AT Command Document
GSM0308PB001MAN

Enfora Enabler III
GSM/GPRS/EDGE Radio Modem
AT Command Set Reference

Ver. 1.01

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Document Title:	Enfora Enabler IIIG GSM/GPRS Radio Modem AT Command Set Reference
Version:	1.01
Date:	03 July 2007
Status:	Released
Document Control ID:	GSM0308PB001MAN

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. Revision History

Date	Rev	Author	Description
11/08/06	Draft	Tom Cone	Draft Release. Derived from GSM0107PB001MAN version 1.06
12/08/06		Diane O'Neil	Edited AT$RTCALRM Edited <name> parameter in +CBST command Added notes to $IOADC and $IOADCx commands
07/03/07	1.01	Tom Cone	Edited AT$VSELECT, AT$IOCFG, AT$IOGPA, AT$IOGP(x), Added AT$IOBLKS, AT$IOADC1, AT$IOPULEN, AT$IOPULUP, AT%CREG, AT%CSTAT, AT$OFF, AT$OFFDLY, AT$LOCI, AT$PWRMSG Deleted AT$IOADC(X), AT$IODAC, Added Notes to $HOSTIF Edited +IPR Edited $AREG Edited $HOSTIF Edited $OFFDLY Added NITZ section and commands Added $PADDISC command Edited +CRES command Added $SMSDA and $SMSDAEN commands Edited Notes section in %CGPCO Added $SRN command

1.3. 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	ATD?
Response	ATD**<storage><n><cmod><;>**
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	ATD>SD12I;
Response	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

- 7 — 9600 bps (V.32)
- 0 — No name
- 1 — Non-transparent

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>** 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
7 - SMSCP
8 - SMSRP

2.1.2.9. AT+CEER	**Extended Error Reporting (continued)**
	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
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 Response	AT+COPS=? +COPS: (2, “ “, “ “, “31022”), (3, “ “, “ “, “310380”) OK
Write Format Response	AT+COPS=**<mode>** **[, <format> [, oper>]]** OK or +CME ERROR: **<err>**
Read Format Response	AT+COPS? +COPS: 0 OK
Execution Format Response	N/A 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

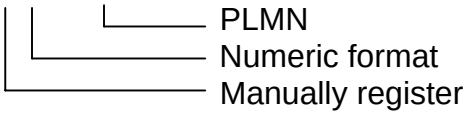
Notes

2.1.3.3. AT+COPS Operator Selection (continued)

Example:

To manually register the modem on a known PLMN:

AT+COPS=1,2,”xxxxx”



To read operator information:

AT+COPS=?
+COPS: (2,”Voicestream”,”Vstream”,”31022”)

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)

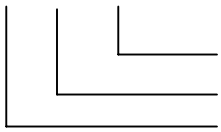
<mode>	**0** Unlock **1** Lock **2** Query Status
<password>	"password"
<class>	**1** voice **2** data **4** fax (fax not supported) **7** all classes **(default)** **8** short message service
<status>	**0** off **1** on
Reference	GSM Ref. 07.07 Chapter 7.4
Standard Scope	Optional
Enfora Implementation Scope	Partial

Notes

Example:

To set Network Personalisation on first SIM inserted:

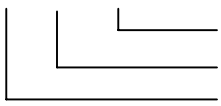
AT+CLCK="PF",1,"password",,"PN"



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>

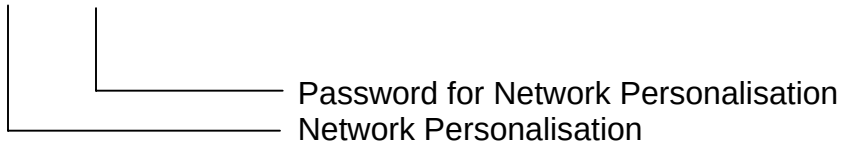
- **"SC"** (SIM PIN 1)
- **"AO"** (Barr All Outgoing Calls)
- **"OI"** (Barr Outgoing International Calls)
- **"OX"** (Barr Outgoing International Calls except Home Country)
- **"AI"** (Barr All Incoming Calls)
- **"IR"** (Barr Incoming Calls when Roaming outside the Home Country)
- **"AB"** (All Barring 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.

