

External AT Commands

MDM6200/6600 Based products

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About this document

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Version History

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| April 20, 2011 | V001 | Y. Vanderstraeten | Initial Draft |
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| Dec 15, 2011 | V025 | P. Simal | Updated AT_OSIMSEL |
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| Jan 15, 2012 | V027 | B. Lamsens | Updated AT_OSCI, AT_ORMI |
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| Feb 17, 2012 | V031 | B. Lamsens | Updated AT_ORMI, AT_OEMM, AT_OSPC. Added AT_OEMR |
| Feb 23, 2012 | V032 | M. Rogmans | Added _ODISPLAY |

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| Feb 28, 2012 | V033 | B.Lamsens | Update At_osci |
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| Mar 22, 2012 | V037 | M. Rogmans | Added _OHDRSQI, modified \$QCSMP |
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| Apr 25, 2012 | V040 | P. Simal | Changed _OSIMSEL |
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| June 28,201 | V043 | M. Rogmans | Added _ODCS |
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| Oct 17, 2012 | V046 | B. Lamsens | Changed _OFACTDFLT |

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1 SCOPE

This document lists the AT commands available on the Nyos product family, dual mode WCDMA/HSDPA/HSUPA - GSM/GPRS/EDGE – (GPS) devices based on the Qualcomm MDM6200/6600 chip set.

Most of the supported AT commands are specified in 3GPP TS 27.007 and 3GPP TS 27.005. Details of these commands can be found in those 3GPP specifications [1] & [2].

Only Option and/or Qualcomm proprietary AT commands are fully described in this document.

Please note that only supported commands are listed.

2 BASIC COMMANDS

| Command | Description | Supported | Applicable Mode |
|---------|--|-----------|-----------------|
| AT | Command line prefix | Yes | Any |
| at | Command line prefix | Yes | Any |
| A/ | Re-execution of previously executed AT command | Yes | Any |
| a/ | Re-execution of previously executed AT command | Yes | Any |
| +++ | Switching from Online Date mode to Online Command mode | Yes | Any |

3 DTE-TA/DCE INTERFACE COMMANDS

All these commands are specified in 3GPP TS27.007 [1] and or ITU-T V.25ter.

| Command | Description | Supported | Applicable Mode |
|---------|---|-----------|-----------------|
| S3 | Command line termination character (S-parameter) | Yes | Any |
| S4 | Response formatting character (S-parameter) | Yes | Any |
| S5 | Command line editing character (S-parameter) | Yes | Any |
| E | Command Echo | Yes | Any |
| Q | Result code suppression | Yes | Any |
| V | DCE Response format | Yes | Any |
| X | Result code selection and call progress monitoring control | Yes | Any |
| &S | DSR control management Default – Always ON (&S0) | Yes | Any |
| &W | Stores the V250 registers and S-registers into NV memory | Yes | Any |
| &E | Controls the display of data rate to be either serial rate or wireless connection speed | Yes | Any |
| &C | Circuit 109 behavior | Yes | Any |
| &D | Circuit 108 behavior | Yes | Any |
| +IPR | Fixed DTE rate | Yes | Any |
| +ICF | DTE-DCE character framing | Yes | Any |
| +IFC | DTE-DCE local flow control | Yes | Any |
| &V | Dump configuration parameters | Yes | Any |

4 GENERAL COMMANDS

All these commands are specified in 3GPP TS27.007 [1].

| Command | Description | Supported | Applicable Mode |
|---------|--|-----------|-----------------|
| +CGMI | Request manufacturer identification | Yes | Any |
| +CGMM | Request model identification | Yes | Any |
| +CGMR | Request revision identification | Yes | Any |
| +CGSN | Request product serial number identification | Yes | Any |
| +CSCS | Select TE character set | Yes | UMTS |
| +CIMI | Request international mobile subscriber identity | Yes | UMTS |
| Z | Reset to default configuration | Yes | Any |
| &F | Set to factory defined configuration | Yes | Any |
| I | Request identification information | Yes | Any |
| +GMI | Request manufacturer identification | Yes | Any |
| +GMM | Request manufacturer identification | Yes | Any |
| +GMR | Request revision identification | Yes | Any |
| +GSN | Request revision identification | Yes | Any |
| +GCAP | Request complete capabilities list | Yes | Any |
| %V | Requests revision identification; command processed regardless of SIM state Similar to +CGMR/+GMR command | Yes | Any |
| \S | Prints the AT command settings | Yes | Any |

PCCA STD-101 commands

| Command | Description | Supported | Applicable Mode |
|---------|--------------------------|-----------|-----------------|
| +WS46=? | Selects wireless network | Yes | UMTS |

5 CALL CONTROL COMMANDS

All these commands are specified in 3GPP TS27.007 [1].

| Command | Description | Supported | Applicable Mode |
|---------|--|--|-----------------|
| +CSTA | Select type of address | Yes - for address types 129 and 145 only | UMTS |
| D | Dial (using new dial modifiers, ">", "I/i", "G/g", and ";" applicable to UMTS only) > = direct dial from phone book I/i = override CLIR supplementary service default G/g = control CUG supplementary service for call ; = initiate voice call | Yes | UMTS |
| +CMOD | Call mode <mode> - 0 | Yes | UMTS |
| +CHUP | Hang up | Yes - for voice call hang-up | UMTS |
| +CBST | Select bearer service type | Yes | UMTS |
| +CRLP | Radio link protocol | Yes | UMTS |
| +CR | Service reporting control | Yes | UMTS |
| +CEER | Extended Error Report | Yes | UMTS |
| +CRC | Cellular result codes | Yes | Any |
| +CVHU | Voice Hang-up Control | Yes | UMTS |
| T | Select tone dialing | Yes - but does nothing | Any |
| P | Select pulse dialing | Yes - but does nothing | Any |
| A | Answer | Yes | UMTS |
| H | Hook control | Yes | UMTS |
| O | Return to online data state | Yes | UMTS |
| S0 | Automatic answer | Yes | Any |
| S6 | Pause before blind dialing | Yes - but does nothing | Any |
| S7 | Connection completion timeout | Yes - but does nothing | Any |
| S8 | Comma dial modifier time | Yes - but does nothing | Any |
| S10 | Automatic connect delay | Yes - but does nothing | Any |
| S30 | Setting of inactive timer value for disconnection when no user data is exchanged during a data call | Yes - but does nothing | Any |
| L | Monitor speaker loudness | Yes - but does nothing | Any |
| M | Monitor speaker mode | Yes - but does nothing | Any |
| +DS | Data compression | Yes | Any |
| +DR | Data compression reporting | Yes | Any |
| W | Enables/disables the display of extended result code in response to a data call | Yes | Any |
| +VTS | DTMF tone generations | Yes | Any |
| +VTD | DTMF tone duration | Yes | Any |

6 NETWORK SERVICE RELATED COMMANDS

All these commands are specified in 3GPP TS27.007 [1].

| Command | Description | Supported | Applicable Mode |
|---------|--|-----------|-----------------|
| +CNUM | Subscriber Number | Yes | UMTS |
| +CREG | Network registration | Yes | UMTS |
| +COPS | Operator selection | Yes | UMTS |
| +CLCK | Facility lock | Yes | UMTS |
| +CPWD | Change password | Yes | UMTS |
| +CLIP | Calling line identification presentation | Yes | UMTS |
| +CLIR | Calling line identification restriction | Yes | UMTS |
| +COLP | Connected line identification presentation | Yes | UMTS |
| +CDIP | Called line identification presentation | Yes | UMTS |
| +CCUG | Closed user group | Yes | UMTS |
| +CCFC | Call Forwarding Number and Conditions | Yes | UMTS |
| +CCWA | Call waiting | Yes | UMTS |
| +CHLD | Call related supplementary services | Yes | UMTS |
| +CTFR | Call deflection | Yes | UMTS |
| +CUSD | Unstructured supplementary service data | Yes | UMTS |
| +CAOC | Advice of charge | Yes | UMTS |
| +CSSN | Supplementary service notifications | Yes | UMTS |
| +CLCC | List current calls | Yes | UMTS |
| +CPOL | Preferred operator list | Yes | UMTS |
| +COPN | Reads operator names | Yes | UMTS |
| +CPLS | Selection of preferred PLMN list | Yes | UMTS |

7 MOBILE EQUIPMENT COMMANDS

All these commands are specified in 3GPP TS27.007 [1].

| Command | Description | Supported | Applicable Mode |
|---------|-----------------------------------|----------------------------------|-----------------|
| +CPAS | Phone activity status | Yes | UMTS |
| +CFUN | Set phone functionality | Yes | UMTS |
| +CPIN | Enter PIN | Yes | UMTS |
| +CBC | Battery charge | Yes – but not applicable | UMTS |
| +CSQ | Signal quality | Yes | Any |
| +CMEC | Mobile equipment control code | Yes – but not applicable | UMTS |
| +CKPD | Keypad control | No | UMTS |
| +CPBS | Select phone book memory storage | Yes | UMTS |
| +CPBR | Read phone book entries | Yes | UMTS |
| +CPBF | Find phone book entries | Yes | UMTS |
| +CPBW | Write phone book entry | Yes | UMTS |
| +CCLK | Clock | Yes – partially as UE has no RTC | UMTS |
| +CSIM | Generic SIM access | Yes | UMTS |
| +CRSM | Restricted SIM access | Yes - partially | UMTS |
| +CACM | Accumulated call meter | No | UMTS |
| +CAMM | Accumulated call meter maximum | No | UMTS |
| +CPUC | Price per unit and currency table | No | UMTS |
| +CLAC | Lists all available AT commands | Yes | UMTS |
| +CTZU | Automatic time zone update | Yes | UMTS |
| +CTZR | Time zone reporting | Yes | UMTS |
| +CLVL | Loudspeaker volume level | Yes | UMTS |
| +CMUT | Mute control | Yes | UMTS |
| +CMEE | Report mobile equipment error | Yes | UMTS |

8 UMTS PACKET DOMAIN COMMANDS

All these commands are specified in 3GPP TS27.007 [1].

| Command | Description | Supported | Applicable Mode |
|----------|--|------------------------|-----------------|
| +CGDCONT | Define PDP context | Yes | UMTS |
| +CGDSCON | Define Secondary PDP context | No | UMTS |
| +CGTFT | Traffic flow template | No | UMTS |
| +CGQREQ | Requested quality of service profile | Yes | UMTS |
| +CGQMIN | Minimum acceptable quality of service profile | Yes – but does nothing | UMTS |
| +CGEQREQ | Requested 3G quality of service profile | Yes | UMTS |
| +CGEQMIN | Minimum acceptable 3G quality of service profile | Yes – but does nothing | UMTS |
| +CGATT | PS attach or detach | Yes | UMTS |
| +CGACT | PDP context activate or deactivate | Yes | UMTS |
| +CGCMOD | PDP context modify | No | UMTS |
| +CGDATA | Enters data state | No | UMTS |
| +CGPADDR | Show PDP address | No | UMTS |
| +CGCLASS | GPRS mobile station class (GPRS only) | Yes | UMTS |
| +CGEREP | Packet domain event reporting | Yes – but does nothing | UMTS |
| +CGREG | GPRS network registration status | Yes | UMTS |
| +CGSMS | Select service for MO SMS messages | Yes | UMTS |

9 UMTS SMS COMMANDS

All these commands are specified in 3GPP TS27.005 [2].

| Command | Description | Supported |
|---------|--|-----------|
| +CSMS | Select message service | Yes |
| +CPMS | Preferred message storage | Yes |
| +CMGF | Message format | Yes |
| +CSCA | Service center address | Yes |
| +CSMP | Set text mode parameters | Yes |
| +CSDH | Show text mode parameters | Yes |
| +CSCB | Select cell broadcast message types | Yes |
| +CNMI | New message indications to TE | Yes |
| +CMGL | List message | Yes |
| +CMGR | Read message | Yes |
| +CNMA | New message acknowledge to ME/TA | Yes |
| +CMGS | Send message | Yes |
| +CMSS | Send message from storage | Yes |
| +CMGW | Write message to memory | Yes |
| +CMGD | Delete message | Yes |
| +CMGC | Send command | No |
| +CMMS | Indicates more messages to send | No |
| +CSAS | Saves the settings of +CSCA, +CSMP, +CSCB into NV | No |
| +CRES | Restores the settings of +CSCA, +CSMP, +CSCB into NV | No |

10 CDMA SMS COMMANDS

These commands are derived from the UMTS 3GPP TS27.005[2] spec.

| Command | Description | Supported |
|---------|--|-----------|
| \$QCSMS | Select message service | No |
| \$QCPMS | Preferred message storage | Yes |
| \$QCMGF | Message format | Yes |
| \$QCSCA | Service center address | No |
| \$QCSMP | Set text/PDU mode parameters | Yes |
| \$QCSDH | Show text mode parameters | No |
| \$QCSCB | Select cell broadcast message types | Yes |
| \$QCNMI | New message indications to TE | Yes |
| \$QCMGL | List message | Yes |
| \$QCMGR | Read message | Yes |
| \$QCNMA | New message acknowledge to ME/TA | No |
| \$QCMGS | Send message | Yes |
| \$QCMSS | Send message from storage | Yes |
| \$QCMGW | Write message to memory | Yes |
| \$QCMGD | Delete message | Yes |
| \$QCMGC | Send command | No |
| \$QCMMS | Indicates more messages to send | No |
| \$QCSAS | Saves the settings of +CSCA, +CSMP, +CSCB into NV | No |
| \$QCRES | Restores the settings of +CSCA, +CSMP, +CSCB into NV | No |

10.1 Send SMS (\$QCMGS)

| Command | Possible Response(s) |
|---|--|
| \$QCMGS=<da>[,<toda>]<CR><LF><text><CTRL-Z> (Text mode, \$QCMGF=1) | If sending successful: +CMGS: <mr> |
| \$QCMGS=<da>,<length>,<encoding>[,<prio>[,<privacy>[,<alertmode>[,<language>[,<replyoption>[,<callbackNr>[,<displayMode>]]]]]]<CR><LF><data><CTRL-Z> (PDU mode, \$QCMGF=0) | if sending fails: +CMS ERROR: <err> |
| \$QCMGS=? | \$QCMGS: ,(0-255),(0-9),(0-3),(0-3),(0-3),(0-7),(0-7),,<0-3> |

Description

This command sends an SMS in text mode or in pdu mode.
Note, with \$QCSMP some other parameters can be set.

Defined Values

<da>:..... Destination address between double quotes.

