1.
9	Copies value of Input Event 9 (modem GSM registration). See AT+CREG command description for GSM registration status information.

Parm2	System Variable Copied to User Variable
10	Copies value of Input Event 10 (modem GPRS registration). See AT%CGREG command for GPRS registration status information.
11	Copies value of Input Event 11 (Receipt of IP address). 0 = No IP address 1 = Valid IP address obtained
12	Copies value of Input Event 12 (Timer 1 status). 0 = Timer not expired 1 = Timer expired
13	Copies value of Input Event 13 (Timer 2 status). 0 = Timer not expired 1 = Timer expired
14	Copies value of Input Event 14 (Timer 3 status). 0 = Timer not expired 1 = Timer expired
15	Copies value of Input Event 15 (Timer 4 status). 0 = Timer not expired 1 = Timer expired
16 to 27	Reserved
28	Copies value of Input Event 28 (RTC Alarm Input)
29 to 50	Reserved
51	Copies value of Input Event 51 (Input Event Counter)
52	Copies value of Input Event 52 (New SMS indication) 0 = SMS message read from SIM 1 = New SMS message received
53	Copies value of Input Event 53 (Current Input Event Counter count that can be used as an AND condition with other input events)
54 to 64	Reserved
65	Copies value of Input Event 64 (Receipt of incoming call with Call Identifier matching one of the numbers configured via the $EVCID command)
66	Copies value of Input Event 66 (Timer 5 status). 0 = Timer not expired 1 = Timer expired
67	Copies value of Input Event 67 (Timer 6 status). 0 = Timer not expired 1 = Timer expired
68	Copies value of Input Event 68 (Timer 7 status). 0 = Timer not expired 1 = Timer expired
69	Copies value of Input Event 69 (Timer 8 status). 0 = Timer not expired 1 = Timer expired
70 to 99	Reserved
100	Copies value of Input Event 100 (User variable 0)
101	Copies value of Input Event 101 (User variable 1)
102	Copies value of Input Event 102 (User variable 2)
103	Copies value of Input Event 103 (User variable 3)
104	Copies value of Input Event 104 (User variable 4)
105	Copies value of Input Event 105 (User variable 5)
106	Copies value of Input Event 106 (User variable 6)
107	Copies value of Input Event 107 (User variable 7)
108	Copies value of Input Event 108 (User variable 8)
109	Copies value of Input Event 109 (User variable 9)

4.9.1.4. GPIO Flash Table

Parm1	Parm2
Bits 16 – 31 determine the low signal state while bits 0 – 15 determine the high signal state. A value of 0 for bits 16 – 31 indicates the GPIO will remain in low signal state for the same amount of time as the high signal state (50% duty cycle). The high or low states are measured in multiples of ¼ seconds. The toggle count is set by **Parm2.**	The flashing GPIO event will cause the GPIO output state to toggle at time 0 to the opposite state prior to starting the GPIO output flash event processing. This counts as toggle #1. An even number of toggle count will force a final state which is the same as the initial state. An odd number of toggle count will force the final state to be opposite of the initial GPIO output condition. 0 = toggle forever.

4.9.1.5. Bit-Field Tables

Bit-Field Table Selection

Use the table below to determine which of the four bit-field tables (0-3) to use for the Parm2 value.

Bit-Field Table Selection		
Bit 31	**Bit 30**	**Description**
0	0	Table selector 0. Format message based on Parm2 values using Message Format Table 0 (legacy format)
0	1	Table selector 1. Format message based on Parm2 values using Message Format Table 1.
1	0	Table selector 2. Format message based on Parm2 values using Message Format Table 2.
1	1	Table selector 3. Format message based on Parm2 values using Message format Table 3.

Bit-Field Table 0 – Legacy (0,0)

The **Parm2** value is obtained as a result of selecting individual bit-fields from the table below.

Bit-Field Table 0 – Legacy (0,0)	
Parm2	**Description**
Bit 0:	1 = send all data generated as a result of this table in Binary format
	0 = send all data generated as a result of this table in ASCII format
Bit 1:	1 = add **parm1** data to UDP message (4 – bytes in Binary format, 11 – bytes of data in ASCII format)
	0 = do not add **parm1** data to outbound UDP message
Bit 2:	1 = add **$MDMID** value (22 – bytes of ASCII data – irrespective of Bit– 0 setting)
	0 = do not add **$MDMID** value
Bit 3:	1 = add **$IOCFG** and **$IOGPA** (GPIO 1 - 8 direction and data) in ASCII-HEX format (2 – bytes in Binary format, 6 – bytes in ASCII format)
	0 = do not add GPIO direction and data value.
Bit 4:	Reserved
Bit 5:	Reserved

Bit-Field Table 0 – Legacy (0,0)	
Parm2	**Description**
Bit 6:	1 =Message is stored in non-volatile memory until it can be sent, regardless of network status. 0 = Check network status before storing message in non-volatile memory. If it appears that the message can be sent out immediately (network status is clear and message queue has few or no messages pending), the message is stored in the non-volatile message queue until it can be sent. Otherwise, the message is deleted.
Bit 7:	1 = add input **<event category>** number (1 – byte in binary format, 3 – bytes in ASCII format) 0 = do not add input **<event category>** number
Bits 8-17:	Reserved
Bit 18:	1 = send this OTA message via SMS when GPRS services is not available 0 = send this OTA message via GPRS only
Bits 19-20	Reserved
Bit 21:	1 = add RTC time (6 – bytes of **RTC** time in Binary format **or** 13 – bytes if Bit-0 is set to 0) 0 = do not add RTC
Bit 22:	1 = Replace/append modem ID field with 10-byte modem ID (including one leading and one ending space character) if bit-0 is set to 0. Replace/append it with 8-bytes long modem ID value if bit-0 is set to 1 (no leading or ending space characters in binary mode.) (NOTE: bit-22 setting overrides bit-2 setting) 0 = Sent the modem ID as defined by Bit-2
Bits 23 – 31: Reserved	

Bit-Field Table 1 – (0,1)

The **Parm2** value is obtained as a result of selecting individual bit-fields from the table below.

Bit-Field Table 1 – (0,1)	
Parm2	**Description**
Bit 0	1 = send all data generated as a result of this table in Binary format 0 = send all data generated as a result of this table in ASCII format
Bit 1	1 = Add parm1 data to message (4 bytes in binary format, 11 bytes of data in ASCII format) 0 = do not add parm1 data to outbound message
Bit 2	1 = add $MDMID value (22 bytes of ASCII data irrespective of Bit 0 setting) 0 = do not add $MDMID value
Bit 7	1 = add input <event category> number (1 byte in binary format, 3 bytes in ASCII format) 0 = do not add input <event category> number
Bit 21	1 = add RTC time (6 bytes of RTC time in binary format or 13 bytes in ASCII format) 0 = do not add RTC time
Bit 22	1 = Replace/append modem ID field with 10-byte modem ID (including one leading and one ending space character) in ASCII format. Replace/append modem ID with 8 bytes long modem ID value in binary format (no leading or ending space characters in binary format). (NOTE: Bit 22 setting overrides Bit 2 setting) 0 = send the modem ID as defined by Bit 2

Bit-Field Table 2 – (1,0)

The **Parm2** value is obtained as a result of selecting individual bit-fields from the table below.

Bit Field Table 2 – (1,0)	
Parm2	**Description**
Bit 0	1 = send all data generated as a result of this table in Binary format 0 = send all data generated as a result of this table in ASCII format
Bit 1	1 = Add parm1 data to message (4 bytes in binary format, 11 bytes of data in ASCII format) 0 = do not add parm1 data to outbound message
Bit 2	1 = add $MDMID value (22 bytes of ASCII data irrespective of Bit 0 setting) 0 = do not add $MDMID value
Bit 3	1 = add user variables 0-9 to message, starting with user variable 0 (4 bytes per user variable in binary format, 8 hex bytes per user variable in ASCII format) 0 = do not add user variables
Bit 7	1 = add input <event category> number (1 byte in binary format, 3 bytes in ASCII format) 0 = do not add input <event category> number
Bit 21	1 = add RTC time (6 bytes of RTC time in binary format or 13 bytes in ASCII format) 0 = do not add RTC time
Bit 22	1 = Replace/append modem ID field with 10-byte modem ID (including one leading and one ending space character) in ASCII format. Replace/append modem ID with 8 bytes long modem ID value in binary format (no leading or ending space characters in binary format). (NOTE: Bit 22 setting overrides Bit 2 setting) 0 = send the modem ID as defined by Bit 2

Bit-Field Table 3 – (1,1)

The **Parm2** value is obtained as a result of selecting individual bit-fields from the table below.

Bit-Field Table 3 – (1,1)	
Parm2	**Description**
Bit 0	1 = send all data generated as a result of this table in Binary format 0 = send all data generated as a result of this table in ASCII format
Bit 1	1 = Add parm1 data to message (4 bytes in binary format, 11 bytes of data in ASCII format) 0 = do not add parm1 data to outbound message
Bit 2	1 = add $MDMID value (22 bytes of ASCII data irrespective of Bit 0 setting) 0 = do not add $MDMID value
Bit 7	1 = add input <event category> number (1 byte in binary format, 3 bytes in ASCII format) 0 = do not add input <event category> number
Bit 21	1 = add RTC time (6 bytes of RTC time in binary format or 13 bytes in ASCII format) 0 = do not add RTC time
Bit 22	1 = Replace/append modem ID field with 10-byte modem ID (including one leading and one ending space character) in ASCII format. Replace/append modem ID with 8 bytes long modem ID value in binary format (no leading or ending space characters in binary format). (NOTE: Bit 22 setting overrides Bit 2 setting) 0 = send the modem ID as defined by Bit 2

4.9.1 $EVENT   User Defined Input/Output (continued)

Notes	A maximum of 400 events (input and output) are supported.
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full

4.9.2. $EVTIM#   User Defined Input Event Timers

Command Function	This command allows the user to define up to 8 separate periodic input events in 1 second increments
Command Functional Group	Enfora Specific
Command Format Query Response	AT$EVTIM#=? $EVTIM#: (0-604800) OK
Write Format Response	AT$EVTIM#=**<rate>** OK
Read Format Response	AT$EVTIM#? $EVTIM#: **<rate>**
Execution Format Response	N/A N/A
Parameter Values	
<rate>	number of seconds between each generated input event.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$EVTIM4 will affect the values in AT$WAKEUP. Do not use this event timer if you are using AT$WAKEUP.

4.9.2. $EVTIM#   User Defined Input Event # = <1-4>
                                (continued)

Example:

These commands will cause the example in AT$EVENT to trigger every 60 seconds.

AT$EVENT=1,1,12,1,1

               Ending range of 1 (high)
               Starting range of 1 (high)
               Activate event timer 1
               Input event
               Event group 1
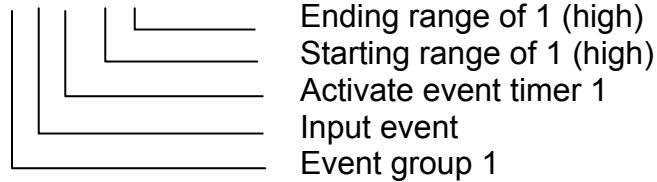
AT$EVTIM1=60

** Please note that you will have to toggle the I/O pin # 2 low with the AT$IOGP2=0 command prior to each event time cycle to see the I/O line go high based on the timer. In this example, prior to each 60 second time cycle.

4.9.3. $EVTEST   Generate Test Input Event

Command Function	This command allows the user to generate any input event. This is useful for testing the user event table.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$EVTEST=<**event**>,<**state**> OK
Parameter Values	
<**event**>	input event number
<**state**>	input event test state
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

Example:

This example will cause the example provided in the AT$EVENT to trigger.

AT$EVTEST=0,0

Create a low input signal
Event category 0 (Input line 1)

AT$EVTEST=0,1

Create a high input signal
Event category 0 (Input line 1)

4.9.4. $EVDEL   Delete Event

Command Function	This command allows the user to delete items from the user generated event table. Entering only the group number will delete the whole group.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$EVDEL=**<group><letter ID>** OK

Parameter Values

<group>	event list group number
<letter ID>	letter indicating which element of the group (optional)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

Notes

Example:

AT$EVDEL=1   Will delete all entries event group 1

AT$EVDEL=1b Will delete only the second entry in event group 1

4.9.5. $EVDELA   Delete Event

Command Function	This command allows the user to delete all user generated events from the event table.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$EVDELA OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.9.6. $STOATEV   Store AT Command Events

Command Function	This commands allows the user to store AT command output events. The AT command is executed upon the triggering of the associated input event.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$STOATEV=? $$STOATEV: (1-25)<,AT commands> OK
Write Format Response	AT$STOATEV = <**1-25**>, < **AT command** > OK
Read Format Response	AT$ STOATEV? $STOATEV: **AT Event# AT Cmds** **1** **2** **…** **…** **25** OK
Execution Format Response	N/A N/A
Parameter Values	
<1-25 >	AT event index.
<AT command>	AT command associated with the AT event index. The AT command is not checked for validity.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.9.6. $STOATEV	Store AT Command Events (continued)

Notes
This command is used in conjunction with the Dynamic Input Output event (AT$EVENT). The output event associated with this command is event 44. When output event 44 is defined in the event table, Parm1 defines which index to refer to. The AT command associated with the index is executed.