Example:

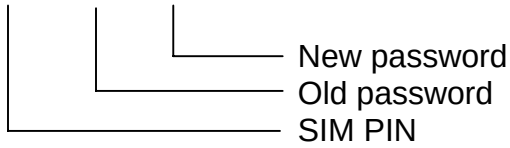
Enter first password for Network Personalisation:

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



To change SIM PIN:

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



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

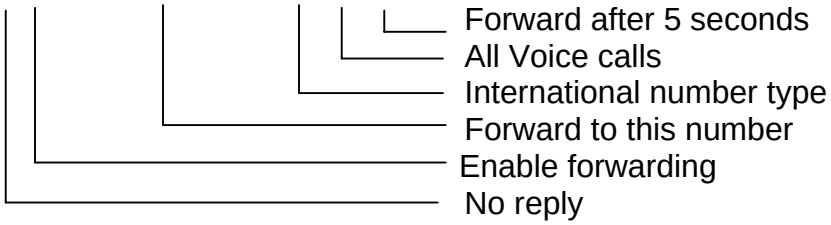
Reference	GSM Ref. 07.07 Chapter 7.10
Standard Scope	Optional
Enfora Implementation Scope	Full

Notes

Example:

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

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



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

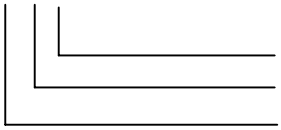
2.1.3.11. AT+CCWA — Call Waiting (continued)

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: (1-30), (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+CPIN2	**Enter PIN2**
Command Function	Set command sends PUK2 to change PIN2. If no PIN2 request is pending, no action is taken towards ME and an error message, +CME ERROR, is returned to TE. The command will set PIN2 regardless of the state of PIN2 being SIM PIN2 or SIM PUK2.
Command Functional Group	Phone Control
Command Format Query Response	AT+CPIN2=? OK
Write Format Response	AT+CPIN2=**<"PUK2">,[<"newpin2">]**
Read Format Response	N/A N/A
Execution Format Response	N/A N/A
Parameter Values	N/A

<code>	**READY**	ME is not pending for any password
	SIM PIN2	ME is waiting SIM PIN to be given
	SIM PUK2	ME is waiting SIM PUK to be given

2.1.4.4	**AT+CPIN2**	**Enter PIN2 (continued)**	
		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)
Reference		N/A	
Standard Scope		Optional	
Enfora Implementation Scope		Full	
Notes		N/A.	

2.1.4.5. 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

2.1.4.6. 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","AF","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

2.1.4.6. 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 dialled 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)
"AF"	comb. of fixed and abbrev. dialing phonebook (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.

2.1.4.6. 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

2.1.4.7. 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**

2.1.4.7. 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.

2.1.4.8. 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**

2.1.4.8. 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”

2.1.4.9. 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>**

2.1.4.9. 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”

2.1.4.10. 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

2.1.4.11. 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

2.1.4.12. 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.

2.1.4.13. 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	AT+CPUC=**<currency>**,**<ppu>**, **<passwd>**
Response	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

2.1.4.14. 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

2.1.4.15. 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

2.1.4.15. 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.

2.1.4.16. 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

2.1.4.17. 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

2.1.4.17. AT+CLAN	Set Language (continued)
Reference	GSM Ref. 07.07 Chapter 8.33
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

2.1.4.18. 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),(1-5),(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 **Response**	AT+CMUX? OK If in CMUX it will return the current settings
Execution Format **Response**	N/A N/A

2.1.4.18. 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

<N1>

(maximum frame size):

10- 100

<T1>

(acknowledgement timer in units of ten milliseconds):

1-255,

<N2>

(maximum number of re-transmissions):

10-100

2.1.4.18. 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

2.1.4.19. 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

2.1.4.19. 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	AT+STTONE=<**mode**>[,<**tone**>[,<**duration**>]]
Response	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.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Tone 1, 2, 7, and 16 generated by audio speaker. All other tones generated by Buzzer

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”, “SE”) OK
Write Format Response	AT+CPMS=**<location>** +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	
<location>	**“SM”** Store in SIM **“ME”** Store in ME (not supported)
Reference	GSM Ref. 07.05 Chapter 3.2.2
Standard Scope	Mandatory
Enfora Implementation Scope	Partial
Notes	Only storage of short messages in the SIM (“SM”) is supported.