<toda>:..... Type of address (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<length>:..... Nr of encoded characters in the pdu (eg pdu 4142 has length 2: (AB))

<encoding>:

| Value | Description |
|-------|---------------------------|
| 0 | Octet unspecified (8 bit) |
| 1 | IS91EP (varies) |
| 2 | ASCII (7 bit) |
| 3 | IA5 (7 bit) |
| 4 | Unicode (16 bit) |
| 5 | Shift JIS (8 or 16bit) |
| 6 | Korean (8 or 16 bit) |
| 7 | Latin Hebrew (8 bit) |
| 8 | Latin (8 bit) |
| 9 | GSM 7 bit default (7 bit) |

Remark, the 7 bit encoding (except the GSM 7 bit default) are encoded following the CDMA 7 bit packing (different from UMTS)

<prio>:

| Value | Description |
|-------|-------------|
| 0 | Normal |
| 1 | Interactive |
| 2 | Urgent |
| 3 | Emergency |

<privacy>:

| Value | Description |
|-------|--------------|
| 0 | Normal |
| 1 | Restricted |
| 2 | Confidential |
| 3 | Secret |

<alertmode>:

| Value | Description |
|-------|---------------------------|
| 0 | Default (preIS637A : OFF) |
| 1 | Low prio (preIS637A : ON) |
| 2 | Medium prio |
| 3 | High prio |

<language>:

| Value | Description |
|-------|-------------|
| 0 | Unspecified |
| 1 | English |
| 2 | French |
| 3 | Spanish |
| 4 | Japanese |
| 5 | Korean |
| 6 | Chinese |
| 7 | Hebrew |

<replyoption>:

| Value | Description |
|-------|--|
| 0 | No acknowledge requested |
| 1 | User acknowledge requested |
| 2 | Delivery acknowledge requested |
| 3 | Delivery & User acknowledge requested |
| 4 | Read acknowledge requested |
| 5 | Read & User acknowledge requested |
| 6 | Read & Delivery acknowledge requested |
| 7 | Read & Delivery & User acknowledge requested |

< callbackNr >: .. Number to be dialled in reply to a received SMS message

<displayMode>:

| Value | Description |
|-------|------------------------|
| 0 | Immediately |
| 1 | Mobile default setting |
| 2 | User Invoke |
| 3 | Reserved |

<data>: Hexadecimal values (two digits per bytes) without 0x. Eg 4142 for 'AB'

<text>: Text message

<mr>:..... Message Reference number.

10.2 Read SMS (\$QCMGR)

| Command | Possible Response(s) |
|-----------------|---|
| \$QCMGR=<index> | <p>if PDU mode (\$QCMGF=0) and command successful: \$QCMGR: <stat>,<oa>,<scts>,<tooa>, <length>,<encoding><prio>,<privacy>,<alertmode>, <language>,<teleservice>,<replyoption>,< callbackNr >, <displayMode>,<nummsg>,<servicecat>,<msgID><CR> <LF><data></p> <p>If TEXT mode (\$QCMGF=1) and command successful: \$QCMGR: <stat>,<oa>,<scts>,<tooa>, <length><CR><LF><text></p> <p>otherwise: +CMS ERROR: <err> if reading fails: +CMS ERROR: <err></p> |
| \$QCMGR=? | OK |

Description

This command reads an SMS in text mode or in pdu mode.

Defined Values

<stat>: Status of message (eg "REC UNREAD")

<oa>:..... Originating address between quotes.

<scts>:..... Service Center TimeStamp between quotes

<tooa>:..... Type of originating address (when first character of <oa> is + (IRA 43) default is 145, otherwise default is 129)

<length>: See Send SMS (\$QCMGS)

<encoding>: See Send SMS (\$QCMGS)

<prio>: See Send SMS (\$QCMGS)

<privacy>: See Send SMS (\$QCMGS)

<alertmode>: See Send SMS (\$QCMGS)

<language>: See Send SMS (\$QCMGS)

<teleservice>: ... Note setting the teleservice with sending is done via \$QCSMP

| Value | Description |
|--------|---|
| 4096 | Embedded IS91 SMS |
| 4097 | Page |
| 4098 | Short message (default) |
| 4099 | Voice Mail Notification (<nummsg> is valid) |
| 4100 | WAP |
| 4101 | Enhanced Messaging / EMS |
| 4102 | Srv Category Programming |
| 4103 | Card App Toolkit |
| 327680 | Broadcast message (<servicecat> is valid) |

<replyopt>: ... See Send SMS (\$QCMGS)

<callbackNr >: .. See Send SMS (\$QCMGS)

<displayMode>: See Send SMS (\$QCMGS)

<nummsg>: Number of voice mail messages.
Note: This number is only valid if Teleservice equals 4099

<servicecat>: Broadcast service category (See table 9.3.1-1 of [3])
Note: This number is only valid if Teleservice equals 327680

| Value | Description |
|-------|---|
| 0 | Unknown or unspecified |
| 1 | Emergency Broadcasts |
| 2 | Administrative |
| 3 | Maintenance |
| 4 | General News – Local |
| 5 | General News – Regional |
| 6 | General News – National |
| 7 | General News – International |
| 8 | Business/Financial News – Local |
| 9 | Business/Financial News – Regional |
| 10 | Business/Financial News – National |
| 11 | Business/Financial News – International |
| 12 | Sports News – Local |
| 13 | Sports News – Regional |
| 14 | Sports News – National |
| 15 | Sports News – International |
| 16 | Entertainment News – Local |
| 17 | Entertainment News – Regional |
| 18 | Entertainment News – National |
| 19 | Entertainment News – International |
| 20 | Local Weather |
| 21 | Area Traffic Reports |
| 22 | Local Airport Flight Schedules |
| 23 | Restaurants |
| 24 | Lodgings |
| 25 | Retail Directory |

| | |
|---------------|--|
| 26 | Advertisements |
| 27 | Stock Quotes |
| 28 | Employment Opportunities |
| 29 | Medical/Health/Hospitals |
| 30 | Technology News |
| 31 | Multi-category |
| 32 | Card Application Toolkit Protocol Teleservice(CATPT) |
| 33..63 | KDDI Corporation |
| 64..4095 | Reserved for standard service categories |
| 4096 | CMAS - Presidential-Level Alert |
| 4097 | CMAS - Extreme Threat to Life and Property |
| 4098 | CMAS - Severe Threat to Life and Property |
| 4099 | CMAS - AMBER (Child Abduction Emergency) |
| 4100 | CMAS - Test Message |
| 4101..4351 | CMAS – RESERVED |
| 4352.. 32768 | Reserved for standard service categories |
| 32769.. 32831 | KDDI Corporation |
| 32832.. 49152 | Reserved |
| 49153.. 49215 | KDDI Corporation |
| 49216.. 65535 | Reserved |

<msgID>: Identification Nr of the message.
Messages that must be concatenated will have the same ID

<data>: See Send SMS (\$QCMGS)

<text>: See Send SMS (\$QCMGS)

10.3 List SMS (\$QCMGL)

| Command | Possible Response(s) |
|------------------|--|
| \$QCMGL[=<stat>] | <p>if PDU mode (\$QCMGF=0) and command successful: \$QCMGL: <stat>,<oa>,<scts>,<tooa>,<length>,<encoding><prio>,<privacy>,<alertmode>,<language>,<teleservice>,<replyoption>,<callbackNr >,<displayMode>,<nummsg>,<servicecat>,<msgID><CR><LF><data>[<CR><LF> \$QCMGL: <stat>,... ...]</p> <p>If TEXT mode (\$QCMGF=1) and command successful: \$QCMGR: <stat>,<oa>,<scts>,<tooa>,<length><CR><LF><text>>[<CR><LF> \$QCMGL: <stat>,... ...]</p> <p>otherwise: +CMS ERROR: <err> if reading fails: +CMS ERROR: <err></p> |
| \$QCMGL=? | +CMGL: (list of supported <stat>) |

Description

This command lists all SMS'es with the given stat in text mode or in PDU mode. It displays the same info as QCMGR does.

Eg:

\$QCMGL="ALL" will list all SMS'es.

\$QCMGL="REC UNREAD" will list all unread SMS'es.

Defined Values

For a list of defined values see Read SMS (\$QCMGR).

10.4 Set SMS parameters (\$QCSMP)

| Command | Possible Response(s) |
|---|---|
| \$QCSMP=<teleservice>,<relValid>,<valid>,<relDef>,<def> | <p>OK</p> <p>Or</p> <p>ERROR</p> |
| \$QCSMP? | \$QCSMP: =<teleservice>,<relValid>,<valid>,<relDef>,<def> |
| \$QCSMP=? | OK |

Description

This command sets some extra SMS parameters: teleservice, validity period and deferred delivery timestamp.

These commands are used in text and in PDU mode.

Defined Values

<teleservice>:

| Value | Description |
|-------|--------------------------|
| 4096 | Embedded IS91 SMS |
| 4097 | Page |
| 4098 | Short message (default) |
| 4099 | Voice Mail Notification |
| 4100 | WAP |
| 4101 | Enhanced Messaging / EMS |
| 4102 | Srv Category Programming |

<relValid>:

| Value | Description |
|-------|---|
| 0 | Validity period is given as a relative timestamp |
| 1 | Validity period is given as a absolute timestamp |
| 2 | Validity period is not sent over the air (give eg.0 as <valid>) (default) |

<valid>:..... Validity timestamp. After this the message can be discarded.

If relative: (<relValid> = 1): (Defined in 3GPP2 C.S0015)

| Value | Description |
|----------|--|
| 0..143 | (Value+1)*5 minutes |
| 144..167 | 12 hours + ((value-143) * 30 minutes |
| 168..196 | (value – 166) days |
| 197..244 | (value -192) weeks |
| 245 | Indefinite |
| 246 | Immediate |
| 247 | Valid until mobile becomes inactive |
| 248 | Valid until registration area changes, discard if not registered |

If absolute : (<relValid> = 0): (Defined in 3GPP2 C.S0015)
Time format is "yy/mm/dd,hh:mm:ss"

<relDef>:

| Value | Description |
|-------|--|
| 0 | Deferred delivery time is given as a relative timestamp |
| 1 | Deferred delivery time is given as a absolute timestamp |
| 2 | Deferred delivery time is not sent over the air (give eg.0 as <def>) (default) |

<def>:..... Deferred delivery timestamp, to give the time of delivery
If relative: (<relDef> = 1): (Defined in 3GPP2 C.S0015)

| Value | Description |
|----------|---|
| 0..143 | (Value+1)*5 minutes |
| 144..167 | 12 hours + ((value-143) * 30 minutes |
| 168..196 | (value – 166) days |
| 197..244 | (value -192) weeks |
| 247 | Deliver when mobile next becomes active |

If absolute : (<defValid> = 0): (Defined in 3GPP2 C.S0015)
Time format is "yy/mm/dd,hh:mm:ss"

10.5 Select cell broadcast message types (\$QCSCB)

| Command | Possible Response(s) |
|---------------------------------|------------------------------|
| \$QCSCB=<mode>,<servicecatlist> | OK Or ERROR |
| \$QCSCB? | \$QCSCB: <mode>,<servicecat> |
| \$QCSCB=? | \$QCSCB: (0-1) |

Description

This command selects which type of cell broadcast message are to be received.
Note that in order to set it, the third parameter of \$QCNMI (<bm>) must be different from 0.

Defined Values

<mode>:

| Value | Description |
|-------|---|
| 0 | Message type defined in <servicecat> are accepted |
| 1 | Message type defined in <servicecat> are NOT accepted |

< servicecatlist >:List of comma separated values, one string (eg. "4097,4098")
See 10.2 Read SMS (\$QCMGR) for pre defined service categories.

10.6 New message indication (\$QCNMI)

| Command | Possible Response(s) |
|--|--|
| \$QCNMI=[<mode>,<mt>,<bm>,<ds>,<bfr>]] | OK Or ERROR |
| \$QCNMI? | \$QCNMI: <mode>,<mt>,<bm>,<ds>,<bfr> |
| \$QCNMI=? | \$QCNMI: (0,1,2),(0,1,2,3,4),(0,1),(0,1,2),(0,1) |

Description

This command selects how incoming messages are to be routed/displayed.

Defined Values

<mode>:

| Value | Description |
|-------|--|
| 0 | Buffer unsolicited result codes when <mt> is not 2. |
| 1 | Normal display of unsolicited result codes (default) (same as 2) |
| 2 | Normal display of unsolicited result codes (default) (same as 1) |

<mt>:

| Value | Description |
|-------|--|
| 0 | No SMS-DELIVER indications are routed to the TE. |
| 1 | If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: \$QCMTI: <mem>,<index> Messages that are not saved (Wap push, flash, broadcast) will give index -1 (default) |
| 2 | SMS-DELIVERs are routed directly to the TE using unsolicited result code: \$QCMT:(see Unsolicited result codes for SMS) (same as 3) |
| 3 | SMS-DELIVERs are routed directly to the TE using unsolicited result code: \$QCMT:(see Unsolicited result codes for SMS) (same as 2) |
| 4 | Special mode, all incoming messages are saved in NV and no indication is given to user, so no unsolicited messages will be given |

<bm>:

| Value | Description |
|-------|--|
| 0 | No Broadcast messages are displayed (default) |
| 1 | Broadcast messages are displayed using \$QCBM (see Unsolicited result codes for SMS) |

<ds>:

| Value | Description |
|-------|--|
| 0 | No meaning, status report routing is not supported in CDMA |
| 1 | No meaning, status report routing is not supported in CDMA |
| 2 | No meaning, status report routing is not supported in CDMA (default) |

<bfr>:

| Value | Description |
|-------|---|
| 0 | Buffer is flushed when mode is not 0. (default) |
| 1 | Buffer is cleared when mode is not 0. |

10.7 Unsolicited result codes for SMS

Syntax of the unsolicited result codes when a message is received:

- When Second parameter (<mt>) of \$QCNMI equals to 1 (default)
\$QCMTI: <mem>,<index>
- When Second parameter (<mt>) of \$QCNMI equals to 2 and pdu mode (\$QCMGF=0):
\$QCMT:
<oa>,<scts>,<tooa>,<length>,<encoding><prio>,<privacy>,<alertmode>,<language>,<teleservice>,<replyoption>,<callbackNr>,<displayMode>,<nummsg>,<servicecat>,<msgID><CR><LF><data>
- When Second parameter (<mt>) of \$QCNMI equals to 2 and text mode (\$QCMGF=1):
\$QCMT: <oa>,<scts>,<tooa>,<length><CR><LF><text>
Note <data> is only displayed when it can be decoded (7bit ascii)
- When Second parameter (<mt>) of \$QCNMI equals to 2 and third parameter <bm> equals to 1 or 2 and pdu mode (\$QCMGF=0) and a broadcast message is received:
\$QCBM:
<oa>,<scts>,<tooa>,<length>,<encoding><prio>,<privacy>,<alertmode>,<language>,<teleservice>,<replyoption>,<callbackNr>,<displayMode>,<nummsg>,<servicecat>,<msgID><CR><LF><data>

Defined values

<mem>:

| Value | Description |
|-------|--|
| "BM" | Broadcast Message Storage |
| "ME" | ME Message Storage |
| "MT" | any of the storages associated with ME |
| "SM" | SIM message storage |
| "SR" | Status Report storage |

<index>: integer type; value in the range of location numbers supported by the associated memory

For the definition of the other defined values, see Read SMS (\$QCMGR).