The use of Dynamic Event Scripting using AT$EVENT or AT$EVDEL as a stored AT Command Event can lead to unpredictable operation and is not recommended.

When storing command to dial a voice call, a "v" replaces the ";" at the end of the dial string..ie atd17195551212v

Example:

Initiate a voice call from abbreviated dialing phone book store location 1.

AT$STOATEV=1,ATD>AD1**v**
       Dial number in phonebook location 1
       AT Command event index
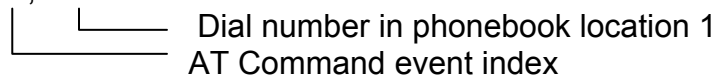
Use a GPIO input event to trigger a stored AT command event:
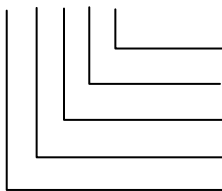
AT$EVENT=1,0,0,1,1
     Ending range of 1 (high)
     Starting range of 1 (high)
     Activity on I/O line #1 based on range
     Input transition event
     Event group 1
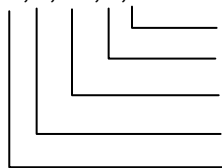
AT$EVENT=1,3,44,1,0
     Ignored
     Stored Event index
     Execute stored AT event
     Output event
     Event group 1

4.9.7. $ETSAV#   Event Timer Save Configuration

Command Function	These commands allow the user to set/query a flag that is used to determine whether the event timer value will be persistent through a reset. If the flag is set for the timer, the timer count will be saved roughly once a minute and the saved value will be used as the starting value for the timer following a reset. This is intended to support long-range timers (for example, 3 hours) where resolution of +/-1 minute would be acceptable.
	If the flag is clear, the timer always starts at zero following an reset.
	The # sign stands for timers 1 through 8 (i.e.. ETSAV1).
Command Functional Group	Enfora Specific
Command Format Query **Response**	AT$ETSAV#=? $ETSAV#:(0-1) OK
Write Format **Response**	AT$ETSAV#=**<flag>** OK
Read Format **Response**	AT$ETSAV#? $ETSAV#: **<flag>**
Execution Format **Response**	N/A
Parameter Values	
<flag>	1 =save this event timer value roughly once a minute to flash 0 = restart this event timer at zero following reset (default)

4.9.7. $ETSAV#

**Event Time Save Configuration
(continued)**

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT&W must be issued after flag is set to ensure flag retains its status through a reset.
Example	N/A

4.9.8. $EVTOFF   Event Engine Disable

Command Function	The $EVTOFF command gives the user the ability to disable the event engine. For example, this would be a good command to run prior to a software upgrade.
Command Functional Group	Enfora Specific
Command Format Query **Response**	AT$EVTOFF=? $EVTOFF:(0-1) OK
Write Format **Response**	AT$EVTOFF=**<state>** OK
Read Format **Response**	AT$EVTOFF? $EVTOFF: **<state>**
Execution Format **Response**	N/A N/A
Parameter Values	
<state>	0 = event engine enabled (default) 1 = event engine disabled
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A
Example	N/A

4.10. Real-Time Clock Commands

4.10.1. $RTCALRM   Real Time Clock Alarm

Command Function	This command handles the setting and querying of the RTC alarm registers. When the alarm feature has been enabled the $EVENT engine will be invoked upon the going off. If the $RTCWAKE call is invoked following the alarm feature setup the modem will power back up automatically upon the alarm going off. The actions of these two features are mutually exclusive of each other, so one or the other will occur but not both.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$RTCALRM=? $RTCALRM: (0..99), (1..12), (1..31), (0..23), (0..59), (0..59), (0..527040) OK
Write Format Response	AT$RTCALRM= **\<rtc_year\>**, **\<rtc_month\>**, **\<rtc_day\>**, **\<rtc_hour\>**, **\<rtc_min\>**, **\<rtc_sec\>**,**\<rtc_alarmTimeinMinutes\>** OK
Read Format Response	AT$RTCALRM? $RTCALRM: **\<rtc_enabled\>**, **\<rtc_year\>**, **\<rtc_month\>**, **\<rtc_day\>**, **\<rtc_hour\>**, **\<rtc_min\>**, **\<rtc_sec\>**,**\<rtc_alarmTimeinMinutes\>**" OK
Execution Format Response	N/A N/A

4.10.1. $RTCALRM   Real Time Clock Alarm (continued)

Parameter Values	Parameters are positional dependent, any parameter may be omitted with the use of the **comma (',')** as a place holder on command line. If a parameter is omitted then the current value in the hardware is used.
< rtc_enabled >	Indicates if alarm is enabled or not. 1->Enabled, 0->Disabled
< rtc_year >	The year on which the alarm is being set to trigger on. The RTC supports years 2000-2099. The data is entered as a two digit value 0..99.
<rtc_month>	The month on which the alarm is being set to trigger on. Values range from 1..12.
<rtc_day>	The day on which the alarm is being set to trigger on. Values range from 1..31.
<rtc_hour>	The hour on which the alarm is being set to trigger on. Values range from 0..24 for 24-Hour mode settings. **NOTE:** only 24-Hour mode currently supported.
<rtc_min>	The minute on which the alarm is being set to trigger on. Values range from 0..59.
<rtc_sec>	The second on which the alarm is being set to trigger on. Values range from 0..59.
<rtc_alarmTimeinMinutes>	Periodic Alarm time in minutes. RTC Alarm will be reset at a period specified by this parameter.

4.10.1. $RTCALRM

Real Time Clock Alarm (continued)

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command is used to set the Alarm time for the RTC. Currently all time is based on 24-Hour time format. The alarm may be cleared using the command **AT$RTCCLRA**. This call in conjunction with the use of either the $EVENT engine or the $RTCWAKE command the user has a rich feature set of driving other events or waking the system up at a pre-determined time in the future. No checks are made for alarm time not being later than current time.

AT$RTCALRM will not trigger if the alarm time is occurring while the unit is resetting. |

Examples

Following sets and alarm for 2003, October, 13th at 17:00 Hours
at$rtcalrm=3,10,13,17,0,0

OK
Following queries the alarm for current time, and shows that the alarm being; Enabled, for 2003, October 13th at 17:00 hours.
at$rtcalrm?

$RTCALRM: 01, 03, 10, 13, 17, 00, 00

OK

Following call unsets alarm followed by displaying alarm time information.
at$rtcclra
OK

at$rtcalrm?

$RTCALRM: 00, 03, 10, 13, 17, 00, 00

OK

4.10.2.$RTCTIME   Real Time Clock Time

Command Function	This command handles the setting and querying of the RTC time registers.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$RTCTIME=? $RTCTIME: (0..6), (0..99), (1..12), (1..31), (0..23), (0..59), (0..59) OK
Write Format Response	AT$RTCTIME= **\<rtc_wkday\>**, **\<rtc_year\>**, **\<rtc_month\>**, **\<rtc_day\>**, **\<rtc_hour\>**, **\<rtc_min\>**, **\<rtc_sec\>** OK
Read Format Response	AT$RTCTIME? $RTCTIME: **\<rtc_wkday\>**, **\<rtc_year\>**, **\<rtc_month\>**, **\<rtc_day\>**, **\<rtc_hour\>**, **\<rtc_min\>**, **\<rtc_sec\>**" OK
Execution Format Response	N/A N/A

4.10.2. $RTCTIME   Real Time Clock Time
                                         (continued)

Parameter Values	Parameters are positional dependent, any parameter may be omitted with the use of the **comma (',')** as a place holder on command line. If a parameter is omitted then the current value in the hardware is used.
< rtc_wkday >	Current week day matching time day being set. The week day values range from 0..6, where; 0->Sunday, 1->Monday, 2->Tuesday, 3->Wednesday, 4->Thursday, 5->Friday, and 6->Saturday.
< rtc_year >	The year on which the time is being set to. The RTC supports years 2000-2099. The data is entered as a two digit value 0..99.
<rtc_month>	The month on which the time is being set to. Values range from 1..12.
<rtc_day>	The day on which the time is being set to. Values range from 1..31.
<rtc_hour>	The hour on which the time is being set to. Values range from 0..24 for 24-Hour mode settings. **NOTE:** only 24-Hour mode currently supported.
<rtc_min>	The minute on which the time is being set to. Values range from 0..59.
<rtc_sec>	The second on which the time is being set to. Values range from 0..59.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.10.2. $RTCTIME   **Real Time Clock Time**
                             (continued)

Notes   This command is used to set the time for
                             the RTC. Currently all time is based on
                             24-Hour time format.

Examples:

at$rtctime?

$RTCTIME: 01, 03, 10, 13, 14, 03, 2

OK

at$rtctime=?

$RTCTIME: (0..6), (0..99), (1..12), (1..31), (0..23), (0..59), (0..59)

at$rtctime=1,3,10,13,14,37,50

OK

4.10.3. $RTCWAKE   Real Time Alarm Wake

Command Function	This command attempts to de-register from the network, at the end of a 5 second delay then powers down the modem so only the RTC is running. Upon the RTC alarm going off the modem will re-boot and initialize again. The command relies on the RTC Alarm feature being set prior, if system is to wake up at a preset time in the future.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	$RTCWAKE N/A
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	The $RTCWAKE command powers down the modem, so only the RTC clock will be running. The modem will power up automatically only if the RTC Alarm feature has been, otherwise modem will remain powered off. See the $RTCALRM command for setup of the RTC alarm.

4.10.4. $RTCCLRA   Real Time Clock Clear Alarm

Command Function	This command allows the modem to clear/disable the active RTC alarm. The alarm interrupt enable is cleared but alarm time not altered.
Command Functional Group	Enfora Specific
Command Format Query	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT$RTCCLRA
Response	OK
Parameter Values	None
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command will disable the RTC alarm while leaving the value of the last alarm time setting alone.

4.10.5. $RTCRSET   RTC Report Reset State

Command Function	This command reports the reset state of the RTC following a power cycle. The command reports TRUE only if a reset occurred since last power up and last call to check it. So multiple calls will report the current status only.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$RTCRSET $RTCRSET **: <reset state>** OK
Parameter Values	
<reset state>	**1** indicates that a RTC reset occurred, **0** indicates that a RTC reset did NOT occur
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command returns the current reset state of the RTC since power-up. If multiple calls are made only current reset state is returned.

4.10.5. $RTCRSET RTC Report Reset State (continued)

Examples

Following example shows the check for the RTC being reset since last check of reset and since last power up, with a response of True.

at$rtcrset?

$RTCRSET: 1

OK

Following example shows the check for the RTC being reset since last check of reset and since last power up, with a response of False.

at$rtcrset?