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	AT+CNMI=**<mode>, <mt>, <bm>,<ds>,<bfr>**
Response	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”**
<do/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**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT+CMGD=**<index>** OK
Parameter Values	
<index>	Integer value of memory location.
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	N/A

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 **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT&V 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	N/A

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 Group	Equipment Information
Command Format Query Response	AT+GSN=? OK
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT+GSN 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
Reference	GSM Ref. 07.05 Chapter 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.**

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 Group	State Control
Command Format Query Response	AT+IFC=? +IFC: (0-2), (0-2) OK
Write Format	AT+IFC=**<DCE_by_DTE>, <DTE_by_DCE>**
Response	OK
Read Format Response	AT+IFC? +IFC: 2,2 OK
Execution Format Response	N/A 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+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.	**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	AT+S10=? 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.

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.

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 **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	H 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

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

4.3. 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=? $SPKCFG: (0-12), (0-5), (0,1), (0,1) OK
Write Format	AT$SPKCFG=<**gain**>, <**volume**>,<**filter**>,**<highpass filter>**
Response	OK
Read Format Response	AT$SPKCFG? $SPKCFG: <**gain**>,<**volume**>,<**filter**>,**<highpass filter>**
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
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	When filter =1, volume controls are disabled. Volume is fixed to a moderate level and can not be changed.
Examples	
AT$SPKCFG=12,5,0,0	Max gain/volume with both filters enabled.
AT$SPKCFG=12,0,0,0	Downlink voice is muted.
AT$SPKCFG=8,4,1,1	Less than optimal voice quality with both filters disabled.

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=? $MICANR: (0-2),(0-1,3),(0-2),(0-20),(0-2) OK
Write Format	AT$MICANR=<**control**>, <**mode**> ,<**noise level**>,<**tone thresh**>, <**tone count**>
Response	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=? $MICAEC: (0-2), (3,7), (0,1),(0,3), (0-24) ,(3275-32767) OK
Write Format	AT$MICAEC=<**control**>, <**mode** >, <**cont filter**>,<**uplink scaling**>, <**downlink scaling** >,< **max level** >, <**smoothing coef**>
Response	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. $MICAEC	Echo Cancellation (continued)
Parameter Values	
< control >	**0** => stop. **1** => start. **2** => update
< mode >	**3** => divergence control enable **7** => divergence control disable
< cont filter >	**0** => disable **1 =>** enable
< uplink scaling >	**0**=> disable. **3**=> enable.
< downlink scaling >	**0** => enable **3 =>** disable
< max level >	**0** => -24 dB **…** **24 =>** 0 dB
< smoothing coef >	**3275** => ???? **…** **32767 =>** ????
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	
Examples	
AT$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. A User can choose to only enter the first 8 GPIO, as in the example below. See AT$IOBLKS For configuration of the multi-purpose GPIO blocks.

Examples:

```
at$iocfg?
$IOCFG: 00000000000000000000  00000000000000000000

OK
at$iocfg=10101010101010101010
OK
at$iocfg?
$IOCFG: 10101010101010101010  10101010101010101010

OK
at$iocfg=11111111
OK
at$iocfg?
$IOCFG: 11111111101010101010  11111111101010101010

OK
```

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=? $IOBLKS:(0-2),(0-1) OK
Write Format Response	AT$IOBLKS**=<block>,<mode>** OK
Read Format Response	AT$IOBLKS? $IOBLKS: **<current mode of MCSI>, <current mode of SPI>, <current mode of Keyboard>** OK
Execution Format Response	N/A N/A
Parameter Values	
<block>	**0** MCSI **1** SPI **2** Keyboard
<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).

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

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**)	**1-20** GPIO bit
<mode>	**0** off **1** on

4.4.3 $IOGP(x)	GPIO Bit Control (continued)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	See Enabler III Integration Guide for pinout definitions. For GPIO 9-20 see command AT$IOBLKS for configuration.

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 =1111111000000000000
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=1111111111100011111
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.

4.6. 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=? $TCPAPI: (0-3) OK
Write Format Response	AT$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
<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

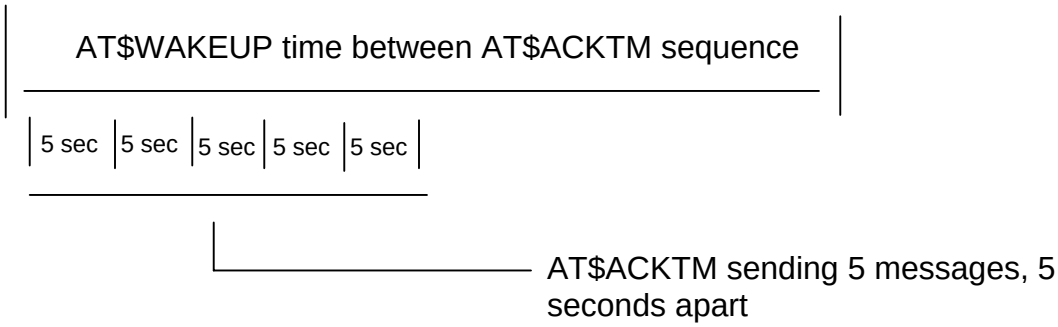
Standard Scope Optional

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.



