

Application Note 010

GSM AT Command Set

Technical specifications and claims may be subject to variation without prior notice. UbiNetics has endeavoured to ensure that the information in this document is correct and fairly stated, but does not accept liability for any error or omission.

Prepared by: Chris Cockings
Date: 09-04-2001
Document Number: BCO-00-0621-AN

UbiNetics Ltd
Cambridge Technology Centre
Melbourn
Herts SG8 6DP
Tel: +44 (0) 1763 285 183
Fax: +44 (0) 1763 260 023
<http://www.ubinetics.com>
Email: support@ubinetics.com

Table of Contents

1.	Overview	7
2.	Definitions and Abbreviations.....	8
3.	Format of the AT Command String and Result Code.....	10
4.	Commands Specified by GSM 07.07	12
4.1	General Commands	12
4.1.1	AT+CGMI, Request Manufacturer Identification.....	12
4.1.2	AT+CGMM, Request Model Identification.....	12
4.1.3	AT+CGMR, Request Revision Identification	12
4.1.4	AT+CGSN, Request Product Serial Number Identification.....	12
4.1.5	AT+CSCS, Select TE Character Set.....	12
4.1.6	AT+CIMI, Request International Mobile Subscriber Identity.....	13
4.1.7	AT+WS46, Select Wireless Network.....	13
4.2	Call Control Commands.....	13
4.2.1	ATD, Dial Command.....	13
4.2.2	ATD>, Dial Selected Phone Book.....	14
4.2.3	ATD>, Dial Current Phone Book.....	14
4.2.4	AT+CHUP, Hangup Call	14
4.2.5	AT+CBST, Select Bearer Service Type	15
4.2.6	AT+CRLP, Radio Link Protocol	15
4.2.7	AT+CR, Service Reporting Control	16
4.2.8	AT+CEER, Extended Error Report	16
4.2.9	AT+CRC, Cellular Result Codes.....	18
4.3	Network Service Related Commands	18
4.3.1	AT+CNUM, Subscriber Number	18
4.3.2	AT+CREG, Network Registration	19
4.3.3	AT+COPS, Operator Selection	19
4.3.4	AT+CLCK, Facility Lock.....	20
4.3.5	AT+CPWD, Change Password.....	21
4.3.6	AT+CLIP, Calling Line Identification Presentation.....	22
4.3.7	AT+CLIR, Calling Line Identification Restriction.....	22
4.3.8	AT+COLP, Connected Line Identification Presentation.....	23
4.3.9	AT+CCFC, Call Forwarding Number and Conditions	23
4.3.10	AT+CCWA, Call Waiting	25
4.3.11	AT+CHLD, Call Related Supplementary Services	26
4.3.12	AT+CUSD, Unstructured Supplementary Service Data.....	26
4.3.13	AT+CLCC, List Current Calls	27
4.3.14	AT+CPOL, Preferred Operator List	28
4.3.15	AT+COPN, Read Operator Names	28
4.4	Mobile Equipment Control and Status Commands.....	28
4.4.1	AT+CFUN, Set Phone Functionality	28
4.4.2	AT+CPIN, Enter PIN.....	29

4.4.3	AT+CSQ, Signal Quality	29
4.4.4	AT+CPBS, Select Phone Book Memory Storage.....	30
4.4.5	AT+CPBR, Read Phone Book Entries	30
4.4.6	AT+CPBF, Find Phone Book Entries	30
4.4.7	AT+CPBW, Write Phone Book Entry	31
4.4.8	AT+CRSL, Ringer Sound Level	31
4.4.9	AT+CLVL, Set Speaker Amplifier Gain	32
4.5	Mobile Equipment Errors	32
4.5.1	AT+CMEE, Mobile Equipment Errors	32
4.6	Commands from TIA IS-101	32
4.6.1	AT+FCLASS, Select Mode	32
4.6.2	AT+VTS, DTMF Tone Generation	33
5.	Commands Specified by GSM 07.05	34
5.1	SMS Parameter Definitions	34
5.1.1	Message Storage Parameters	34
5.1.2	Message Data Parameters	34
5.2	General Configuration Commands	36
5.2.1	AT+CSMS, Select Message Service	36
5.2.2	AT+CPMS, Preferred Message Storage.....	37
5.2.3	AT+CMGF, SMS Format	37
5.3	Message Configuration Commands.....	37
5.3.1	AT+CSCA, Service Centre Address	37
5.3.2	AT+CSMP, Set Text Mode Parameters	38
5.3.3	AT+CSDH, Show Text Mode Parameters.....	38
5.3.4	AT+CSCB, Select Cell Broadcast Message Types	38
5.4	Message Receiving and Reading Commands	39
5.4.1	AT+CNMI, New Message Indications to TE.....	39
5.4.2	+CBM:, New Cell Broadcast Message.....	40
5.4.3	+CMT:, New Mobile Terminated Short Message	40
5.4.4	+CMTI:, New Mobile Terminated Short Message Indicator.....	40
5.4.5	AT+CMGL, List Messages.....	40
5.4.6	AT+CMGR, Read Message	41
5.5	Message Sending and Writing Commands	41
5.5.1	AT+CMGS, Send Message	41
5.5.2	AT+CMSS, Send Message from Storage	42
5.5.3	AT+CMGW, Write Message to Memory.....	42
5.5.4	AT+CMGD, Delete Message	43
6.	Commands Specified V.25ter Referenced by GSM 07.07	44
6.1	Generic DCE Control Commands.....	44
6.1.1	+++, Changes from Online Data mode to Online Command mode	44
6.1.2	A/, Repeat Last Command	44
6.1.3	ATZ, Reset to Default Configuration	44

6.1.4	AT&F, Set to Factory-Defined Configuration.....	44
6.1.5	ATI, Request Identification Information.....	44
6.1.6	AT+GMI, Request Manufacturer Identification.....	45
6.1.7	AT+GMM, Request Model Identification.....	45
6.1.8	AT+GMR, Request Model Revision.....	45
6.1.9	AT+GSN, Request Product Serial Number Identification.....	45
6.1.10	AT+GCAP, Request Complete Capabilities List.....	46
6.1.11	ATS3, Command Line Termination Character.....	46
6.1.12	ATS4, Response Formatting Character.....	46
6.1.13	ATS5, Command Line Editing Character.....	46
6.1.14	ATE, Command Echo.....	47
6.1.15	ATQ, Result Code Suppression.....	47
6.1.16	ATV, DCE Response Format.....	47
6.1.17	ATX, Call Progress Result Code Selection.....	47
6.1.18	AT+IPR, Fixed DTE-DCE Rate.....	48
6.1.19	AT+IFC, DTE-DCE Local Flow Control.....	48
6.2	Call Control Commands and Responses.....	49
6.2.1	ATA, Answer.....	49
6.2.2	ATH, Hook Control.....	49
6.2.3	ATO, Return to Online Data State.....	49
6.2.4	ATS0, Automatic Answer.....	49
6.2.5	ATS6, Pause Before Blind Dialling.....	49
6.2.6	ATS7, Connection Completion Timeout.....	50
6.2.7	ATS8, Comma Dial Modifier Time.....	50
6.2.8	ATL, Monitor Speaker Loudness.....	50
6.2.9	ATM, Monitor Speaker Mode.....	51
7.	Manufacturer Specified Commands.....	52
7.1	GDC200 Commands.....	52
7.1.1	AT+IMEI, Firmware Version.....	52
7.1.2	AT+INIT, Network Initialisation.....	52
7.2	GC201 Commands.....	52
7.2.1	AT+IMEI, Firmware Version.....	52
7.3	GA100 Commands.....	53
7.3.1	AT+IMEI, Firmware Version.....	53
7.3.2	AT+SIGN_ON, Application Takes Control of the Serial Bus.....	53
7.3.3	GEM_OFF, GA100 Powering Down.....	53
7.3.4	AT+SIGN_OFF, Application Releases the Serial Bus.....	53
7.3.5	AT+CLIP_CBC, Battery Level.....	53
7.3.6	AT+WAKE, Incoming Call Wakes Palm.....	54
7.3.7	AT+NOWAKE, Incoming Call Doesn't Wake Palm.....	54
7.3.8	AT+P_OFF, Powers Off GA100.....	54
7.3.9	AT+CLIP_PIN, Enters SIM PIN.....	54
7.3.10	AT+CLIP_PUK, Enters PUK.....	54

- 7.4 Common Specified Commands55
 - 7.4.1 AT+SET_VUS, Set Microphone Gain Control.....55
 - 7.4.2 ATD*#06#, Display IMEI Number55
- 8. CME and CMS Result Codes.....56
 - 8.1 Mobile Equipment Error Result Code +CME ERROR:56
 - 8.2 Message Service Failure Result Code +CMS ERROR:57
- 9. References.....60

1. OVERVIEW

UbiNetics produces a range of dual band GSM radio modems, which give compatible mobile devices wireless connectivity using the GSM900/1800 cellular networks.

Each modem interfaces to the host via a Universal Synchronous/Asynchronous Serial Receiver-Transmitter (USART), which is automatically detected by the operating system and easily configured using standard operating system drivers.

The modems are controlled by industry standard AT commands which are defined by ETSI in GSM 07.07, GSM 07.05, V.25ter and T.32. These may be downloaded from <http://www.etsi.org> or <http://www.3gpp.org>

This application note describes the AT command set supported by UbiNetics for use with the following modems;

- GDC200 Firmware 1.18.5
- GC201 Firmware 1.18.5
- GA100 Firmware R13.000.01

All other commands not included within this document, whether recognised or not, are not supported and their use is not guaranteed.