$RTCRSET: 0

OK

4.11. Network Identity and Time Zone Commands

4.11.1. AT$RTCUPD   Update RTC with NITZ

Command Function	This command allows the user to enable/disable setting of the RTC time with either UTC or local time received in the NITZ.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$RTCUPD=? $RTCUPD: (0..2) OK
Write Format Response	AT$RTCUPD =<mode>,< reset > OK
Read Format Response	AT$RTCUPD? $RTCUPD: <mode>,<update> OK
Execution Format Response	N/A N/A
Parameter Values	
<reset>	**0** Do not reset $RTCUPD <update> parameter **1** Reset $RTCUPD <update> parameter to 0
< mode >	**0** disables updating the RTC. **1** enables updating the RTC to UTC time **2** Enables updating RTC to local time (based on the TZ in the NITZ)
<update>	**0** RTC has not been updated **1** RTC has been updated

4.11.1   **$RTCUPD**   **Update RTC with NITZ**
                                                (continued)

Reference	TS 22.042
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	None

4.11.2.AT+CCLK   Enable Setting and reading of RTC

Command Function	This command allows the user to set or read the Real Time Clock.
Command Functional Group	Mobile Equipment Control and Status
Command Format Query Response	AT+CCLK=? +CCLK: ("yy/MM/dd,hh:mm:ss+zz") OK
Write Format Response	AT+ CCLK ="yy/MM/dd,hh:mm:ss+zz" OK
Read Format Response	AT+ CCLK? +CCLK: "00/01/12,05:44:53+00" OK
Execution Format Response	N/A N/A
Parameter Values	Year/month/day,hour:minutes:seconds+time zone
Reference	ETSI 7.07 section 8.14
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	+CCLK shares the same functionality as AT$RTCTIME. When one is updated, the other will also be updated. **Time zone is in quarter hour increments referenced to UTC time.**

4.11.3. AT+CTZR — Generate URC with Time Zone

Command Function	This command allows the user to enable/disable the sending of an Unsolicited Response to the serial port with the time zone, when a message has been received through NITZ.
Command Functional Group	Enfora Specific
Command Format Query Response	AT+CTZR=? +CTZR: (0,1) OK
Write Format Response	AT+CTZR =<**mode**> OK
Read Format Response	AT+CTZR? +CTZR: <**mode**> OK
Execution Format Response	N/A N/A
Parameter Values	
< mode >	**0** disables URC when NITZ is received **1** enables URC when NITZ is received
Reference	TS 22.042
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Time zone value in quarter hour increments, referenced to UTC time.
Example:	None

4.11.4. AT+CTZU   Enable saving of Time zone

Command Function	This command allows the user to enable/disable the saving of the time zone information from NITZ.
Command Functional Group	Enfora Specific
Command Format Query Response	AT+CTZU=? +CTZR: (0,1) OK
Write Format Response	AT+CTZU =<**mode**> OK
Read Format Response	AT+CTZU? +CTZU: <**mode**> OK
Execution Format Response	N/A N/A
Parameter Values	
< mode >	**0** disable saving of the time zone **1** enables saving of the time zone
Reference	TS 22.042
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	None
Example:	None

4.11.5. AT%CNIV   Generate URC with network name

Command Function	This command allows the user to enable/disable the sending of an Unsolicited Response to the serial port with the network name, when a message has been received through NITZ.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%CNIV=? %CNIV: (0,1) OK
Write Format Response	AT%CNIV =<**mode**> OK
Read Format Response	AT%CNIV? %CNIV: <**mode**> OK
Execution Format Response	N/A N/A
Parameter Values	
< mode >	**0** disables URC when NITZ is received **1** enables URC when NITZ is received
Reference	TS 22.042
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	None
Example:	%CNIV: "T-Mobile","T-Mobile","310260"

4.11.6. AT%CTZV   Generate URC with date and time

Command Function	This command allows the user to enable/disable the sending of an Unsolicited Response to the serial port when the date and time have been updated from NITZ.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%CTZV=? %CTZV: (0,1) OK
Write Format **Response**	AT%CTZV =<**mode**> OK
Read Format **Response**	AT%CTZV? %CTZV: <**mode**> OK
Execution Format **Response**	N/A N/A
Parameter Values	
< mode >	**0** disables URC when NITZ is received **1** enables URC when NITZ is received
Reference	TS 22.042
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Time zone value in quarter hour increments, referenced to UTC time.
Example:	%CTZV: "07/03/19,19:58:36-20"

4.12. IP Router Commands

4.12.1.$HOSTIF   Configure Host to Modem Interface

Command Function	This command allows the user to configure the desired Host to Modem interface. This parameter determines the behavior of the ATD command.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$HOSTIF=? (0-3)
Write Format Response	AT$HOSTIF=<**host interface**> OK
Read Format Response	AT$HOSTIF=? HOSTIF: <**host interface**>
Execution Format Response	N/A N/A
Parameter Values	
<**host interface**>	**0** = Establish normal external Dial up networking modem to network connection. **1** = Establish UDP PAD session. Upon establishment of a network activation, a CONNECT message will be displayed. "No Carrier" or error will indicate failed or terminated UDP PAD session. **2** = Establish TCP PAD session Upon establishment of a network activation, a CONNECT message for at$active=1, or a LISTEN message for at$active=0 will be displayed. "No Carrier" or error will indicate failed or terminated TCP PAD session. **3** = Establish non-GPRS PPP connection.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.12.1 $HOSTIF   Configure Host to Modem Interface (continued)

Notes

When HOSTIF = 3, all port connection requests must originate from the Host system. When the modem is configured for this mode, it is operating as a non-configurable router / firewall. FTP active mode is not supported. Some programs may require a remote proxy in order to work.

- **Do not use AT$AREG=2 with autobauding of the serial port and TCP or UDP PAD functions. The serial port will not respond to at commands if the modem establishes a connect state before the baud rate has been determined for the serial port.**

4.12.2.$CONN   Initiate Network Connection

Command Function	This command allows the user to initiate a network connection while the modem already has a local PPP connection. This command is only valid when AT$HOSTIF=3 after the local PPP connection has been established.
Command Functional Group	Enfora Specific
Command Format Query **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT$CONN OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This feature is only valid when AT$HOSTIF=3.

4.12.3.$DISC   Disconnect Network Connection

Command Function	This command allows the user to initiate a network disconnect. This command is only valid for AT$HOSTIF=3 after the local PPP connection has been established or over-the-air as an API command when in TCP PAD mode.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$DISC OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command will only disconnect the network connection when AT$HOSTIF=3. The local PPP connection will remain active. This command can also be used to function as a disconnect request for TCP PAD. It must be sent over the air using the UDPAPI AT Command write sequence

4.12.4.$LOCIP Display Local Modem to Host IP & DNS

Command Function	This command allows the user to query the modem's locally assigned IP.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	AT$LOCIP? **<"IP">,<"DNS1">,<"DNS2">**
Execution Format Response	N/A N/A
Parameter Values	
<IP>	local host to modem IP
<DNS1>	local host to modem DNS1
<DNS2>	local host to modem DNS2
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.12.5. $NETIP   Display Network Assigned IP & DNS

Command Function	This command allows the user to query the modem's network assigned IP.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	AT$NETIP? **<"IP">,<"DNS1">,<"DNS2">**
Execution Format Response	N/A N/A
Parameter Values	
<IP>	network assigned IP
<DNS1>	network assigned DNS1
<DNS2>	network assigned DNS2
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.13. Network Commands

4.13.1. $MSCLS   Set GPRS Multislot Class

Command Function	This command is used to set the GPRS multislot class.
Command Functional Group	Equipment Information
Command Format Query Response	AT$MSCLS=? $MSCLS: (1-6, 8-10) OK
Write Format Response	AT$MSCLS=**\<msclass\>** OK
Read Format Response	AT$MSCLS? $MSCLS: **\<msclass\>** OK
Execution Format Response	N/A N/A
Parameter Values	
\<msclass\>	1-6, 8-10
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	The value is saved when using AT&W command. To return to default MS class, use AT&F command.

4.13.2. $CGEER

Get PDP Context Activation Reject Cause

Command Function	This command is used to get the last GPRS PDP context activation reject cause.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$CGEER=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$CGEER $CGEER: <reject cause> OK

Parameter Values

< reject cause >

no PDP reject cause

insufficient resources

missing or unknown APN

unknown PDP address or PDP type

user authentication failed

activation rejected by GGSN

activation rejected, unspecified

service option not supported

requested service option not subscribed

service option temporarily out of order

NSAPI already used

protocol errors

4.13.2. $CGEER   Get PDP Context Activation Reject Cause   (continued)

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Default reject cause is "no PDP reject cause" . <reject cause> is reset to this default reject cause by PDP context activation confirmed or PDP context deactivation confirmed.

4.13.3. $LOCI   Location Information Configuration

Command Function	This command allows the user to enable storage of the GSM LOCI info in the modem NVMEM
Command Functional Group	Enfora Specific
Command Format Query Response	AT$LOCI=? (0-1) OK
Write Format **Response**	AT$LOCI=**<mode>** <cr> OK
Read Format **Response**	AT$ LOCI? $LOCI: **<mode>**,**<IMSI>**,**<TMSI>**,**<LAI>**, **<TMSI Time>**,**<LOC UPDATE STATUS>** OK
Execution Format **Response**	N/A N/A
Parameter Values	
<fmode>	**0** GSM LOCI information is stored in the SIM **1** GSM LOCI information is stored in the Modem
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes:	The GSM LOCI is saved in non-volatile memory every time the SIM's GSM LOCI is updated. AT&W is not needed to save the settings.

4.13.4. %BAND   Frequency Band Information

Command Function	This command sets the Frequency bands the modem will scan for available network service.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%BAND=? %BAND**:** (0-1),**(<band>)*** OK
Write Format Response	AT%BAND= **<mode>,<band>** N/A
Read Format Response	AT%BAND? %BAND: 0,<band>
Execution Format Response	AT%BAND %BAND: **<band>** OK
Parameter Values	

<mode>	**0**	automatic
	1	manual
<band>	**1**	GSM 900 MHz
	2	DCS 1800 MHz
	4	PCS 1900 MHz
	8	EGSM channels (in 900 band but not all the GSM channels)
	16	850
Examples of combining Primary bands	**11**	GSM/EGSM/DCS
	15	GSM/EGSM/DCS/PCS
	20	850/PCS
	31	GSM/EGSM/DCS/PCS/850

Reference	
Standard Scope	Optional

4.13.4. %BAND   Frequency Band Information (continued)

Enfora Implementation Scope   N/A

Notes   Usable frequency bands dependent on product type. Do not enter <band> in Write command if <mode> is automatic.

After entering and saving this command, the modem must be power cycled before it will take effect.

Examples   The parameter values for <band> can be added together to support multiple frequency bands.

1 + 8 = 9 – The value of 9 is a combination of adding the bands 1 and 8 together, which would include the complete 900 MHz band., supported by the Enfora radio.

1 + 2 + 4+ 8 + 16 = 31 – The combination of all values supports the quad-band radio.

4.14. Network Monitoring Commands

4.14.1. $AREG   Auto Registration

Command Function	This command sets the auto registration state of the modem
Command Functional Group	Enfora specific
Command Format Query Response	AT$AREG=? $AREG: (0,2) OK
Write Format Response	AT$AREG**=\<state>** OK
Read Format Response	AT$AREG? $AREG: **\<state>** OK
Execution Format Response	N/A N/A
Parameter Values	

\<state>	**0**	Autoreg off
	1	Autoreg on
	2	Auto GPRS Activation on Power up. (for $hostif=1 and 2, MT will perform GPRS activation and go into PAD data mode. For Hostif=0 and 3, MT will perform GPRS activation, but remain in AT command mode)

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.14.1. $AREG   Auto Registration
                              (continued)

Notes   This command sets GMS registration state.
                              When set to **1,** upon power on, the modem
                              will automatically register on the GSM
                              network. To set the modem to
                              automatically attach to the GPRS network
                              on power on, see AT%CGAATT command.

                              AT+CGDCONT must be entered and saved
                              before MT is placed in AREG=2.

                              - **If PIN is enabled, the modem will not
                                complete the auto registration
                                process until after the PIN has been
                                entered (AT+CPIN).**
                              - **Do not use AT$AREG=2 with
                                autobauding of the serial port and
                                PAD functions. The serial port will
                                not respond to at commands if the
                                modem establishes a connect state
                                before the baud rate has been
                                determined for the serial port.**

4.14.2.$RESET   Reset Modem

Command Function	This command is used to perform a modem reset.
Command Functional Group	Equipment Information
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$RESET N/A
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Execution of this command will perform a full reset of the software stack. If the modem is currently registered onto the GSM/GPRS network, the modem will perform a detach before performing the stack reset.

4.14.3. $NETMON   Monitor Network Availability

Command Function	This command allows the modem to take aggressive network recovery action based upon the results of continuous network monitoring.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$NETMON=? $NETMON: (0,5-1440),(0-10),(0-255),(0-1) OK
Write Format Response	AT$NETMON= **<net_unavail_min>**, **<reset_cnt>**,**<ping check>**,**<rst timers>** OK
Read Format Response	AT$NETMON? $NETMON: "**<net_unavail_min >**, **<reset_cnt>**,**<ping check>**,**<rst timers>**"
Execution Format Response	N/A N/A

4.14.3 $NETMON   Monitor Network Availability
                                       (continued)

Parameter Values

<net_unavail_min >   Number of minutes the network must
                                remain unavailable before current GPRS
                                Activation is released, and a new GPRS
                                Activation is attempted. Network availability
                                is determined by monitoring GPRS attach
                                status (AT%CGREG) and valid Network IP
                                (AT$NETIP). A value of zero means the
                                GPRS Activation will never be released via
                                AT$NETMON.

<reset_cnt >   Number of GPRS Activations attempted
                                before all volatile network knowledge is
                                erased and the modem performs a soft
                                reset. A value of 1 indicates the modem
                                will perform a graceful detach from the
                                network and then a soft reset of the device.
                                For values greater than 1, the modem will
                                attempt a GPRS deactivation / activation
                                sequence every <net_unavail_min> until
                                the number of attempts equals <reset_cnt>.
                                The modem then will perform a graceful
                                detach from the network and then a soft
                                reset. A value of zero indicates that a
                                modem reset will never occur via
                                AT$NETMON.

