CDMA AT Commands

AT Commands
Reference Guide

MultiTech Systems

CDMA AT Commands
Reference Guide
This Command Set Applies to the Following Products:

SocketModem® CDMA (MTSMC-C)
MultiModem® CDMA (MTCBA-C)
MultiModem® CDMA with USB (MTCBA-C-U)
MultiModem® iCell (MTCMR-C)
MultiModem® CDMA with Ethernet Interface (MTCBA-C-EN)
MMCModem™ CDMA (MTMMC-C)

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Revisions

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I	05/14/07	Updated Technical Support contact list. Moved chapter covering Unsolicited Result Codes to a later chapter (Chapter 21) in the manual instead of its previous position as Chapter 3.
J	01/16/08	Updated Technical Support contact list again. Removed command +WMSN (Modem Serial Number). Changed cover layout. Updated product name for ModemModule to MMCModem.
K	01/20/09	Added the MultiModem® iCell (MTCMR-C) to the list of products that use these commands. Removed fax commands. Changed the default value for &C "Data Carrier Detect" to 2 in the values section. Removed MultiModem CDMA PCI as a product using this command set. Made minor editorial changes.
L	10/04/10	Changed 110dBm to -110dBm and changed 31 = -75dBm to 31 = -76dBm in the +CSQ command. Also, in +CSQ, shortened the note inside the example to "2 messages are unread." Changed the Technical Support statement.
M	12/21/10	Updated +WSTX. Removed text that didn't apply to the command and removed example 2.

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Technical Support

Please refer to the Copyright/Technical Support page in the product User Guide or Developer Guide.

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Chapter 1 – Introduction

The AT command set is one of the main interfaces for the modem to interact with an external application layer. CDMA AT commands are defined in TIA/EIA/IS707.3. However, as the wireless applications increase, TIA/EIA/IS707.3 is not sufficient. In addition, a lot of GSM applications already exist and GSM customers would like to maintain the same interface in order to make no or minimum changes to the applications to be used with CDMA modem. To meet the all these needs, this CDMA AT command set is designed to cover the following:

1. IS707.3 AT commands;
2. GSM 07.07 when applicable;
3. GSM 07.05 when applicable,
4. ITU-T v25 when applicable;
5. Proprietary AT set;
6. Customer specific AT commands;
7. Qualcomm defined AT commands.

Please note that in several instances, the GSM 7.07 and 7.05 specifications could not be followed because of fundamental differences between CDMA and GSM call processing behaviors. In these cases, minimal changes were made to the GSM-related commands.

Scope of This Document

This document describes CDMA AT commands, their syntax, responses, and result codes. It serves as the reference for wireless application development based on the CDMA modem and for its integration and testing. The intended audience is expected to be familiar with CDMA data services protocol and AT modem commands.

Related References

This interface specification is based on the following recommendations or standards:

1. ETSI GSM 07.05: Digital cellular telecommunications system (Phase 2); Use of DTE-DCE interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
2. ETSI GSM 07.07: Digital cellular telecommunications system (Phase 2); AT command set for GSM Mobile Equipment (ME)
3. ITU-T Recommendation V.25 ter: Serial asynchronous automatic dialing and control
4. ETSI GSM 03.40: Digital cellular telecommunications system (Phase 2); Technical implementation of the Short Message Service (SMS) Point-to-Point (PP)
5. ETSI GSM 03.38: Digital cellular telecommunications system (Phase 2); Alphabets and language-specific information
6. ETSI GSM 04.80: Digital cellular telecommunications system (Phase 2): Mobile radio interface layer 3, Supplementary service specification, Formats and coding
7. TIA/EIA/IS-707.3: Data Service Options for Wideband Spread Spectrum Systems: AT Command Processing and the Rm Interface
8. IS-131: Data Transmissions Systems and Equipment – Extensions to Asynchronous Dialing and Control.
9. TIA/EIA-592: Asynchronous Facsimile DCE Control Standard – Service Class 2.

Terminology and Acronyms

This is an alphabetical list of terms and acronyms used throughout this document and the CDMA cellular industry.

2G Second Generation. All digital cellular systems developed to replace the first analog cellular systems. (GSM and CDMA).

3G Third Generation. Next generation digital cellular systems designed to have high-speed data access and higher voice capacity (CDMA & CDMA2000).

AFLT Advanced Forward Link Trilateration. A type of handset-based position location technology. GPS satellites are not used to determine location. To determine location using AFLT, the phone takes measurements of signals from nearby cellular base stations (towers) and reports the time/distance readings back to the network, which are then used to triangulate an approximate location of the handset. In general, at least three surrounding base stations are required to get an optimal position fix.

CBM Cell Broadcast Message. An SMS message that is broadcast to all mobiles on the network.