For technical support please send a clear and concise email to support@ubinetics.com, where your query will be logged and answered as quickly as possible.

2. DEFINITIONS AND ABBREVIATIONS

This section contains a list of commonly used definitions and abbreviations which are used through out this document.

Offline Command State

The modem enters this state after power up i.e. the modem is not in a data call (offline) and ready to accept AT commands.

Online Data State

The modem will change from offline command state to online data state after successfully setting up a data call. This allows the mobile station to exchange data with the remote station.

Online Command State

To change from online data state to online command state the DTE sends the escape sequence +++. This allows AT commands to be sent to the modem whilst still retaining the data connection to the remote station. The command ATH will end the data call and ATO will return to online data state.

Remote Station

This is the term given to describe the equipment or modem at the other end of the link, when making a mobile originated or mobile terminated call.

Mobile Station

Through out this document this term refers to the UbiNetics modem.

Mobile Originated (MO)

This means a voice call, data call or SMS has initiated by the modem.

Mobile Terminated (MT)

This means a voice call, data call or SMS has been received by the modem.

Syntactical Definitions

The following syntactical definitions are used throughout this document;

<cr> Carriage Return character.

<lf> Line Feed character.

<...> a subparameter enclosed within angle brackets, is a syntactical element. The brackets themselves do not appear in the command line.

[...] Optional subparameter, is enclosed within square brackets. This indicates the element may or may not be present within a result code or can be omitted from

the command string. The square brackets themselves do not appear in the command line.

underline Indicates a default setting of a subparameter value.

Abbreviations

GSM	Global System for Mobile communications
AT	ATtention, used to start a command line.
CBM	Cell Broadcast Message.
SMS	Short Message Service.
PIN	Personal Identity Number.
DCE	Data Connection Equipment, within this document refers to the modem.
DTE	Data Terminal Equipment, this refers to the host device/application.
ETSI	European Telecommunications Standards Institute.
IMEI	International Mobile station Equipment Identity.
ITU-T	International Telecommunication Union = Telecommunication Standardisation Sector.
PDU	Protocol Data Unit.
RLP	Radio Link Protocol.
SIM	Subscriber Identity Module.
TE	Terminal Equipment, refers to the host device/application.
TA	Terminal Adapter, refers to the modem.
ME	Mobile Equipment, refers to the modem.
TIA	Telecommunications Industry Association.
TAPI	Telephone APplication Interface.
PIN	Personal Identification Number, 4 digit code used to protect the SIM.
PUK	Unblocking Key, 8 digit code used to unblock SIM PIN.

3. FORMAT OF THE AT COMMAND STRING AND RESULT CODE

In general AT commands comprises of three parts, which start with AT, followed by a command and ended with the line termination character <cr>. The exceptions to this are A/ and +++ which are sent without AT and carriage return.

The response from each command varies and is documented within the following text. In general a successful command will respond with OK, whilst an unrecognised command will fail with an error. If the command is recognised but fails due to an invalid subparameter, equipment error or network error, a more informative result code may be obtained by using the command AT+CMEE=2, to display extended verbose result codes.

Types of Commands

AT commands have three basic structures, some of which are not applicable to all command types, for further information see the individual commands.

- **Test Commands (ATxxx=?)** test's the existence of a command and checks it's range of subparameter(s). UbiNetics may not support the full range of values returned by this command.
- **Read Commands (ATxxx?)** reads the current value of the subparameter(s).
- **Set Command (ATxxx=a,b)** will attempt to set a new subparameter value(s). If the command is successful the AT command interpreter will return OK (if ATV1, ATQ0) otherwise an error or informative result code will be returned.

Command Line Editing

When using a terminal screen to talk directly to the modem, the Back Space <bs> character is useful for deleting previous character(s) sent in error. However Back Space can not delete the initial AT or the line termination character <cr>.

Command Line Termination

The line termination character Carriage Return <cr> tells the modem to accept and process the command.

Command Formatting

Result code(s) that are sent from the modem use the Line Feed character <lf> appended to a Carriage Return <cr>, to correctly format the text on different lines.

Command Line Echo

In command mode, characters that are sent to the modem are echoed back to the DTE. This can be disabled by using the AT Command ATE0.

Concatenation

Several commands may be joined together to form a single command string, that must be no longer than 350 characters (including the line termination character <cr>).

When concatenating commands only one AT is required at the beginning of the string and one carriage return at the end. In the middle, commands joined together in the order to be processed. Extended command i.e. ones which start AT+ also require an additional semi-colon (;). If an error occurs whilst processing the string, the following commands will not be processed and an error returned. See the examples below;

```
ATE0V1D123456;<cr>  
AT+CMGR=1,2;+CMGR=3,4<cr>
```

Some AT commands are not suitable for concatenation and careful thought is required before stringing together many AT commands.

Response Code Format

The format of the result code is controlled by ATV. The default setting is verbose <cr><lf>OK<cr><lf>.

Response Code Suppression

Response code suppression is controlled by ATQ. By default response codes are shown.

Final Result Code

This is the last result code returned by the command being processed. In the case of the Dial command this could be OK, NO CARRIER, NO DIALTONE, NO ANSWER, BUSY, ERROR.

Intermediate Result Code

This is a result code which is displayed before the final result code. In the case of the Dial command this could be CONNECT or CONNECT<text>.

Unsolicited Result Code

These are result codes generated by an event not directly linked to the command which is being processed. A good example is an incoming voice call will generate RING or +CRING: VOICE when AT+CRG=1.

4. COMMANDS SPECIFIED BY GSM 07.07

This section covers the AT commands that specified within GSM 07.07 and supported by the UbiNetics modems.

4.1 GENERAL COMMANDS

4.1.1 AT+CGMI, Request Manufacturer Identification

Execution command causes the modem to return the manufacturer specific identity.

Command	Possible Response
AT+CGMI=?	
AT+CGMI	Ubinetics Ltd

4.1.2 AT+CGMM, Request Model Identification

Execution command causes the modem to return the manufacturer specific model identity.

Command	Possible Response
AT+CGMM=?	
AT+CGMM	GDC200 GC201 GA100

4.1.3 AT+CGMR, Request Revision Identification

Execution command causes the modem to return the manufacturer specific model revision identity.

Command	Possible Response
AT+CGMR=?	
AT+CGMR	<revision>

4.1.4 AT+CGSN, Request Product Serial Number Identification

This command causes the modem to return the product serial number.

Command	Possible Response
AT+CGSN=?	
AT+CGSN	02-GDC200-xxxxxxx 02-GC201-xxxxxxx 02-GA100-xxxxxxx

4.1.5 AT+CSCS, Select TE Character Set

This command selects the character set used by the modem, to allow correct conversion of the character strings between the DTE and the modem.

Command	Possible Response
AT+CSCS=?	+CSCS: (list of supported <chset>s)
AT+CSCS?	+CSCS: <chset>
AT+CSCS=<chset>	

<chset>:

- "GSM" GSM alphabet
- "IRA" International Reference Alphabet
- "HEX" Hexadecimal numbers from 00 to FF

Note: GA100 defaults to HEX

4.1.6 AT+CIMI, Request International Mobile Subscriber Identity

Execution command causes the modem to return the International Mobile Subscriber Identity Number (IMSI), when IMSI attached to a network.

Command	Possible Response
AT+CIMI	<imsi>

<imsi>:

International Mobile Subscriber Identity number

4.1.7 AT+WS46, Select Wireless Network

Selects the cellular network Wireless Data Service (WDS) to operate with the modem.

Command	Possible Response
AT+WS46=?	(list of supported <n>s)
AT+WS46?	<n>
AT+WS46=[<n>]	

<n>:

- 12 GSM digital cellular

4.2 CALL CONTROL COMMANDS

4.2.1 ATD, Dial Command

Initiates a Mobile Originated call to the destination number <n>. If characters are sent after <cr> but before receiving the connect (or OK) message, the call will be aborted.

Command	Possible Response
ATD<n>[<mgsm>][;]	see the table below

<n>:

destination number containing the following characters 0-9,*,#,+ ,A,B,C,D

<mgsm>:

- , pause during dialling, ignored
- T tone dialling, ignored
- P pulse dialling, ignored
- ! register recall/hook flash, ignored

W wait for dial tone, ignored
 @ wait for quiet answer, ignored
 I restrict CLI presentation, overriding AT+CLIR setting
 ; originate a voice call

Note: ATD112; is reserved for emergency calls only.

Verbose Result Code	Numeric Result Code	Description
OK	0	Command executed, no error
CONNECT	1	Connection set up (ATX=0)
CONNECT <text>	1	Connection set up (ATX=n) where n>0
RING	2	Ringing tone is present (AT+CRC=0)
NO CARRIER	3	Call failed to connect or disconnected
ERROR	4	Invalid command or too long
BUSY	7	The called party is currently in another call
NO ANSWER	8	Connection failed up to time out

4.2.2 ATD>, Dial Selected Phone Book

Initiates a Mobile Originated call, from the specified phone book and location. If characters are sent after <cr> but before receiving the connect (or OK) message, the call will be aborted.