<ping check >   Number of minutes between modem-
                                initiated ping checks. If no network data
                                has been received within <ping check>
                                minutes, the modem will initiate pings (up to
                                4 ICMP messages are generated) to the 1st
                                server on the $FRIEND list. If no ping
                                response is received to any of the 4 ICMP
                                messages, the modem will initiate pings to
                                the next server in the list. If no ping
                                response is returned from any of the
                                $FRIEND servers, a new IP is obtained via
                                a modem-initiated GPRS de-activation /
                                activation sequence. A value of zero

4.14.3 $NETMON   Monitor Network Availability (continued)

indicates that the modem will never initiate a ping check.

<rst timers>   **0** Reset network monitoring timers upon any activity on the serial port
1 Do not reset the network monitoring timers if there is activity on the serial ports

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   This command is intended for extreme activation conditions, such as repeatedly moving in and out of coverage areas, or for modems that are required to be attached to the network continuously.

4.15. FTP Commands

4.15.1. $FTPCFG   **Configure FTP parameters**

Command Function	Configures FTP parameters required to open connection to FTP Server
Command Functional Group	Enfora Specific
Command Format Query Response	AT$FTPCFG=? $FTPCFG: "host", (0-65535), "username","password" OK
Write Format `	AT$FTPCFG=\<host\>,\<portnum\>, \<username\>,\<password\>
Response	OK
Read Format Response	AT$FTPCFG? $FTPCFG: \<host\>, \<port\>, \<username\>, \<password\>
Execution Format Response	N/A N/A

Parameter Values

\<host\>	Fully qualified domain name or dotted-decimal notation IP address of FTP server, character string up to 64 characters
\<portnum\>	FTP server port number, 0 – 65535
\<username\>	FTP server user name, character string up to 32 characters
\<password\>	FTP server password, character string up to 32 characters
Reference	N/A
Standard Scope	Optional

4.15.1 $FTPCFG   Configure FTP Parameters
                                      (continued)

Enfora Implementation Scope   Full

Notes   AT$FTPCFG must be entered
                                     initially before opening connection to
                                     FTP server. Configuration
                                     information will be saved to flash
                                     when flash write command is
                                     executed and will be re-used on
                                     subsequent FTP connections.

4.15.2. $FTPOPEN   Opens FTP Connection

Command Function	Opens FTP control connection to FTP server
Command Functional Group	Enfora Specific
Command Format Query Response	AT$FTPOPEN=? $FTPOPEN: ("ACTIVE,"PASSIVE") OK
Write Format Response	N/A N/A
Read Format Response	AT$FTPOPEN? OK $FTPOPEN: \<status\>
Execution Format Response	AT$FTPOPEN="\<mode\>" OK \<status\>
Parameter Values	
\<mode\>	ACTIVE or PASSIVE Mode is an optional parameter. If not specified, the FTP connection will be in the ACTIVE mode.
\<status\>	FTP CONNECTION OPEN FTP CONNECTION CLOSED FTP STACK ERROR Status will display the state of the control connection with the remote FTP server.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

**4.15.2 $FTPOPEN   Opens FTP Connection
                                  (continued)**

    Notes   AT$FTPOPEN must be entered after FTP
                                  configuration information has been entered. If
                                  any FTP configuration information has been
                                  saved to flash, it will be used to open the
                                  connection to the FTP server. After the FTP
                                  open completes successfully, FTP
                                  CONNECTION OPEN will be printed, otherwise
                                  an error string will be printed.

4.15.3. $FTPDIR   Directory Listing

Command Function	Prints a directory listing of the current working directory on the FTP server
Command Functional Group	Enfora Specific
Command Format Query **Response**	AT$FTPDIR=? OK
Write Format **Response**	N/A N/A
Read Format **Response**	AT$FTPDIR? OK $FTPDIR: <current directory information>
Execution Format **Response**	AT$FTPDIR OK <directory listing information>
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$FTPDIR can only be entered after the connection to the FTP server has been established. Directory listing information may be delayed due to the latency of the data connection to the FTP server.

4.15.4. $FTPGET   Retrieve a Remote File

Command Function	Retrieves a remote file from the FTP server for either output on the serial port or storage to the local flash file system.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$FTPGET=? $FTPGET: "remotefile", "localfile" OK
Write Format Response	AT$FTGET=<remotefile>,<localfile> OK
Read Format Response	AT$FTPGET? $FTPGET: <remotefile>, (SERIAL, <localfile>), <output>/<available>, <eof>
Execution Format Response	N/A N/A

Parameter Values

<remotefile>	File name on the remote FTP server.
<localfile>	File name to use for storage of the retrieved file in the local flash file system
<output>	Number of bytes which have been transferred out the serial port
<available>	Number of bytes of file which are available for output to the serial port
<eof>	0 = file currently being transferred 1 = complete file has been transferred to FTP client
Reference	N/A
Standard Scope	Optional

4.15.4 $FTPGET   Retrieve a Remote File
                                       (continued)

Enfora Implementation Scope   Full

Notes   If local file is not specified, the remote file
                                   will be maintained in memory buffers until a
                                   subsequent FTP read request is performed
                                   to output a block of bytes onto the serial
                                   port. As the file is transmitted out the serial
                                   port, the FTP client will refill the memory
                                   buffers with additional file data from the
                                   FTP server.

4.15.5. $FTPR — Outputs block of file data onto serial port

Command Function	Outputs the requested number of bytes of a retrieved file from the remote FTP server onto the serial port.
Command Functional Group	Enfora Specific
Command Format Query	AT$FTPR=?
Response	$FTPR: (0-1500) OK
Write Format **Response**	N/A N/A
Read Format **Response**	AT$FTPR? $FTPR: <available>
Execution Format **Response**	AT$FTPR=<blocksize> OK
Parameter Values	
<blocksize>	Number of bytes to output to serial port. This number is limited to the current number of bytes of the remote file which have been transferred from the FTP server.
<available>	The number of bytes available for output to the serial port.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.15.5 $FTPR   **Outputs block of file data onto serial port (continued)**

Notes   This command is only available after an FTP get operation has been initiated using the serial port as the file destination. It directs buffered file data from the FTP server to be transmitted in blocks out the serial port. This command is repetitively issued until the complete file is transmitted from the FTP server out the serial port.

4.15.6. $FTPCLOSE Closes the connection to FTP server

Command Function	Closes the current connection with the remote FTP server.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$FTPCLOSE=? OK
Write Format Response	N/A N/A
Read Format Response	AT$FTPCLOSE? ERROR
Execution Format Response	AT$FTPCLOSE OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command is only available when a connection to the FTP server is active. If a connection to an FTP server is not active, FTP INVALID CLIENT is returned.

4.15.7. $FTPABORT Aborts current data operation with FTP server

Command Function	Interrupts the current data operation with the FTP server.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$FTPABORT=? OK
Write Format Response	N/A N/A
Read Format Response	AT$FTPABORT? ERROR
Execution Format Response	AT$FTPABORT OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	If a data operation is not in operation, no action is performed. If a connection to an FTP server is not active, FTP INVALID CLIENT is returned.

4.15.8. $FTPCHDIR   Change current working directory

Command Function	Changes the current working directory on the FTP server.
Command Functional Group	Enfora Specific
Command Format Query	AT$FTPCHDIR=?
Response	$FTPDIR: "directory" OK
Write Format **Response**	AT$FTPCHDIR=<directory> OK
Read Format **Response**	AT$FTPCHDIR? ERROR
Execution Format	N/A
Response	N/A
Parameter Values	
<directory>	Directory name on remote FTP server
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$FTPCHDIR can only be entered after the connection to the FTP server has been established. To navigate up a directory, use the ".." directory notation.

4.16. Miscellaneous Commands

4.16.1.%NRG   Network Registration and Service Selection

Command Function	Set command forces an attempt to select and register the GSM network operator. **<regMode>** is used to select whether the selection is done automatically by the ME or is forced by this command to operator <opr> (it shall be given in format **<oprFrmt>**).
Command Functional Group	Network
Command Format Query Response	AT%NRG=? %NRG: (0,1,4),(0-3),(0-2) OK
Write Format Response	AT%NRG=**<regMode>, <srvMode>, <oprFrmt>, <opr>** OK
Read Format Response	AT%NRG? %NRG==**<regMode>, <srvMode>, <oprFrmt>, <srvStat>, <opr>** OK
Execution Format Response	N/A N/A

4.16.1   %NRG

Network Registration and Service Selection (continued)

Parameter Values

\<regMode\>	**0**	automatic registration (**\<opr\>** field is ignored)
	1	manual registration (**\<opr\>** field shall be present on registration attempt)
	4	both

\<srvMode\>	**0**	full service
	1	limited service
	2	no service
	3	set registration mode only

\<oprFrmt\>	**0**	long format alphanumeric **\<opr\>**
	1	short format alphanumeric **\<opr\>**
	2	numeric **\<opr\>**

\<srvStat\>	**0**	full service
	1	limited service
	2	no service

\<opr\>	string type
\<oprFrmt\>	indicates if the format is alphanumeric or numeric; long alphanumeric format can be up to 16 characters long and short format up to 8 characters; numeric format is the GSM Location Area Identification number (refer GSM 04.08 subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A, plus a two BCD digit network code, which is administration specific; returned **\<opr\>** shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)

4.16.1.   %NRG   Network Registration and Service Selection (continued)

Reference   N/A

Standard Scope   N/A

Enfora Implementation Scope   N/A

Notes   The command %NRG is an expansion of the +COPS command. The new command allows specifying the service state of the registration. For a list of current available network operators please use the test command of +COPS>

4.16.2.%CACM

Query Accumulated Call Meter Using PUCT

Command Function	Returns the current value of the accumulated call meter, calculated with the values given by the price per unit and currency table stored in SIM. Refer subclause 9.2 of [GSM 07.07] for possible **<err>** values.
Command Functional Group	Phone Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT%CACM %CACM: **<cur>**,**<price>** OK
Parameter Values	
<cur>	string type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select
<price>	string type; calculated price value of accumulated call meter; dot is used as a decimal separator (e.g. 2.66)
Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	N/A
Notes	N/A

4.16.3. %CAOC

Query Current Call Meter Using PUCT

Command Function	Returns the current value of the current call meter, calculated with the values given by the price per unit and currency table stored in SIM. Refer subclause 9.2 of [GSM 07.07] for possible **<err>** values.
Command Functional Group	Phone Control
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT%CAOC %CAOC: **<cur>**,**<price>** OK
Parameter Values	
<cur>	string type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select
<price>	string type; calculated price value of accumulated call meter; dot is used as a decimal separator (e.g. 2.66)
Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	N/A
Notes	N/A

4.16.4. %CPI   Call Progress Information

Command Function	This command refers to call progress information, which is indicated by the network during call establishment. The set command enable/disables the presentation of unsolicited notification result codes from TA to TE. When **<mode>**=1 and a call progress information is received during a call establishment, intermediate result code %CPI: **<cld>**,**<msgType>**,**<ibt>**,**<tch>** is sent to TE. **<cld>** identifies the call in the call table. The value of **<msgType>** describes the layer 3-message type that was used to transfer the call progress information. The state of TCH assignment and the use of in-band tones for that call can be monitored by the values of **<ibt>** and **<tch>**. Test command returns values supported by the TA as compound value.
Command Functional Group	Call Control
Command Format Query Response	AT%CPI=? %CPI: (0-3) OK
Write Format Response	AT%CPI=**<mode>** OK
Read Format Response	AT%CPI? %CPI: 0 OK
Execution Format Response	N/A N/A

4.16.4. %CPI

Call Progress Information (continued)

Parameter Values

<mode>	(parameter sets/shows the result code presentation status in the TA)
	0 disable
	1 enable
	2 status
	3 append cause and ALS bearer state to unsolicited result code

<cld>	integer type; call identification number as described in GSM 02.30 subclause 4.5.5.1

<msgType>	(layer 3 message type)

0	setup message
1	disconnect message
2	alert message
3	call proceed message
4	synchronization message
5	progress description message
6	connect
7	reset request for call reestablishment
8	reset confirm for call reestablishment
9	call release
10	call reject
11	mobile originated call setup
12	call hold

<ibt>	(status of the usage of in-band tones)
	0 no in-band tones
	1 in-band tones

<tch>	(TCH assignment)
	0 TCH not assigned
	1 TCH assigned

Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	N/A

4.16.4. %CPI

Call Progress Information
(continued)

Notes

%CPI=4 appends an Advanced Cause
Code (For Experienced Users Only)

4.16.5. %CTV   Call Timer Value

Command Function	Returns the current value of the last call duration in seconds. Refer subclause 9.2 of [GSM 07.07] for possible **<err>** values
Command Functional Group	Results
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT%CTV %CTV: **<dur>**
Parameter Values	
<dur>	integer type; represents the duration of the last call in unit of seconds.
Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	N/A
Notes	N/A

4.16.6.%SNCNT

Query (or Reset) the Byte Counters. (Only GPRS)

Command Function	Returns (or resets) the byte counts of every current connection.
Command Functional Group	GPRS
Command Format Query Response	AT%SNCNT=? OK %SNCNT: (0)
Write Format Response	%SNCNT=<rst> OK
Read Format Response	AT%SNCNT? OK %SNCNT: **<nsapi1>, <upo>, <dno>, <upp>, <dnp><CR><LF>** %SNCNT: **<nsapi2>, <upo>, <dno>, <upp>, <dnp><CR><LF>**
Execution Format Response	N/A N/A
Parameter Values	
<rst>	resets the counters if **rst** = 0
<nsapi>	connection id
<upo>	uplink octets count.
<dno>	downlink octets count.
<upp>	uplink packets count.
<dnp>	downlink packets count.
Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	N/A
Notes	If multiple contexts are activated / deactivated, set/query will result in OK

followed by byte counts (set command resets the counters to 0) for each connection.