11 SYNCHRONOUS DATA MODE COMMANDS

These commands are specified in ITU-T V.80ter.

| Command | Description | Supported | Applicable Mode |
|---------|------------------------------|-----------|-----------------|
| +ES | Enables the synchronous mode | Yes | Any |
| +ESA | Preferred message storage | Yes | UMTS |

These commands are not tested and probably will not work over the USB interface.

12 OPTION PROPRIETARY GENERAL COMMANDS

These are commands added by Option to accomplish things that cannot be done via the standard AT commands that are available in both the GSM/GPRS/UMTS as the CDMA specifications. This list of proprietary commands will grow during the development of the module.

12.1 Hardware version “AT_OHWV”

| Command | Possible Response(s) |
|---------|------------------------|
| OHWV | OHWV: Hardware Version |

Description

This command returns hardware version.

12.2 Power Amplifier Temperature “AT_OPATEMP”

| Command | Possible Response(s) |
|------------------|-------------------------------------|
| AT_OPATEMP? | _OPATEMP: <n>, <overtemp>, <patemp> |
| AT_OPATEMP=? | _OPATEMP: (0-1) |
| AT_OPATEMP=[<n>] | _OPATEMP: (list of supported <n>s) |

Description

This commands shows the current temperature measured near the power amplifiers. A write of n=1 enables an unsolicited result when the temperature changes with 1 degree Celsius. When the PA temperature exceeded a preset safe value the unsolicited result is shown regardless of this setting.

Syntax of the unsolicited result: _OPATEMP: <overtemp>, <patemp>

Defined values

<overtemp>:

| Value | Description |
|-------|---|
| 0 | PA temperature has not exceeded safety value. |
| 1 | PA temperature has exceeded safety after which the unit was put in low power mode (+CFUN=0). Will change back to 0 after a +CFUN=1. |

<patemp>: Current temperature measured near the power amplifiers in degrees Celsius (10-100).

Possible customization

It's possible to customize the unsolicited output of this command. This will allow for two thresholds instead of one for over temperature

This changes the syntax of the unsolicited to the following:

_OPATEMP: <n>, <data_overtemp>, <voice_overtemp>, <patemp>

<data_overtemp>:

| Value | Description |
|-------|---|
| 0 | PA temperature has not exceeded data safety value. |
| 1 | PA temperature for data calls has been exceeded. Any active data calls will have been disconnected. Attempting to make a new data call with ATD will result in CME ERROR: 631 |

<data_overtemp>:

| Value | Description |
|-------|---|
| 0 | PA temperature has not exceeded data safety value. |
| 1 | PA temperature for voice calls has been exceeded. Any active voice calls will have been disconnected. Attempting to make a new voice call with AT+CDV will result in CME ERROR: 631 |

Note:

Upon disconnecting an active data or voice call, an unsolicited result code will be sent over the AT port with the following format:

For Data:

_OPATEMP: Data Call Abort <patemp>

For Voice:

_OPATEMP: Voice Call Abort <patemp>

12.3 W_Disable State INDication “AT_OWIND”

| Command | Possible Response(s) |
|-----------------|-------------------------------------|
| AT_OWIND=<wind> | OK |
| AT_OWIND? | _OWIND: <wind>,<wind_state> |
| AT_OWIND=? | _OWIND: (list of supported <wind>s) |

Description

Set command allows the enabling or disabling of the unsolicited “_OWSTAT: <wind_state>” result code, which reports a W_DISABLE signal state change. The result code is disabled by default. The <wind> value is not stored in NV-RAM, so when required, the result code needs to be enabled at each power cycle.

When enabled, an unsolicited “_OWSTAT” indication will be generated each time the W_DISABLE signal state changes.

Read command returns the current <wind> setting, as well as the current W_DISABLE state. Test command returns the range of supported <wind>s.

Defined values

<wind>:..... unsolicited result code state

| Value | Description |
|-------|-----------------------------|
| 0 | _OWSTAT indication disabled |
| 1 | _OWSTAT indication enabled |

<wind_state>: ... state of the W_DISABLE signal

| Value | Description |
|-------|------------------------------|
| 0 | W_DISABLE signal active low |
| 1 | W_DISABLE signal active high |

12.4 Aircraft mode “AT_OAIR”

| Command | Possible response(s) |
|-----------------------|---|
| _OAIR=<aircraft mode> | OK |
| _OAIR? | _OAIR: <aircraft mode> |
| _OAIR=? | _OAIR: (list of supported <aircraft mode>s) |

Description

Allows the user to switch the RF mode of the GSM/WCDMA (protocol stack), or query its current state. It actually does the same for the GSM/WCDMA part as AT+CFUN does for the values 0 and 1.

After every reboot of the card, this mode will be used for both GSM/WCDMA (protocol stack).

Defined Values

<aircraft mode>:

| Value | Description |
|-------|---------------------------------|
| 0,2 | RF stack on (cfr. “AT+CFUN=1”) |
| 1,3 | RF stack off (cfr. ”AT+CFUN=0”) |

12.5 Request Product Serial Number “AT_OGSN”

| Command | Possible response(s) |
|------------------|-----------------------|
| _OGSN | <serial number> OK |
| _OGSN? | ERROR |
| _OGSN=? | OK |
| _OGSN=<argument> | ERROR |

Description

Allows the user to read the UE’s Product Serial Number.

Note: this is the exact same functionality as the AT+CGSN command as described in Chapter 4 of this document.

12.6 Card ID “AT_OID”

| Command | Possible response(s) |
|---------|-----------------------|
| _OID | <key>: <value> ... |
| _OID? | ERROR |
| _OID=? | OK |

Description

This command reads out the ADC so that the various keys which define a card can be obtained.

Defined values

| Key | Value |
|-----|---|
| SN | Serial Number (same as with AT+CGSN) |
| HWV | Hardware Version (same as with AT_OHWV) |
| FWV | Firmware Version (same as with ATI) |
| BTV | Boot Code Version (same as in _OBTV except when FULL BUILD) |
| HA | Reserved |
| HI | Reserved |
| FBT | Firmware Build Time, e.g.: FBT: (Date: Oct 25 2004, Time: 16:28:21) |
| PMN | Product Marketing Name |

12.7 Restore Factory Defaults “AT_OFACDFT”

| Command | Possible response(s) |
|--------------|----------------------|
| _OFACDFT=<n> | OK ERROR |

Description

Will schedule or execute the requested factory default type. After using the command, a manual reset is needed for the settings to be deleted.

Defined values

<n>:

| Value | Description |
|-------|---|
| 1 | Delete customer’s settings (except otasp settings for cdma phone) |
| 2 | Delete customer’s settings (only cdma keys kept for cdma phone) |
| 8 | Delete customer’s settings (only akey kept) |

12.8 List Slot Image Information “AT_OIMGLST”

| Command | Possible response(s) |
|--------------|---|
| _OIMGLST=<n> | ERROR |
| _OIMGLST? | _OIMGLST: <image_type> Type: <type> UniqueID: <unique_id> BuildID: <build_id> Tech: <tech> OK |
| _OIMGLST=? | ERROR |

Description

This command will list information about the 2 Flash Slots (when filled).
Per <image_type>, all applicable slots will be listed by type, uid, build-id and tech.

Defined values

<image_type>:

| Value | Description |
|------------|---------------------------|
| UMTS Image | 2G/3G technology image |
| CDMA Image | 1.x/EVDO technology image |

<type>:

| Value | Description |
|-------|--------------------|
| OSBL | OSBL slot |
| AMSS | AMSS slot |
| Cust | Customization Slot |

<uniqueID>:..... numerical value

<BuildID>: string value

<tech>

| Value | Description |
|-------|------------------|
| UMTS | 2G/3G technology |
| CDMA | 1.x/EVDO |

12.9 Activate Slot Technology “AT_OIMGACT”

| Command | Possible response(s) |
|-----------------|---|
| _OIMGACT=<tech> | OK ERROR |
| _OIMGACT? | _OIMGACT: Type: <type> UniqueID: <unique_id> BuildID: <build_id> Tech: <tech> OK |
| _OIMGACT=? | ERROR |

Description

Will active a technology or will list the current active running slot. If a technology is activated, the device will perform a reset.

All applicable slots will listed by type, uid, build-id and tech.

Defined values

<type>:

| Value | Description |
|-------|--------------------|
| OSBL | OSBL slot |
| AMSS | AMSS slot |
| Cust | Customization Slot |

<uniqueID>:..... numerical value

<BuildID>: string value

<tech>:

| Value | Description |
|-------|------------------|
| UMTS | 2G/3G technology |
| CDMA | 1.x/EVDO |

12.10 Call status info indication “AT_OLCC”

| Command | Possible Response(s) |
|---------------|----------------------|
| AT_OLCC? | _OLCC: <n> |
| AT_OLCC=? | _OLCC: (0-1) |
| AT_OLCC=[<n>] | OK |

Description

This command enables/disables the unsolicited result code “_OLCC: <+CLCC parameters>”.

Defined values

<n>:

| Value | Description |
|-------|---|
| 0 | Turns off unsolicited result code _OLCC: <+CLCC parameters> |
| 1 | Turns on unsolicited result code _OLCC: <+CLCC parameters> |

<+CLCC parameters>:

See 3GPP 27.007 AT+CLCC

Additionally to the <stat> parameters described in 27.007:

<stat>:

| Value | Description |
|-------|-------------------------------|
| 30 | Call has been ended/torn down |

13 OPTION PROPRIETARY UMTS COMMANDS

These are commands added by Option to accomplish things that cannot be done via the standard AT commands that are available in the GSM/GPRS/UMTS specifications. This list of proprietary commands will grow during the development of the module.

13.1 SECURITY “AT_OSEC”

| Command | Possible Response(s) |
|---------------|-----------------------------------|
| _OSEC=[<sec>] | OK |
| _OSEC? | _OSEC: <sec> |
| _OSEC=? | _OSEC: (list of supported <sec>s) |

Description

This command sets the 3G RRC security setting. Please note that a hard reset of the card is required before the setting will take effect.

Defined values

<sec>:

| Value | Description |
|-------|-------------------------|
| 0 | None |
| 1 | Integrity |
| 2 | Ciphering |
| 3 | Fake Security |
| 4 | Integrity and Ciphering |

13.2 Background Layer Status “AT_OBLS”

| Command | Possible Response(s) |
|---------|-------------------------|
| _OBLS | _OBLS: <sim>,<lm>,<sms> |

Description

This command returns the status of the SIM, LM and SM procedures in the Background Layer.

Defined Values

<sim>:

| Value | Description |
|-------|--|
| 0 | The SIM is not ready to accept SIM unlock commands (+CPIN) |
| 1 | The SIM is ready to accept SIM unlock commands (+CPIN) |
| 2 | The SIM has been removed or is faulty |

<lm>:

| Value | Description |
|-------|---|
| 0 | List management is not ready, i.e. the phonebooks and recent calls lists cannot be accessed |
| 1 | List management is ready, phonebooks can be accessed |

<sms>:

| Value | Description |
|-------|---|
| 0 | Short message services are not ready; short messages cannot be sent nor read and written from the SIM |
| 1 | Short message services are ready |

13.3 Preferred SYStem “AT_OPSYS”

| Command | Possible Response(s) |
|----------------------------|-------------------------|
| _OPSYS=[<mode>[,<domain>]] | OK |
| _OPSYS? | _OPSYS: <mode>,<domain> |
| _OPSYS=? | _OPSYS: (0-3),(0-4) |

Description

This command changes the preferred system, GSM/WCDMA, the acquisition order and the service domain preference PS/CS.

Defined values

<mode>:

| Value | Description |
|-------|-------------|
| 0 | GSM only |
| 1 | WDMA only |
| 2 | GSM first |
| 3 | WCDMA first |

<domain>:

| Value | Description |
|-------|--|
| 0 | Acquire only circuit-switched systems |
| 1 | Acquire only packet-switched systems |
| 2 | Acquire circuit-and/or packet-switched systems |
| 3 | Any domain will do; no preference |
| 4 | To be used by clients who do not want to change the service domain |

13.4 Selected SYStem “AT_OSSYS”

| Command | Possible Response(s) |
|--------------|----------------------|
| _OSSYS=[<n>] | OK |
| _OSSYS? | _OSSYS: <n>,<AcT> |
| _OSSYS=? | _OSSYS: (0-1),(0,2) |

Description

This command enables/disables the unsolicited result code “_OSSYSI: <AcT>”

Defined values

<n>:

| Value | Description |
|-------|--|
| 0 | Turns off unsolicited result code “_OSSYSI: <AcT>” |
| 1 | Turns on unsolicited result code “_OSSYSI: <AcT>” |

<AcT>:

| Value | Description |
|-------|-------------|
| 0 | GSM |
| 2 | UTRAN |
| 3 | No service |

13.5 Preferred Band Mode “AT_OPBM”

| Command | Possible response(s) |
|------------------|---|
| _OPBM=<band>,<n> | OK |
| _OPBM=? | _OPBM: (list of supported <band>s) |
| _OPBM? | <band>: <n><CR><LF> [<band>: <n><CR><LF> [...]] |

Description

This command is used to disable/enable specific frequency bands.

Defined Values

<band>:

| Value | Description |
|---------|---|
| “ANY” | any band |
| “EGSM” | EGSM (900MHz) band |
| “DCS” | DCS (1800MHz) band |
| “PCS” | PCS (1900MHz) band |
| “G850” | GSM 850MHz band |
| “U2100” | WCDMA 2100MHz band (Band Class I) |
| “U1700” | WCDMA 3GPP UMTS1800 band (Band Class III) |
| “U1900” | WCDMA 3GPP UMTS1900 band (Band Class II) |
| “U850” | WCDMA 3GPP UMTS850 band (Band Class V) |

<n>:

| Value | Description |
|-------|-------------|
| 0 | disable |
| 1 | enable |

13.6 Prioritized Operator Name Indication “AT_OPONI”

| Command | Possible Response(s) |
|--------------|----------------------|
| _OPONI=[<n>] | OK |
| _OPONI? | _OPONI: <n> |
| _OPONI=? | _OPONI: (0-1) |

Description

This command is obsolete.

This command enables/disables the unsolicited result code “_OPON: <cs>,<oper>,<src>”.

Defined values

<n>:

| Value | Description |
|-------|--|
| 0 | Turns off unsolicited result code “_OPON: <cs>,<oper>,<src>” |
| 1 | Turns on unsolicited result code “_OPON: <cs>,<oper>,<src>” |

<cs>:

| Value | Description |
|-------|-------------|
| 1 | 8-bit code |

<oper>: network operator name string

<src>:

| Value | Description |
|-------|--|
| 3 | SE13 list: <oper> presented in hex format |
| 4 | Actual MCC/MNC: <oper> presented by MCCMNC in decimal format |

13.7 Prioritized Operator Name “AT_OPON”

| Command | Possible Response(s) |
|---------|--------------------------|
| _OPON? | _OPON: <cs>,<oper>,<src> |
| _OPON=? | OK |

Description

This command is obsolete.