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=? $ACTIVE: (0-1) OK
Write Format Response	AT$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
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$PADBLK=? PADBLK: (3-512) OK
Write Format Response	AT$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.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

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=? $PADCMD: (00-1B) OK
Write Format Response	AT$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.** 01=Enable forwarding on special char 02=Forward special char with data 08=Enable backspace
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.

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	N/A
Response	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	N/A
Response	N/A
Execution Format	N/A
Response	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	N/A
Response	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	N/A
Response	N/A
Execution Format	N/A
Response	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.

4.9. 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	33	1	0
2A	0	9	5	5
2B	3	17	0	0
3A	0	9	0	0
3B	3	9	0	0
4A	0	9	1	1
4B	3	17	0	0

Execution Format Response

N/A
N/A

4.9.1. $EVENT — User Defined Input/Output (continued)

Parameter Values

<event group> The event group. This parameter defines all of the events and the order they are executed. Events are grouped together to control execution sequence. If all input event group entries or an entry in the group are within range and at least 1 trigger input is valid, all event group outputs are activated. An event group should have at least 1 trigger input event, and at least 1 output event.

<event type> Event type

Type of event	Description	Value
transition trigger	Trigger when the requested event has transitioned into the event range. Valid when within the event range.	0
occurrence trigger	Trigger anytime the event occurs and is in the valid event range. Valid when within the event range.	1
input	Valid when within the event range.	2
output	Event is created when all inputs are valid & a trigger is present.	3

<event category> Event categories

Input State Event - Event based on GPIO pin activity when defined as an input. 0 = LOW 1 = HIGH

Value	Description	Valid range
0	GPIO1 – General Purpose Input/Output #1	0,1
1	GPIO2 – General Purpose Input/Output #2	0,1
2	GPIO3 – General Purpose Input/Output #3	0,1
3	GPIO4 – General Purpose Input/Output #4	0,1
4	GPIO5 – General Purpose Input/Output #5	0,1
5	GPIO6 – General Purpose Input/Output #6	0,1
6	GPIO7 – General Purpose Input/Output #7	0,1
7	GPIO8 – General Purpose Input/Output #8	0,1

4.9.1. $EVENT User Defined Input/Output (continued)

Modem Status Events - Events based on modem status.

Value	Description	Valid range
8	PWRUP – Modem power up	1
9	PLUS_CREG – Modem GSM registration. See AT+CREG command for range definitions.	0 to 5
10	%CGREG – Modem GPRS registration. See AT%CGREG command for range definitions.	0 to 8
11	NETWORK_IP – Receipt of IP address from network provider.	0,1 0 = No IP 1 = Available IP received from network
18	ADC1 – Input event ADC 1	0 to 1750
19	ADC2 – Input event ADC 2	0 to 1750
28	RTC (Real-Time Clock) Activation – Modem RTC has activated.	1
51	Input Event Counter	0
52	notification of a new incoming SMS message	0,1 0 = SMS is read from memory 1 = SMS is received

Input Timer Events - Event timer used to provide input signal based on timer value. See AT$EVTIME command to set pulse rate.

Value	Description	Valid range
12	EVTIM1 – Input event timer #1	1
13	EVTIM2 – Input event timer #2	1
14	EVTIM3 – Input event timer #3	1
15	EVTIM4 – Input event timer #4	1

4.9.1. $EVENT User Defined Input/Output (continued)

Output State Event - Events based on GPIO pin activity when defined as an output.