CDMA Code Division Multiple Access. CDMA is a spread spectrum, digital wireless modulation scheme for cellular communications systems. It has approximately 3 times the voice capacity of GSM networks. See IS-95, IS-95B, IS-2000.

cdmaONE cdmaOne is a brand name, trademarked and reserved for the exclusive use of the CDMA Development Group. cdmaOne describes a complete wireless system that incorporates the IS-95 CDMA air interface, the ANSI-41 network standard for switch interconnection and many other standards that make up a complete wireless system.

cdma2000 cdma2000 is a third generation (3G) wireless system. It contains a significant increase in voice capacity and high-speed data rates. It is backward compatible with IS-95B and IS-95A.

DCE Data Communications Equipment. This is the modem in the traditional serial communication paradigm of a computer connected via two modems to another computer.

DTE Data Terminal Equipment. This is the computer in the traditional serial communication paradigm of a computer connected via two modems to another computer.

DTMF Dual Tone Multi-Frequency: A pre-defined set of tones sent over the air when keys are pressed on the keypad.

Handset (Path) The audio path (microphone & speaker) that connects to a traditional hand held telephone receiver, usually dual balanced electrical lines.

Headset (Path) The audio path (microphone & speaker) that connects to an earpiece with a microphone, usually single electrical lines.

IMSI International Mobile Station IS. This is an international 15 digital phone number that uniquely identifies a mobile. IMSI=MCC + MNC + MIN.

IOTA Internet Over The Air.

IS-95 The first CDMA standard published by Qualcomm in 1993. It is a TIA standard for North American cellular systems based on CDMA. It is widely deployed in North America and Asia.

IS-95A A CDMA standard with improved voice quality. IS-95A defines what generally is known as cdmaOne, which supports voice and 14.4 Kbps data rates. This is a worldwide standard.

IS-95B This CDMA standard contains Medium Data Rate capabilities and bug fixes for system access failures. It is considered a 2.5G system. It supports data rates up to 115 Kbps.

IS-2000 The first 3G CDMA standard based on IS-95B. It contains a significant increase in voice capacity and high-speed data rates. It is backward compatible with IS-95B and IS-95A.

IS-707 TIA/EIA/IS-707 describes data services available on wideband spread spectrum systems. It is organized into a series of related recommendations, some of which address functions common to all CDMA data services and others that describe a specific data service.

IWF: Interworking Function. A process that acts as a gateway or interface between two or more communication components. For example, an IWF is used to interface wireless CDMA networks and wire line PSTN or packet-data networks.

LAPM: Link Access Procedure for Modems. An error control protocol defined in the ITU-T recommendations V.42. Like the MNP protocols, LAPM uses cyclic redundancy checking (CRC) and retransmission of corrupted data (ARQ) to ensure data reliability.

MCC Mobile Country Code. A pre-defined 30-digital number that represents a country in the IMSI.

MDN	Mobile Data Number or the mobile phone number.
MIN	Mobile Identification Number or mobile user account number.
MNC	Mobile Network Code. A pre-defined 2-digital number that represents a sub-network in the IMSI (usually set to “00”).
MO	Mobile Originated. An action (usually a call) that is first started from the phone. An outgoing call or SMS.
MS	Mobile Station. The term MS is commonly used to represent the phone or mobile.
MT	Mobile Terminated: An action that is initiated from a land based network. An incoming call or SMS.
MSM	Mobile Station Modem.
NAM	Number Assignment Modem. The NAM is collection of internal parameters that define a working phone for a given network (phone number, access parameters, etc.).
NID	Network ID. The NID is an identification number that represents geographic location of a common coverage area; but is a subset of the SID, usually a neighborhood in a large city. NID is usually not used and is set to zero. Also see SID.
NV-RAM	Non-Volatile Random Access Memory, NV-RAM is a data storage device that does not lose its data when power is turned off.
OTAPA	Over The Air Parameter Administration. An automatic update in internal software parameters (PRL for example) by means of a specially defined CDMA data call that is mobile terminated (MT).
OTASP	Over The Air Service Programming. An automatic update in internal software parameters PRL; for example, by means of a specially defined CDMA data call that is mobile terminated (MT).
PD	Position Determination. Process by which the mobile GPS position is obtained.
PDU	A GSM SMS standard where any type of binary data can be transported via an SMS message. In the CDMA system, the PDU mode is not supported; instead, the Unicode format message is supported.
PN Offset	Pseudorandom Noise Offset: In a CDMA network the PN offset is a variable time delay offset of a repeating random noise generator that is used to distinguish individual sectors of a base station.
P-REV	The CDMA revision of the mobile or base station.
PRI	Product Release Instructions. Carrier specific information required for activation on a CDMA network.
PRL	Preferred Roaming List. The PRL is a collection of frequencies, SIDs and NIDs that the call processing software uses to search for approved and unapproved CDMA networks. The PRL is loaded into the phone and is saved in NV-RAM.
PSTN	Public Switching Telephone Network. The traditional telephone network.
RF	Radio Frequency.
RSSI	Receive Signal Strength Indicator: This parameter represents the total RF received signal power from the base station(s) the mobile sees..
R-UIM	**Removable User Identity Module** – The R-UIM is similar to a subscriber identity module (SIM), but designed for networks other than GSM (global system for mobile telecommunications), such as CDMA. The R-UIM card contains user information and data features on a removable smart card about the size of a postage stamp. It is a dual-mode solution that can store both GSM provisioning and CDMA provisioning on a single card. When used with a GSM handset, the R-UIM operates like a GSM SIM.
SID	System ID. The SID is an identification number that represents geographic locations of a common coverage area, usually a large city. Also see NID.
SIM	**Subscriber Identity Module.** A SIM card is a portable memory chip. The SIM holds personal identity information, cell phone number, phone book, text messages, and other data.
SMS	Short Messaging Service; A supplement service that is capable of sending and receiving short length text messages to/from the mobile.
SREJ:	Selective Reject. An optional feature of V.42 which enhances data throughput on noisy connections. As data blocks are sent out, the remote side acknowledges only after an agreed upon number of blocks are received (window size). If any block is received bad, the sender is notified of the rejected bad block so it can be retransmitted.
TA/TE	Terminal Application/Terminal Equipment. This is the end “device” (combination of hardware and software) that communicates with a modem via a serial link. In this context, it is the device (PDA/Computer) connected to the WISMO Quik. Also see DTE.