This command reads the "REAL" network name of the currently registered network.

Defined values

<cs>:

| Value | Description |
|-------|-------------|
| 1 | 8-bit code |

<oper>: network operator name string

<src>:

| Value | Description |
|-------|--|
| 3 | SE13 list: <oper> presented in hex format |
| 4 | Actual MCC/MNC: <oper> presented by MCCMNC in decimal format |

13.8 Cell Type Indicator “AT_OCTI”

| Command | Possible Response(s) |
|----------------|--------------------------|
| _OCTI=[<mode>] | OK |
| _OCTI? | _OCTI: <mode>,<celltype> |
| _OCTI=? | _OCTI: (list) |

Description

This command is used to get the Cell Type (GSM/GPRS/EDGE) and to enable the unsolicited result code _OCTI: <celltype> that is sent whenever the cell type changes.

Defined values

<mode>:

| Value | Description |
|-------|--|
| 0 | Disable sending of the unsolicited result code |
| 1 | Enable sending of the unsolicited result code |

<celltype>:

| Value | Description |
|-------|-------------|
| 0 | Unknown |
| 1 | GSM |
| 2 | GPRS |
| 3 | EDGE |

13.9 HSDPA Call In Progress “AT_OHCIP”

| Command | Possible Response(s) |
|----------|----------------------|
| _OHCIP | _OHCIP: <status> |
| _OHCIP? | _OHCIP: <status> |
| _OHCIP=? | OK |

Description

This command can be used to see whether a HSDPA call is in progress. <status> will be set to 1 only when a HSDPA transaction is in progress (i.e. when a HS-DSCH transport channel is active), not when merely the cell supports HSDPA.. The reason that it is not possible to determine whether the serving cell supports HSDPA is because the System Information messages broadcast by the cell don't convey this information.

Defined values

<status>:

| Value | Description |
|-------|----------------------------|
| 0 | HSDPA call not in progress |
| 1 | HSDPA call in progress |

13.10 Unsolicited HSDPA Call In Progress “AT_OUHCIP”

| Command | Possible Response(s) |
|------------------|--------------------------|
| _OUHCIP=[<mode>] | OK |
| _OUHCIP? | _OUHCIP: <mode>,<status> |
| _OUHCIP=? | _OUHCIP: (0,1) |

Description

This is a variant of the `_OHCIP` command which will generate an unsolicited message `_OUHCIP: <status>` when the HSDPA call status changes . <status> will be set to 1 only when a HSDPA transaction is in progress (i.e. when a HS-DSCH transport channel is active), not when merely the cell supports HSDPA.. The reason that it is not possible to determine whether the serving cell supports HSDPA is because the System Information messages broadcast by the cell don't convey this information.

Defined values

<mode>:

| Value | Description |
|-------|-------------------------------|
| 0 | Turn unsolicited response off |
| 1 | Turn unsolicited response on |

<status>:

| Value | Description |
|-------|----------------------------|
| 0 | HSDPA call not in progress |
| 1 | HSDPA call in progress |

13.11 Unsolicited WCDMA Cell Type Indicator “AT_OUWCTI”

| Command | Possible Response(s) |
|-------------------|------------------------------------|
| AT_OUWCTI? | _OUWCTI: <u_ena>,<WCDMA Cell Type> |
| AT_OUWCTI=<u_ena> | OK |
| AT_OUWCTI=? | ERROR |

Description

This is a variant of the `_OUWCTI` command which will generate an unsolicited message `_OUWCTI: <WCDMA Cell Type>` when the cell type changes (if enabled via <u_ena>).

Defined values

<u_ena>:

| Value | Description |
|-------|---|
| 0 | Disable unsolicited _OUWCTI message response. |
| 1 | Enable unsolicited _OUWCTI message response. |

<WCDMA Cell Type>:

| Value | Description |
|-------|---|
| 0 | Non-WCDMA cell type or not registered to cell |
| 1 | WCDMA only |
| 2 | WCDMA + HSDPA |
| 3 | WCDMA + HSUPA |
| 4 | WCDMA + HSDPA + HSUPA |

13.12 WCDMA Cell Type Indicator “AT_OWCTI”

| Command | Possible Response(s) |
|-----------|---------------------------|
| AT_OWCTI? | _OWCTI: <WCDMA Cell Type> |

Description

Query command returns the current cell type if broadcasted by a cell in SIB 5 if compliant with 3GPP Rel. 6.

Defined values

<WCDMA cell type>:

| Value | Description |
|-------|---|
| 0 | Non-WCDMA cell type or not registered to cell |
| 1 | WCDMA only |
| 2 | WCDMA + HSDPA |
| 3 | WCDMA + HSUPA |
| 4 | WCDMA + HSDPA + HSUPA |

13.13 Get ENS PLMN Mode “AT+PACSP”

| Command | Possible Response(s) |
|-----------------------|--|
| AT+PACSP AT+PACSP? | <p>If ENS not enabled (nv item): +CME ERROR: operation not allowed:</p> <p>If ENS enabled but no PIN entered yet: +CME ERROR: SIM busy</p> <p>Else: +PACSP: <PLMN mode> OK</p> |

Description

This command can be used to read the PLMN Mode Bit of the CSP file (CPHS), provided that ENS is enabled.

Defined values

<PLMN mode>:

| Value | Description |
|-------|------------------------|
| 0 | PLMN mode bit equals 0 |
| 1 | PLMN mode bit equals 1 |

13.14 Show HPLMN Operator Name “AT_OSIMOP”

| Command | Possible Response(s) |
|---------|--|
| _OSIMOP | _OSIMOP: “<long_operator_name>”, “<short_operator_name>”, “<MCC_MNC>” +CME ERROR: <err> |

Description

This command displays the HPLMN operator name in long and short alphanumeric format, as well as the MCC/MNC combination, provided that the HPLMN is listed in the UCS2 or SE13 list internal operator list. If the HPLMN is not found, only the <MCC_MNC> is returned.

Defined values

<long_operator_name>:(string type)

HPLMN operator name in long alphanumeric format. String character set is coded according to the AT+CSCS setting. If the character set is <UCS2>, and the operator name is listed in the internal UCS2 table, then the string will be presented in UCS2 characters; if the HPLMN is not in the UCS2 list, then the SE13 presentation will be used;

<short_operator_name>:(string type)

HPLMN operator name in short alphanumeric format. String character set is coded according to the AT+CSCS setting. If the character set is <UCS2>, and the operator name is listed in the internal UCS2 table, then the string will be presented in UCS2 characters; if the HPLMN is not in the UCS2 list, then the SE13 presentation will be used;

<MCC_MNC>:(numeric type)

MCC and MNC of HPLMN, presented in IRA characters converted from BCD. Hence, the number has structure: (country code digit 1)(country code digit 2) (country code digit 3)(network code digit 1)(network code digit 2)[(network code digit 3)].

13.15 Unsolicited Signal Quality Indication “AT_OSQI”

| Command | Possible Response(s) |
|-----------|---------------------------------|
| _OSQI=<n> | +CME ERROR: <err> |
| _OSQI? | _OSQI: <n> |
| _OSQI=? | _OSQI: (list of supported <n>s) |

Description

This command controls sending of the unsolicited result code _OSIQQ which is sent when a significant change (more than 10 dBm) in received signal strength.

_OSIQQ syntax:

_OSIQQ: <rss>,<ber>

Defined Values

<n>:

| Value | Description |
|-------|---|
| 0 | Disable sending of _OSIGQ unsolicited result code |
| 1 | Enable sending of _OSIGQ unsolicited result code |

<rssi>:

| Value | Description |
|--------|-----------------------------|
| 0 | -125 dBm or less |
| 1 | -122 dBm |
| 2...30 | -121...-75 dBm |
| 31 | -75 dBm or greater |
| 99 | not known or not detectable |

<ber>:.....0 to 7 as RXQUAL values defined in GSM 05.08 section 8.2.4

13.16 Indicate signal strength for WCDMA “AT_OEANT”

| Command | Possible Response(s) |
|------------|----------------------|
| _OEANT | _OEANT: <n> |
| _OEANT? | _OEANT: <m> |
| _OEANT=<m> | OK |

Description

OEANT implements an indication of signal strength depending on RSCP.

Defined values

<n>:

| Value | Description |
|-------|--------------------|
| 0 | Not in coverage |
| 1 | Very weak signal |
| 2 | Weak signal |
| 3 | Normal signal |
| 4 | Strong signal |
| 5 | Very strong signal |

<m>:

| Value | Description |
|-------|---|
| 0 | Disable sending of “_OEANT” unsolicited result code |
| 1 | Enable sending of “_OEANT” unsolicited result code |

The unsolicited and query response from OEANT are in the form of: `_OEANT: <n>`

The number of bars is calculated based on certain RSCP THRESHOLDS (A)

6 values (0-5) are defined:

| Antenna | RSCP[dBm] |
|---------|-----------------|
| 5 | RSCP <=A0 |
| 4 | A0 < RSCP <=A1 |
| 3 | A1 < RSCP <= A2 |
| 2 | A2 < RSCP <=A3 |
| 1 | A3 < RSCP |
| 0 | Out of Service |

13.17 Enable/Disable CHAP “AT_OCHAP”

| Command | Possible Response(s) |
|---------------------------------|----------------------------------|
| <code>_OCHAP=<sec></code> | OK |
| <code>_OCHAP?</code> | <code>_OCHAP: <sec></code> |
| <code>_OCHAP=?</code> | <code>_OCHAP: (0-1)</code> |

Description

This command enables or disables CHAP Protocol security setting during activation of a PDP context. The value is stored in NV. The default state is enabled.

Note that this command only affects PDP contexts activate via Windows Dial-Up.

Defined values

`<sec>`:

| Value | Description |
|-------|-------------|
| 0 | Disabled |
| 1 | Enabled |

13.18 Disable NBNS Info “AT_ONBNS”

| Command | Possible Response(s) |
|--|---|
| <code>AT_ONBNS=<disable nbns></code> | OK |
| <code>AT_ONBNS?</code> | <code>_ONBNS: <disable nbns></code> |
| <code>AT_ONBNS=?</code> | <code>_ONBNS: (0,1)</code> |

Description

Set command is used to modify the ‘OSKNV_DISABLE_NBNS’ NV-item, which is used to control the sending of NBNS/WINS information in the PDP context activation request.

Read command returns the current status, test command returns the range of supported values.

Any change will be used when making the next PDP context activation after a reboot.

Defined values

<disable nbns>:

| Value | Description |
|-------|--|
| 0 | NBNS/WINS enabled (i.e. NBNS info included in PDP context activation) |
| 1 | NBNS/WINS disabled (i.e. NBNS info not included in PDP context activation) |

13.19 Network Call “AT_OWANCALL”

| Command | Possible Response(s) |
|-------------------------|--------------------------|
| AT_OWANCALL=<c>,<s>,<u> | OK |
| AT_OWANCALL? | _OWANCALL: <c>, <s>, <u> |

Description

This commands starts or stops a network call for a specific context. There’s also an option to enable unsolicited notification of state changes in the call state of that context.

Example: To set up a call on context 1 with unsolicited notifications enabled.

AT_OWANCALL=1,1,1 (<- set up call)
OK

_OWANCALL: 1, 1 (<- call is up now)

AT_OWANCALL=1,0,1 (<- tear down call)
OK

_OWANCALL: 1, 0 (<- call has torn down)

Defined values

<c>: The context corresponding to the cgdcont id.

<s>: Desired state.

| Value | Description |
|-------|---|
| 0 | Disconnect |
| 1 | Connected |
| 2 | Call Failed (only available at query command) |
| 3 | Connection failed |

<u>: unsolicited notifications of state changes for that context.
If enabled, the card will put unsolicited notifications to the NDIS port of the format: _OWANCALL: <c>,<s>

| Value | Description |
|-------|-------------|
| 0 | Disable |
| 1 | Enable |

13.20 Network Data “AT_OWANDATA”

| Command | Possible Response(s) |
|-----------------|--|
| AT_OWANDATA=<c> | _OWANDATA: <c>, <ip>, <gw>, <dns1>, <dns2>, <nbns1>, <nbns2>, <csp> OK |
| AT_OWANDATA? | _OWANDATA: <c>, <ip>, <gw>, <dns1>, <dns2>, <nbns1>, <nbns2>, <csp> ... OK |

Description

This command is used with an active call (set up using AT_OWANCALL) to get the IP details used for configuring the network interface.

The write command will just look up the IP details for that specific context and return nothing if the context is not active.

The query command will loop through all the contexts and display the IP details for the ones who's context is active.

Defined values

<c>: The context corresponding to the cgdcont id.
 <ip>: IP address
 <gw>: Gateway address
 <dns1>: First DNS server
 <dns2>: Second DNS server
 <nbns1>: First NBNS server
 <nbns2>: Second NBNS server
 <csp>: Connection Speed

13.21 WWAN Network Errors “AT_OWANNWERROR”

| Command | Possible Response(s) |
|----------------|--|
| _OWANNWERROR? | _OWANNWERROR: <nwErrRegistration>,<nwErrAttach>,<nwErrActivation> |
| _OWANNWERROR=? | OK |

Description

This command can be used to query network error codes, which are used by the driver to identify and forward network errors to the Microsoft WWAN driver model. Three types of possible errors are returned by this command:

- <nwErrRegistration>: Registration reject and network originated deregistration errors (eg “Illegal ME”, “Congestion”,...);
- <nwErrAttach>: Attach reject and NW originated detach errors (eg “GPRS Services Not Allowed”, “No suitable Cells”,...);
- <nwErrActivation>: PDP Context activation rejection and NW originated context deactivation errors (eg “Missing or unknown APN”,...);

All errors are returned as numeric values, which are all defined in 3GPP 24.008.

The FWR will store each and every error value as received by the mobile network, regardless of whether the WWAN Driver Model can interpret them. The FWR will decide if the error in question is a registration error, an attach error, or a PDP context activation error, and will fill the corresponding error value accordingly.

It is specified in the WWAN Driver Model that unrecognized errors are handled transparently: they are logged by Microsoft for further debugging, and no other action is taken. Error values that are recognized by the driver model will be shown to the user. Unknown errors or “no errors” are defined as 0x00.

It is highly likely that more than one error happens in a single error situation, or during consecutive errors. For example, “Illegal MS” will result in a registration error as well as in an attach error. This will also result in more than one error value being filled. Microsoft handles these scenarios by interpreting the provided error values according to their hierarchy: Registration errors have highest priority, next attach errors, and finally PDP context activation errors.

It is also possible that there are intermediate errors. For example, “registration denied” when trying to roam on a hostile network will result in a network error. Afterwards a friendly network can be found, resulting in a ‘no error’ situation: the corresponding error value will be reset to 0x00. Because the error values are monitored by the Driver, the WWAN driver will be able to handle such scenarios.