Value	Description
0	GPIO1 input – Changes GPIO line #1 to an input
1	GPIO2 input – Changes GPIO line #2 to an input
2	GPIO3 input – Changes GPIO line #3 to an input
3	GPIO4 input – Changes GPIO line #4 to an input
4	GPIO5 input – Changes GPIO line #5 to an input
5	GPIO6 input – Changes GPIO line #6 to an input
6	GPIO7 input – Changes GPIO line #7 to an input
7	GPIO8 input – Changes GPIO line #8 to an input
8	GPIO1 low – Generate a low signal on GPIO line #1
9	GPIO2 low – Generate a low signal on GPIO line #2
10	GPIO3 low – Generate a low signal on GPIO line #3
11	GPIO4 low – Generate a low signal on GPIO line #4
12	GPIO5 low – Generate a low signal on GPIO line #5
13	GPIO6 low – Generate a low signal on GPIO line #6
14	GPIO7 low – Generate a low signal on GPIO line #7
15	GPIO8 low – Generate a low signal on GPIO line #8
16	GPIO1 high – Generate a high signal on GPIO line #1
17	GPIO2 high – Generate a high signal on GPIO line #2
18	GPIO3 high – Generate a high signal on GPIO line #3
19	GPIO4 high – Generate a high signal on GPIO line #4
20	GPIO5 high – Generate a high signal on GPIO line #5
21	GPIO6 high – Generate a high signal on GPIO line #6
22	GPIO7 high – Generate a high signal on GPIO line #7
23	GPIO8 high – Generate a high signal on GPIO line #8

Output Transition Events - Events based on GPIO pin activity to transition an output line to the opposite state.

24	GPIO1 toggle – Transition line signal on GPIO line #1
25	GPIO2 toggle – Transition line signal on GPIO line #2
26	GPIO3 toggle – Transition line signal on GPIO line #3
27	GPIO4 toggle – Transition line signal on GPIO line #4
28	GPIO5 toggle – Transition line signal on GPIO line #5
29	GPIO6 toggle – Transition line signal on GPIO line #6
30	GPIO7 toggle – Transition line signal on GPIO line #7
31	GPIO8 toggle – Transition line signal on GPIO line #8

(continued)

Output Flash Events - Events based on GPIO pin activity to flash an output line.

32	GPIO1 flash – Flash line signal on GPIO line #1 based on parm1 and parm2 values
33	GPIO2 toggle – Flash line signal on GPIO line #2 based on parm1 and parm2 values
34	GPIO3 toggle – Flash line signal on GPIO line #3 based on parm1 and parm2 values
35	GPIO4 toggle – Flash line signal on GPIO line #4 based on parm1 and parm2 values
36	GPIO5 toggle – Flash line signal on GPIO line #5 based on parm1 and parm2 values
37	GPIO6 toggle – Flash line signal on GPIO line #6 based on parm1 and parm2 values
38	GPIO7 toggle – Flash line signal on GPIO line #7 based on parm1 and parm2 values
39	GPIO8 toggle – Flash line signal on GPIO line #8 based on parm1 and parm2 values

Output Message Events - Events that generate a UDP message based on GPIO pin activity.

40	Udp Message – Generate and transmit one UDP message based on parm1 and parm2 values.
41	Udp Message w/ Acknowledge – Generate and transmit a UDP message based on parm1 and parm2 values. This message is controlled by the $ACKTM and $WAKEUP parameters. This message can also be acknowledged thus canceling the $ACKTM and $EVTIM parameters.
42	UDP Broadcast message – Generate and broadcast an UDP message based on parm1 and parm2 values to all the IP addresses listed in the $friend command
45	Output message via SMS – Generate and broadcast a SMS message based on parm1 and parm2 values to all the SMS/email addresses listed in the $smsda command

4.9.1. $EVENT User Defined Input/Output

(continued)

Output Reset Timer Event -

43	Reset Timer – Reset timer (1 – 4) indicated by parm1 to a value specified by parm2 or to the original value if parm2 is set to 0. Continuous timers are used NOTE: Timers are reset, when expired, and start the countdown immediately after being reset. Hence, A user doesn't have to reset the timer every time it expires

Output AT Command Event - Event that executes stored AT commands as defined in the AT$STOATEV command.

44	Execute stored AT command – Execute stored AT command as defined in AT$STOATEV. Parm1 identifies the index number of the command to be executed as defined in AT$STOATEV. Parm 2 is ignored.

Real Time Clock Output Event

46	Set RTC On/Off time. Parm1 sets the RTC ON time in minutes while Parm2 sets the OFF time in mins

Event Counter

47	Event Counter. Counts occurrences of an event till the number specified by parm2 (parm1 is not used). The input event 51 is generated when maximum number is reached.