TON/NP	Type of Number/Numbering Plan Identification.
V24-V25	A data compression algorithm.
V42	A data compression algorithm.

Chapter 2 – AT Command Features

Serial Interface Settings

A module serial interface is set with the following default values (factory settings):

115,200bps
8 bits data
1 stop bit
no parity
RTS/CTS flow control.

Note: Some models may have a different value for the default baud rate.

The **+IPR**, **+IFC** and **+ICF** commands can be used to change these settings, if required. Changes made using these commands become effective immediately following the transmission of the successful command result (OK).

Command Line

Commands always start with AT (which means ATtention) and finish with a <CR> character.
For example:

ATI3<cr>	Display the model and software revision information.
AT+CGSN<cr>	Display the electronic serial number (ESN).
AT+CMEE=1<cr>	Enable extended AT command results.
ATD5551212<cr>	Initiate a voice call.

Information Responses and Result Codes

Command responses start and end with <cr><lf>, unless the ATV0 (DCE response format) and the ATQ1 (result code suppression) commands have been entered.

- If the command has been performed successfully, an **OK** is returned following any command-related output.
- If command syntax is incorrect, an **ERROR** string is returned.
- If extended error reports are enabled (+CMEE), the **+CME ERROR:** <Err> or **+CMS ERROR:** <SmsErr> strings are returned with different error codes. Refer to the appendix for a definition of error codes and their meanings.
- If the command line has been performed successfully, an **OK** string is returned.
- In the following examples <CR> and <CR><LF> are intentionally omitted.

Chapter 3 - General Commands

Attention AT

Description: This two character command prefix is used to alert the module software that a command has been entered for processing. This prefix must be included in all commands unless otherwise noted. When entered alone, the module responds with OK to signify it is ready to process commands.

Syntax: Command syntax: AT

Command	Possible responses
AT Note: Module in online mode.	Note: No response returned.
+++ Note: Reset module.	Note: No response returned.
AT Note: Module in offline mode.	OK Note: Ready to process commands.

Request Revision Identification +CGMR

Description: This command is used to display the operating software version.

Syntax: Command syntax: AT+CGMR

Command	Possible Responses
AT+CGMR Note: Get software version	+CGMR: S/W VER: WISMOQ WQ1.1 Mar 20 2002 17:30:00 OK Note: Software Version WISMOQ, revision WQ1.1 generated on the March 20th, 2002 at 17:30:00

Electronic Serial Number +CGSN

Description: This command allows the user application to get the ESN of the product. The ESN value is displayed in hexadecimal format.

Syntax: Command syntax: AT+CGSN

Command	Possible Responses
AT+CGSN Note: Get the ESN	+CGSN: FE7A7704 OK Note: ESN read from NV

Select TE Character Set +CSCS

Description: This command informs the MS which character set is in use by the TE. The MS uses this information to convert each character of entered or displayed text data. The character set is used for send, read or write of short messages.

Values: **<Character Set>**
"CDMA" CDMA default (ASCII) character set.
"CUST" Custom character set.