The following tables list all error values that are recognized by the WWAN Driver model:

| Error Value | Name | Interpretation of cause code |
|-------------|---|--|
| 2 | IMSI unknown in HLR | 1. SIM/Device not activated 2. Subscription expired resulting in network deactivation |
| 3 | Illegal MS | MS blocked by network due to stolen report |
| 4 | IMSI unknown in VLR | Roaming is not subscribed |
| 6 | Illegal ME | MS blocked by network due to stolen report |
| 7 | GPRS Services not allowed | no subscription for GPRS |
| 8 | GPRS and non-GPRS services not allowed | GPRS / non GPRS service not allowed |
| 11 | PLMN not allowed | Service is blocked by the network due to subscription expiry or any other causes |
| 12 | Location Area not allowed | Location area is not allowed because of subscription |
| 13 | Roaming not allowed in this location area | Roaming is subscribed but it is not allowed in this area |
| 14 | GPRS services not allowed in this PLMN | Selected network does not provide GPRS service to the MS |
| 15 | No suitable cells in location area | No subscription for the service |
| 22 | Congestion | Registration failed due to congestion in the network |

Table: 3GPP TS 24.008 cause codes for registration / attach failures

| Error Value | Error Value | Interpretation of cause code |
|-------------|--|---|
| 8 | Operator determined barring | Packet data service is blocked by the operator |
| 26 | Insufficient resources | Context cannot be activated because of insufficient resources on network |
| 27 | Missing or unknown APN | No APN or Unknown APN is provided in the activation request |
| 29 | User authentication failed | Wrong user name or password provided in the activation request |
| 32 | Service option not supported | GPRS is not supported by the network |
| 33 | Requested service option is not subscribed | Requested service (GPRS) is not subscribed by the user. |
| 34 | Service option is temporarily out of order | Packet data service is temporarily out of order. User needs to retry after sometime |

Table: 3GPP TS 24.008 cause codes for connection failures

Please also refer to the Microsoft “WWAN Driver Model Specification (v0.8)” for more information about this implementation.

Exceptions

There are two exceptions to the above explanation:

1) Option Proprietary error value(s):

Certain scenarios do not provide an error from the network. Currently, only 'moving out of coverage' is defined. When the MS moves out of coverage, the NW is obviously no longer available to generate the appropriate error, but the driver will still get C(G)REG indications to inform that registration is lost. A custom registration error will be loaded in this scenario:

| Error Value | Meaning |
|-------------|---------------------|
| 300 | No Network Coverage |

Table: Option Proprietary WWAN NW errors

2) Normal Network Initiated PDP Context Deactivation:

Not all network initiated PDP context deactivation are the result of an error situation. Upon a 'normal' release, the NW sends '0x24' (36d) as 'error' value. This would result in the following response:

```
_OWANNWERROR: 0,0,36
```

Since 0x24 (36d) is not specified in the WWAN Driver Model, we cannot predict how Microsoft would react to this scenario. To avoid problems, The FWR will simply reset the activation error value:

```
_OWANNWERROR: 0,0,0
```

in order not to confuse the WWAN driver.

Defined values

<nwErrRegistration>: integer value

Error code as forwarded by the Network upon registration failure;

<nwErrAttach>: integer value

Error code as forwarded by the Network upon attach failure;

<nwErrActivation>: integer value

Error code as forwarded by the Network upon PDP context activation failure;

13.22 Set PAP/CHAP Security Parameters “AT_OPDPP”

| Command | Possible Response(s) |
|-----------------------------------|-----------------------------------|
| _OPDPP=[<cid>,<n>,<passw>,<user>] | OK |
| _OPDPP? | _OPDPP: <cid>,<n>,<user> |
| _OPDPP=? | _OPDPP: (1-16),(0-2), passw, user |

Description

This command is used to set the security parameters of PAP/CHAP for use with PDP context activation.

For each PDP context id, a password, username and type of security (PAP or CHAP) is set. Please note that both Username and Password are mandatory
Also note that this command only affects PDP contexts activated over NDIS.

Defined values

<cid>:

Value between 1-16 (max contexts) which depicts the PDP context ID

<n>:

| Value | Description |
|-------|-------------|
| 0 | No Security |
| 1 | PAP |
| 2 | CHAP |

<passw>: Password to be used in security handling

<user>:.....Username to be used in security handling

13.23 Set PAP/CHAP Security Parameters “AT\$QCPDPP”

REMARK

*Option recommends to use AT_OPDPP instead of AT\$QCPDPP!
AT_OPDPP and AT\$QCPDPP provide the exact same functionality.
AT\$QCPDPP should only be used in case problems with backwards compatibility of software applications is needed.*

| Command | Possible Response(s) |
|-------------------------------------|-------------------------------------|
| \$QCPDPP=[<cid>,<n>,<passw>,<user>] | OK |
| \$QCPDPP? | \$QCPDPP: <cid>,<n>,<user> |
| \$QCPDPP=? | \$QCPDPP: (1-16),(0-2), passw, user |

Description

This command is used to set the security parameters of PAP/CHAP for use with PDP context activation.

For each PDP context id, a password, username and type of security (PAP or CHAP) is set.

Please note that both Username and Password are mandatory.
Also note that this command only affects PDP contexts activated over NDIS.

Defined values

<cid>: Value between 1-16 (max contexts) which depicts the PDP context ID

<n>:

| Value | Description |
|-------|-------------|
| 0 | No Security |
| 1 | PAP |
| 2 | CHAP |

<passw>:..... Password to be used in security handling

<user>:.....Username to be used in security handling

13.24 Read out HSPA capabilities “AT_OHSPACAT”

| Command | Possible Response(s) |
|-----------------|------------------------|
| _OHSPACAT=[<n>] | ERROR |
| _OHSPACAT? | _ OBBV: <n>,<m> |
| _OHSPACAT=? | (6,8,12),(<hsupa_pos>) |

Description

This command can be used to read the HSPA capabilities of a unit

Defined Values

<n>:.....Value for the HSDPA capability

<m>:.....Value for the HSUPA capability

<hsupa_pos>:.....If the firmware supports 2ms TTI: 1-6
.....If the firmware does not support 2ms TTI: 1,3,5

13.25 Get Neighbor cell information “AT_ONCI”

| Command | Possible Response(s) |
|---------|----------------------|
| _ONCI? | See below |
| _ONCI | ERROR |
| _ONCI=? | ERROR |
| | |

Description

This command returns information about current cell and neighbour cells in 2G or 3G mode. Neighbour cells information are formatted as lines of 3 results, preceded by <NUM MSGS>, <MSG NUM>.

- Output of the command when no network:

_ONCI: -1

OK

- Output of the command when connected to 2G:

_ONCI: 2G

_ONCI: <LAC>, <CID>

_ONCI: <NUM OPER>

_ONCI: <Timing Advance>

_ONCI: (<SC NCC>, <SC BCC>)

_ONCI: <NUM MSGS>, <MSG NUM>,(<ARFCN>, <NCC>, <BCC>,
<RXLEV>),(<ARFCN>, <NCC>, <BCC>, <RXLEV>),(<ARFCN>, <NCC>, <BCC>,
<RXLEV>)

_ONCI: <NUM MSGS>, <MSG NUM>,(<ARFCN>, <NCC>, <BCC>,
<RXLEV>),(<ARFCN>, <NCC>, <BCC>, <RXLEV>),(<ARFCN>, <NCC>, <BCC>,
<RXLEV>)

OK

- Output of the command when connected to 3G

_ONCI: 3G

_ONCI: <UC-ID>

_ONCI: <NUM OPER>

_ONCI: <DCH FLAG>

_ONCI: <NUM MSGS>, <MSG NUM>, (<PRI SC>, <SEC SC>, <PATH
LOSS>),(<PRI SC>, <SEC SC>, <PATH LOSS>),(<PRI SC>, <SEC SC>, <PATH
LOSS>)

_ONCI: <NUM MSGS>, <MSG NUM>, (<PRI SC>, <SEC SC>, <PATH
LOSS>),(<PRI SC>, <SEC SC>, <PATH LOSS>),(<PRI SC>, <SEC SC>, <PATH
LOSS>)

OK

13.26 Retrieve Retry Counter “AT_OERCN”

| Command | Possible Response(s) |
|------------|---|
| _OERCN | _OERCN: <PIN retries>, <PUK retries> |
| _OERCN? | _OERCN: <PIN retries>, <PUK retries> |
| _OERCN=? | _OERCN: (1-2) (see description) |
| _OERCN=<x> | _OERCN: <PINX retries>, <PUKX retries> (see description) |

Description

Retrieves the PIN and PUK retry counters. Displays how many PIN and PUK retries are left. In the first version, this command could only be used to get the PIN(1)/PUK(1) retry counters (via AT_OERCN or AT_OERCN?). AT_OERCN=? and AT_OERCN=<X> would return ERROR with the first version. Now when using the write command (_OERCN=<X>) you can specify if you want to read the pin/puk or the pin2/puk2 retry counters.

Defined values

<PIN retries>:.....The number of PIN retries will be a value from 0 to 3.

<PUK retries>:The number of PUK retries will be a number from 0 to 10.

<X>:1 -> get PIN/PUK retry counters
.....2 -> get PIN2/PUK2 retry counters

<PINX retries>:The number of PIN1/PIN2 retries (according to <X>).
.....Will be a value from 0 to 3.

<PUKX retries>:....The number of PUK1/PUK2 retries (according to <X>).
.....Will be a number from 0 to 10.

13.27 PDP Call Status Info Indication “AT_OGACT”

| Command | Possible Response(s) |
|--------------|----------------------|
| _OGACT=[<n>] | OK |
| _OGACT? | _OGACT: <n> |
| _OGACT=? | _OGACT: (0,1) |

Description

This command enables/disables the unsolicited result code “_OGACT: <CGACT parameters>”

Defined Values

<n>:

| Value | Description |
|-------|--|
| 0 | Turns off unsolicited result code “_OGACT: <CGACT> parameters >” |
| 1 | Turns on unsolicited result code “_OGACT: <CGACT> parameters >” |

<CGACT parameters>

See 3GPP 27.007 AT+CGACT

13.28 SIM Background Layer Status “AT_OSRPE”

| Command | Possible Response(s) |
|--------------|-----------------------|
| _OSRPE=[<n>] | OK |
| _OSRPE? | OK |
| _OSRPE=? | OK |
| _OSRPE | _OSRPE = <SIM status> |

Description

This command returns the status of the SIM in the Background Layer.

Defined Values

<SIM status>:

| Value | Description |
|-------|---|
| 0 | SIM not ready to accept SIM unlock commands |
| 1 | SIM ready to accept SIM unlock commands |
| 2 | SIM removed or faulty |

13.29 SIM Select “AT_OSIMSEL”

| Command | Possible response(s) |
|------------------------------------|---|
| _OSIMSEL=<select>, <require_reset> | OK, ERROR |
| _OSIMSEL? | _OSIMSEL: selection: <select> or ERROR |
| _OSIMSEL=? | _OSIMSEL: (0,1), (1) or ERROR |

Description

Select the normal (external – off module) SIM or the extended (internal – on module) SIM. This command can only be used on GTM6x1WFS device variants.

Defined values

<select>: choose between the normal and extended SIM.

| Value | Description |
|-------|--|
| 0 | means normal (external - off module) SIM selected. |
| 1 | means extended (internal - on module) SIM selected |

<require_reset>: the SIM switch is only performed after a reset.

| Value | Description |
|-------|----------------------------|
| 1 | Means a reset is required. |

14 OPTION PROPRIETARY CDMA COMMANDS

These are commands added by Option to accomplish things that cannot be done via the standard AT commands that are available in the CDMA specifications. This list of proprietary commands will grow during the development of the module.

14.1 Preferred SYStem “AT_OPSYS”

| Command | Possible Response(s) |
|----------------------------|-------------------------|
| _OPSYS=[<mode>[,<domain>]] | OK |
| _OPSYS? | _OPSYS: <mode>,<domain> |
| _OPSYS=? | _OPSYS: (5-7),(4) |

Description

This command changes the preferred system, 1.x/EV-DO or automatic

Defined values

<mode>:

| Value | Description |
|-------|------------------------------|
| 5 | Acquire system automatically |
| 6 | 1.x only (CDMA) |
| 7 | EV-DO only (HDR) |

<domain>:

| Value | Description |
|-------|----------------------------------|
| 4 | Do not change the service domain |

14.2 Selected SYStem “AT_OSSYS”

| Command | Possible Response(s) |
|--------------|----------------------|
| _OSSYS=[<n>] | OK |
| _OSSYS? | _OSSYS: <n>,<AcT> |
| _OSSYS=? | _OSSYS: (0-1),(0,2) |

Description

This command enables/disables the unsolicited result code “_OSSYSI: <AcT>”

Defined values

<n>:

| Value | Description |
|-------|--|
| 0 | Turns off unsolicited result code “_OSSYSI: <AcT>” |
| 1 | Turns on unsolicited result code “_OSSYSI: <AcT>” |

<AcT>:

| Value | Description |
|-------|---|
| 3 | No Service |
| 4 | 1.x/CDMA |
| 5 | EV-DO/HDR |
| 6 | HDR Hybrid, listening to both 1.x & EVDO systems for attachment |

14.3 Preferred Band Mode “AT_OPBM”

| Command | Possible response(s) |
|------------------|---|
| _OPBM=<band>,<n> | OK |
| _OPBM=? | _OPBM: (list of supported <band>s) |
| _OPBM? | <band>: <n><CR><LF> [<band>: <n><CR><LF> [...]] |

Description

This command is used to disable/enable specific frequency bands.

Defined Values

<band>:

| Value | Description |
|---------|-----------------------------|
| “ANY” | any band |
| “BC0_A” | Band Class 0, A-Side System |
| ”BC0_B” | Band Class 1, B-Side System |
| ”BC1” | Band Class 1 |

<n>:

| Value | Description |
|-------|-------------|
| 0 | disable |
| 1 | enable |

14.4 Network Call “AT_OWANCALL”

| Command | Possible Response(s) |
|-------------------------|-----------------------------|
| AT_OWANCALL=<c>,<s>,<u> | OK |
| AT_OWANCALL? | _OWANCALL: <c>, <s>, <u> |
| AT_OWANCALL=? | _OWANCALL=(1,2),(0,1),(0,1) |

Description

This command initiates a network connection on the desired Profile ID

Example: To set up a call on profile 1 with unsolicited notifications enabled.

```
AT_OWANCALL=1,1,1 ( <- set up call )
OK
```

```
_OWANCALL: 1, 1 ( <- call is up now )
```

```
AT_OWANCALL=1,0,1 ( <- tear down call )
OK
```

```
_OWANCALL: 1, 0 ( <- call has torn down )
```

Defined values

<c>: Desired profile ID
 1: Test Mode (Agilent/CMU test systems)
 2: Live Network connection (currently still under development)

<s>: Desired state.

| Value | Description |
|-------|---|
| 0 | Disconnect |
| 1 | Connected |
| 2 | Call Failed (only available at query command) |
| 3 | Connection failed |

<u>: unsolicited notifications of state changes for that context.
 If enabled, the card will put unsolicited notifications to the NDIS port of the
 format: _OWANCALL: <c>,<s>

| Value | Description |
|-------|-------------|
| 0 | Disable |
| 1 | Enable |

14.5 Network Data “AT_OWANDATA”

| Command | Possible Response(s) |
|-----------------|---|
| AT_OWANDATA=<c> | _OWANDATA: <c>, <ip>, <gw>, <dns1>, <dns2>, <nbns1>, <nbns2>, <csp> OK |
| AT_OWANDATA? | _OWANDATA: <c>, <ip>, <gw>, <dns1>, <dns2>, <nbns1>, <nbns2>, <csp> ... OK |

Description

This command is used with an active call (set up using AT_OWANCALL) to get the IP details used for configuring the network interface.