4.9.1. $EVENT User Defined Input/Output (continued)

<parm1> parameter values

Event Type	Event Category	Result
Input, transition, occurrence	Input State Event	Defines the valid start range
Input, transition, occurrence	Modem Status Event	Defines the valid start range
Input, transition, occurrence	Input Timer Event	Defines the valid start range
Output, transition, occurrence	Output State Event	Parm1 is ignored
Output	Output Transition Event	Parm1 is ignored
Output	Output Flash Event	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 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.
Output	Output Message Event	parm1 is a special user message identification. The 32-bit number entered can be used to dynamically generate intelligent messages. It will be the first 4 bytes of data following the API header in the output message. An example of using this field would be to designate the bytes as unique identifiers. Bytes 1 and 2 could identify the device, byte 3 could define the message format, and byte 4 could provide the event group that triggered the message.
Output	Output Reset Timer Event	Parm1 defines the timer (1 – 4) to be reset.

Output	Output AT Command Event	Parm1 identifies the index number of the command to be executed as defined in AT$STOATEV.
Output	Real Time Clock Output Event	Parm1 defines the ON time that the device will stay in normal power mode. The unit of this value is Minutes.
Output	Event Counter	Parm1 is Ignored

4.9.1. $EVENT User Defined Input/Output (continued)

<parm2> parameter values

Event Type	Event Category	Result
Input, transition, occurrence	Input State Event	Defines the valid end range
Input, transition, occurrence	Modem Status Event	Defines the valid end range
Input, transition, occurrence	Input Timer Event	Defines the valid end range
Output	Output State Event	Parm2 is ignored
Output	Output Transition Event	Parm2 is ignored
Output	Output Flash Event	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.
Output	Output Message Event	Parm2 defines the output UDP message format. **Bit 0**: 1 = send all numeric data, generated as a result of enabling and disabling bits below, in binary format 0 = send all numeric data, generated as a result of enabling and disabling bits below, in ASCII format **Bit 1**: 1 = add PARM1 value (4 bytes binary or 11 bytes ASCII) 0 = do not add Parm1 value **Bit 2**: 1 = add $MDMID value (22 bytes ASCII)

		0 = do not add $MDMID value **Bit 3**: 1 = add GPIO data and direction (2 bytes binary or 6 bytes ASCII) 0 = do not add GPIO data **Bit 4**: 1 = add ADC-1 value (2 bytes binary or 5 bytes ASCII) 0 = do not add ADC-1 value **Bit 5**: 1 = add ADC-2 value (2 bytes binary or 5 bytes ASCII) 0 = do not add ADC-1 value **Bit 6**: 1 = Store data when out of coverage 0 = discard data when out of coverage **Bit 7**: 1 = add Input Event code (1 bytes binary or 3 bytes ASCII) 0 = do not add Input Event code **Bits 8-17**: Reserved **Bit 18:** 1 = send message via SMS when GPRS is not present 0 = do not send message via SMS as backup **Bits 19–32**: Reserved
Output	Output Reset Timer Event	Parm2 defines the time that the timer needs to be reset to. A value of 0 indicates that the original timer value will not be changed. Unit of time is: seconds
Output	Output AT Command Event	Parm1 identifies the index number of the command to be executed as defined in AT$STOATEV.
Output	Real Time Clock Output Event	Parm2 defines the OFF time that the device will stay in RTC sleep mode. The unit of this value is Minutes.
Output	Event Counter	Parm2 defines the maximum value of the counter, which when reached will cause an input event (event 51) to be triggered. Range= 0 to 2147483647

Reference
Standard Scope Optional
Enfora Implementation Scope Full

4.9.1. $EVENT — User Defined Input/Output (continued)

Notes

Example:

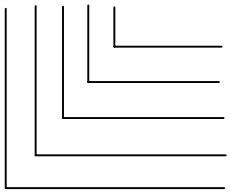
Objective: Create an input event that will generate an output event.

AT$EVENT parameters:

1a). Define, as a part of the first event group, a setting that monitors a state transition on pin 1 when it goes high (value of 1)

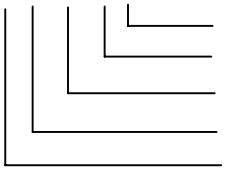
1b). Define, as a part of the first event group, a setting that transitions I/O (output) pin #2 state

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=1,3,25,0,0



Ignored
Ignored
Transition I/O line signal on GPIO #2
Output event
Event group 1

Query the EVENT table:

AT$EVENT?