Syntax: Command syntax: AT+CSCS=<Character Set>

Command	Possible Responses
AT+CSCS="CDMA" Note: CDMA default alphabet	OK Note: Command valid
AT+CSCS? Note: Custom character set	+CSCS: "CDMA" OK Note: Command valid
AT+CSCS=? Note: Get possible values	+CSCS: ("CDMA","CUST") OK Note: Possible values

Request IMSI +CIMI

Description: This command is used to read and identify the IMSI (International Mobile Subscriber Identity) of the modem. The PIN may need to be entered using the CPIN command before reading the IMSI.

Syntax: Command syntax: AT+CIMI

Command	Possible Responses
AT+CIMI Note: Read the IMSI	+CIMI: 310008585551212 OK Note: IMSI value (15 digits)

Capabilities List +GCAP

Description: This command gets the complete list of capabilities.

Syntax: Command syntax: AT+GCAP

Command	Possible Responses
AT+GCAP Note: Get capabilities list	+GCAP: +CGSM, +CIS707-A, +MS, +ES, +DS, +FCLASS OK

Repeat Last Command A/

Description: This command repeats the previous command. Only the A/ command itself cannot be repeated.

Syntax: Command syntax: A/

Command	Possible Responses
A/ Note: Repeat last command	

Phone Offline +CPOF

Description: This command sends all CDMA software stack tasks offline. AT command can still be received, however, there is no RF functionality. The AT+CFUN=0 command is equivalent to +CPOF.

Syntax: Command syntax: AT+CPOF

Command	Possible Responses
AT+CPOF Note: Stop CDMA stack	+CPOF: OK Note: Command valid

Set Phone Functionality +CFUN

Description: This command selects the mobile station's level of functionality. AT+CFUN=0 is equivalent to AT+CPOF The AT+CFUN=1 (by default, AT+CFUN will act the same as AT+CFUN=1) command restarts the entire CDMA stack and CDMA functionality: **a complete software reset is performed**. In addition, the OK response will be sent at the last baud rate defined by the +IPR command.

Values: **<functionality level>**

- **0** Set the phone to OFFLINE mode.
- **1** Set the phone to ONLINE mode and resets.

Syntax: Command syntax: AT+CFUN=<functionality level>

Command	Possible Responses
AT+CFUN? Note: Ask for current functionality level	+CFUN: 1 OK Note: Full functionality
AT+CFUN=0 Note: Set phone offline	OK Note: Command valid
AT+CFUN=1 Note: Set phone ONLINE. A software reset is performed.	OK Note: Command valid

Phone Activity Status +CPAS

Description: This command returns the activity status of the mobile equipment.

Values: **<pas>**

- **0** ready (allow commands from TA/TE)
- **1** unavailable (does not allow commands)
- **2** unknown
- **3** ringing (ringer is active)
- **4** call in progress
- **5** asleep (low functionality)
- **6** corrupted RF calibration values (checksum mismatch)

Syntax: Command syntax: AT+CPAS

Command	Possible Responses
AT+CPAS Note: Current activity status	+CPAS: <pas> OK

Report Mobile Equipment Errors +CMEE

Description: This command disables or enables the use of the "+CME ERROR : <xxx>" or "+CMS ERROR :<xxx>" result code instead of simply "ERROR". See Chapter 20 "*MS Error Result Codes"* for +CME ERROR result codes description and Chapter 20 *"Message Service Failure Result Codes"* for +CMS ERROR result codes.

Syntax: Command syntax: AT+CMEE=<error reporting flag>

Command	Possible Responses
AT+CMEE=0 Note: Disable MS error reports, use only « ERROR »	OK
AT+CMEE=1 Note: Enable «+CME ERROR: <xxx>» or «+CMS ERROR: <xxx>»	OK

Keypad Control +CKPD

Description: This command emulates the MS keypad by sending each keystroke as a character in a <keys> string. If emulation fails, a +CME ERROR: <err> is returned. If emulation succeeds, the result depends on the CDMA sequence activated: <keys>: string of the following characters (0-9,*,#).

Syntax: Command syntax: AT+CKPD=<keys>

Command		Possible Responses
AT+CKPD="*#21#"	Note: Key sequence allowed	OK
AT+CKPD=1234	Note: Sequence not allowed	+CME ERROR 3

Clock Management +CCLK

Description: This command is used to set or get the current date and time of the MS real-time clock.
String format for date/time is: "yy/MM/dd,hh:mm:ss".
Valid years are 98 (for 1998) to 97 (for 2097). The seconds field is not mandatory.
Default date/time is "98/01/01,00:00:00" (January, 1998 / midnight).

Syntax: Command syntax: AT+CCLK=<date and time string>

Command	Possible Responses
AT+CCLK="00/06/09,17:33:00" Note: set date to June 9th, 2000, and time to 5:33pm	OK or ERROR Note: Date/Time stored – ERROR returned when RTC not enabled
AT+CCLK="00/13/13,12:00:00" Note: Incorrect month entered	+CME ERROR 3
AT+CCLK? Note: Get current date and time	+CCLK: "00/06/09,17:34:23" Note: current date is June 9, 2000 current time is 5:34:23 pm – network time if available, otherwise calculated based on previous network time if available, otherwise ERROR.