Command	Possible Response
ATD><mem><n>[I];]	see the table within Dial Command

<mem>:

EN Emergency Number
 AD SIM phone book

<n>: (memory location of number to dial)

I restrict CLI presentation, overriding AT+CLIR setting
 ; originate a voice call

4.2.3 ATD>, Dial Current Phone Book

Initiates a mobile originated call, from the currently selected phone book, location <n>. If characters are sent after <cr> but before receiving the connect (or OK) message, the call will be aborted.

Command	Possible Response
ATD><n>[I];]	see the table within Dial Command

<n>: (number of memory location to dial)

I restrict CLI presentation, overriding AT+CLIR setting
 ; originate a voice call

4.2.4 AT+CHUP, Hangup Call

Execution command hangs up all active calls, giving an assured procedure to terminate an alternating mode call.

Command	Possible Response
AT+CHUP	

4.2.5 AT+CBST, Select Bearer Service Type

Set command selects the bearer service for Mobile Originated calls. Values may also be used during mobile terminated data call setup.

Command	Possible Response
AT+CBST=?	+CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s)
AT+CBST?	+CBST: <speed>,<name>,<ce>
AT+CBST=[<speed>[,<name>[,<ce>]]]	

<speed>:

- 7 9600 bps (V.32)
- 12 9600 bps (V.34)
- 14 14400 bps (V.34)
- 71 9600 bps (V.110)
- 75 14400 bps (V.110)

<name>:

- 0 data circuit asynchronous (UDI or 3.1 kHz modem)

<ce>: (sets whether error correction is performed by RLP, or by other means)

- 0 transparent
- 1 non-transparent

Note: fax is only supported at 9600 bps

4.2.6 AT+CRLP, Radio Link Protocol

Radio link protocol (RLP) parameters used for non-transparent data calls.

Command	Possible Response
AT+CRLP=?	+CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <t1>s),(list of supported <n2>s)]<cr><lf> [+CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <t1>s),(list of supported <n2>s)] [...]]
AT+CRLP?	+CRLP: <iws>,<mws>,<t1>,<n2>]]<cr><lf> +CRLP:<iws>,<mws>,<t1>,<n2>]] [...]]
AT+CRLP=[<iws>[,<mws>[,<t1>[,<n2>]]]]]	

<iws>: (IWF to MS window size)

- 0-61

<mws>: (MS to IWF window size)

- 0-61

<t1>: (acknowledgement timer t1, in 10ms units)

39-~~48~~-255

<n2>: (retransmission attempts n2)

1-~~6~~-255

Note: Only version 1 is supported. <ver> and <t4> are not implemented. Not all of the combinations of parameters have not been tested.

4.2.7 AT+CR, Service Reporting Control

Set command controls whether or not intermediate result code is returned from the modem to the DTE. If enabled, the intermediate result code is transmitted when the modem has established the speed, which is before the final result code connect.

Command	Possible Response
AT+CR=?	+CR: (list of supported <mode>s)
AT+CR?	+CR: <mode>
AT+CR=[<mode>]	
intermediate result code	+CR: <serv>

<mode>:

0 disables reporting

1 enables reporting

<serv>: (service supported, displayed after connect message)

ASYNC asynchronous transparent

REL ASYNC asynchronous non-transparent

4.2.8 AT+CEER, Extended Error Report

This command returns information text, which offers the user an extended report for the reason of the failure of the last unsuccessful call set up (originating or answering) or in-call modification.

Command	Possible Response
AT+CEER	+CEER: <report>

<report>: (list of possible reports)

no error

unassigned number

no route to destination

channel unacceptable

operator determined barring

normal call clearing

user busy

no user responding

user alerting no answer

call rejected

number changed

non selected user clearing
destination out of order
invalid number format
facility rejected
response to status enquiry
normal unspecified
no channel available
network out of order
temporary failure
switching equipment congestion
access information discarded
requested channel unavailable
resources unavailable
quality of service unavailable
requested facility unsubscribed
incoming calls barred within CUG
bearer capability not authorized
bearer capability not available
service not available
bearer service not implemented
ACM reached ACM maximum
facility not implemented
only restricted bearer cap. avail.
service not implemented
invalid TI
no member of CUG
incompatible destination
invalid transit network selection
incorrect message
invalid mandatory information
message type not implemented
message type incompatible
info element not implemented
conditional info element error
message incompatible
recovery on time expiry
protocol error

interworking error
 bearer service not available
 no TI available
 timer 303 expiry
 establishment failure
 no error
 operation failed
 timeout
 bearer service not compatible
 NULL

4.2.9 AT+CRC, Cellular Result Codes

Set command controls the use of extended format reporting during a MT call set up.

Command	Possible Response
AT+CRC=?	+CRC: (list of supported <mode>s)
AT+CRC?	+CRC: <mode>
AT+CRC=[<mode>]	
unsolicited result code	+CRING: <type>

<mode>:

- 0 disables extended format (i.e. +RING)
- 1 enables extended format (i.e. +CRING: VOICE)

<type>:

- ASYNC asynchronous transparent
- REL ASYNC asynchronous non-transparent
- VOICE normal voice
- FAX Facsimile

4.3 NETWORK SERVICE RELATED COMMANDS

4.3.1 AT+CNUM, Subscriber Number

Action command returns the MSISDNs related to the subscriber. If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line.

Command	Possible Response
AT+CNUM=?	
AT+CNUM	+CNUM: [<alpha1>],<number1>,<type1> [,<speed>,<service>[,<itc>]][<cr><lf> +CNUM: [<alpha2>],<number2>,<type2> [,<speed>,<service>[,<itc>]][...]]

<alphax>:

optional alphanumeric string associated with <numberx>

<numberx>:

string type phone number of format specified by <typex>

<typex>:

type of address octet in integer format

<speed>:

As defined in AT+CBST

<service>: (service related to the phone number)

- 0 asynchronous modem
- 1 synchronous modem
- 2 PAD access (asynchronous)
- 3 packet access (synchronous)
- 4 voice
- 5 fax

<itc>: (information transfer capability)

- 0 3.1 kHz
- 1 UDI

4.3.2 AT+CREG, Network Registration

Displays network registration status.

Command	Possible Response
AT+CREG=?	+CREG: (list of supported <n>s)
AT+CREG?	+CREG: <n>,<stat>
AT+CREG=<n>	
unsolicited result code	+CREG: <stat>

<n>:

- 0 disable network registration unsolicited result code
- 1 enable network registration unsolicited result code

<stat>:

- 0 not registered new operator to registered and not searching
- 1 registered, home network
- 2 not registered, currently searching a new operator to register with
- 3 registration denied
- 4 unknown
- 5 registered, roaming

4.3.3 AT+COPS, Operator Selection

Registers/displays network operators available.

Command	Possible Response
AT+COPS=?	+COPS: ([list of supported <stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>)][,,(list of supported <mode>s),(list of supported <format>s)]
AT+COPS?	+COPS: <mode>[,<format>,<oper>]
AT+COPS=[<mode>[,<format>,<oper>]] e.g. AT+COPS=1,2,"23410"	

<stat>: (availability of operator)

- 0 unknown
- 1 available
- 2 current
- 3 forbidden

<oper>:

shows the operator identity, within speech marks, in the format set by <format>

<mode>: (registration mode)

- 0 automatic (<oper> field is ignored)
- 1 manual (<oper> field shall be present)
- 2 de-register from network
- 3 set only <format> (for read command AT+COPS?), do not attempt registration / de-registration (<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>: (format of <oper> reports)

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

4.3.4 AT+CLCK, Facility Lock

This command is used to lock, unlock or interrogate the modem or a network facility. A password is required for some actions.

Command	Possible Response
AT+CLCK=?	+CLCK: (list of supported <fac>s)
AT+CLCK=<fac>,<mode>[,<passwd>] ,<class>]] e.g. AT+CLCK="SC",0,"1111"	when <mode>=2 and command successful; +CLCK: <status>[,<class1>[<cr><lf> +CLCK: <status>,<class2>[...]]

<fac>: (within speech marks)

- SC SIM (lock SIM card) SIM asks password in modem power-up and when this lock command issued

- AO BAOC (Barr All Outgoing Calls)
- OI BOIC (Barr Outgoing International Calls)
- OX BOIC-exHC (Barr Outgoing International Calls except to Home Country)
- AI BAIC (Barr All Incoming Calls)
- IR BIC-Roam (Barr Incoming Calls when Roaming outside the home country)
- AB All Barring services
- AG All outGoing barring services
- AC All inComing barring services
- FD SIM fixed dialling memory feature, if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>

<mode>:

- 0 unlock
- 1 lock
- 2 query status

<status>:

- 0 not active (when mode=2, indicates no services are active)
- 1 active

<passwd>: (the same password used by AT+CPWD, within speech marks)

<classx>: (is a sum of integers each representing a class of information)

- 1 voice (telephony)
- 2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)
- 4 fax (facsimile services)
- 7 all classes

4.3.5 AT+CPWD, Change Password

Action command sets a new password for the facility lock function defined by command facility lock (AT+CLCK).

Command	Possible Response
AT+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>)s
AT+CPWD=<fac>,<oldpwd>,<newpwd> e.g. AT+CPWD="SC","1234","4321"	

<fac>:

- SC lock SIM card, asks password in modem power-up and when this lock command issued (SIM PIN1)
- AO Barr All Outgoing Calls (BAOC)
- OI Barr Outgoing International Calls (BOIC)
- OX Barr Outgoing International Calls except to Home Country (BOIC-exHC)

- AI Barr All Incoming Calls (BAIC)
- IR Barr Incoming Calls when Roaming outside the home country (BIC-Roam)
- AB All Barring services
- AG All outGoing barring services
- AC All inComing barring services
- P2 SIM PIN2

<pwdlength>:

integer type, maximum length of the password for the facility (see, AT+CPWD=?)