The table should reflect the following:

$EVENT:	evgp	evtyp	evcat	p1	p2
	1A	0	0	1	1
	1B	3	25	0	0

4.9.2. $EVTIM# User Defined Input Event Timers

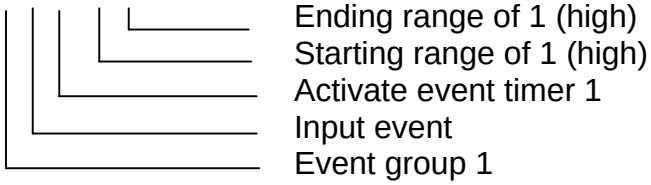
Command Function	This command allows the user to define up to 4 separate periodic input events in 1 second increments
Command Functional Group	Enfora Specific
Command Format Query Response	AT$EVTIM#=? $EVTIM#: (0-604800) OK
Write Format Response	AT$EVTIM#=<**rate**> OK
Read Format Response	AT$EVTIM#? $EVTIM#: <**rate**>
Execution Format Response	N/A N/A
Parameter Values	
<rate>	number of seconds between each generated input event.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$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



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: (1-5)<,AT commands> OK
Write Format Response	AT$STOATEV = <**1-15**>, < **AT command** > OK
Read Format Response	AT$ STOATEV? **$**STOATEV: **AT Event# AT Cmds** **1** **2** **…** **…** **15** OK
Execution Format Response	N/A N/A
Parameter Values	
<1-15 >	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.
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

4.10. 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=? $RTCALRM: (0..99), (1..12), (1..31), (0..23), (0..59), (0..59) OK
Write Format Response	AT$RTCALRM= <**rtc_year**>, <**rtc_month**>, <**rtc_day**>, <**rtc_hour**>, <**rtc_min**>, <**rtc_sec**> OK
Read Format Response	AT$RTCALRM? $RTCALRM: <**rtc_enabled**>, <**rtc_year**>, <**rtc_month**>, <**rtc_day**>, <**rtc_hour**>, <**rtc_min**>, <**rtc_sec**>” 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.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full

4.10.1. $RTCALRM — Real Time Clock Alarm (continued)

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 **Response**	N/A N/A
Write Format **Response**	N/A N/A
Read Format **Response**	N/A N/A
Execution Format **Response**	AT$RTCCLRA 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**>,<**update**> OK
Read Format Response	AT$RTCUPD? $RTCUPD: <**mode**>,<**update**> OK
Execution Format Response	N/A N/A
Parameter Values	
< 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
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	+CLCK 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. Miscellaneous Commands

4.12.1.%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

4.12.1 %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)

4.12.1. %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>

4.12.2.%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

4.12.3. %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	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT%CAOC
Response	%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

4.12.4. %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: **<cId>**,**<msgType>**,**<ibt>**,**<tch>** is sent to TE. **<cId>** 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

4.12.4. %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) **-1** not present **0** setup message **1** disconnect message **2** alert message **4** call proceed message **5** synchronization message **6** progress description message **7** connect **8** reset request for call reestablishment **9** reset confirm for call reestablishment **10** call release **11** call reject **12** mobile originated call setup
<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

4.12.4. %CPI	Call Progress Information (continued)
Notes	%CPI=4 appends an Advanced Cause Code (For Experienced Users Only)

4.12.5. %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	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT%CTV
Response	%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

4.12.6.%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=? %SNCNT: (0) OK
Write Format Response	N/A N/A
Read Format Response	AT%SNCNT? %SNCNT: **<nsapi1>, <upo>, <dno>, <upp>, <dnp><CR><LF>** %SNCNT: **<nsapi2>, <upo>, <dno>, <upp>, <dnp><CR><LF>** OK
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	N/A

4.12.7. %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.

4.12.8. %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.

4.12.9.%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.

4.12.9. %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.

4.12.9. %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
776F726480211001010010810600000000830600000000)

Example of Hex input parameters:

AT%CGPCO=0, “80C023160101001608757365726E616D650870617373
776F726480211001010010810600000000830600000000”, 1

4.12.10. %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

4.12.11. %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: (0,2) 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>].

4.12.11 %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

4.12.12. %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

4.12.13. %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

4.12.13. %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.
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.

4.12.14. %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

4.12.14. %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

4.12.15. %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.

4.12.16. $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

4.12.16. $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.**

4.12.17. $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

4.12.17 $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.**

4.12.18. $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.

4.12.19. $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

4.12.20. $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

4.12.21. $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

4.12.22. $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.