The write command will just look up the IP details for that specific profile ID and return nothing if the context is not active.

The query command will loop through all the contexts and display the IP details for the ones who's connection is active.

Defined values

- <c>: The context corresponding to the cgdcont id.
- <ip>: IP address
- <gw>: Gateway address
- <dns1>: First DNS server
- <dns2>: Second DNS server
- <nbns1>: First NBNS server
- <nbns2>: Second NBNS server
- <csp>:Connection Speed

14.6 Unsolicited Signal Quality Indication “AT_OSQI”

| Command | Possible Response(s) |
|-----------|---------------------------------|
| _OSQI=<n> | +CME ERROR: <err> |
| _OSQI? | _OSQI: <n> |
| _OSQI=? | _OSQI: (list of supported <n>s) |

Description

This command controls sending of the unsolicited result code _OSIGQ which is sent when a significant change (more than 10 dBm) in received signal strength. The CDMA variant of OSQI is only applicable for 1.x/CDMA (voice) systems.

_OSIGQ syntax:
_OSIGQ: <rssi>,<ber>

Defined Values

<n>:

| Value | Description |
|-------|---|
| 0 | Disable sending of _OSIGQ unsolicited result code |
| 1 | Enable sending of _OSIGQ unsolicited result code |

<rssi>:

| Value | Description |
|--------|-----------------------------|
| 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>:..... will always be 99

14.7 Base Station Info “AT_OBSI”

| Command | Possible Response(s) |
|---------|----------------------|
| _OBSI | _OBSI=<aa>,<bb>,<cc> |

Description

This command reads the base station info.

Defined Values

<aa>: Base Station ID
 <bb>: Base Station Latitude (gps coordinate : divide <bb >by 14400)
 <cc>: Base Station Longitude (gps coordinate : divide <cc> by 14400)

14.8 Emergency Mode Status “AT_OEMM”

| Command | Possible Response(s) |
|-----------------|----------------------|
| _OEMM? | _OEMM:<unsol>, |
| _OEMM = <unsol> | |
| _OEMM=? | _OEMM : (0-1) |

Description

This command checks the Emergency Mode Status. AT+CDV=911 will bring the modem in emergency mode. The modem will stay in Emergency Mode for minimum 6 minutes, even when the emergency call is terminated.

Defined Values

<unsol>.....unsolicited message status

| Value | Description |
|-------|--------------------------|
| 0 | Unsolicited messages Off |
| 1 | Unsolicited messages On |

.....emergency mode status

| Value | Description |
|-------|--------------------|
| 0 | Emergency Mode Off |
| 1 | Emergency Mode On |

14.9 Emergency Mode Release “AT_OEMR”

| Command | Possible Response(s) |
|---------|----------------------|
| _OEMR | OK |

Description

This command releases the Emergency Mode Status if the phone is in Emergency mode.

14.10 Send Flash Command “AT_OFLSH”

| Command | Possible Response(s) |
|------------|----------------------|
| _OFLSH | OK |
| _OFLSH=<n> | OK |

Description

This command is used to send a flash command with (AT_OFLSH=<n>) or without information (AT_OFLSH). The information <n> is the phone number. This can only be executed while a voice call is active. The _OFLSH unsolicited AT command will be returned if a flash was sent to the base station over the air.

This command sends a flash or flash with information to the base station. The flash command is used to manage call waiting and 3-way calls. For call waiting situations when the 3 party call is received, send a flash (AT_OFLSH) to toggle between the two different call parties. The _OFLSH unsolicited AT command will be returned if a flash was sent to the base station over the air. Note that on CDMA networks, this does not guarantee that an actual switch between calls took place, because there is no acknowledgement to the modem. For 3-way calls, initiate the first call to party # 1. Then send a flash with information (AT_OFLSH=1234567890) to initiate a call to party # 2, party # 1 will automatically be placed on hold. The “information” is the phone number of party # 2. Once a conversation with party # 2 is established, send a regular flash (AT_OFLSH) to connect all 3 parties. Send another flash (AT_OFLSH) to disconnect party # 2, or End call (see ATH) to end the call with all parties.

Defined Values

<n>:..... Phone Number

14.11 Play a Single DTMF tone “AT+VTS”

| Command | Possible Response(s) |
|----------|----------------------|
| +VTS=<n> | OK |

Description

This command enables playing a single DTMF tone, locally as well as remotely on an active call.

Defined Values

<n>:..... 0 1 2 3 4 5 6 7 8 9 A B C D # *

14.12 Set DTMP tone Duration “AT+VTD”

| Command | Possible Response(s) |
|----------|----------------------|
| +VTD=<n> | OK |

Description

This command sets the DTMF tone duration.

Defined Values

<n>:..... Duration dtmf signal = n * 0.1 sec

Note that a value of 0 produces a continuous dtmf

14.13 Read Preferred Roaming List “AT_OPRLV”

| Command | Possible Response(s) |
|---------|----------------------|
| _OPRLV? | _OPRLV: <n> |

Description

This command reads the Preferred Roaming List Version of the current NAM.

Defined Values

<n>:..... 0-65535

14.14 CDMA/1x Dial Command “AT+CDV”

| Command | Possible Response(s) |
|------------|----------------------|
| +CDV = <n> | OK |

Description

This command will initiate a voice call on the 1x/CDMA network

Defined Values

<n>:..... Receiver Phone Number

14.15 CDMA/1x Terminate Call Command “AT+CHV”

| Command | Possible Response(s) |
|---------|----------------------|
| +CHV | OK |

Description

This command will terminate an ongoing voice call on the 1x/CDMA network

14.16 Roaming Indicator “AT_ORMI”

| Command | Possible Response(s) |
|------------|---------------------------------|
| _ORMI? | _ORMI: <aa>,<bb>,<cc>,<dd>,<ee> |
| _ORMI=<aa> | OK |
| _ORMI=? | _ORMI: (0-1) |

Description

This command reads the roaming indicator info

Defined Values

<aa>.....Unsolicited message status

| Value | Description |
|-------|--------------------------|
| 0 | Unsolicited messages OFF |
| 1 | Unsolicited messages ON |

<bb>:..... Roaming Indicator Value

| Value | Description |
|--------|---------------------------------------|
| 0 | SYS_ROAM_STATUS_OFF |
| 1 | SYS_ROAM_STATUS_ON |
| 2 | SYS_ROAM_STATUS_BLINK |
| 3 | SYS_ROAM_STATUS_OUT_OF_NEIGHBORHOOD |
| 4 | SYS_ROAM_STATUS_OUT_OF_BLDG |
| 5 | SYS_ROAM_STATUS_PREF_SYS |
| 6 | SYS_ROAM_STATUS_AVAIL_SYS |
| 7 | SYS_ROAM_STATUS_ALLIANCE_PARTNER |
| 8 | SYS_ROAM_STATUS_PREMIUM_PARTNER |
| 9 | SYS_ROAM_STATUS_FULL_SVC |
| 10 | SYS_ROAM_STATUS_PARTIAL_SVC |
| 11 | SYS_ROAM_STATUS_BANNER_ON |
| 12 | SYS_ROAM_STATUS_BANNER_OF |
| 64-127 | Non-standard roaming indicator values |

<cc>:..... Roaming Indicator Icon

| Value | Description |
|-------|-----------------|
| 0 | ROAM ICON ON |
| 1 | ROAM ICON OFF |
| 2 | ROAM ICON BLINK |

<dd>:..... Roaming Indicator text (max 16 characters)
Text is default 7-bit ASCII

<ee>:..... Alert id

| Value | Description |
|-------|------------------------|
| 0 | Verizon Wireless |
| 1 | Network Extender |
| 2 | - |
| 3 | - |
| 4 | Extended Network |
| 5 | Roaming |
| 6 | - |
| 7 | - |
| 255 | Alert id not supported |

Alert Id will reference a file that contains the sound to be played

NOTE!!!

If the cdma service is lost, an unsolicited message will be displayed. (Alert : Service Lost)

14.17 System ID “AT_OSID”

| Command | Possible Response(s) |
|---------|-----------------------|
| _OSID | _OSID: <aa>,<bb>,<cc> |

Description

This command reads the network system id info.

Defined Values

- <aa>:..... IS95 or IS856
Note : if another system detected or no system available then command returns “ERROR”
- <bb>:..... System ID
For is95 this is a 16 bit number
For is856 this is a 16 byte number
- <cc>: Network ID
For is95 is is a 16 bit number
For is856 this is not available.

14.18 MEID and PseudoESN number “AT_OMEID”

| Command | Possible Response(s) |
|---------|----------------------|
| _OMEID | _OMEID: <aa>, <bb> |

Description

This command reads the MEID and Pseudo ESN.

Defined Values

- <aa>:..... MEID number
- <bb>:..... Pseudo ESN number

14.19 1.x/CDMA Signal Quality Level “AT+CSQ”

| Command | Possible Response(s) |
|---------|----------------------|
| +CSQ | +CSQ: <N> |

Description

This command returns a signal strength level indication depending on the RSSI. This command is only valid for 1.x/CDMA (voice) systems.

Defined Values

<N>:

| Value | Description |
|-------|-------------|
| 7 | -113 dbm |
| 9 | -110 dbm |
| 14 | -102 dbm |
| 16 | -99 dbm |
| 21 | -91 dbm |
| 24 | -86 dbm |
| 27 | -81 dbm |
| 31 | -75 dbm |

14.20 EVDO/HDR Signal Quality Level “AT^HDRCSQ”

| Command | Possible Response(s) |
|-----------|-----------------------------|
| ^HDRCSQ | ^HDRCSQ: <N> |
| ^HDRCSQ=? | ^HDRCSQ: (0,20,40,60,80,99) |

Description

This command returns a signal strength level indication depending on the RSSI. This command is only valid for EVDO/HDR systems.

Defined Values

<N>:

| Value | Description |
|-------|----------------------------|
| 99 | -60 dbm |
| 80 | -75 dbm |
| 60 | -90 dbm |
| 40 | -105 dbm |
| 20 | <-105 dbm but still signal |
| 0 | No signal |

14.21 Voice Privacy “AT_OPRV”

| Command | Possible Response(s) |
|---------------------|----------------------------|
| _OPRV= <n>, <unsol> | OK _OPRV: 0 _OPRV: 1 |
| _OPRV? | _OPRV: <n>,<disp> |
| _OPRV=? | _OPRV: (0-1),(0-1) |

Description

This command sets the desired voice privacy and can generate an unsolicited message when the voice privacy setting is being set or changes.

It will write the NV item NV_VOICE_PRIV_I with the given privacy setting so all following calls will have the new privacy option.
When a voice call is active, the new privacy will be applied for that call.
Note that the base station can reject the privacy option or can change it.

Extract from 3GPP2 C.S0005:

“Voice privacy is the process by which user voice transmitted over a CDMA Traffic Channel is afforded a modest degree of protection against eavesdropping over the air.”

“Voice privacy is provided in the CDMA system by means of the private long code mask used for PN spreading. Voice privacy is provided on the Traffic Channels only. All calls are initiated using the public long code mask for PN spreading. The mobile station user may request voice privacy during call set-up using the Origination Message or Page Response Message, and during Traffic Channel operation using the Long Code Transition Request Order.”

Defined Values

<n>:

| Value | Description |
|-------|------------------|
| 0 | Standard privacy |
| 1 | Enhanced privacy |

<unsol>:

| Value | Description |
|-------|--|
| 0 | No unsolicited message when privacy changes |
| 1 | Unsolicited message will be printed when privacy changes |

14.22 Selected System in PRL List “AT_OSYS PRL”

| Command | Possible Response(s) |
|--------------|----------------------|
| _OSYS PRL= x | ERROR |
| _OSYS PRL? | _OSYS PRL: <n> |
| _OSYS PRL=? | ERROR |

Description

This command can be used to check if the currently selected system is a part of the Preferred Roaming List

Defined Values

<n>:

| Value | Description |
|-------|--|
| 0 | Selected system is not a part of the PRL |
| 1 | Selected system is a part of the PRL |

14.23 Access Overload Class “AT_OAOC”

| Command | Possible Response(s) |
|---------------|----------------------|
| _OAOC=[<aoc>] | OK |
| _OAOC? | _OAOC: <aoc> |
| _OAOC=? | _OAOC: (0-15) |

Description

This command changes the Access Overload Class of the current nam. The Access Overload Class of the phone is normally determined by the last digit of the MIN, thus producing an equal distribution of classes from 0-9. There are six additional classes (10-15), which are used for special purpose mobiles, such as test phones.

Defined values

<aoc>: 0-15

14.24 Read Current NAM “AT_OCNM”

| Command | Possible response(s) |
|------------|----------------------|
| _OCNM= <n> | ERROR |
| _OCNM=? | ERROR |
| _OCNM? | _OCNM: <nam> |

Description

This command is used to read out the current NAM

Defined Values

<nam>: Numerical NAM value

14.25 Roaming Preference “AT_ORMP”

| Command | Possible Response(s) |
|--------------|----------------------|
| _ORMP=<rp>]] | OK |
| _ORMP? | _ORMP: <rp> |
| _ORMP=? | _ORMP: (1-3,255) |

Description

This command changes the Roam Preference of the current nam. The Roam Preference of a CDMA modem informs the MS whether it is allowed to roam on foreign CDMA networks or only allow operation on home networks.

Defined values

<rp>:..... Desired Roaming Preference

| Value | Description |
|-------|--------------------------------------|
| 1 | Allow Home Network only |
| 2 | Allow Roaming Only |
| 3 | Allow Roaming on affiliated networks |
| 255 | Allow Roaming on any network |

14.26 Slot Cycle Index “AT_OSCI”

| Command | Possible Response(s) |
|-------------|----------------------|
| _OSCI=<sci> | OK |
| _OSCI? | _OSCI: <sci1> |
| _OSCI=? | _OSCI: (0-3) |

Description

On the CDMA Paging Channel (this is the shared channel that all phones listen to for incoming calls and other control info), time is divided into "slots". To conserve power, phones that are currently idle only "wake up" and listen for messages on the Paging Channel during their assigned slots. The slot cycle index determines how often the phone's slot comes around.