<oldpwd>: (string type; shall be the same as password specified for the facility from the modem AT command interface or with command Change Password AT+CPWD)

<newpwd>: (string type; shall be the new password for the facility from the modem AT command interface or with command Change Password AT+CPWD)

4.3.6 AT+CLIP, Calling Line Identification Presentation

This command allows the called subscriber to get the Calling Line Identity (CLI) of the calling party, in a mobile terminated call.

Command	Possible Response
AT+CLIP=?	+CLIP: (list of supported <n>s)
AT+CLIP?	+CLIP: <n>,<m>
AT+CLIP=[<n>]	
unsolicited result code, displayed when CLI is enabled for the first two rings	+CLIP: <number>,<type>

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

0 disable

1 enable

<m>: (parameter shows the subscriber CLIP service status in the network)

0 CLIP not provisioned

1 CLIP provisioned

2 unknown (e.g. no network, etc.)

<number>: (string type phone number in "quotes", in the format specified by <type>)

<type>: (type of number)

129 dial string without the international access character

145 dial string which includes the international access character "+"

4.3.7 AT+CLIR, Calling Line Identification Restriction

This command enables/disables CLI to the called party, when originating a call.

Command	Possible Response
AT+CLIR=?	+CLIR: (list of supported <n>s)
AT+CLIR?	+CLIR: <n>,<m>
AT+CLIR=[<n>]	

<n>: (this setting effects CLI status for following calls)

- 0 presentation indicator is used according to the subscription of the CLIR service
- 1 CLIR invocation (hide)
- 2 CLIR suppression (show)

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

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

4.3.8 AT+COLP, Connected Line Identification Presentation

COLP enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call.

Command	Possible Response
AT+COLP=?	+COLP: (list of supported <n>s)
AT+COLP?	+COLP: <n>,<m>
AT+COLP=[<n>]	
Intermediate result code	+COLP:<number>,<type>[,<subaddr>,<satype> [,<alpha>]]

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

- 0 disable
- 1 enable

<m>: (parameter shows the subscriber COLP service status in the network)

- 0 COLP not provisioned
- 1 COLP provisioned
- 2 unknown (e.g. no network, etc.)

<number>: (string type phone number in "brackets" of format specified by <type>)

<type>: (type of address octet in integer format. 145 when the dial string contains + otherwise 129)

4.3.9 AT+CCFC, Call Forwarding Number and Conditions

This command allows control over the call forwarding supplementary service providing, registration, erasure, activation, deactivation and status query.

Command	Possible Response
AT+CCFC=?	+CCFC: (list of supported <reason>s)
AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]]	When <mode>=2 and command successful; +CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][<cr><lf> +CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][...]]
e.g. AT+CCFC=0,3,"01763262222"	

<reason>:

- 0 unconditional
- 1 mobile busy
- 2 no reply
- 3 not reachable
- 4 all call forwarding
- 5 all conditional call forwarding

<mode>:

- 0 disable
- 1 enable
- 2 query status
- 3 registration
- 4 erasure

<number>: (string type phone number of forwarding address in format specified by <type>)

<type>: (type of number)

- 129 dial string without the international access character
- 145 dial string which includes the international access character "+"

<subaddr>: (string type subaddress of format specified by <satype>)

<satype>: (type of subaddress octet in integer format)

- 128 default

<classx>: (is a sum of integers each representing a class of information)

- 1 voice (telephony)
- 2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)
- 4 fax (facsimile services)
- 7 All classes
- 8 short message service
- 16 data circuit sync
- 32 data circuit async
- 64 dedicated packet access

128 dedicated PAD access

<time>:

1-20-30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded

<status>:

0 not active (when <mode>=2, means not active for all class)

1 active

4.3.10 AT+CCWA, Call Waiting

This command allows control over the call waiting supplementary service providing, activation, deactivation, and status query.

Command	Possible Response
AT+CCWA=?	+CCWA: (list of supported <n>s)
AT+CCWA?	+CCWA: <n>
AT+CCWA=[<n>[,<mode>[,<class>]]]	When <mode>=2 and command successful; +CCWA: <status>,<class1>[<cr><lf> +CCWA: <status>,<class2>[...]]
unsolicited result code (when <n>=1)	+CCWA: <number>,<type>,<class>[,<alpha>]

<n>: (sets/shows the result code presentation status in the modem)

0 disable

1 enable

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

0 disable

1 enable

2 query status

<classx>: (is a sum of integers each representing a class of information)

1 voice (telephony)

2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)

4 fax

8 short message service

16 data circuit sync

32 data circuit async

64 dedicated packet access

128 dedicated PAD access.

<status>:

0 not active, (when <mode>=2, means not active for all class)

1 active

<number>: (string type phone number of calling address in format specified by <type>)

<type>: (type of address octet in integer format)

<alpha>: (optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook)

4.3.11 AT+CHLD, Call Related Supplementary Services

This command allows call control using Call Hold and MultiParty.

Command	Possible Response
AT+CHLD=?	+CHLD: (list of supported <n>s)
AT+CHLD=[<n>]	

<n>: (integer type)

- 0 releases all held calls or sets User Determined User Busy (UDUB) for a waiting call
- 1 releases all active calls (if any exist) and accepts the other (held or waiting) call
- 1x releases a specific active call X
- 2 places all active calls (if any exist) on hold and accepts the other (held or waiting) call
- 2x places all active calls on hold except call X with which communication shall be supported
- 3 adds a held call to the conversation
- 4 connects the two calls and disconnects the subscriber from both calls (ECT)

4.3.12 AT+CUSD, Unstructured Supplementary Service Data

This command allows control of the Unstructured Supplementary Service Data, for both network and mobile initiated operations.

Command	Possible Response
AT+CUSD=?	+CUSD: (list of supported <n>s)
AT+CUSD?	+CUSD: <n>
AT+CUSD=[<n>[,<str>[,<dcs>]]]	
unsolicited result code	+CUSD: <m>[,<str>,<dcs>]

<n>:

- 0 disable the result code presentation in the TA
- 1 enable the result code presentation in the TA

<str>: (string type USSD-string, when <str> parameter is not given, network is not interrogated)

<dcs>: (Cell Broadcast Data Coding Scheme in integer format)

<m>:

- 0 no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation)

- 1 further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)
- 2 USSD terminated by network
- 3 other local client has responded
- 4 operation not supported
- 5 network time out Implementation

4.3.13 AT+CLCC, List Current Calls

This returns a list of current call of the modem, if any.

Command	Possible Response
AT+CLCC	[+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]][<cr><lf>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]][...]]

<idx>: (call identification number, this number can be used in AT+CHLD command operations)

<dir>:

- 0 mobile originated (MO) call
- 1 mobile terminated (MT) call

<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
- 9 unknown

<mpty>:

- 0 call is not one of multiparty (conference) call parties
- 1 call is one of multiparty (conference) call parties

<number>: (phone number in format specified by <type>, within "quotes")

<type>: (type of number)

- 129 dial string without the international access character
- 145 dial string which includes the international access character "+"

<alpha>: (alphanumeric representation of <number> corresponding to the entry found in phonebook)

4.3.14 AT+CPOL, Preferred Operator List

This command is used to edit the SIM preferred list of networks.

Command	Possible Response
AT+CPOL=?	+CPOL: (list of supported <index>s),(list of supported <format>s)
AT+CPOL?	+CPOL: <index1>,<format>,<oper1> [<cr><lf> +CPOL: <index2>,<format>,<oper2>[...]]
AT+CPOL=[<index>][,<format>[,<oper>]]	

<index>,<indexn>: (integer type; the order number of operator in the SIM preferred operator list. With the execute command, if <index> is left out the next free location shall be used)

<format>: (If only the <format> is given, the result format changes for the read command)

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

<oper>,<opern>: (string type; <format> indicates if the format of <oper> also see AT+COPS)

Note: To delete an entry, give <index> but leave out <oper>.

4.3.15 AT+COPN, Read Operator Names

This command returns the list of operator names from the modem. Each operator code <numeric n> that has an alphanumeric equivalent <alpha n> in the ME memory.

Command	Possible Response
AT+COPN=?	
AT+COPN	+COPN: <numeric1>,<alpha1>[<cr><lf> +COPN: <numeric2>,<alpha2>[...]]

<numeric n>: (string type; operator in numeric format (see AT+COPS))

<alpha n>: (string type; operator in long alphanumeric format (see AT+COPS))

4.4 MOBILE EQUIPMENT CONTROL AND STATUS COMMANDS

4.4.1 AT+CFUN, Set Phone Functionality

This command sets level of functionality provided by the modem.

Command	Possible Response
AT+CFUN=?	CFUN: (list of supported <fun>s)
AT+CFUN?	CFUN: <fun>
AT+CFUN=[<fun>]	

<fun>:

- 0 sets minimum functionality. In this mode the modem de-registers from the network and powers down the SIM interface and RF circuitry
- 1 sets full functionality

Note: The GDC200 defaults to 0

4.4.2 AT+CPIN, Enter PIN

This command is used to query and enter a password which is necessary before the modem will operate. If the PIN is to be entered twice, the modem shall automatically repeat the PIN.