4.12.23. $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=? $MSCLS: (1-12) OK
Write Format Response	AT$MSCLS=**<msclass>** OK
Read Format Response	AT$MSCLS? $MSCLS: **<msclass>** OK
Execution Format Response	N/A N/A
Parameter Values	
<msclass>	1-12
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.

4.12.24. $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

4.12.25. $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.

4.12.26. $GATEWAY Gateway IP

Command Function	This command allows the user to select a gateway IP. Windows CE 3.0 devices and some Linux platforms require a gateway address. Default value “0.0.0.0” indicates that no gateway IP will be requested from the host. A non-zero value will cause the modem to request the indicated gateway IP from the host.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$GATEWAY=? $GATEWAY: ("<**IP**>") OK
Write Format Response	AT$GATEWAY =”<**IP** >” OK
Read Format Response	AT$GATEWAY? $GATEWAY: "<**IP** >”
Execution Format Response	N/A N/A
Parameter Values	
<IP>	gateway IP address.
Reference	
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

4.12.27. $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

4.12.27 $NETMON — Monitor Network Availability (continued)

Parameter Values

<net_unavail_min >	Number of minutes the network must remain unavailable before current network connection is released, and a new network connection is attempted. A value of zero means the connection will never be released via AT$NETMON.
<reset_cnt >	Number of connections released before the modem erases all volatile network knowledge, before attempting to make a network connection. A value of zero indicates that a reset will never occur via AT$NETMON.
<ping check >	Number of minutes between modem initiated ping checks. A value of zero indicates that the modem will never initiate a ping check. If a ping check is requested and the modem has obtained a valid IP, and no network data has been received within “ping check” minutes, the modem will generate a ping to the 1st server friend. If no ping response is received, the modem will initiate pings to all server friends. If no ping response is returned from the friend servers, a new IP is obtained via a modem initiated de-activate/activate sequence.
<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

4.12.27 $NETMON — Monitor Network Availability (continued)

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.

RST TIMERS parameter is only available on later firmware versions. For earlier versions and in the default configuration of later firmware versions, if the modem senses at command activity on the serial port, it will reset the timers defined in parameters <net unavail min> and <ping check>, and will not reset the modem if the timers expire. To disable serial port activity form effecting the timers, set this bit to 1

For later firmware versions, a check for valid IP has been added to the first parameter, <net_unavail_min>.

4.12.28. $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*

4.12.28. $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.

4.12.29. $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
4.12.29 $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.

.

4.12.30. $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

4.12.30 $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

4.12.31. $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$UDPMSG=<format>,<type>,<data> <cr>
Response	OK
Read Format Response	AT$ UDPMSG? OK
Execution Format Response	N/A 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)

(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)
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
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.

4.12.31 $UDPMSG

Send and Receive UDP Messages (continued)

<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.

4.12.32. $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

4.12.32 $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

4.12.33. $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

4.12.34. $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
<"data">	a maximum of 50 bytes ASCII characters

4.12.34 $MSGSND Message Send (continued)

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

4.12.34.1. $LOCI	**Location Information Configuration**
Command Function	This command allows the user to enable storage of the GSM LOCI info in the modem NVMEM
Command Functional Group	Enfora Specific
Command Format Query **Response**	AT$LOCI=? **(**0-1) OK
Write Format	AT$LOCI=<**mode**> <cr>
Response	OK
Read Format **Response**	AT$ 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.

4.12.34.2. $OFF	**Power off command**
Command Function	This command allows the user to perform a software-controlled shutdown. The modem gracefully deregisters from the network before powering down so it may take a few seconds before current consumption decreases. Requires a pulse on the PWR_CTRL or RESET pin to wake the unit back up.
Command Functional Group	Enfora Specific
Command Format Query	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT$OFF
Response	None, unit powers down
Parameter Values	None
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Refer to GSM0000AN020 for more details.

4.12.34.3. $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

4.12.34.3 $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.

4.12.34.4. $PWRMSG	**Power On Message**
Command Function	This command allows the user to change the default Power up message.
Command Functional Group	Enfora Specific
Command Format Query Response	AT$PWRMSG=? $PWRMSG: "<message>"
Write Format Response	AT$PWRMSG=”new pwr up message” OK
Read Format Response	AT$PWRMSG? $PWRMSG: "AT-Command Interpreter ready"
Execution Format Response	N/A N/A
Parameter Values <message>	New Power up Message
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$PWRMSG=”” will restore the power up message to the factory default.

4.12.34.4 $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"
```

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

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:	115200
Default Value Meaning:	The data rate of TA serial interface is 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.