Defined values

<sci>: Slot Cycle Index

| Value | Description |
|-------|--|
| 0 | Default Passive SCI=9 (Idle sleep = 5.12s) |
| 1 | Passive SCI=6 (Idle sleep = 426.66 ms) |
| 2 | Passive SCI=5 (Idle sleep = 213.33 ms) |
| 3 | Passive SCI=7 (Idle sleep = 1280 ms) |

Important Note!

The slot cycle information can ONLY be read/written when there is a data connection established. In all other cases, AT_OSCI will return “error”.

14.27 Answer Hold “AT_OANHO”

| Command | Possible Response(s) |
|-------------|------------------------------|
| _OANHO= <n> | OK _OANHO: 0 _OANHO: 1 |
| _OANHO? | _OANHO:<n> |
| _OANHO=? | _OANHO: (0-1) |

Description

This command can only be called when there is an incoming voice call or when a voice call is put on hold.

By issuing AT_OANHO=1 an incoming voice call is put on hold, issuing AT_ONHO=0 will make the conversation active.

Unsolicited results will be given when answer hold becomes active and inactive.

Defined Values

<n>:

| Value | Description |
|-------|---|
| 0 | Stops putting the incoming voice call on hold , “_OANHO: 0” will be displayed if successful |
| 1 | Puts the incoming voice call on hold, “_OANHO: 1” will be displayed if successful |

14.28 Voice Mail Indication “AT_OVMI”

| Command | Possible Response(s) |
|------------|----------------------|
| _OVMI= <n> | ERROR |
| _OVMI? | _OVMI: <LineID>,<n> |
| _OVMI=? | _OVMI: <LineID>,<n> |

Description

This command is used to display the current number of Voice Mail messages stored on the phone.

Defined Values

<LineID>:..... Voice Mail LineID, will be 1

<n>:..... Number of stored Voice Mail messages

14.29 1.x/CDMA system registration “AT+CREG”

| Command | Possible Response(s) |
|-----------|----------------------|
| +CREG=<n> | OK |
| +CREG? | +CREG: <n>,<state> |
| +CREG=? | +CREG: (0-1) |

Description

This command is used to query the UE's registration state on 1.x/CDMA (voice) systems and to enable an unsolicited result code for network registration updates if so desired.

Defined Values

<n>:

| Value | Description |
|-------|---------------------------------|
| 0 | Disable Unsolicited Result Code |
| 1 | Enable Unsolicited Result Code |

<state>:

| Value | Description |
|-------|-------------------------------|
| 0 | Not Registered, Not Searching |
| 1 | Registered on Home Network |
| 2 | Not Registered, Searching |
| 3 | Registration Denied |
| 4 | Unknown Registration State |
| 5 | Registered on Roaming Network |

14.30 HDR/EVDO system registration "AT+CGREG"

| Command | Possible Response(s) |
|------------|----------------------|
| +CGREG=<n> | OK |
| +CGREG? | +CGREG: <n>,<state> |
| +CGREG=? | +CGREG: (0-1) |

Description

This command is used to query the UE's registration state on HDR/EVDO systems and to enable an unsolicited result code for network registration updates if so desired.

Defined Values

<n>:

| Value | Description |
|-------|---------------------------------|
| 0 | Disable Unsolicited Result Code |
| 1 | Enable Unsolicited Result Code |

<state>:

| Value | Description |
|-------|-------------------------------|
| 0 | Not Registered, Not Searching |
| 1 | Registered on Home Network |
| 2 | Not Registered, Searching |
| 3 | Registration Denied |
| 4 | Unknown Registration State |
| 5 | Registered on Roaming Network |

14.31 Read Base Station System Time “AT_OBSTIME”

| Command | Possible Response(s) |
|--------------|----------------------------------|
| _OBSTIME? | _OBSTIME:<stl>,<sth>,<l>,<o>,<d> |
| _OBSTIME=<n> | OK |

Description

This command reads the base station system time from the sync channel message. Using the write command will enable/disable unsolicited OBSTIME updates. Note that the default behaviour is enabled from boot up.

Defined Values

<stl>: System time (lowest 4 bytes)
Time unit = 80ms
Time starting from 06/01/1980 known as GPS Zero Time

<sth>: System time (highest 4 bytes)

<l>: Number of leap seconds that have occurred since the start of System Time

<o>: Offset of local time from System Time
Number Presentation is 6 bit two's complement
Time unit: Half Hour

<q>: Daylight savings time indicator

<n>:

| Value | Description |
|-------|---------------------------------|
| 0 | OBSTIME unsolicited is enabled |
| 1 | OBSTIME unsolicited is disabled |

14.32 Enable Page Hold Mechanism “AT_OPHOLDEN”

| Command | Possible Response(s) |
|---------------|----------------------|
| _OPHOLDEN=<n> | OK ERROR |
| _OPHOLDEN? | <n> OK |
| _OPHOLDEN=? | _OPHOLDEN: (0-2) |

Description

This command will enable/disable the paging hold mechanism for incoming voice calls, SMS messaging and OTAPA requests. This mechanism introduces a system that allows for the initial paging for a voice call, SMS or OTAPA to be put in a fabricated “hold” state. This allows the receiving party to handle some other desired business before either activating the Tx Radio and respond to the incoming page or to reject it altogether. The amount of retries allowed from the network before automatically accepting the page is indicated by <n>

When an incoming page is received, the UE sends an unsolicited result code, indicating that such a page has been received:

_OPAGHOLD=<m>

For a full flow of the mechanism, please refer to the flowchart in 14.38 below.

Defined Values

<n>:

| Value | Description |
|-------|--|
| 0 | Page Hold Mechanism is disabled |
| 1 | Page Hold Mechanism is enabled, 1 paging retry allowed |
| 2 | Page Hold Mechanism is enabled, 2 paging retries allowed |

<m>:

| Value | Description |
|-------|---|
| 0 | Paging for incoming Voice Call has been received |
| 1 | Paging for incoming SMS has been received |
| 2 | Paging for incoming OTAPA has been received (can be PRL update) |

14.33 Handle Held Paging Request “AT_OCTPAG”

| Command | Possible Response(s) |
|-------------|----------------------|
| _OCTPAG=<n> | OK ERROR |
| _OCTPAG? | ERROR |
| _OCTPAG=? | _OCTPAG: (0-1) |

Description

In the case of when an incoming page is being held via the OPHOLDEN mechanism, this command allows for handling the currently held page, either accepting or declining it.

For a full flow of the mechanism, please refer to the flowchart in 14.38 below.

Defined Values

<n>:

| Value | Description |
|-------|----------------------------|
| 0 | Reject Currently Held Page |
| 1 | Accept Currently Held Page |

14.34 Page Hold Flowchart

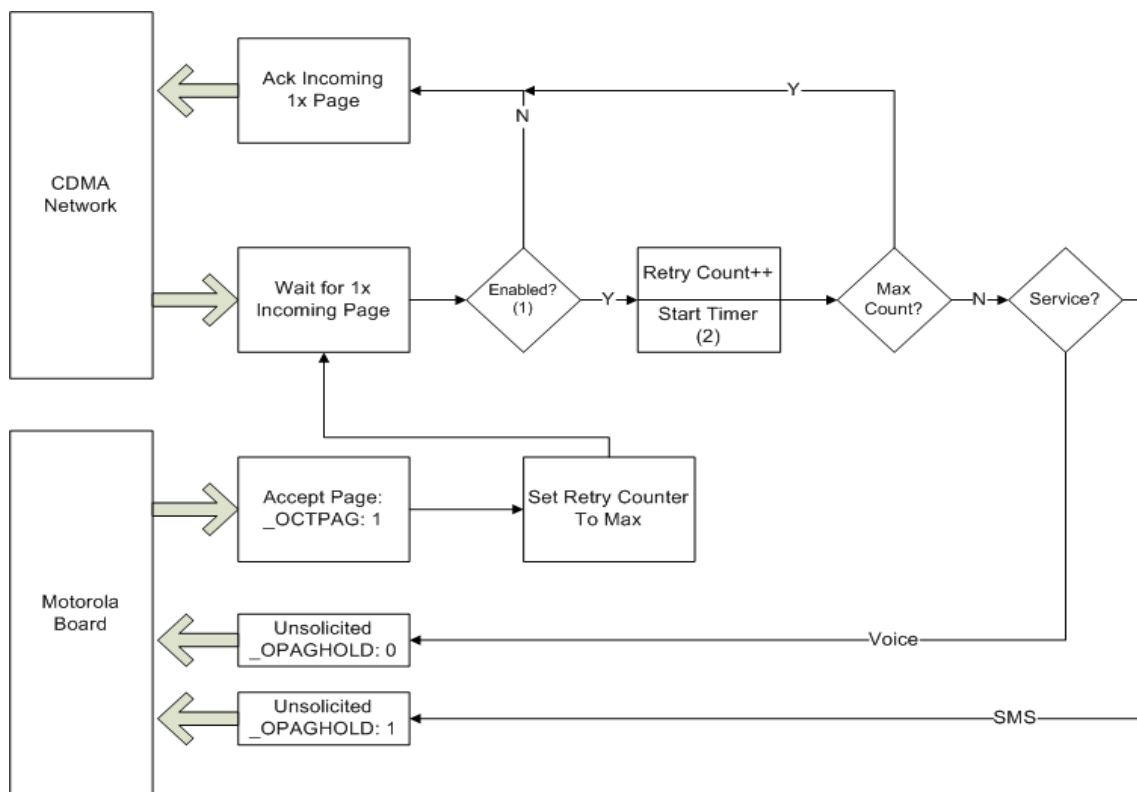


Figure 1: Page Hold Flowchart

14.35 Check 1.x/EVDO Revision “AT_OCDMAREV”

| Command | Possible Response(s) |
|-------------|---------------------------------|
| _OCDMAREV? | _OCDMAREV: <1x_rev>, <evdo_rev> |
| _OCDMAREV | OK |
| _OCDMAREV=? | ERROR |

Description

This command checks the current 1.x and/or EVDO revision of the network.

Defined values

<1x_rev>:

| Value | Description |
|-------|--------------------------|
| 0x1 | CDMA 1x IS95 |
| 0x2 | CDMA 1x IS2000 |
| 0x4 | CDMA 1x IS2000 Release A |

<evdo_rev>:

| Value | Description |
|--------|-------------|
| 0x1 | CDMA 1x |
| 0x2 | EVDO Rev 0 |
| 0x4 | EVDO Rev A |
| 0x8 | EVDO Rev B |
| 0x8000 | Null Bearer |

14.36 Data Session info “AT_ODSI”

| Command | Possible Response(s) |
|---------|----------------------|
| _ODSI? | _ODSI: <m>, <n> |
| _ODSI | OK |
| _ODSI=? | ERROR |

Description

This command checks on which service the data connection is made 1x or hdr, and if the data session is dormant or not.

Defined values

<m>:

| Value | Description |
|-------|---------------------------|
| 0 | No data service available |
| 1 | 1x data service |
| 2 | Hdr data service |

<n>:

| Value | Description |
|-------|-------------|
| 0 | Active |
| 1 | Dormant |

14.37 PRL Status “AT_OPRLSTAT”

| Command | Possible Response(s) |
|--------------------|------------------------------|
| _OPRLSTAT=<enable> | OK ERROR |
| _OPRLSTAT? | _OPRLSTAT: <enable> ERROR |
| _OPRLSTAT=? | _OPRLSTAT: (0-1) |

Description

This commands can check the enable status of the PRL (Preferred Roaming List). It can enable or disable the PRL. By default the PRL is enabled. This command can be used for testing, to make the device register on a network which is not in the PRL (together with _ORMP and _OHOMESID).

If the NV item is not active or cannot be written the command will return ERROR.

Defined values

<enable>:

| Value | Description |
|-------|--------------------------|
| 0 | PRL is not enabled |
| 1 | PRL is enabled (default) |

14.38 ERI Text on “AT_OERITXT”

| Command | Possible Response(s) |
|-------------------|-----------------------------|
| _OERITXT=<enable> | OK ERROR |
| _OERITXT? | _OERITXT: <enable> ERROR |
| _OERITXT=? | _OERITXT: (0-1) |

Description

This commands will enable/disable ERI banner text messages in the result message of “AT_ORMI?”.

Defined values

<enable>:

| Value | Description |
|-------|--------------------------|
| 0 | ERI text not shown |
| 1 | ERI text shown (default) |

14.39 ERI Alert on “AT_OERIALRT”

| Command | Possible Response(s) |
|--------------------|------------------------------|
| _OERIALRT=<enable> | OK ERROR |
| _OERIALRT? | _OERIALRT: <enable> ERROR |
| _OERIALRT =? | _OERIALRT: (0-1) |

Description

This command will enable/disable the ERI alert sound id's in the result message of “AT_ORMI?”

Defined values

<enable>:

| Value | Description |
|-------|-------------------------------------|
| 0 | ERI alert messages not played |
| 1 | ERI alert messages played (default) |

14.40 ERI Version “AT_OERIV”

| Command | Possible Response(s) |
|---------|-------------------------------|
| _OERIV? | _OERIV: <version nr> ERROR |

Description

This command will read the version number from the header of the eri file.

Defined values

<version nr>: version number of eri file (0 - 65535)

14.41 Unsolicited display message: “AT_ODISPLAY”

| Command | Possible Response(s) |
|---------------|------------------------------|
| _ODISPLAY=<n> | OK ERROR |
| _ODISPLAY? | _ODISPLAY: <enable> ERROR |
| _ODISPLAY =? | _ODISPLAY: (0-1) |

Description

When display information is available from the network, _ODISPLAY: <text> will be sent unsolicited when n is set to 1. By default n is 0, so nothing will be sent.

Defined values

<n>:

| Value | Description |
|-------|---|
| 0 | No unsolicited message is sent out (default) |
| 1 | Unsolicited message is sent when display info comes from the network. |

<text>: Text coming from the network. When a WPS call is queued, this text will be “QUEUED” without the quotes.

14.42 Block Services during PTT connection “AT_OPTTBLOCK”

| Command | Possible Response(s) |
|----------------|--------------------------|
| _OPTTBLOCK=<n> | OK ERROR |
| _OPTTBLOCK? | _OPTTBLOCK: <n> ERROR |
| _OPTTBLOCK =? | _OPTTBLOCK: (0-3) |

Description

This command will allow the blocking of incoming voice calls or outgoing SMS and is intended to be used while a PTT (push-to-talk) connection is active. For incoming voice calls, the MDM will immediately generate a call end event, preventing the MDM from going into ringing state. For sending SMS, entering the command for sending an SMS will return CMS ERROR 521.

Defined values

<n>:

| Value | Description |
|-------|--|
| 0 | Nothing is blocked |
| 1 | Block incoming voice calls, allow outgoing SMS |
| 2 | Block outgoing SMS, allow incoming voice calls |
| 3 | Block both incoming voice calls and outgoing SMS |

14.43 Data call release “AT_ODCR”

| Command | Possible Response(s) |
|---------|----------------------|
| _ODCR? | ERROR |
| _ODCR | OK/ERROR |
| _ODCR=? | ERROR |

Description

This command release the data call interface. It returns OK when interface released, ERROR when no interface found.