4.16.7. %CGAATT — Automatic Attach and Detach Mode

Command Function	This command is used to chose the behavior of the attach procedure.
Command Functional Group	GPRS Commands
Command Format Query Response	AT%CGAATT=? %CGAATT: (0,1),(0,1) OK
Write Format Response	AT%CGAATT=**<att_m>**,**<det_m>** OK
Read Format Response	AT%CGAATT? %CGAATT: 1,1 OK
Execution Format Response	
<att_m>	automatic attach mode **0** automatic attach **1** manual attach
<det_m>	automatic detach mode **0** automatic detach after last context deactivation **1** manual detach
Reference	
Standard Scope	
Enfora Implementation Scope	
Notes	When automatic attach/detach is enabled and at$areg=1 or 2, the modem will automatically attach onto and detach from the GPRS network upon power on or power down.

4.16.8. %CGPPP   PPP Negotiation Selection

Command Function	This command is used select the type of negotiation protocol.
Command Functional Group	GPRS Commands
Command Format Query Response	AT%CGPPP=? %CGPPP: (0-3) OK
Write Format Response	AT%CGPPP=**<pt>** OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<pt>	(authentication protocol) **0** No authentication (ignore login + pwd) **1** PAP **2** CHAP **3** automatic authentication
Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	Full
Notes	This command is used in conjunction with the %CGPCO command.

4.16.9.%CGPCO

Set Type of Authentication, Username and Password

Command Function	This command sets the type of Authentication, username and password for GPRS context activation.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%CGPCO=? %CGPCO: 0,(0-251),(1-2) OK
Write Format	AT%CGPCO**=<Input format>,** **"<Authentication data>",** **<cid>**
Response	OK
Read Format Response	AT%CGPCO? CGPCO: 0,"<PCO Hex string>",1 CGPCO: 0,"<PCO Hex string>",2 OK AT%CGPCO? CGPCO: 1,"<Username,Password>",1 CGPCO: 1,"<Username,Password>",2 OK
Execution Format Response	N/A N/A
Notes	AT+CGDCONT command must be set before the %CGPCO command is used.

4.16.9. %CGPCO Set Type of Authentication, Username and Password (continued)

Parameter Values

<Input format>

0 - Inputs specified in Hexadecimal
1 - Inputs specified in ASCII

<Authentication data>

Authentication data (**ASCII**)
<username>,<password> where

Username: Maximum 64 bytes ASCII string.
Password: Maximum 64 bytes ASCII string.

Authentication data (**Hexadecimal**):
Protocol Configuration Option specified in Hex value; maximum size is equal to 251 bytes.

<cid>

0 – The new username and password is to be applied to all context Activation.
1 – The new username and password is to be applied to Context identifier 1.
2 – The new username and password is to be applied to Context identifier 2.

Reference   N/A

Standard Scope   N/A

Enfora Implementation Scope Full

Notes

If %CGPCO is set with the input format of 0 (hexadecimal), then the setting of AT%CGPPP will be ignored.

Username and Password are case sensitive.

4.16.9.   %CGPCO   Set Type of Authentication, Username and Password (continued)

Example:

Example of ASCII input parameters:

AT%CGPCO=1, "username, password", 1

AT%CGPCO?
CGPCO: 1,"username,password",1
(PAP:80C023160101001608757365726E616D65087061737
776F72648021100101001081060000000830600000000)

Example of Hex input parameters:

AT%CGPCO=0, "80C023160101001608757365726E616D650870617373
776F72648021100101001081060000000830600000000", 1

4.16.10.   %ALS   Alternating Line Service

Command Function	Alternate Line Service provides the MS with the capability of associating two alternate lines with one IMSI. A user will be able to make and receive calls on either line as desired and will be billed separately for calls on each line. Each line will be associated with a separate directory number (MSISDN) and separate subscription profile.
Command Functional Group	GPRS Commands
Command Format Query Response	AT%ALS=? %ALS: (0,1) OK
Write Format Response	AT%ALS=**<line>** OK
Read Format Response	AT%ALS? %ALS: 0 OK
Execution Format Response	N/A N/A
Parameter Values	
<line>	line number **0** line one **1** line two
Reference	
Standard Scope	
Enfora Implementation Scope	
Notes	N/A

4.16.11. %CGREG GPRS Extended Registration State

Command Function	This command reports extended information about GPRS registration state. %CGREG behaves exactly as +CGREG does. In addition %CGREG supports three states +CGREG does not support.
Command Functional Group	GPRS Commands
Command Format Query Response	AT%CGREG=? %CGREG: (0,3) OK
Write Format Response	AT%CGREG=**<mode>** OK
Read Format Response	AT%CGREG? %CGREG: **<n>,<stat>,[,<lac>,<ci>,<act>]** OK
Execution Format Response	N/A N/A
Parameter Values	
<mode>	enable or disable extended GPRS registration state reporting

    0   do not report registration state
    1   do report registration state
    2   enable network registration and location information unsolicited result code +CGREG: **<stat>[,<lac>,<ci>]**
    3   enable network registration, location information, and activated/deactivated PDP context unsolicited result code +CGREG: <stat>[,<lac>,<ci>,<act>].

4.16.11   %CGREG   GPRS Extended Registration State
(continued)

\<state\>	**0**	not registered
	1	registered to home network
	2	not yet registered, but searching for network to register to
	3	registration denied
	4	unknown state
	5	registered to foreign network (roaming)
	6	limited service (cell might be overloaded)
	7	GSM call active
	8	no cell available
	9	next attempt to update MS

\<lac\>   string type; two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

\<ci\>   string type; two-byte cell ID in hexadecimal format

\<act\>	**0**	deactivated
	1	activated

Reference   N/A

Standard Scope   N/A

Enfora Implementation Scope   N/A

Notes   N/A

4.16.12. %CSTAT Unsolicited SIM status

Command Function	Enable/disable unsolicited status reports from SIM processes
Command Functional Group	Enfora Specific
Command Format Query **Response**	AT%CSTAT=? **%CSTAT: (0,1)**
Write Format **Response**	AT%CSTAT=<mode> OK
Read Format **Response**	AT%CSTAT? %CSTAT: <mode> OK
Execution Format **Response**	N/A N/A
Parameter Values	
<mode>	0 = disabled 1 = enabled
Reference	None
Standard Scope	N/A
Enfora Implementation Scope	N/A
Notes	
Example:	**AT%CSTAT=1**

After power on, the following unsolicited results codes will be delivered to the SIM as the processes are have been initialized and are initialized.

%CSTAT: EONS, 0	EONS not ready
%CSTAT: PHB, 1	Phonebook ready
%CSTAT: SMS, 1	SMS Ready
%CSTAT: RDY, 1	All SIM functions ready

4.16.13. %SLEEP Select level of sleep mode

Command Function	This command allows the user to select the level of sleep the modem will enter during periods of inactivity.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%SLEEP=? %SLEEP: (0-4) OK
Write Format Response	AT%SLEEP=<**mode**> OK
Read Format Response	AT%SLEEP? %SLEEP: <**mode**> OK
Execution Format Response	N/A N/A
Parameter Values	
< mode >	**0**=> no sleep **1**=> Small **2** => Big **3** => Big + Deep **4** => Small+ Big +Deep
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.16.13.   %SLEEP   Select Level of Sleep Mode
(continued)

Notes   If %SLEEP <mode> of 3 or 4 is selected,
                                       and the modem has entered Deep sleep,
                                       the UART will miss the first character that
                                       is sent over the serial port. This first
                                       character will wake up the UART and
                                       subsequent characters will be accepted by
                                       the UART. Default setting is 2

4.16.14. %EM Engineering Mode

Command Function	This command allows the user to view engineering mode functions including Serving cell and neighboring cell information
Command Functional Group	Enfora Specific
Command Format Query Response	AT%EM=? %EM: (2-3),(1-13) OK
Write Format Response	AT%EM=<mode>,<type> OK
Read Format Response	AT%EM? Error
Execution Format Response	N/A N/A

Parameter Values

< mode >	**2**	AT Command
	3	PCO
<type>		**See Engineering Mode Document**

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Please see the Engineering mode Manual Technical note GSM0000TN012 for complete details of this command.

4.16.15. $PKG Request Firmware Package

Command Function	This command is used to obtain the firmware package version.
Command Functional Group	Equipment Information
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$PKG **<firmware version>** OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Return value is manufacturer specific.

4.16.17. $SNDMSG Send Test message

Command Function	This command allows the user to send the requested test message to the destination IP and port as defined in AT$FRIEND and AT$UDPAPI.
Command Functional Group	Enfora Specific Test Command
Command Format Query Response	N/A N/A
Write Format Response	AT$SNDMSG=<**test message select** > OK
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	
<test message select >	**AND selected HEX options into a single 16 bit word.** 01=Send Remote Ack Test Msg 02=Send Remote Broadcast Test Msg 04=Send Remote Fire & Forget Test Msg 08=Send Local PAD Test Msg 10=Send Local UDP Test Msg
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.16.18. $SMSDA   Destination Address for SMS Messages

Command Function	This command allows a user to configure the phone number or email address for the sending of event data. It is also used in limiting the originating address for sending AT commands Over SMS
Command Functional Group	Enfora Specific
Command Format Query Response	AT$SMSDA=? $SMSDA: (1 - 5),"1234...","123.."
Write Format Response	AT$SMSDA=*<index>*,*<dest addr>*,*<gateway number>*
Read Format Response	AT$SMSDA? $SMSDA: 1,"*<dest addr>*","*<gateway number>*", $SMSDA: 2,"*<dest addr>*","*<gateway number>*", $SMSDA: 3,"*<dest addr>*","*<gateway number>*", $SMSDA: 4,"*<dest addr>*","*<gateway number>*", $SMSDA: 5,"*<dest addr>*","*<gateway number>*", OK
Execution Format Response	N/A
Parameter Values	
<index>	1 – 5 defines the index number for destination address
<dest addr>	38 characters or less phone number or email address
<gateway>	7 characters or less gateway number for email address
Reference	N/A

4.16.18 $SMSDA

Destination Address for SMS messages (continued)

Standard Scope   Optional

Enfora Implementation Scope   Full

Notes   *** For Enabler III products only, The ability to limit AT Commands over SMS is now also contolled by AT#SMSDAEN. If AT$SMSDAEN=1, (default) and if there are no addresses populated in AT$SMSDA, then all SMS with the correct AT command format addressed to the MSISDN of the device, and with the correct MDMID (if populated) will be allowed.**

To disable all AT Commands over SMS, set AT$SMSDAEN=0.

The *gateway number* is provided by the Network Provider (ex: AT&T, Cingular, etc) and is only used for sending email over SMS. It is not required if you are sending SMS to a phone number.

If using this command with a international number (preceded by a "+") it may be required to change the command at+csca=145.

An AT$EVENT command has to be set to send a message over SMS.

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4.16.19. $SMSDAEN Enable/Disable AT Commands over SMS

Command Function	This command allows the user to enable or disable the ability to allow AT commands over SMS
Command Functional Group	Enfora Specific
Command Format Query Response	AT$SMSDAEN =? $SMSDAEN: (0..1) OK
Write Format Response	AT$SMSDAEN =**<mode>** OK
Read Format Response	AT$SMSDAEN? $SMSDAEN: **<mode>** OK
Execution Format Response	N/A N/A
Parameter Values	
< mode >	**0** disables ability to send AT commands over SMS **1** Enables the ability to send AT commands over SMS
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.16.19 $SMSDAEN   Enable/Disable AT Commands over SMS
                                (continued)

Notes   **AT$SMSDAEN is set to 1 by default. This allows SMS over AT commands to be sent to the modem. IF there is no entries in AT$SMSDA, then all SMS with the correct AT command format, and addressed to the MSISDN of the device, and with the correct MDMID (if populated) will be allowed.**

                                AT$SMSDAEN=0 will completely disable all AT COMMAND over SMS. Any SMS received, will be treated as normal SMS.