Ring Melody Playback +CRMP

Description: This command causes a melody to be played. The specified melody will playback in an endless loop until stopped with another +CRMP command. All melodies are manufacturer defined. Up to ten manufacturer-defined melodies may be available for individual playback.
Note: Looped melodies must be stopped by a +CRMP command with the <index> field set to 0 (example: +CRMP=0,,,0).
When the +CRMP command is performed, the <volume> parameter overwrites the <sound level> value of the +CRSL command.

Values:

<call type> A value must be specified; however, the value is currently ignored.
- **0** Reserved
- **1** Reserved
- **2** Reserved
- **3** Reserved

<volume>
- **0** Min volume (mute)
- **...**
- **1** Default volume
- **4** Max volume

<type> A value must be specified if <index> is specified; however, the value is currently ignored.
- **0** Manufacturer Defined (default)

<index>
- **0** Stop Melody Playback
- **1-10** Melody ID for voice/data call type (default:1)

Syntax: Command syntax: AT+CRMP=<call type>[,<volume>,<type>,<index>]

Command	Possible Responses
AT+CRMP=0,2,0,2 Note: Play voice call melody index 2 with volume level 2.	OK Note: Melody Playback.
AT+CRMP=0,,,0 Note: Stop the melody.	OK Note: The melody is stopped.
AT+CRMP=? Note: supported parameters	+CRMP: (0-3),(0-4),(0-0),(0-10) OK

Ringer Sound Level +CRSL

Description: This command is used to set/get the sound level of the ringer on incoming calls.

Values: **<sound level>**
- **0** Min volume (muted)
- **1** Default volume (default)
- **4** Max volume

Syntax: Command syntax: AT+CRSL=<sound Level>

Command	Possible Responses
AT+CRSL=0 Note: Set volume to Min (muted).	OK Note: Current ring playing is muted.
AT+CRSL=4 Note: Set volume to Max.	OK Note: Current ring playing with Max. volume.
AT+CRSL? Note: Get current ringer sound level	CRSL:4 OK Note: Current level is 4
AT+CRSL=4 Note: Supported parameters	CRSL: (0-4) OK

Subscriber Number +CNUM

Description: This command is used to return the subscriber MSISDN. If the subscriber has different MSISDNs for different services, each MSISDN is returned on a separate line.

Values: **<alphax>** optional alphanumeric string associated with <numberx>
<numberx> string type phone number with format as specified by <typex>
<typex> type of address byte in integer format – only supports 129

Syntax: **Command syntax:** AT+CNUM
Ruim command syntax: AT+CNUM=<number> (RUIM software releases only)
Response syntax: +CNUM: <alpha1>, <number1>, <type1>, <CR><LF>+CNUM: <alpha2>, <number2>, <type2> …

Command	Possible Responses
AT+CNUM Note: Get MSISDN	+CNUM :“Phone”,”8585551212”,129 Note: MSISDNs
AT+CNUM=?	+CNUM: OK
AT+CNUM=8585551212 Note: Set module phone number in RUIM software releases. Entry of the SPC is not required.	OK Note: New number set.

Note: For RUIM software releases, this command provides a means for setting the phone number without the need to have previously entered the SPC (+WSPC command). The value for <number> can be up to 15 digits. The use of this command does not effect the IMSI.

Select Type of Address +CSTA

Description: This command is used to select the type of phone address to use.

Values: **<typex>** type of address byte in integer format – only supports 129

Syntax: Command syntax: AT+CSTA=<typex>

Command	Possible Responses
AT+CSTA? Note: Get type of address	+CSTA: 129 Note: Local Number format
AT+CSTA=? Note: Get supported address types	+CSTA: (129-129) OK

View Modem Timers +WTMR

Description: This command is used to read the modem's accumulated internal timers. These timers include Uptime, Call Time, Call Count, and Last Call Time. Uptime is the number of seconds the modem has been running since boot-up. Call Time is the total number of seconds the modem has been in a call since manufacture (Voice, Data, OTASP, and CDMA Test Calls; but SMS is not included). Call count is the total number of calls made since manufacture. Last Call Time returns the time of the most recent call in seconds. It is not stored in NV and is initialized to zero on boot-up. The range of all returned timer items is 0 to 4294967295 (136 years).