Command	Possible Response
AT+CPIN=?	
AT+CPIN?	+CPIN: <code>
AT+CPIN=<pin>[,<newpin>] e.g. AT+CPIN? +CPIN: SIM PIN AT+CPIN="1234"	

<pin>,<newpin>: (string type values within "quotes")

<code>:

READY	no passwords required
SIM PIN	waiting for SIM PIN i.e. on power up SIM PIN 1
SIM PUK	waiting for SIM PUK, SIM PIN 1 unblocking code. parameter <newpin> in the new SIM PIN code.
PH-SIM PIN	waiting for phone-to-SIM card password
PH-FSIM PIN	waiting for phone-to-very first SIM card password
PH-FSIM PUK	waiting for phone-to-very first SIM card un-blocking password
SIM PIN2	waiting for SIM PIN2 password. This <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17)
SIM PUK2	waiting for SIM PUK2 password. This <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18)

4.4.3 AT+CSQ, Signal Quality

This command returns the signal strength of the registered network.

Command	Possible Response
AT+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported <ber>s)
AT+CSQ	+CSQ: <rssi>,<ber>

<rssi>:

2 - 30	-109 to -53 dBm
31	-51 dBm or greater
99	not known or not detectable

<ber>: (in percent, not supported)

99 unknown

4.4.4 AT+CPBS, Select Phone Book Memory Storage

This command selects phonebook memory storage <storage>, which is used by other phonebook commands.

Command	Possible Response
AT+CPBS=?	+CPBS: (list of supported <storage>s)
AT+CPBS?	+CPBS: <storage>[,<used>,<total>]
AT+CPBS=<storage> e.g. AT+CPBS="AD"	

<storage>:

EN Emergency Number

AD SIM phone book

<used>: (indicates the number of used locations in selected memory)

<total>: (indicates the total number of locations in selected memory)

4.4.5 AT+CPBR, Read Phone Book Entries

This command returns the phonebook entry for location <index> of the currently selected phone book (AT+CPBS). If all queried locations are empty (but available), no information text lines may be returned.

Command	Possible Response
AT+CPBR=?	+CPBR: (list of supported <index>s),[<nlength>],[<tlength>]
AT+CPBR=<index1> [,<index2>]	[+CPBR: <index1>,<number>,<type> ,<text>[[...]<cr><lf> +CPBR: <index2>,<number>,<type> ,<text>]]

<index1>,<index2>,<index>: (range of location numbers of phonebook memory)

<number>: (phone number in format <type>)

<type>: (type of phone number)

129 dial string without international access character

145 dial string which includes the international access character "+"

<text>: (text field of maximum length <tlength>)

<nlength>: (value indicating the maximum length of field <number>)

<tlength>: (value indicating the maximum length of field <text>)

4.4.6 AT+CPBF, Find Phone Book Entries

This command returns phonebook entries from the current phone book which alphanumeric field start with string <findtext>.

Command	Possible Response
AT+CPBF=?	+CPBF: [<nlength>],[<tlength>]
AT+CPBF=<findtext> e.g. AT+CPBF="UbiNetics"	[+CPBF: <index1>,<number>,<type> ,<text>[[...]<cr><lf> +CBPF: <index2>,<number>,<type> ,<text>]]

<index1>,<index2>: (values in the range of location numbers of phonebook memory)

<number>: (phone number of format <type>)

<type>: (type of phone number)

129 dial string without the international access character

145 dial string which includes the international access character "+"

<findtext>,<text>: (field of maximum length <tlength>)

<nlength>: (value indicating the maximum length of field <number>)

<tlength>: (value indicating the maximum length of field <text>)

4.4.7 AT+CPBW, Write Phone Book Entry

This command writes an entry to location number <index> in the current phonebook.

Command	Possible Response
AT+CPBW=?	+CPBW: (list of supported <index>s), [<nlength>],[list of supported <type>s), [<tlength>]
AT+CPBW=[<index>][,<number>[,<type> [,<text>]]] e.g. AT+CPBW=1,"+441763262222",145,"Ubi Netics"	

<index>: (range of valid location numbers for the selected phonebook memory. If this is omitted when writing an entry the first free location shall be used)

<number>: (phone number of format <type>)

<type>: (type of phone number)

129 dial string without the international access character

145 dial string which includes the international access character "+"

<text>: (field of maximum length <tlength>)

<nlength>: (value indicating the maximum length of field <number>)

<tlength>: (value indicating the maximum length of field <text>)

Note: To delete an entry only specify the <index> field

4.4.8 AT+CRSL, Ringer Sound Level

This command is queries and sets, the sound level of the incoming call ringer.

Command	Possible Response
AT+CRSL=?	+CRSL: (list of supported <level>s)
AT+CRSL?	+CRSL: <level>
AT+CRSL=<level>	

<level>: (integer type value)

0-175-255 smallest value represents the lowest sound level

Note: not supported on the GA100.

4.4.9 AT+CLVL, Set Speaker Amplifier Gain

This command is used to select the output level of the handsfree kit ear piece when fitted.

Command	Possible Response
AT+CLVL=?	+CLVL: (list of supported <level>s)
AT+CLVL?	+CLVL: <level>
AT+CLVL=<level>	

<level>: (integer type value)

0-175-255 smallest value represents the lowest sound level

4.5 MOBILE EQUIPMENT ERRORS

4.5.1 AT+CMEE, Mobile Equipment Errors

This command controls the presentation of result codes, generated by errors relating to the functionality of the modem.

Command	Possible Response
AT+CMEE =?	+CMEE: (list of supported <n>s)
AT+CMEE?	+CMEE: <n>
AT+CMEE=[<n>]	
result code	+CME ERROR: <err>

<n>:

- 0 disable result code and use ERROR instead
- 1 enable result code and use numeric <err> values
- 2 enable result code and use verbose <err> values

<err>:

for a complete list of error code see CME result codes within section 8.

4.6 COMMANDS FROM TIA IS-101

4.6.1 AT+FCLASS, Select Mode

This command puts the modem in to the correct mode of operation, allowing information to be processed in a suitable manner.

Command	Possible Response
AT+FCLASS=?	(list of supported <n>s)
AT+FLCASS?	<n>
AT+FCLASS=<n>	

<n>:

- 0 data
- 2.0 fax (T.32)

4.6.2 AT+VTS, DTMF Tone Generation

This command allows the transmission of DTMF tones within a voice call. The tones are generated by the network and heard at the remote station.

Command	Possible Response
AT+VTS=?	+VTS: (list of supported <tone>s)
AT+VTS=<dtmf>	

<dtmf>: (single tone, fixed duration)

0-9,A,B,C,D,#,* are valid for this command

5. COMMANDS SPECIFIED BY GSM 07.05

This section covers the AT commands that specified within GSM 07.05 and supported by the UbiNetics modems.

5.1 SMS PARAMETER DEFINITIONS

5.1.1 Message Storage Parameters

<index>: (value in the range of location numbers supported by the associated memory)

<mem1>: (memory from which messages are read and deleted)

ME ME (modem) message storage, not supported

SM SIM message storage

<mem2>: (memory to which writing and sending operations are made, refer <mem1> for defined values)

<mem3>: (memory to which received short messages are preferred to be stored, unless forwarded directly to DTE. Also refer to AT+CNMI and <mem1> for defined values. Received CBMs can not be stored and must be sent directly to the DTE.

<stat>: (displays the status of the message in memory)

0 "REC UNREAD" received unread message (i.e. new message)

1 "REC READ" received read message

2 "STO UNSENT" stored unsent message

3 "STO SENT" stored sent message

4 "ALL" all messages (only applicable to AT+CMGL)

<total1>: (total number of message locations in <mem1>)

<total2>: (total number of message locations in <mem2>)

<total3>: (total number of message locations in <mem3>)

<used1>: (number of messages currently in <mem1>)

<used2>: (number of messages currently in <mem2>)

<used3>: (number of messages currently in <mem3>)

5.1.2 Message Data Parameters

<ackpdu>: (GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without GSM 04.11 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter)

<alpha>: (alphanumeric representation of <da> or <oa> corresponding to the entry found in phonebook)

<cdata>: (GSM 03.40 TP-Command-Data in text mode responses; ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)))

<ct>: (GSM 03.40 TP-Command-Type)

<da>: (GSM 03.40 TP-Destination-Address Address-Value field)

<data>: (In the case of SMS: GSM 03.40 TP-User-Data in text mode) response format;

-if <dc> indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set;

- if TE character set other than "HEX", ME/TA converts GSM alphabet into current TE character set according to rules

- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character II (GSM 23) is presented as 17 (IRA 49 and 55))

-if <dc> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

In the case of CBS: (GSM 03.41) CBM Content of Message in text mode responses; format:

- if <dc> indicates that GSM 03.38 default alphabet is used;

- if TE character set other than "HEX", ME/TA converts GSM alphabet into current TE character set according to rules.

- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number

- if <dc> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<dc>: (depending on the command or result code: GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format

<dt>: (GSM 03.40 TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss±zz" where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. e.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08")

<fo>: (depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format)

<length>: (integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length))

<mid>: (GSM 03.41 CBM Message Identifier in integer format)

<mn>: (GSM 03.40 TP-Message-Number in integer format)

<mr>: (GSM 03.40 TP-Message-Reference in integer format, returned to the TE on successful message delivery)

<oa>: (GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>)

<page>: (GSM 03.41 CBM Page Parameter bits 4-7 in integer format)

<pages>: (GSM 03.41 CBM Page Parameter bits 0-3 in integer format)

<pdu>: (In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA

character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)))

In the case of CBS: GSM 03.41 TPDU in hexadecimal format

<pid>: (GSM 03.40 TP-Protocol-Identifier in integer format)

<ra>: (GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set type of address given by <tora>)

<sca>: (GSM 04.11, Service Centre Address, in format <tosca>)

<scts>: (GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format)

<sn>: (GSM 03.41 CBM Serial Number in integer format)

<st>: (GSM 03.40 TP-Status in integer format)

<toda>: (GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129))

<tooa>: (GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>))

<tora>: (GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>))

<tosca>: (type of Service Centre Address, 129 for normal dial string, 145 for international access (number which contains '+' character))

<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>)

5.2 GENERAL CONFIGURATION COMMANDS

5.2.1 AT+CSMS, Select Message Service

This command selects the messaging service and returns the type of messages supported.

Command	Possible Response
AT+CSMS=?	+CSMS: (list of supported <service>s)
AT+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm>
AT+CSMS=<service>	+CSMS: <mt>,<mo>,<bm>

<service>: (type of PDU mode)

0 GSM standard.

<mt>: (mobile terminated (MT) messages)

0 type not supported

1 type supported

<mo>: (mobile originated (MO) messages)

0 type not supported

1 type supported

<bm>: (Broadcast type Messages)

0 type not supported

1 type supported

5.2.2 AT+CPMS, Preferred Message Storage

This command selects SMS memory storage types, to be used for short message operations.

Command	Possible Response
AT+CPMS=?	+CPMS: (list of supported <mem1>s),(list of supported <mem2>s), (list of supported <mem3>s)
AT+CPMS?	+CPMS: <mem1>,<used1>,<total1>, <mem2>,<used2>,<total2>, <mem3>,<used3>,<total3>
AT+CPMS=<mem1>, <mem2>,<mem3>	+CPMS: <used1>,<total1>,<used2> ,<total2>,<used3>,<total3>

Note: "SM", SIM is the only supported storage type.

5.2.3 AT+CMGF, SMS Format

This command controls the presentation format of short messages, from the modem.

Command	Possible Response
AT+CMGF=?	+CMGF: (list of supported <mode>s)
AT+CMGF?	+CMGF: <mode>
AT+CMGF=<mode>	

<mode>:

- 0 PDU mode
- 1 text mode

5.3 MESSAGE CONFIGURATION COMMANDS

5.3.1 AT+CSCA, Service Centre Address

This command updates the short message service centre address, through which mobile originated shot messages are transmitted.

Command	Possible Response
AT+CSCA=?	
AT+CSCA?	+CSCA: <sca>,<tosca>
AT+CSCA=<sca>[,<tosca>] e.g. AT+CSCA="+44973100973",145	

Note: Subscription to this service may be required. This number can be obtained from your network provider. Below is a list of the UK service centres;

BT Cellnet	+447802000332
Vodafone	+447785016005
Orange	+447973100973
One 2 One	+447958879879
Virgin	+447958879890

5.3.2 AT+CSMP, Set Text Mode Parameters

This command used to select values for additional parameters needed when short message is sent to the network or placed in storage when text format message mode is selected.

Command	Possible Response
AT+CSMP=?	+CPMS: (list of supported <fo>s),(list of supported <vp>s),(list of supported <pid>s),(list of supported <dcsc>s)
AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcsc>
AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcsc>]]]]	

5.3.3 AT+CSDH, Show Text Mode Parameters

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

Command	Possible Response
AT+CSDH=?	+CSDH: (list of supported <show>s)
AT+CSDH?	+CSDH: <show>
AT+CSDH=[<show>]	

<show>:

- 0 do not show header values
- 1 show the values in result codes

5.3.4 AT+CSCB, Select Cell Broadcast Message Types

This command selects which types of Cell Broadcast Messages are to be received by the modem.

Command	Possible Response
AT+CSCB?	+CSCB: <mode>,<mids>,<dcsc>
AT+CSCB=[<mode>[,<mids>[,<dcsc>]]]	

<mode>:

- 0 message types specified in <mids> and <dcsc> are accepted

<mids>: (all different possible combinations of CBM message identifiers)

<dcsc>: (all different possible combinations of CBM data coding schemes)

5.4 MESSAGE RECEIVING AND READING COMMANDS

5.4.1 AT+CNMI, New Message Indications to TE

This command selects the procedure, how receiving of new messages from the network is indicated to the DTE when DTE is active. Further information can be found in GSM 03.38.

Command	Possible Response
AT+CNMI=?	+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)
AT+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>
AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	

<mode>:

- 0 buffer unsolicited result codes in the modem. When the buffer is full, indications may be discarded.
- 1 discard indication and reject new received message unsolicited result codes when modem-DTE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the DTE
- 2 buffer unsolicited result codes in the modem when modem-DTE link is reserved (e.g. in on-line data mode) and flush them to the DTE after reservation. Otherwise forward them directly to the DTE

<mt>: (the rules for storing received short messages depend on its data coding scheme (GSM 03.38), preferred memory storage (AT+CPMS) setting and this value;

- 0 no SMS-DELIVER indications are routed to the DTE
- 1 If SMS-DELIVER is stored into SIM, indication of the memory location is routed to the DTE using unsolicited result code +CMTI:
- 2 SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the DTE using unsolicited result code +CMT:
class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1
- 3 class 3 SMS-DELIVERs are routed directly to DTE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1

<bm>: (UbiNetics GSM modems do not support storage of CBM's, this value selects whether or not CBM's are routed to the DTE)

- 0 no CBM indications are routed to the DTE
- 2 new CBMs are routed directly to DTE using unsolicited result code +CBM:

<ds>:

- 0 no SMS-STATUS-REPORTs are routed to the DTE
- 1 SMS-STATUS-REPORTs are routed to the DTE using unsolicited result code +CDS:

<bfr>:

- 0 modem buffer of unsolicited result codes defined within this command is flushed to the DTE when <mode> 1 - 3 is entered (OK response shall be given before flushing the codes)
- 1 modem buffer of unsolicited result codes defined within this command is cleared when <mode> 1 - 3 is entered

5.4.2 +CBM:, New Cell Broadcast Message

Command	Possible Response
unsolicited result code, received when <bm>=2 and new CBM is delivered	<p>If PDU mode; +CBM: <length><cr><lf><pdu></p> <p>If text mode; +CBM: <sn>,<mid>,<dc>,<page>,<pages> <cr><lf><data></p>

5.4.3 +CMT:, New Mobile Terminated Short Message

Command	Possible Response
unsolicited result code, received when <mt>=2 and new short message is delivered	<p>If PDU mode; +CMT: [<alpha>],<length><cr><lf><pdu></p> <p>If text mode; +CMT: <oa>, [<alpha>],<scts> [,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>] <cr><lf><data></p>

5.4.4 +CMTI:, New Mobile Terminated Short Message Indicator

Command	Possible Response
unsolicited result code, is sent by the modem when a new short message is received.	+CMTI: <mem>,<index>

5.4.5 AT+CMGL, List Messages

This command returns messages with status value <stat> from message storage <mem1> to the DTE. If status of the message is 'received unread', status in the storage changes to 'received read'.

Command	Possible Response
AT+CMGL=?	+CMGL: (list of supported <stat>s)
AT+CMGL[=<stat>]]	<p>If text mode, command successful and SMS-SUBMITs and/or SMS-DELIVERs;</p> <p>+CMGL: <index>, <stat>, <oa/da>, [<alpha>], [<scts>], [<tooa/toda>, <length>] <cr> <lf> <data> [<cr> <lf>]</p> <p>+CMGL: <index>, <stat>, <da/oa>, [<alpha>], [<scts>], [<tooa/toda>, <length>] <cr> <lf> <data> [...]</p> <p>If PDU mode, command successful;</p> <p>+CMGL: <index>, <stat>, [<alpha>], <length> <cr> <lf> <pdu> [<cr> <lf>]</p> <p>+CMGL: <index>, <stat>, [<alpha>], <length> <cr> <lf> <pdu> [...]</p>

5.4.6 AT+CMGR, Read Message

This command returns short message from location <index>, of message storage <mem1> to the DTE. If status of the message is 'received unread', status in the storage changes to 'received read'.

Command	Possible Response
AT+CMGR=?	
AT+CMGR=<index>	<p>If text mode, command successful and SMS-DELIVERs;</p> <p>+CMGR: <stat>, <oa>, [<alpha>], <scts> [<tooa>, <fo>, <pid>, <dc>, <sca>, <tosca>, <length>] <cr> <lf> <data></p> <p>if text mode, command successful and SMS-SUBMIT;</p> <p>+CMGR: <stat>, <da>, [<alpha>], [<toda>, <fo>, <pid>, <dc>, [<vp>], <sca>, <tosca>, <length>] <cr> <lf> <data></p> <p>If PDU mode, command successful;</p> <p>+CMGR: <stat>, [<alpha>], <length> <cr> <lf> <pdu></p>

5.5 MESSAGE SENDING AND WRITING COMMANDS

5.5.1 AT+CMGS, Send Message

This command sends a short message from the modem to the network (SMS-SUBMIT).