                                To limit AT commands Over SMS to originating from a given address, ensure AT$SMSDAEN=1 and populate the desired addresses in AT$SMSDA.

Example: See App note GSM0000AN022 - Sending AT Commands over SMS.doc

4.16.20. $UDPMSG   Send and Receive UDP Messages

Command Function	This command allows the user to send UDP/IP data packets while in AT command mode. The destination IP address is set by the $friend command while the port number is set by the $udpapi command. The modem must have a GPRS context activation established ($areg=2 command setting).
	Incoming messages addressed to the modem's IP and port specified in AT$UDPAPI will be displayed on the serial port with the unsolicited response $UDPMSG: followed by the message.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$UDPMSG=? (0-1),(0-2),("data") OK
Write Format	AT$UDPMSG=<format>,<type>,<data> <cr>
Response	OK
Read Format	AT$ UDPMSG?
Response	OK
Execution Format	N/A
Response	N/A
Parameter Values	
<format>	**0** <data> is an ASCII string (i.e.: "is this is my data") **1** <data> is an ASCII-Hex bytes (i.e.: 050a25)

4.16.20 $UDPMSG   Send and Receive UDP Messages (continued)

<type>	**0** message will only be sent to the first IP address in the friend's list and to port number mentioned by the $UDPAPI command **1** message will be sent via the ACK method (controlled by $ACKTM command) to the IP address listed in $FRIEND and port number listed by $UDPAPI command **2** message will be sent to all IP address in $FRIEND command at port number listed by $UDPAPI command.
<data>	"ABCD" (Data to be transmitted in quotes) (NOTE: HEX format data shall always be entered as two ASCII characters per byte. ex: 0x5 should be entered as 05)
<flash>	This optional parameter, when enabled, allows a user to store the message in the device's FLASH memory when the device is out of coverage or not registered. Stored messages will be transmitted when the device enters GSM/GPRS coverage. **0** – Do not store messages in FLASH memory. **1** – Store messages in FLASH memory.

Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.16.20 $UDPMSG   **Send and Receive UDP Messages (continued)**

Notes

Data received from OTA shall be sent to the modem's serial port as:
$UDPMSG: <text> (ASCII or Binary data)
(NOTE: Binary message will be displayed as two ASCII Hex characters

<data> field from the at$udpmsg command will be sent to IP address(es)
listed in the $FRIEND command and at port number defined by $UDPAPI command.

<data> sent or received OTA shall be appended with a 4-byte UDP-API header as follows:

Bytes 0 - 1: First 2 bytes of <data> field
Byte   2: 0x06 for ASCII data type or 0x07 for Binary data type

Byte   3: reserved
Byte 4 - n: <data> minus the first two bytes

* A minimum of 2 and maximum of 250 ASCII characters are support. For HEX, a minimum of 2 and maximum of 125 bytes are supported.

4.16.21. $LUPREJ   Get LUP Reject Cause

Command Function	This command is used to get the last Location Area Update cause.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$LUPREJ=? $LUPREJ: (0,1)
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$LUPREJ $LUPREJ: <output>,<cause>,<MCC/MNC> OK
Parameter Values	
<cause>	Location Area Update reject cause. See notes section for reject codes.
<MCC/MNC>	Mobile network that issued the Reject
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.16.21 $LUPREJ   Get LUP Reject Cause
                                        (continued)

Notes

LUP Reject codes:

02	RC_IMSI_IN_HLR
03	RC_ILLEGAL_MS
04	RC_IMSI_IN_VLR
05	RC_IMEI_NOT_ACCEPTED
06	RC_ILLEGAL_ME
11	RC_PLMN_NOT_ALLOWED
12	RC_LA_NOT_ALLOWED
13	RC_ROAMING_NOT_ALLOWED
17	RC_NETWORK_FAILURE
22	RC_CONGETION
32	RC_SERVICE_NOT_SUPPORTED
33	RC_SERVICE_NOT_SUBSCRIBED
34	RC_SERVICE_ORDER
38	RC_IDENTIFIY
95	RC_INCORRECT_MESSAGE
96	RC_INVALID_MAND_MESSAGE
97	RC_MESSAGE_TYPE_NOT_IMPLEM
98	RC_MESSAGE_TYPE_INCOMPAT
99	RC_IE_NOT_IMPLEM
100	RC_CONDITIONAL_IE
101	RC_MESSAGE_INCOMPAT
111	RC_UNSPECIFIED

Examples

AT$LUPREJ

$LUPREJ: 0,13,310260

Network 310260 (TMO) reject the Location Area Update for roaming not allowed

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4.16.22. $SRN   Module Serial Number

Command Function	This command will return the serial number of the module.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$SRN=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$SRN $SRN: xxxxxxxxxxxxx
Parameter Values	N/A
Reference	N/A
Standard Scope	N/A
Enfora Implementation Scope	N/A
Notes	Returned values are unique for each module

4.16.23. $MSGSND   Message Send

Command Function	The $MSGSND command has been created to allow sending of data from one mode to another.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$MSGSND=? $MSGSND: (0-4),("ASCII DATA") OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$MSGSND=**<destination>,<"data">** OK
Parameter Values	
<destination>	0 – 4 (possible Valid Values) 0 = <"data"> is sent out the serial port 1 = <"data"> is sent to all SMS addresses listed in AT$SMSDA command. 2 = <"data"> is sent via GPRS to first IP address, configured as server, in AT$FRIEND command and port number defined by AT$UDPAPI command 3 = <"data"> is sent via GPRS to IP address and Port number listed in the AT$PADDST command 4 = <"data"> is sent via GPRS to first IP address, configured as server, in AT$FRIEND command and port number for TCP API values

4.16.23 $MSGSND   Message Send (continued)

<"data">	a maximum of 50 bytes ASCII characters
	*If <"data"> shall contain the ';' character (semicolon) the hexadecimal equivalent '\3b' must be used instead.
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$MSGSND=4 checks if TCPAPI is enabled (AT$TCPAPI=1) before attempting to send message. Will report error if not enabled.
Example:	
	AT$MSGSND=0,"hello;" ERROR OK AT$MSGSND=0,"hello\3b" OK hello;

4.16.24. $MLQSIZ   Message Log Queue Size

Command Function	The $MLQSIZ allows the user to restrict the number of unsent messages maintained in the buffers for the four message log queues: UDP, UDP with SMS backup, SMS, and TCP.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$MLQSIZ=? $TODOM:(0-3000),(0-3000),(0-3000),(0-3000) OK
Write Format	AT$MLQSIZ=**\<UdpQsize\>, \<SmsBckupQsize\>,\<SmsQsize\>, \<TcpQsize\>**
Response	OK
Read Format	AT$MLQSIZ?
Response	$MLQSIZ: **\<UdpQsize\>, \<SmsBckupQsize\>,\<SmsQsize\>, \<TcpQsize\>**
Execution Format Response	N/A
Parameter Values	
\<UdpQsize\>	Maximum # of unsent messages stored in message log queue for UDP messages. Valid range is 0-3000. The default is 0, which which is treated as a special value indicating no message size restriction. This is the equivalent of restricting the size of this queue to 3000 messages.

4.16.24 $MLQSIZ   **Message Log Queue Size (continued)**

<SmsBckupQsize>   Maximum # of unsent messages stored in message log queue for UDP messages where SMS messaging is allowed as a backup when UDP messaging is unavailable. Valid range is 0-3000. The default is 0, which which is treated as a special value indicating no message size restriction. This is the equivalent of restricting the size of this queue to 3000 messages.

<SmsQsize>   Maximum # of unsent messages stored in message log queue for SMS messages. Valid range is 0-3000. The default is 0, which which is treated as a special value indicating no message size restriction. This is the equivalent of restricting the size of this queue to 3000 messages.

<TcpQsize>   Maximum # of unsent messages stored in message log queue for TCP messages. Valid range is 0-3000. The default is 0, which which is treated as a special value indicating no message size restriction. This is the equivalent of restricting the size of this queue to 3000 messages.

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope   Full

4.16.25. $OFF Power off command

Command Function	This command allows the user to perform a software-controlled shutdown. The modem gracefully deregisters from the network before powering down so it may take a few seconds before current consumption decreases. Requires a pulse on the PWR_CTRL or RESET pin to wake the unit back up.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$OFF None, unit powers down
Parameter Values	None
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Refer to GSM0000AN020 for more details.

4.16.26. $OFFDLY   Power off delay

Command Function	This command allows the user to configure the minimum time that the PWR_CTRL signal must be low before the module recognizes the signal as a power off command. This delay can be considered as a software debounce time for the PWR_CTRL signal. If the PWR_CTRL signal is held low for longer than the time specified by $OFFDLY, then the modem performs a software-controlled shutdown. The modem gracefully deregisters from the network before powering down so it may take a few seconds before current consumption decreases. Requires a pulse on the PWR_CTRL or RESET pin to wake the unit back up.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$OFFDLY=? $OFFDLY: (0,1-255 msec) OK
Write Format Response	AT$OFFDLY=**<delay0>** OK
Read Format Response	AT$OFFDLY? $OFFDLY: **<delay0>**
Execution Format Response	N/A N/A

4.16.25 $OFFDLY   **Power Off Delay**
                                    (continued)

Parameter Values

< delay >   Delay time in milliseconds
                                    0 = disable power down via PWR_CTRL
                                    signal.
                                    1 to 255 = enable power down command
                                    via PWR_CTRL signal after signal is low for
                                    specified time in milliseconds

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope Full

Notes   Refer to GSM0000AN020 for more details.

4.16.27. $PWRMSG   Power On Message

Command Function	This command allows the user to change the default Power up message.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PWRMSG=? $PWRMSG: "<message>",<0,1>
Write Format Response	AT$PWRMSG="new pwr up message" OK
Read Format Response	AT$PWRMSG? $PWRMSG: "AT-Command Interpreter ready"
Execution Format Response	N/A N/A
Parameter Values	
<message>	New Power up Message
<0,1>	Optional parameter that will remove the message altogether. Please see the examples at the end of this command.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$PWRMSG="" will restore the power up message to the factory default. The The power up message can be a maximum of 40 characters.

4.16.26 $PWRMSG   Power On Message
(continued)

Example:

> AT$PWRMSG?
> $PWRMSG: "AT-Command Interpreter ready"
> AT$RESET
> AT-Command Interpreter ready
> AT$PWRMSG ="Ready To Go"
> OK
> AT$PWRMSG?
> $PWRMSG: "Ready To Go"
> AT$RESET
> Ready To Go
> AT$PWRMSG =""
> OK
> AT$PWRMSG?
> $PWRMSG: "AT-Command Interpreter ready"

The second parameter is optional.

Command	Description
AT$PWRMSG="New Powerup Msg"	sets 'New Powerup Msg' as powerup msg
AT$PWRMSG="New Powerup Msg",0	same as previous
AT$PWRMSG=,1	removes the powerup msg
AT$PWRMSG="some text",1	removes the powerup msg (ignores text)
AT$PWRMSG=""	sets powerup msg back to default string
AT$PWRMSG="",0	same as previous

4.16.28. $SIMDTC   SIM Detection Enable / Disable

Command Function	This command allows the user to configure the hardware SIMDTC pin for automatic detection of SIM card insertion / removal.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$SIMDTC=? $SIMDTC: (0..2),(0,1)
Write Format Response	AT$SIMDTC=<Enable>,<Control>
Read Format Response	AT$SIMDTC? $SIMDTC: <Enable>,<Control> OK
Execution Format Response	N/A
Parameter Values	
<Enable>	0 – Disabled (default) 1 – SIM Remove only detect 2 – SIM Remove/Insertion detect
<Control>	0 - insertion corresponds to open state of contacts 1 - insertion corresponds to closed state of contacts (Default)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Default is SIMDTC is disabled. Please refer to EIII Integration Guide for connection details to ensure correct operation

4.16.29. $BBCHG   Recharge Backup Battery

Command Function	The backup battery can be recharged from the main battery. A programmable voltage regulator powered by the main battery allows recharging the backup battery. VBACKUP (pin 83) can be enabled to supply a charging voltage.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$BBCHG=? $BBCHG: (0-1),(0-3) OK
Write Format Response	AT$BBCHG=\<Mode\>,\<VoltageSetting\> OK
Read Format Response	N/A N/A
Execution Format Response	AT$BBCHG? $BBCHG: 0,1
Parameter Values	
\<Mode\>	0 – Disable the backup battery charger circuit (factory default) 1 – Enable the backup battery charger circuit
\<VoltageSetting\>	0 – 3.1V 1 – 3.2V (factory default) 2 – 3.0V 3 – VBAT
Reference	N/A
Standard Scope	Optional

4.16.28 $BBCHG   **Recharge Backup Battery (continued)**

Enfora Implementation Scope Full

Notes   Default state is disabled. Charging
                                  capability for lithium cell battery only.
                                  Typical charging current is 500 uAmps (350
                                  uAmps minimum, 900 uAmps maximum.