Values:

<Uptime>	seconds since modem boot-up
<Call Time>	total call seconds since modem manufacture (excluding SMS)
<Call Count>	total calls made since modem manufacture
<Last Call Time>	time of the most recent call in seconds

Syntax:

Command syntax: AT+WTMR
Response syntax: +WTMR: <Uptime>,<Call Time>, <Call Count>, <Last Call Time>

Command	Possible Responses
AT+WTMR Note: Display modem timers	+WTMR: 1029, 45670,289, 85 OK Note: Uptime = 1029 seconds Call Time = 45670 seconds Call Count = 289 calls Last Call Time = 85 seconds

Chapter 4 – Call Control Commands

Dial Command D

Description: The ATD command is used to originate a **voice** or **data** call. The dial command also controls supplementary services.
For a **data** call, the application sends the following ASCII string to the product:

ATD<nb> where <nb> is the destination phone number.
Note: ATD<nb> is followed by PPP negotiation.

For a **voice call**, the application sends the following ASCII string to the product:
ATD<nb>; where <nb> is the dialing string or destination phone number, followed a semicolon "**;**". The dialing string may only contain characters "0-9","#","*" only. Note that some countries may have specific numbering rules for their CDMA handset numbering.

The response to the ATD command is one of the following:

Verbose Result Code	Numeric Code (with ATV0 set)	Description
OK	0	Command executed (voice)
CONNECT <speed>	10,11,12,13,14,15	If the call succeeds, for data calls only, <speed> takes the value negotiated by the product.
BUSY	7	If the called party is already in communication,
NO ANSWER	8	If no hang up is detected after a fixed network time-out
NO CARRIER	3	Call setup failed or remote user release.
NO DIALTONE	6	Voice call with missing ";"

Direct Dial Syntax: **Command syntax:** ATD<nb>[;]

Command	Possible Responses
ATD18005551212; Note: Attempt a voice call.	OK Note**:** Command executed +WORG:18005551212 Note: Voice call origination sent to Base Station with dial string "18005551212". +WCNT: 9 Note: Call Connected, CDMA traffic channel established with service option 9. You can now hear audio of the calling party's phone ringing. However, this event does not mean the other calling party has answered.
ATD5551212; Note: Example of a failed voice call attempt.	OK Note**:** Command executed +WORG:5551212 Note**:** Voice call origination sent to Base Station with dialing string "5551212". +WEND: 3 Note**:** Call Attempt failed/ended. Reason 3, signal faded.

Dialing from a phonebook entry (stored in the RUIM card or NV) can be performed with the following commands:

ATD><index>; Call <index> from the +CPBS selected phonebook.
ATD>"Bill"; Call "Bill" from the +CPBS selected phonebook.
ATD><mem><index>; <mem> is a +CPBS=? listed phonebook and <index> is a valid location within the phonebook

Note: A semicolon must be used at the end of the AT command to signal phonebook dialing. Otherwise, the command will result in an error.

Phonebook Syntax:

Command syntax: ATD><index>[;]
ATD>[<mem>]<name>[;]
ATD>[<mem>]<index>[;]

Command	Possible Responses
AT+CPBS? Note: Which phonebook is selected.	+CPBS: ME,11,100 OK Note: Command executed
ATD>5; Note: Dial location #5 from ME phonebook.	OK Note: Command executed +WORG:5551212 Note: Voice call origination sent to Base Station with dialing string “5551212”. +WEND: 3 Note: Call Attempt failed/ended. Reason 3, signal faded.
ATD>SM202; Note: Dial location 202 from the SM(RUIM card) phonebook.	OK Note: Command executed +WORG:5551212 Note: Voice call origination sent to Base Station with dialing string “5551212”. +WEND: 3 Note: Call Attempt failed/ended. Reason 3, signal faded.
ATD>”Bill”; Note: This command is NOT valid for MC, RC, and LD phonebooks as they are supported in CDMA networks	OK Note: Command executed +WORG:5551212

Note: When the FD facility is enabled, only the numbers in the FDN phonebook can be called. For example, if “014629” is present in the FD phonebook, the command ATD014629; will be successful. Data calls are not allowed when the FD facility is enabled.

Hang-Up Command H

Description: The ATH (or ATH0) command is used by the application to disconnect the remote user. In the case of multiple calls, all calls are released (active, on-hold and waiting calls).

The specific ATH1 command has been appended to disconnect the current outgoing call, only in dialing or alerting state (i.e., ATH1 can be used only after the ATD command, and before its terminal response (OK, NO CARRIER, ...). It can be useful in the case of multiple calls.

Syntax: **Command syntax:** ATH

Command	Possible Responses
ATH Note: Ask for disconnection	OK +WEND: 10 Note: Every call, if any, is released
ATH1 Note: Ask for outgoing call disconnection	ERROR +WEND: 10 Note: Outgoing call, if any, is released

Answer a Call A

Description: When the product receives a call, it sets the **RingInd** signal and sends the ASCII "**RING**" or "**+CRING: <type>**" string to the application (+CRING if the cellular result code +CRC is enabled). Then it waits for the application to accept the call with the ATA command.