Command	Possible Response
If text mode; AT+CMGS=<da>[,<toda>]<cr> text is entered <ctrl+z/esc>	If text mode and sending successful; +CMGS: <mr>
If PDU mode; AT+CMGS=<length><cr> PDU mode is given <ctrl+z/esc>	If PDU mode and sending successful; +CMGS: <mr>
e.g. (text mode) AT+CMGS="01763262222"<cr> >Write your test here <ctrl+z>	

Note:

1. Control+z = terminate and send, escape = terminate and quit (without sending).
2. After sending the command AT+CMGS="123456"<cr> wait for the character > before sending the text or characters will be lost.
3. The text string is terminated by ctrl+z do not use a carriage return like other commands.

5.5.2 AT+CMSS, Send Message from Storage

This command sends a message from SIM storage location value <index> (SMS-SUBMIT).

Command	Possible Response
AT+CMSS=?	
AT+CMSS=<index>[,<da>[,<toda>]]	If text mode and sending successful; +CMSS: <mr>
e.g. (text mode) AT+CMSS=1,"01763262222"<cr>	If PDU mode and sending successful; +CMSS: <mr>

5.5.3 AT+CMGW, Write Message to Memory

This command writes a message to SIM storage (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given.

Command	Possible Response
If text mode; AT+CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<cr> text is entered<ctrl+z>	+CMGW: <index>
If PDU mode; AT+CMGW=<length>[,<stat>]<cr> PDU is given<ctrl+z>	
e.g. (text mode) AT+CMGW="01763262222"<cr> Write your test message here <ctrl+z>	

Note:

1. Control+z = terminate and write, escape = terminate and quit (without writing).
2. After sending the command AT+CMGW="123456"<cr> wait for the character > before sending the text or characters will be lost.
3. The text string is terminated by ctrl+z do not use carriage return like other commands.

5.5.4 AT+CMGD, Delete Message

This command deletes a message from the location <index> from SIM storage.

Command	Possible Response
AT+CMGD=?	
AT+CMGD=<index>	

6. COMMANDS SPECIFIED V.25TER REFERENCED BY GSM 07.07

This section covers the AT commands specified within ITU-T, V.25ter referenced by GSM 07.07.

6.1 GENERIC DCE CONTROL COMMANDS

6.1.1 +++ , Changes from Online Data mode to Online Command mode

This command changes the modem from online data mode to online command mode, whilst still retaining the data call. No AT or line termination is required.

Command	Possible Response
<wait_for_0.5_second>+++<wait_for_0.5_second>	

6.1.2 A/, Repeat Last Command

This command repeats the last command sent to the modem, which is held in non-volatile memory. No AT or line termination is required.

Command	Possible Response
A/	

6.1.3 ATZ, Reset to Default Configuration

This command instructs the modem to set all parameters to the factory defaults.

Command	Possible Response
ATZ	

6.1.4 AT&F, Set to Factory-Defined Configuration

This command instructs the modem to set all parameters to default values.

Command	Possible Response
AT&F	

6.1.5 ATI, Request Identification Information

This command causes the modem to transmit the manufacturer specific information about the modem.

Command	Possible Response Netcard
For the GDC200 and GC201. ATI[0] ATI1 ATI2 ATI3 ATI4 ATI5 ATI6	14400 Ubinetics Ltd. Ubinetics Ltd. 1.18.5 (the software version) Ubinetics Ltd. Dual Band PC Card Designed in UK
For the GA100. ATI[0] ATI1 ATI2 ATI3 ATI4	14400 Ubinetics Ltd. Ubinetics Ltd. R13 (the software version) Ubinetics Ltd.

6.1.6 AT+GMI, Request Manufacturer Identification

Execution command causes the modem to return the manufacturer specific identity.

Command	Possible Response
AT+GMI=?	
AT+GMI	Ubinetics Ltd

6.1.7 AT+GMM, Request Model Identification

Execution command causes the modem to return the manufacturer specific model identity.

Command	Possible Response
AT+GMM=?	
AT+GMM	GDC200 GC201 GA100

6.1.8 AT+GMR, Request Model Revision

Execution command causes the modem to return the manufacturer specific model revision identity.

Command	Possible Response
AT+GMR=?	
AT+GMR	<revision>

6.1.9 AT+GSN, Request Product Serial Number Identification

This command causes the modem to return the product serial number.

Command	Possible Response
AT+GSN=?	
AT+GSN	02-GDC200-xxxxxxx 02-GC201-xxxxxxx 02-GA100-xxxxxxx

6.1.10 AT+GCAP, Request Complete Capabilities List

This command causes the modem to return the list of additional capabilities.

Command	Possible Response
AT+GCAP	list of capabilities

6.1.11 ATS3, Command Line Termination Character

This S-parameter sets the command line termination character, which is set to carriage return. UbiNetics recommend that you do not change this setting.

Command	Possible Response
ATS3=?	S3(list of supported <value>s)
ATS3?	<value>
ATS3<value>	

<value>:

0 -13-127 13 = carriage return

6.1.12 ATS4, Response Formatting Character

This S-parameter command sets the response formatting character, which is set to line feed. UbiNetics recommend that you do not change this setting.

Command	Possible Response
ATS4=?	S4(list of supported <values>s)
ATS4?	<value>
ATS4<value>	

<value>:

0-10-127 10 = line feed

6.1.13 ATS5, Command Line Editing Character

This S-parameter sets the command line editing character, which is set to backspace. UbiNetics recommend that you do not change this setting.

Command	Possible Response
ATS5=?	S5(list of supported <values>s)
ATS5?	<value>
ATS5<value>	

<value>:

0-8-127 8 = backspace

6.1.14 ATE, Command Echo

This command determines whether or not the modem echoes characters received from the DTE during command state.

Command	Possible Response
ATE?	E: <value>
ATE<value>	

<value>:

- 0 characters are not echoed
- 1 characters are echoed

6.1.15 ATQ, Result Code Suppression

This command determines whether or not the modem transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code header, result text, line terminator or trailer is transmitted.

Information text transmitted in response to commands is not effected by the setting of this parameter.

Command	Possible Response
ATQ?	Q: <value>
ATQ<value>	

<value>:

- 0 result codes are sent to the DTE
- 1 result codes are suppressed

6.1.16 ATV, DCE Response Format

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

Command	Possible Response
ATV?	V: <value>
ATV<value>	

<value>:

- 0 DCE transmits limited headers and trailers and numeric text
Example: <numeric code><cr>
- 1 DCE transmits full headers and trailers and verbose response text
Example: <cr><lf><verbose code><cr><lf>

6.1.17 ATX, Call Progress Result Code Selection

This command determines whether or not the modem transmits particular result codes to the DTE.

Command	Possible Response
ATX?	X: <value>
ATX<value>	

<value>:

- 0 CONNECT result code is given upon entering online data state. Dial tone and busy detection are disabled
- 1 CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are disabled
- 3 CONNECT <text> result code is given upon entering online data state. Dial tone detection is disabled, and busy detection is enabled
- 4 CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are both enabled

6.1.18 AT+IPR, Fixed DTE-DCE Rate

This command specifies the data rate at which the modem will accept commands.

Command	Possible Response
AT+IPR=?	+IPR: (list of supported <rate> values)
AT+IPR?	+IPR: <rate>
AT+IPR=<rate>	

<rate>:

- 300 baud
- 1200 baud
- 2400 baud
- 4800 baud
- 9600 baud
- 19200 baud
- 38400 baud

Note: with the GDC200 and GC201, the serial UART is configured to autobaud up to 38400 bps.

6.1.19 AT+IFC, DTE-DCE Local Flow Control

This command is used to control the operation of local flow control between the DTE and modem.

Command	Possible Response
AT+IFC=?	+IFC: (list of supported <DCE/DTE values>),(list of supported <DTE/DCE values>)
AT+IFC?	+IFC: <DCE/DTE>,<DTE/DCE>
AT+IFC=[<DCE/DTE>[,<DTE/DCE>]]	

<DCE/DTE>: (DTE to control the flow of received data from the modem)

- 0 none
- 1 XON/XOFF software flow control (filtered characters)

2 RTS hardware flow control

<DTE/DCE>: (modem to control the flow of transmitted data from the DTE)

0 none

1 XON/XOFF software flow control

2 CTS hardware flow control

Note: The flow control values must be set in pairs i.e. RTS/CTS, XON/XOFF, NONE/NONE.

6.2 CALL CONTROL COMMANDS AND RESPONSES

6.2.1 ATA, Answer

This command instructs the modem to immediately connect to the line and start the answer sequence.

Command	Possible Response
ATA	

6.2.2 ATH, Hook Control

This command instructs the modem to disconnect from the line, terminating any call in progress. All of the functions of the command shall be completed before the modem returns a result code.

Command	Possible Response
ATH	

6.2.3 ATO, Return to Online Data State

This command returns the modem to online data state after being in online command state. Provided the data connection is still retained.

Command	Possible Response
ATO	

6.2.4 ATS0, Automatic Answer

This S-parameter controls the automatic answering feature of the modem.

Command	Possible Response
ATS0=?	S0(list of supported <values>s)
ATS0?	<value>
ATS0<value>	

<value>:

0 automatic answering is disabled

1 - 255 enable automatic answering on the ring number specified

6.2.5 ATS6, Pause Before Blind Dialling

This S-parameter has been implemented for compatibility reasons and does not provide any useful function.