Example: AT$BBCHG=1,2 Enabler battery charging
                                  at 3.0V

4.16.30.   %MEPD   MEPD Configuration Data

Command Function	This command allows the user to read the current values of the MEPD configuration data. This configuration data is used for SIM personalization. The data is entered using a special application to bind the MEPD data to the modem. This AT command can only query the contents of the data, not change it.
Command Functional Group	Enfora Specific
Command Format Query Response	AT%MEPD=? %MEPD: ("MAX","ALE","RFM","RFA", "RSM","RSA","TMF","ETF","AIF","NPL", "CPL","PPL") OK
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT$MEPD=<**type**> %MEPD: <data per "type"> OK

4.16.29   %MEPD   MEPD Configuration Data
                             (continued)

Parameter Values

<type>   <ASCII string> specifying MEPD data type

"MAX"	Max value of failure counter
"ALE"	Current value of failure counter
"RFM"	Failure counter RESET fail max value
"RFA"	Failure counter RESET fail current value
"RSM"	Failure counter RESET success value
"RSA"	Failure counter RESET success current value
"TMF"	Timer flag
"ETF"	ETSI flag
"AIF"	AIRTEL flag
"NPL"	Network personalization lock
"CPL"	Corporate personalization lock
"PPL"	Provider personalization lock

Reference   N/A

Standard Scope   Optional

4.16.29   %MEPD   MEPD Configuration Data
                                        (continued)

Enfora Implementation Scope   Full

Notes: "NPL" MEPD data replaces AT+CLCKCFG.
                                         "CPL" MEPD data replaces AT+CLCKCP.
                                         "PPL" MEPD data replaces AT+CLCKSP.

4.16.31. $ICCID   Integrated Circuit Card ID

Command Function	This command allows the user to retrieve the Integrated Circuit Card Identification (ICCID) from the SIM.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$ICCID=? OK
Write Format	N/A
Response	OK
Read Format Response	AT$ICCID? $ICCID: 89014103211116517727 OK
Execution Format Response	N/A N/A
Parameter Values	N/A
Reference	GSM 11.11 Chapter 10.1.1
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes:	A SIM must be inserted into the module and initialized in order to read the ICCID of the SIM

4.16.32. $RICSD   CSD Ring Indicate

Command Function	This command allows the user to set the act of the ring indicate for a CS data call.
Command Functional Group	Enfora Specific
Command Format Query Response **Write Format**	AT$RICSD=? $RICSD: (0-1) AT$RICSD= CSD RI mode
Response	OK
Read Format **Response**	AT$RICSD? $RICSD: CSD RI mode
Execution Format **Response**	N/A N/A
Parameter Values	N/A
<CSD RI Mode>	0 Ring goes low and will remain low. 1 The Ring line goes low for 1 second and high for another 2 seconds. Every 3 seconds the ring string is generated and sent over the Receive (Data Out) (Rx) line. If there is a call in progress and call waiting is activated for a connected handset or hands free device, the Ring pin switches to ground in order to generate acoustic signals that indicate the waiting call.

4.16.33. $USRVAL   User Value

Command Function	Allows the user to store a value in flash memory which can later be retrieved.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$USRVAL=? OK
Write Format Response	AT$USRVAL=<hex value> OK
Read Format Response	AT$USRVAL? $USRVAL:(hex value) OK
Execution Format Response	N/A N/A
Parameter Values	
<hexval>	(0-FFFFFFFF)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

**4.16.32 $USRVAL   User Value
                                (continued)**

Reference   N/A

Standard Scope   Optional

Enfora Implementation Scope Full

Notes: N/A

4.16.34. $SPN   Software Part Number

Command Function	This command shows the revision number assigned to the software version running on the modem.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$SPN? $SPN: SWxxx
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Notes:	In the response "$SPN: SWxxx" the value "xxx" is the revision number assigned to the software running on the modem.

4.16.35. $PASSWD   Set authorization for AT commands for serial, SMS and API

Command Function	This command allows the user to enable or disable authorization for AT commands for the serial, SMS and API. It also sets the password required to run this command
Command Functional Group	Enfora Specific
Command Format Query Response	AT$ATPASSWD=? $ATPASSWD: ("oldpasswd",mask|"newpasswd") OK
Write Format Response	N/A
Read Format Response	N/A
Execution Format Response	AT$ATPASSWD= <**"oldpasswd","newpasswd"**> AT$ATPASSWD=<**"passwd",mask**>

Parameter Values

<oldpasswd>	Specified when the password is being changed. If the password has been lost, there is a utility that given the unit's IMEI, will provide a back door password.
<newpasswd>	This is the value of the new password and is specified only when the password is being changed. It must be no more than eight characters in length and must be enclosed in double quotes.
<passwd>	Specified when changing the AT command authorization mask. The backdoor password will not work in this format of the command.
<mask>	Bit mask specifying which interfaces will be authorized to enter AT commands. Each bit specifies one interface as enumerated in the table below.

4.16.34 $PASSWD

Set authorization for AT commands for serial, SMS and API (continued)

Bit value	Interface
1	Serial Port
2	SMS
4	API

To select multiple items to authorize, add the bit values of each interface to be authorized. To authorize API and SMS only, the mask value is 6 (4 + 2). AT commands entered over the serial port will not execute and will reply with ERROR.

Notes   N/A

4.16.36. $DEVTYP   Query the device type

Command Function	The $DEVTYP queries returns the product ID and software version.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A
Write Format	AT$DEVTYP
Response	$DEVTYP: **<pid>,<swver>**
Read Format	AT$DEVTYP?
Response	$DEVTYP: **<pid>,<swver>**
Execution Format	N/A
Response	N/A
Parameter Values	
<pid>	Product ID
<swver>	4-digit hex Software Version value (for example, 2.1.4.0 would be displayed as 2140)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A
Example	N/A

4.16.37. $URTWTO   UART Wakeup Timeout

Command Function	This sets the number of seconds the UART will prevent the modem from going to deep sleep after it receives a character.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$URTWTO=? $URTWTO: (0-60) OK
Write Format Response	AT$URTWTO=<seconds> OK
Read Format Response	AT$URTWTO? $URTWTO: 10 OK
Execution Format Response	N/A
Parameter Values <*seconds*>	0 – Sets the UART Wakeup time to the default value of 10 seconds. 1-60 – Sets the UART Wakeup time to the specified number of seconds.

Appendix A – Result Codes

Result Codes

Modem Verbose Response	Modem Terse Response	Definition
OK	0	command successful completed; ready
CONNECT	1	entering data transfer state
RING	2	Ring indication detected
NO CARRIER	3	connection terminated
ERROR	4	Command abnormally completed, ready
NO DIALTONE	6	Dial tone not found
BUSY	7	Busy signal detected
NO ANSWER	8	connection completion timeout

Unsolicited Result Codes

Result Code	Definition	
+CCCM: <ccm>	Current call meter value	AT+CACM=1
+CCWA: <number>,<type> ,<class>[,<alpha>]	Call Waiting Status	AT+CCWA=1
+CLAV: <code>	ME Language Change	AT+CLAE=1
+CLIP: <number> ,<type>[,<subaddr> ,<satype>[,<alpha>]]	Calling Line Identification Presentation	AT+CLIP=1
+CME ERROR: <err>	ME Error Result Code	AT+CMEE=x
+COLP: <number> ,<type>[,<subaddr> ,<satype>[,<alpha>]]	Connected Line Identification Presentation	AT+COLP=1
+CR: <type>	Service Reporting Control	AT+CR=1
+CREG: <stat>[,<lac>,<ci>]	Registration status indication	AT+CREG=1
+CRING: <type>	Incoming Call Indication	AT+CRC=1
+CSSI: <code1>[,<index>]	Supplementary Services Result Code	AT+CSSN=1,1
+CSSU: <code2> [,<index>[,<number>, <type>[,<subaddr>,<satype>]]]	Supplementary Services Result Code	AT+CSSN=1,1
+CUSD: <m>[,<str>,<dcs>]	Indication of Incoming USSD String	AT+CUSD=1
+CGREG: <stat>[,<lac>,<ci>]	GPRS Registration Status	AT+CGREG=1

SMS Unsolicited Result Codes

Result Code	Definition	AT Command
+CMTI: <mem>,<index>	Indication of new short message	AT+CNMI=1,1
+CMT: <length><CR><LF><pdu>	Short Message output Directly to TE (PDU mode)	AT+CNMI=1,2
+CBM: <sn>,<mid>,<dcs>, <page>,<pages><CR><LF><data>	Incoming Cell Broadcast Message routed directly to TE	AT+CNMI=1,0,2
+CDS: <length><CR><LF><pdu>	SMS status report routed directly to the TE	AT+CNMI=1,0,0,1, AT+CSMP=49,

SAT Application Toolkit Result Codes

Result Code	Definition	AT Command
%SATI: <satCmd>	Indication of SAT command	AT%SATC=1
%SATE: <satRsp>	Indication of SAT envelope response	AT%SATC=1
%SATA: <rdl> (<rdl> redial timeout for the call in milliseconds.)	SAT pending call alert	AT%SATC=1
%SATN: <satNtfy> (<satNtfy> commands or responses sent my the ME to SIM or handled by the ME.)	Notification of SAT commands and responses sent by ACI	AT%SATC=1

Appendix B – Error Codes

General Error Codes

Modem Numeric Response	Modem Verbose Response
0	phone failure
1	no connection to phone
2	phone-adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed - emergency calls only
40	network personalisation PIN required
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
44	service provider personalisation PIN required
45	service provider personalisation PUK required

Modem Numeric Response	Modem Verbose Response
46	corporate personalisation PIN required
47	corporate personalisation PUK required
48	SIM personalization PIN required
49	SIM personalization PUK required
100	unknown

GPRS Error Codes

Modem Numeric Response	Modem Verbose Response
25 (19)	LLC or SNDCP error
26 (1a)	Insufficient resources
27 (1b)	Unknown or missing access point name
28 (1c)	Unknown PDP address or PDP type
29 (1d)	User authentication failed
30 (1e)	Activation reject by GGSN
31 (1f)	Activation rejected, unspecified
32 (20)	Service option not supported
33 (21)	Requested service option not subscribed
34 (22)	Service option temporarily out of order
35 (23)	NSAPI already used
36 (24)	Regular PDP context deactivation
37 (25)	QoS not accepted
38 (26)	Network Failure
39 (27)	Reactivation requested
40 (28)	Feature not supported
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
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class

SMS Error Codes (+CMS)

Modem Numeric Response	Modem Verbose Response
1	unassigned (unallocated) number
8	operator determined barring
10	call barred
21	short message transfer rejected
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 unavailable, unspecified
50	requested facility not subscribed
69	requested facility not implemented
81	invalid short message transfer ref. value
95	invalid message, unspecified
96	invalid mandatory information
97	message type non-existent or not implemented
98	message not compatible with SM protocol state
99	information element non-existent or not impl.
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

Modem Numeric Response	Modem Verbose Response
197	SM rejected-duplicate SM
208	SIM SMS storage full
209	no SMS storage capability in SIM
210	error in MS
211	memory capacity exceeded
255	unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
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
500	unknown error
512	failed to abort
255	other error

Release Causes for Extended Error Reporting (+CEER)

Error Description
-1,**255**   no error
1   unassigned number
3   no route to destination
6   channel unacceptable
8   operator determined barring
16   normal call clearing
17   user busy
18   no user responding
19   user alerting
21   call rejected
22   number changed
26   non selected user clearing
27   destination out of order
28   invalid number format
29   facility rejected
30   response to status enquiry"
31   normal
34   no channel available
38   network out of order
41   temporary failure
42   switching equipment congestion
43   access information discarded
44   requested channel unavailable
47   resources unavailable
49   quality of service unavailable
50   requested facility unsubscribed
55   incoming calls barred within CUG
57   bearer capability not authorized
58   bearer capability not available
63   service not available
65   bearer service not implemented
68   ACM reached ACM maximum
69   facility not implemented
70   only restricted bearer cap. avail.
79   service not implemented
81   invalid TI
87   no member of CUG
Error Description

88	incompatible destination
91	invalid transit network selection
95	incorrect message
96	invalid mandatory information
97	message type not implemented
98	message type incompatible
99	info element not implemented
100	conditional info element error
101	message incompatible
102	recovery on time expiry
101	unsuccessful GPRS attach
102	unsuccessful PDP context activation
103	GPRS detach
104	GPRS PDP context deactivation
128	NoService
202	timer 303 expiry
203	establishment failure
210	no error
211	operation failed
212	timeout
213	bearer service not compatible

Appendix C – Default AT Values

ATE Enable Command Echo
Default Value: 1
Default Value Meaning: Echo on.