Syntax: **Command syntax:** ATA

Command	Possible Responses
	RING Note: Incoming call
ATA Note: Answer to this incoming call	+WANS:0 +WCNT: 10 Note: Call accepted
ATH Note: Disconnect call	OK +WEND: 10 Note: Call disconnected

Remote Disconnection

Description: A message is used by the product to inform the application that the remote user has released an active call. The product sends +WEND: <result code> to the application. The DCD signal may be set based upon the AT&C2 setting for packet calls. See Chapter 21,*Unsolicited AT Result Codes,* for more information on the +WEND command.

Extended Error Report +CEER

Description: This command gives the cause of any general call processing error or malfunction. See Chapter 20, *Extended Error Report*.

Syntax: **Command syntax:** AT+CEER

Command	Possible Responses
ATD18005551212; ATD1234567; Note: Outgoing voice call while already in a call AT+CEER	OK +WORG:18005551212 +WCNT:3 ERROR Note: Call setup failure +CEER: Error 2 OK Note: Operation not allowed when call in progress
AT+CEER Note: Ask for reason of release	+CEER : Error <x> OK Note: <x>is the cause information element values

DTMF Signals +VTD, +VTS

+VTD

Description: The product enables the user application to send DTMF tones over the CDMA network. This command is used to define tone duration (the default value is 0,0). To define this duration, the application uses: AT+VTD=<on>,<off>.

Values: **<on>** on tone duration
- **0** 95 milliseconds
- **1** 150 milliseconds
- **2** 200 milliseconds
- **3** 250 milliseconds
- **4** 300 milliseconds
- **5** 350 milliseconds

<off> off tone duration
- **0** 60 milliseconds
- **1** 100 milliseconds
- **2** 150 milliseconds
- **3** 200 milliseconds

Syntax: **Command syntax**: AT+VTD=<on>,<off>

Command	Possible Responses
AT+VTD=4,3 Note: To define 300 ms on tone duration and 200 ms off tone duration.	OK Note: Command valid
AT+VTD=? Note: Display valid parameter ranges.	+VTD: (0-5), (0-3) OK

+VTS

Description: The product supports the ability of the user application to send **burst DTMF tones** over the CDMA network. This command enables the transmission of burst DTMF tones. To transmit DTMF tones (only when there is an active call), the application uses: AT+VTS=<Tone> where <Tone> is in {0-9,*,#}.

Syntax: **Command syntax:** AT+VTS=<Tone>

Command	Possible Responses
AT+VTS=#	OK Note: Command valid
AT+VTS=11	OK
AT+VTS=4	OK

Informative Example: To send tone sequence 13#, the application sends: AT+VTS=13#

DTMF Start and Stop Continuous +WSDT, +WSDS

Description: Starts and stops a continuous DTMF tone while in a call state (conversation).

Values: **<X>:** (0-9, #,*)

Syntax: **Command syntax:** AT+WSDT=<X>

Command	Possible Responses
AT+WSDT=2	OK Starts DTMF tone
AT+WSDS	OK Stops DTMF tone

Redial Last Telephone Number DL

Description: This command is used by the application to redial the last number used in an ATD commanded voice call. The ATDL command causes the last voice call number to be redialed. The phonebook is not referenced for the redial. Data call numbers are not supported by this command; only voice call numbers.

Syntax: **Command syntax:** ATDL

Command	Possible Responses
ATDL Note: Redial last number	OK +WORG: 8585551212 Note: Last call was a voice call. Command valid

Automatic Dialing with DTR %Dn

Description: This command enables and disables the automatic sending of the short message (SMS) stored in the first location. The number is dialed and then short message is sent when DTR OFF switches ON.

Values:

<n>	(0-2) Enable or disable automatic message transmission or number dialing. Informs the product that the number is a voice rather than a data number.
AT%D0	Disables automatic DTR number dialing / message transmission.
AT%D1	Currently not implemented.
AT%D2	Activates automatic DTR message transmission if DTR switches from OFF to ON.

Syntax: **Command syntax:** AT%D<n>

Command	Possible Responses
AT%D2 Note: Activates DTR short message sending	OK Note: Command has been executed

Automatic Answer S0

Description: This S0 (zero) register parameter determines and controls the product automatic answering mode.

Values:

<value>	**(0-255**)
0	No automatic answer.
1 – 255	Answers after the specified number of rings.

Syntax: **Command syntax:** ATS0=<value>

Command	Possible Responses
ATS0=2 Note: Automatic answer after 2 rings	OK
ATS0? Note: Current value	002 OK Note: always 3 characters padded with zeros
ATS0=0 Note: No automatic answer	OK Note: Command valid

Other S-parameter registers are implemented.