14.44 Unsolicited HDR Signal Quality Indication “AT_OHDRSQI”

| Command | Possible Response(s) |
|--------------|----------------------|
| _OHDRSQI=<n> | OK ERROR |
| _OHDRSQI? | _OHDRSQI: <n> |
| _OHDRSQI=? | _OHDRSQI: (0-1) |

Description

This command controls sending of the unsolicited result code _OHDRSIGQ which is sent when the HDR signal quality changes. This command is only valid for EVDO/HDR systems. It returns the same value as ^HRCSSQ (see 14.20).

_OHDRSIGQ syntax:
_OHDRSIGQ: <val>

Defined Values

<n>:

| Value | Description |
|-------|--|
| 0 | Disable sending of _OHDRSIGQ unsolicited result code (default) |
| 1 | Enable sending of _OHDRSIGQ unsolicited result code |

Defined Values

<val>:

| Value | Description |
|-------|----------------------------|
| 99 | -60 dbm |
| 80 | -75 dbm |
| 60 | -90 dbm |
| 40 | -105 dbm |
| 20 | <-105 dbm but still signal |
| 0 | No signal |

14.45 Unsolicited Data state change

| Command | Possible Response(s) |
|--------------|-----------------------------|
| _ODSTATE=<n> | OK ERROR |
| _ODSTATE? | _ODSTATE: <enabled>,<state> |
| _ODSTATE =? | _ODSTATE: (0-2) |

Description

This command controls sending of the unsolicited result code _ODSTATE which is sent when the CDMA 1x or HDR data call changes its state.

When <enabled> is set to 1, only data call active and data call ended will be sent unsolicited. When going from dormant to active, this will not be sent.

When <enabled> is set to 2, all state changes are sent unsolicited, including going to dormant mode and waking up again and data call ended.

The dormant timer at the device side can be controlled with AT+CTA=x. X is a value in seconds going from 0 (never go to dormant) to a max of 255 seconds. Default it is set to 30 seconds. Note that there is also a network timer. The data connection will go in dormant mode when one of those 2 timers expires. Whenever data is exchanged the timers are restarted and the link is active again.

When the data call goes to dormant mode, after a period of no data exchange, the 1x/HDR data link is closed, but the IP link is still connected. AT+CLCC will not list a dormant data call. Whenever data has to be sent out or comes in, the 1x/HDR data link has to be brought up again.

The data call state also can be checked with AT_ODSI (see 14.36).

Unsolicited _ODSTATE syntax:
_ODSTATE: <state>

Defined Values

<enabled>:

| Value | Description |
|-------|--|
| 0 | Disable sending of _ODSTATE unsolicited result code (default) |
| 1 | Enable partial sending of _ODSTATE unsolicited result code, no dormant state |
| 2 | Enable full sending of _ODSTATE unsolicited result code |

Defined Values

<state>:

| Value | Description |
|-------|--------------------|
| 0 | Data call is ended |

| | |
|---|----------------------|
| 1 | Data call is active |
| 2 | Data call is dormant |

14.46 Data call start “AT_ODCS”

| Command | Possible Response(s) |
|---------|----------------------|
| _ODCS? | ERROR |
| _ODCS | OK/ERROR |
| _ODCR=? | OK |

Description

This command starts a data call. It returns OK when it is possible to start one, ERROR if not (eg when there is still a data call busy). It does the same as ATD#777. After some time on the modem port the unsolicited CONNECT 3072000 (or 23) is sent out, NO CARRIER when the data call ended.

The command can be started from any AT port.

15 CDMA: UNSOLICITED RESULTS DURING OTA SERVICE PROVISIONING

15.1 Unsolicited Result Strings during manual provisioning

OTASP: MDN_DOWNLOADED
OTASP: NAM_DOWNLOADED
OTASP: BAD_SPC
OTASP: SPC_FAILLURE
OTASP: SPL_UNLOCKED
OTASP: IMSI_DOWNLOADED
OTASP: AKEY_EXCHANGED
OTASP: PRL_DOWNLOADED
OTASP: COMMIT_SUCCESFUL

15.2 Unsolicited Results Strings during automatic provisioning

OTASP: OTAPA_STARTED
OTASP: OTAPA_STOPPED
OTASP: OTAPA_ABORTED

16 CDMA: MOBILE IP PROGRAMMING

16.1 Enable/disable Mobile IP “AT\$QCMIP”

| Command | Possible Response(s) |
|-------------|----------------------|
| \$QCMIP=<n> | OK |
| \$QCMIP? | \$QCMIP: <n> |
| \$QCMIP=? | \$QCMIP: (0-2) |

Description

This command enables/disables the mobile ip capabilities

Defined Values

<n> :

| Value | Description |
|-------|--|
| 0 | Mobile IP disabled, Single IP only |
| 1 | Mobile IP preferred. If no Mobile IP available switch to single IP |
| 2 | Mobile IP only |

16.2 Enable/disable currently active profile “AT\$QCMIPPEP”

| Command | Possible Response(s) |
|----------------|----------------------|
| \$QCMIPPEP=<n> | OK |
| \$QCMIPPEP? | \$QCMIPPEP: <n> |
| \$QCMIPPEP=? | \$QCMIPPEP: (0-1) |

Description

This command enables/disables the mobile ip active profile

Defined Values

<n>:

| Value | Description |
|-------|-------------------------|
| 0 | Active profile disabled |
| 1 | Active profile enabled |

16.3 Return MIP profile info “AT \$QCMIPGETP”

| Command | Possible Response(s) |
|-------------------|--|
| \$ QCMIPGETP =<n> | Returns all parameters of active MIP profile specified OK |
| \$ QCMIPGETP? | \$ QCMIPGETP: <n> |
| \$ QCMIPGETP =? | \$ QCMIPGETP: (0-5) |

Description

This command enables/disables the mobile ip active profile

Defined Values

<n>:..... Active Profile

Note :

Active profile parameters:

- Profile:
- NAI:
- Home Addr:
- Primary HA:
- Secondary HA:
- MN-AAA SPI:
- MN-HA SPI:
- Rev Tun:
- MN-AAA SS:
- MN-HA SS:

16.4 Set MIP MN-AAA SPI “AT\$QCMIPMASPI”

| Command | Possible Response(s) |
|------------------------|-------------------------------------|
| \$ QCMIPMASPI =<n>,<m> | OK |
| \$ QCMIPMASPI? | ERROR |
| \$ QCMIPMASPI =? | \$ QCMIPMASPI: (0-4294967295),(0-1) |

Description

This command stores MN-AAA SPI for the active profile

Defined Values

<n>:..... SPI value

<m>:

| Value | Description |
|-------|---------------------|
| 0 | do not commit to NV |
| 1 | commit to NV |

16.5 Set MIP MN-AAA shared secret “AT\$QCMIPMASSX”

| Command | Possible Response(s) |
|------------------------|---|
| \$ QCMIPMASSX =<n>,<m> | OK |
| \$ QCMIPMASSX? | Set/Not Set |
| \$ QCMIPMASSX =? | \$QCMIPMASSX: [0x00-0xFF] (max 16 bytes), 0-1 |

Description

This command stores the MN-AAA shared secret key for the active profile.

Defined Values

<n>:..... MN-AAA shared secret key
Note: This value must be entered in Hex format

<m>:

| Value | Description |
|-------|---------------------|
| 0 | do not commit to NV |
| 1 | commit to NV |

16.6 Set MIP MN-HA SPI “AT\$QCMIPMHSPI”

| Command | Possible Response(s) |
|------------------------|-------------------------------------|
| \$ QCMIPMHSPI =<n>,<m> | OK |
| \$ QCMIPMHSPI? | Set/Not Set |
| \$ QCMIPMHSPI =? | \$ QCMIPMHSPI: (0-4294967295),(0-1) |

Description

This command stores the SPI value for MN-HA for the active profile.

Defined Values

<n>:..... SPI value

<m>:

| Value | Description |
|-------|---------------------|
| 0 | do not commit to NV |
| 1 | commit to NV |

16.7 Set MIP MN-HA shared secret “AT\$QCMIPMHSSX”

| Command | Possible Response(s) |
|----------------------|--|
| \$QCMIPMHSS =<n>,<m> | OK |
| \$QCMIPMHSS? | Set/Not Set |
| \$QCMIPMHSS =? | \$QCMIPMHSS: [0x00-0xFF] (max 16 bytes), 0-1 |

Description

This command stores the MN-HA shared secret key for the active profile.

Defined Values

<n>:..... MN-HA shared secret key
Note: This value must be entered in Hex format

<m>:

| Value | Description |
|-------|---------------------|
| 0 | do not commit to NV |
| 1 | commit to NV |

16.8 Set MIP NAI “AT\$QCMIPNAI”

| Command | Possible Response(s) |
|---------------------|----------------------------------|
| \$QCMIPNAI =<n>,<m> | OK |
| \$QCMIPNAI? | <n>,<m> |
| \$QCMIPNAI =? | \$ QCMIPNAI: (20,21,23-7E),(0-1) |

Description

This command stores the Network Access Identifier for the active profile.

Defined Values

<n>:..... NAI String, containing user info used to access network.

<m>:

| Value | Description |
|-------|---------------------|
| 0 | do not commit to NV |
| 1 | commit to NV |

16.9 Select MIP user profile to be active “AT\$QCMIPP”

| Command | Possible Response(s) |
|----------------|----------------------|
| \$ QCMIPP =<n> | OK |
| \$ QCMIPP? | <n> |
| \$ QCMIPP =? | \$QCMIPP: (0-5) |

Description

This command selects profile to be active.

Defined Values

<n>:..... Profile Number

16.10 Set MIP reverse tunnelling “AT\$QCMIPRT”

| Command | Possible Response(s) |
|--------------------|------------------------|
| \$QCMIPRT =<n>,<m> | OK |
| \$QCMIPRT? | <n>,<m> |
| \$QCMIPRT =? | \$QCMIPRT: (0-1),(0-1) |

Description

This command enables/disables reverse tunnelling for the active profile.

Defined Values

<n>:

| Value | Description |
|-------|--|
| 0 | No MIP reverse tunnelling requested |
| 1 | Request MIP reverse tunnelling requested |

<m>:

| Value | Description |
|-------|---------------------|
| 0 | do not commit to NV |
| 1 | commit to NV |

16.11 Enable/disable RFC 2002bis authentication “AT\$QCMIPT”

| Command | Possible Response(s) |
|----------------|----------------------|
| \$ QCMIPT =<n> | OK |
| \$ QCMIPT? | <n> |
| \$ QCMIPT =? | \$ QCMIPT: (0-1) |

Description

This command enables/disables RFC 2002bis authentication.

Defined Values

<n>:

| Value | Description |
|-------|---|
| 0 | MIP RFC 2002bis authentication disabled |
| 1 | MIP RFC 2002bis authentication enabled |

17 CDMA: KEYBOARD PROGRAMMING

17.1 Unlock modem “AT_OSPC” (Service Programming Code)

| Command | Possible Response(s) |
|-------------|---|
| _OSPC=<key> | If match : SPC CODE OK OK If no match : ERROR |
| _OSPC? | _OSPC: LOCKED Or _OSPC: UNLOCKED OK |
| _OSPC =? | _OSPC : 6 DIGITS SPC CODE |

Description

This command will unlock the modem if the given key matches the programmed key. If the modem is unlocked, then the values of the at-commands in this chapter can be written. As long as the modem is locked, the write functions of the at-commands in this chapter cannot change the content of the items and the write function will return ERROR.

Defined Values

<key>: 6 digits key

17.2 Manual programming A-key “AT_OAKEYUPDATE

| Command | Possible Response(s) |
|--------------------|---|
| _OAKEYUPDATE=<key> | _OAKEYUPDATE: successful _OAKEYUPDATE: a-key programming failed _OAKEYUPDATE: invalid a-key OK |
| _OAKEYUPDATE? | ERROR |
| _OAKEYUPDATE =? | _OAKEYUPDATE : 26 DIGIT AKEY |

Description

This command will program the a-key for the current nam.

Defined Values

<key>: 26 digits a-key

17.3 Read/Write IMSI value “AT_OIMSI”

| Command | Possible Response(s) |
|----------------|-------------------------------|
| _OIMSI= <imsi> | OK |
| _OIMSI? | _OIMSI : <m> |
| _OIMSI =? | _OIMSI : IMSI 15 digit string |

Description

This command will read/program the IMSI value for the current nam.

Defined Values

<imsi>:..... 15 digit IMSI value

| Value | Description |
|----------------|------------------|
| Digit [10...0] | IMSI_S value |
| Digit[12..11] | IMSI_11_12 value |
| Digit[15..13] | MCC |

17.4 Read/Write MDN value “AT+MDN”

| Command | Possible Response(s) |
|-------------|----------------------|
| +MDN= <mdn> | OK |
| +MDN? | +MDN : <mdn> |
| +MDN | +MDN : <mdn> |
| +MDN=? | OK |

Description

This command will read/program the MDN value from current nam, only useful if not yet provisioned.

Defined Values

<mdn>:..... MDN value (max 15 digits, ranging from 0 to 9)

17.5 Read/Write home sid/nid pairs “AT_OHOMESID”

| Command | Possible Response(s) |
|----------------------------|--|
| _OHOMESID= <n>,<sid>,<nid> | OK |
| _OHOMESID? | _ OHOMESID: <n>,<sid>,<nid> |
| _OHOMESID =? | _ OHOMESID: (0-19),(0-65535),(0-65535) |

Description

This command will read/program the home sid/nid pairs for the current nam.

Defined Values

<n>:..... index of the home sid/nid pair.
 <sid>: home System Identification number.
 <nid>: home Network Identification number.

17.6 Get GT Code “AT_OGTC”

| Command | Possible Response(s) |
|---------|------------------------|
| _OGTC? | _OGTC: <GT code> OK |

Description

This command will read the GT code (string) from NV. If the GT code is not written to NV the default UNKNOWN will be shown.

Defined values

<GT mode>: string type; GT mode of data card;

17.7 Get Customisation Identification “AT_OCID”

| Command | Possible Response(s) |
|---------|----------------------|
| _OCID? | _OCID: <cid> OK |

Description

This command will read the Customisation identification (string) from NV. If it is not written to NV the default UNKNOWN will be shown.

Defined values

<cid>: string type; customisation identification.

REFERENCES

| Reference documents | | Owner |
|---------------------|--|-------|
| [1] | 3GPP TS 27.007 V3.7.0 (2000-12) AT Command set for User Equipment (UE) (Release 1999) | 3GPP |
| [2] | 3GPP TS 27.005 V3.1.0 (2000-01) Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS) | 3GPP |
| [3] | 3GPP2 C.R1001 Administration of Parameter Value Assignments for cdma2000 Spread Spectrum Standards | 3GPP2 |