ATQ Result Code Suppression
Default Value: 0
Default Value Meaning: DCE transmits result codes.

ATV Set Result Code Format Mode
Default Value: 1
Default Value Meaning: Information response:
                                             <CR><LF><text><CR><LF>

ATX Set ATD Call Result Code Selection and Call Progress Monitoring Control
Default Value: 0
Default Value Meaning: Dial tone and busy detection are disabled.

AT&C Set circuit Data Carrier Detect (DCD) function mode
Default Value: 1
Default Value Meaning: DCD matches the state of the remote modem's
                                             carrier.

AT&D Set Circuit Data Terminal Ready (DTR) Function Mode
Default Value: 0
Default Value Meaning: TA ignores status on DTR.

ATS0 Set Number of Rings Before Automatically Answering the Call
Default Value: 0
Default Value Meaning: Automatic answering is disabled.

ATS3 Write Command Line Termination Character
Default Value: 13
Default Value Meaning: Command line terminal character is ASCII 13.

ATS4 Set Response Formatting Character
Default Value: 10
Default Value Meaning: Response formatting character is ASCII 10.

ATS5 Write Command Line Editing Character
Default Value: 8
Default Value Meaning: Command line editing character is ASCII 8.

AT+WS46 Select Wireless Network
Default Value: 12
Default Value Meaning: GSM Digital Cellular.

AT+CBST Select Bearer Service Type
Default Value: speed=7, name=0, ce=1
Default Value Meaning: Over the air baud rate is 9600, no name, non-transparent connection element.

AT+CRLP Select Radio Link Protocol Param. for Orig. Non-Transparent Data Call
Default Value: iws=61,mws=61,T1=48,N2=6
Default Value Meaning: **<iws>**   0-61 Interworking window size (IWF to MS)
                             <mws>   0-61 Mobile window size (MS to IWF)
                             <T1>   48-78-255 Acknowledgement timer (T1 in 10 ms units)
                             <N2>   1-6-255 Re-transmission attempts N2

AT+CR Service Reporting Control
Default Value: 0
Default Value Meaning: Disable.

AT+FCLASS Fax: Select, Read or Test Service Class
Default Value: 0
Default Value Meaning: Data.

AT+CRC Set Cellular Result Codes for Incoming Call Indication
Default Value: 0
Default Value Meaning: Disable.

AT+ILRR Set TE-TA Local Rate Reporting
Default Value: 0
Default Value Meaning: Disable reporting of local port rate.

AT+IPR Set Fixed Local Rate
Default Value: 0 (autobaud)
Default Value Meaning: The data rate of TA serial interface is not defined until the first AT is received by the TA. In autobaud, any power up message is displayed at 115200.

AT+CMEE Report Mobile Equipment Error
Default Value: 0
Default Value Meaning: Disable CME Error reporting.

AT+CSMS Select Message Service
Default Value: service=0,mt=1,mo=1,bm=1
Default Value Meaning: Service=0: CSMS_SERV_GsmPh2
                                        Mt=1: mobile terminated message enable
                                        Mo=1: Mobile originated message enable
                                        Bm=1: broadcast type message enable

AT+CMGF Select SMS Message Format
Default Value: 1
Default Value Meaning: Text Mode.

AT+CNMI New SMS Message Indications
Default Value: mode=1,mt=1,bm=0,ds=0,bfr=0
Default Value Meaning: Mode=1: Discard indication and reject new
                                        received message unsolicited result codes when
                                        TA-TE link is reserved Mt=0: prefer memory under
                                        different class
                                        Mt=1: If SMS-DELIVER is stored into ME/TA,
                                        indication of the memory location is routed to the
                                        TE using unsolicited result code:+CMTI:
                                        <mem>,<index>
                                        Bm=0: no CBM indications
                                        Ds=0: no status report indications
                                        Bfr=0:   TA buffer of unsolicited result codes
                                        defined within this command is flushed to the TE
                                        when <mode>1…3 is entered

AT+CREG Network Registration
Default Value: 0
Default Value Meaning: Not registered.

AT+CGREG Network Registration
Default Value: 0
Default Value Meaning: Not registered.

AT+CLIP Calling Line Identification Presentation
Default Value: 0
Default Value Meaning: Calling Line Identification Presentation disabled.

AT+CLIR Calling Line Identification Restriction
Default Value: 0
Default Value Meaning: Calling Line Identification Restriction disabled.

AT+COLP Connected Line Identification Presentation
Default Value: 0
Default Value Meaning: Connected Line Identification Presentation disabled.

AT+COPS Operator Selection
Default Value: mode=0, format=0,oper="operator"
Default Value Meaning: Mode=0: Automatic selection
                                                   Format=0: long format alphanumeric
                                                   Oper="operator", the name of the operator

AT+CSCS   Select Character Set
Default Value: "PCCP437"
Default Value Meaning: Character set equals PCCP437.

AT+CSNS Single Numbering Scheme
Default Value: 0
Default Value Meaning: Single numbering scheme set to voice.

AT+CAOC Advice of Charge
Default Value: 1
Default Value Meaning: Advice of charge deactivated.

AT+CSSN Supplementary Services Notification
Default Value: 0,0
Default Value Meaning: Supplementary Service notifications disabled.

AT+CPBS Select Phonebook Memory Storage
Default Value: "AD"
Default Value Meaning: Phonebook storage facility set to abbreviated
                                                   dialing.

AT+CLAE Set Language Event
Default Value: 1
Default Value Meaning: Language Event enabled.

AT+CLAN Set Language
Default Value: "en"
Default Value Meaning: English.

AT+CPMS Preferred Message Storage
Default Value: "SM","SM","SM"
Default Value Meaning: Store short messages in SIM.

AT+CSDH Show Text Mode Parameters
Default Value: 0
Default Value Meaning: Do not show header values.

AT+IFC Local Flow Control
Default Value: 2,2
Default Value Meaning: Hardware flow control enabled.
AT+ICF Character Framing
Default Value: 3
Default Value Meaning: 8 bits, 1 stop bit, parity ignored.

AT+CGDCONT Define PDP Context
Default Value:
Default Value Meaning: No context defined.

AT+CGQREQ Quality of Service (requested)
Default Value: 1,0,0,0,0,0
Default Value Meaning: Subscribed.

AT+CGQMIN Quality of Service (minimum)
Default Value: 1,0,0,0,0,0
Default Value Meaning: Subscribed.

AT+CGAUTO Automatic Response to Network Request of PDP Context
             Activation
Default Value: 3
Default Value Meaning: Modem Capability mode, GPRS and Circuit
                                                        switched calls.

AT+CGCLASS GPRS Mobile Station Class
Default Value: "B"
Default Value Meaning: Class B.

AT+CGEREP GPRS Events Reporting
Default Value: 0,0
Default Value Meaning: Reporting disabled.

AT+CGSMS Select Service for MO SMS
Default Value: 3
Default Value Meaning: Circuit Switched Preferred.

AT%CGPPP PPP Negotiation Selection
Default Value: 3
Default Value Meaning: Automatic authentication.

AT+CMOD Call Mode
Default Value: 0
Default Value Meaning: Single call mode service.

AT+CFUN Set Phone Functionality
Default Value: 0
Default Value Meaning: Minimum functionality.

AT+CMUT Mute Control
Default Value: 0
Default Value Meaning: Muting off.

AT+CSVM Set Voicemail Number
Default Value: 0,"",129
Default Value Meaning: No voicemail number entered.

AT+CSTA Select Type of Address
Default Value: 129
Default Value Meaning: Dialing string without International Access Code
                                        character "+".

AT+CCUG Closed User Group
Default Value: 0,0,0
Default Value Meaning: Closed User Group disabled.

AT+CCWA Call Waiting
Default Value: 0
Default Value Meaning: Call Waiting disabled.

AT+CUSD Unstructured Supplementary Service
Default Value: 0
Default Value Meaning: Unstructured Supplementary Service disabled.

AT+CPAS Phone Activity Status
Default Value: 0
Default Value Meaning: Ready (ME allows commands
                                        from TA/TE).

AT+CCWE Call Meter Maximum Event
Default Value: 0
Default Value Meaning: Call Meter Warning Event disabled.

AT+CGDATA Enter Data State
Default Value: PPP
Default Value Meaning: Use PPP as PDP context activation protocol.

AT%CGAATT Automatic Attach and Detach Mode
Default Value: 0,1
Default Value Meaning: Automated GPRS Attach, manual GPRS detach.

AT$AREG Set Auto Registration
Default Value: 1
Default Value Meaning: Auto registration set to on.

AT$BAT Battery Status Query
Default Value: 0,0,0
Default Value Meaning: No battery detected.

AT$UDPAPI Modem API Address
Default Value: "199.245.180.013",1720
Default Value Meaning: Default UDP API IP and Port.

AT$APIPWD API Password
Default Value: ""
Default Value Meaning: No password defined.

AT$FRIEND Modem Friends   (_NOT_ affected by AT&F)
Default Value: 1,0,"0.0.0.0"…..10,0,"0.0.0.0"
Default Value Meaning: No friends defined.

AT$HOSTIF Configure Host to Modem Interface
Default Value: 0
Default Value Meaning: Normal network PPP connection.

AT$MDMID Modem ID
Default Value: ""
Default Value Meaning: No modem id defined.

AT$WAKEUP Modem to Server Wakeup/Keep Alive
Default Value: 0,0
Default Value Meaning: No wakeup or keep alive messages sent.

AT$EVENT User Defined Input/Output
Default Value: evgrp evtyp evcat   p1 p2
Default Value Meaning: No events populated.

AT$EVTIM(x) User Defined Input Event Timers
Default Value: 0
Default Value Meaning: No event timers populated.

AT$ACKTM Acknowledgment Message Period & Retry Number
Default Value: 0,0
Default Value Meaning: No acknowledgment event count and period
                                                          defined.

AT$PADBLK PAD Block Size
Default Value: 512
Default Value Meaning: PAD block size.

AT$PADBS PAD Backspace Character
Default Value: 08
Default Value Meaning: PAD backspace character is backspace key.

AT$PADFWD PAD Forward Character
Default Value: 0D
Default Value Meaning: PAD forwarding character is carriage return.

AT$PADTO PAD Timeout Value
Default Value: 50
Default Value Meaning: PAD forwarding timeout is 5 seconds.

AT$PADDST PAD Destination IP/Port
Default Value: 0.0.0.0.,0
Default Value Meaning: No PAD destination IP and port defined.

AT$PADSRC PAD Source Port
Default Value: 0
Default Value Meaning: No PAD source port defined.

AT$PADCMD PAD Command Features
Default Value: 1B
Default Value Meaning: All PAD features enabled.

AT$ACTIVE TCP PAD State
Default Value: 1
Default Value Meaning: Active/client mode.

AT$CONNTO TCP PAD Connection Timeout
Default Value: 60
Default Value Meaning: TCP Connection timer 1 minute.

AT$IDLETO TCP PAD Idle Timeout
Default Value: 120
Default Value Meaning: TCP Idle timer 2 minutes.

AT$VGR Microphone Receiver Gain
Default Value: 20
Default Value Meaning: Receive level gain is 8 dB.

AT$VGT Speaker Transmit Gain
Default Value: 12
Default Value Meaning: Coarse transmit speaker gain is +6 dB.

AT$VLVL Speaker Volume
Default Value: 4
Default Value Meaning: Speaker volume is set to –6 dB.

AT$VST Sidetone Volume
Default Value: 4
Default Value Meaning: Side tone volume set to –14 dB.

AT$IOCFG GPIO Configuration
Default Value: 11111111 11111111
Default Value Meaning: All I/O set to input, current status: all input.

AT$IOGP(x) GPIO Bit Control
Default Value: 1
Default Value Meaning: I/O bit enabled.

AT$IOGPA GPIO Byte Control
Default Value: 11111111 11111111
Default Value Meaning: All I/O pins enabled, current status: all enabled.

AT$GATEWAY Gateway IP
Default Value: 0.0.0.0
Default Value Meaning: No Gateway IP defined.

AT$VSELECT Voice Select
Default Value: 0
Default Value Meaning: Selects handset for voice

AT$SPKCFG Set Downlink Voice Parameters
Default Value: 8,4,0
Default Value Meaning: 2 dB of gain, -6 dB of volume, filter on

AT$PREAMP Set Uplink Voice Parameters
Default Value: 0,20,0
Default Value Meaning: 2V bias, 8 dB of gain, 0 dB of extra gain.

AT$TCPAPI TCP API Control
Default Value: 0
Default Value Meaning: TCP API Disabled