Command	Possible Response
ATS6=?	S6(list of supported <values>s)
ATS6?	<value>
ATS6<value>	

<value>:

2-10 number of seconds to wait before blind dialling

6.2.6 ATS7, Connection Completion Timeout

This S-parameter has been implemented for compatibility reasons and does not provide any useful function.

Command	Possible Response
ATS7=?	S7(list of supported <values>s)
ATS7?	<value>
ATS7<value>	

<value>:

0-255 value in seconds for connection to complete, before disconnecting the call

6.2.7 ATS8, Comma Dial Modifier Time

This S-parameter has been implemented for compatibility reasons and does not provide any useful function.

Command	Possible Response
ATS8=?	S8(list of supported <values>s)
ATS8?	<value>
ATS8<value>	

<value>:

0 DCE does not pause when "," encountered in dial string

1-2-255 number of seconds to pause, when a "," is encountered

6.2.8 ATL, Monitor Speaker Loudness

This parameter has been implemented for compatibility reasons and does not provide any useful function.

Command	Possible Response
ATL?	L: <value>
ATL<value>	

<value>: (adjust monitor speaker level)

0 speaker muted

1 low speaker volume

2 medium speaker volume

3 high speaker volume

6.2.9 ATM, Monitor Speaker Mode

This parameter has been implemented for compatibility reasons and does not provide any useful function.

Command	Possible Response
ATM?	M: <value>
ATM<value>	

<value>:

- 0 speaker is always off
- 1 speaker on until DCE informs DCE that carrier has been detected
- 2 speaker is always on when DCE is off-hook

7. MANUFACTURER SPECIFIED COMMANDS

This section covers the AT commands specified by UbiNetics, adding extra functionality that is not detailed within the ETSI specifications.

7.1 GDC200 COMMANDS

The GDC200 is the OEM version of the GSM Dual Band PC Card modem. This modem requires manual network registration using the AT+CFUN=1 and AT+COPS=0.

7.1.1 AT+IMEI, Firmware Version

This command returns the encrypted IMEI number and firmware version.

Command	Possible Response
AT+IMEI?	0070554017a65c4c2da6b31dfbd1a9a11f56c287 25/01/01 1.18.5

7.1.2 AT+INIT, Network Initialisation

This command sets the GDC200 to full functionality (AT+CFUN=1), enters the PIN (AT+CPIN="<simpin>") and automatically registers with a network (AT+COPS=0).

This command has been implement for use only with GDC200's to give a single command to start up and register with a GSM network provider.

Command	Possible Response
AT+INIT=?	
AT+INIT?	
AT+INIT[="<simpin>"]	

<simpin>: (PIN required at power up)

7.2 GC201 COMMANDS

7.2.1 AT+IMEI, Firmware Version

This command returns the encrypted IMEI number and firmware version.

Command	Possible Response
AT+IMEI?	0070554017a65c4c2da6b31dfbd1a9a11f56c287 25/01/01 1.18.5

7.3 GA100 COMMANDS

7.3.1 AT+IMEI, Firmware Version

This command returns the encrypted IMEI number and firmware version.

Command	Possible Response
AT+IMEI?	0070554017a65c4c2da6b31dfbd1a9a11f56c287 25/01/01 clip R1.000.013

7.3.2 AT+SIGN_ON, Application Takes Control of the Serial Bus

Notifies the GA100 modem that the Palm application is present. This means that the GA100 serial bus is 'owned' by the Palm application. This message must be sent by the Palm application within 2 seconds of the GA100 modem power up, else the GA100 modem will power down.

Command	Possible Response
AT+SIGN_ON	CLIP ON CLIP READY PIN REQUEST BAD SIM

7.3.3 GEM_OFF, GA100 Powering Down

This result code indicates to the Palm application, that the GA100 modem is about to power down. This occurs when the front panel power button is pressed after the AT+SIGN_ON command has been sent.

Command	Possible Response
unsolicited result code	GEM_OFF

7.3.4 AT+SIGN_OFF, Application Releases the Serial Bus

This command notifies the GA100 modem that the Palm application is about to exit and that the serial bus routing in the GA100 modem should be changed to 'standby' mode.

This means that the serial bus will be in pass through mode and cannot be used by any other Palm applications.

Command	Possible Response
AT+SIGN_OFF	

7.3.5 AT+CLIP_CBC, Battery Level

This command returns the current battery level of the GA100 modem.

Command	Possible Response
AT+CLIP_CBC	+CLIP_CBC: 0,(list of supported <n>s)

<n>: (integer number indicating battery level)

0-255

7.3.6 AT+WAKE, Incoming Call Wakes Palm

This command sets the wakeup behaviour of the GA100 modem. This wakeup behaviour will attempt to wake the Palm application on an incoming call event or incoming SMS event.

Command	Possible Response
AT+WAKE	

7.3.7 AT+NOWAKE, Incoming Call Doesn't Wake Palm

This command sets the wakeup behaviour of the GA100 modem. This behaviour will not attempt to wake the Palm application on an incoming call or SMS.

Command	Possible Response
AT+NOWAKE	

7.3.8 AT+P_OFF, Powers Off GA100

This command powers down the GA100 modem.

Command	Possible Response
AT+P_OFF	

7.3.9 AT+CLIP_PIN, Enters SIM PIN

This command sends the 4 digit SIM PIN number which may be required after the AT+SIGN_ON command.

Command	Possible Response
AT+CLIP_PIN="1111"	

7.3.10 AT+CLIP_PUK, Enters PUK

This command sends the 8 digit PUK number which may be required after the AT+SIGN_ON command, to unblock three failed attempts at entering the PIN code.

Command	Possible Response
AT+CLIP_PUK="11111111"	

7.4 COMMON SPECIFIED COMMANDS

7.4.1 AT+SET_VUS, Set Microphone Gain Control

This command sets the microphone gain control level within the modem.

Command	Possible Response
AT+SET_VUS=?	PASS
AT+SET_VUS?	PASS
AT+SET_VUS<level>	PASS - if set OK Fail - if unable to set

<level>: (smallest = quietest)

0 - 175 - 255

7.4.2 ATD*#06#, Display IMEI Number

Command has been implemented as a substitute for the MMI command *#06# to allow the IMEI to be reported, via the AT command interface. You must be registered with a network to use this command.

Command	Possible Response
ATD*#06#	<imei_number>

8. CME AND CMS RESULT CODES

This section lists the typical result codes seen from the Mobile Equipment and Message Service, in both numeric and verbose formats.

8.1 MOBILE EQUIPMENT ERROR RESULT CODE +CME ERROR:

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
41	network personalisation PUK required
42	network subset personalisation PIN required
43	network subset personalisation PUK required

- 44 service provider personalisation PIN required
- 45 service provider personalisation PUK required
- 46 corporate personalisation PIN required
- 47 corporate personalisation PUK required
- 100 unknown

8.2 MESSAGE SERVICE FAILURE RESULT CODE +CMS ERROR:

- 1 unassigned (unallocated) number
- 8 operator determined barring
- 10 call barred
- 17 network failure
- 21 short message transfer rejected
- 22 congestion / memory capacity exceeded
- 27 destination out of service
- 28 unidentified subscriber
- 29 facility rejected
- 30 unknown subscriber
- 38 network out of order
- 41 temporary failure
- 42 congestion
- 47 resources unavailable, unspecified
- 50 requested facility not subscribed
- 69 requested facility not implemented
- 81 Invalid transaction Identifier / Invalid short message transfer reference value
- 95 Invalid message, unspecified / Semantically incorrect message
- 96 Invalid mandatory information
- 97 message type non-existent or not implemented
- 98 message not compatible with short message protocol state
- 99 Information element non-existent or not implemented
- 111 protocol error, unspecified
- 127 Interworking, unspecified
- 128 telematic interworking not supported
- 129 short message Type 0 not supported
- 130 cannot replace short message
- 143 unspecified TP-PID error
- 144 data coding scheme (alphabet) not supported

- 145 message class not supported
- 159 unspecified TP-DCS error
- 160 command cannot be actioned
- 161 command unsupported
- 175 unspecified TP-Command error
- 176 TPDU not supported
- 192 SC busy
- 193 no SC subscription
- 194 SC system failure
- 195 Invalid SME address
- 196 destination SME barred
- 197 SM rejected-duplicate SM
- 198 TP-VPF not supported
- 199 TP-VP not supported
- 208 SIM SMS storage full
- 209 no SMS storage capability in SIM
- 210 error in MS
- 211 memory capacity exceeded
- 212 SIM application toolkit busy
- 213 SIM data download error
- 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

9. REFERENCES

This section lists the references used within this document.

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

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.

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

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

GSM 03.40 (ETS 300 901): "Digital cellular telecommunications system (Phase 2+); Technical realization of the Short Message Service (SMS) Point-to-Point (PP)".

GSM 04.11 (ETS 300 942): "Digital cellular telecommunications system (Phase 2+); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

GSM 03.38 (ETS 300 900): "Digital cellular telecommunications system (Phase 2+); Alphabets and language-specific information".

GSM 03.41 (ETS 300 902): "Digital cellular telecommunications system (Phase 2+); Technical realization of Short Message Service Cell Broadcast (SMSCB)".

8410.011.00.201: 06 January 2000, ACI - Application Control Interface, Functional Interface description, Condat.