Incoming Call Bearer +CICB

Description: This specific command is used to set the type of incoming calls when no incoming bearer is given (see +CSNS). The setting the +CICB command affects the current value of +CSNS.

Values: **<mode>**

- **0** Data
- **2** Speech
- **3** Data once (10 minute timeout)

Syntax: **Command syntax:** AT+CICB=<mode>

Command	Possible Responses
AT+CICB=2 Note: If no incoming bearer, force a voice call	OK Note: Command accepted
AT+CICB? Note: Interrogate value	+CICB: 2 OK Note: Default incoming bearer: voice call
AT+CICB=? Note: Test command	+CICB: (0,2,3) OK Note: Speech, data default incoming bearer

Single Numbering Scheme +CSNS

Description: This command selects the bearer to be used when an MT single numbering scheme call is set up (see +CICB, these commands are the same).
Note: The setting the +CSNS command affects the current value of +CICB.

Values: **<mode>**

- **0** Data
- **2** Speech
- **3** Data once (10 minute timeout)

Syntax: **Command syntax:** AT+CSNS

Command	Possible Responses
AT+CSNS=0 Note: Force a data call	OK Note: Command accepted
AT+CSNS=2 Note: Force a voice call	OK Note: Command accepted
AT+CSNS? Note: Interrogate value	+CSNS: 2 OK Note: Default incoming bearer: voice call
AT+CSNS=? Note: Test command	+CSNS: (0-4) OK Note: Voice, data default incoming bearer

Microphone Gain +VGT

Description: This command sets the microphone gain of the current audio path.

Values: **<MicGain>** value to Microphone relative gain:

AT+VGT Value	Microphone Relative Gain Step (dB)
0	-2
1	+6
2	+8
3	+16

Syntax: **Command syntax:** AT+VGT=<MicGain>

Command	Possible Responses
AT+VGT=2	OK Note: Command valid
AT+VGT? Note: Interrogate value	+VGT: 2 OK Note: Current value
AT+VGT=? Note: Test command	+VGT : (0-3) OK Note: Possible values

Volume Gain Control +VGR

Description: This command is used by the application to tune the receive gain of the speaker. If the modem is in the Idle state, it will generate an audible tone at the selected volume.

Values: **<RGain>** value to Speaker relative gain:

AT+VGR Value	Speaker Relative Gain Step (dB)
0	Mute
1	-23
2	-17
3	-11
4	-5

Syntax: **Command syntax**: AT+VGR=<Rgain>

Command	Possible Responses
AT+VGR=2	OK Note: Command valid
AT+VGR? Note: Interrogate value	+VGR: 2 OK Note: Current value
AT+VGR=? Note: Test command	+VGR : (0-4) OK Note: Possible values; default: 3

Microphone Mute Control +CMUT

Description: This command is used to mute the microphone input on the product (for the active microphone set with the +SPEAKER command). This command is only allowed during a call.

Values: **<mode>**

0 Microphone mute off (default).
1 Microphone mute on.

Syntax: **Command syntax:** AT+CMUT=<mode>

Command	Possible Responses
AT+CMUT=? Note: Test command	+CMUT : (0-1) OK Note: Enable / disable mute
AT+CMUT? Note: Ask for current value	+CMUT : 0 OK Note: Current value is OFF
AT+CMUT=1 Note: Mute ON (call active)	OK Note: Command valid
AT+CMUT? Note: Ask for current value	+CMUT : 1 OK Note: Mute is active (call active)
AT+CMUT=0 Note: Mute OFF (call not active)	+CME ERROR: 3 Note: Command not valid

Speaker & Microphone Selection +SPEAKER

Description: This command is used to select and activate a speaker/microphone audio path. The module provides two audio paths. An audio path is functional only with appropriate module external hardware.

Values: **<ActiveSpkMic >**

0: HEADSET - Audio path corresponding to SPK_2/MIC_2.
1: HANDSET - Audio path corresponding to SPK_1/MIC_1. (Default)

Syntax: **Command syntax:** AT+SPEAKER=<ActiveSpkMic>

Command	Possible Responses
AT+SPEAKER=0 Note: Select HEADSET audio path.	OK Note: Command valid
AT+SPEAKER?	+SPEAKER: 0 OK Note: HEADSET audio path active.

Echo Cancellation +ECHO

Description: This command is used to enable, disable or configure the Echo Cancellation functions for voice calls (in rooms, in cars, etc.). The +SPEAKER function automatically sets echo cancellation based upon handset or headset choice and this command allows non-standard operation.

Values: **<mode>**

0 Vocoder Echo Cancellation Off
1 Ear Seal Echo Cancellation
2 Head Set Echo Cancellation
3 AEC
4 Speaker Echo Cancellation for car kit operation
5 Default Echo Cancellation for current path settings

Syntax: **Command syntax:** AT+ECHO= <mode>

Command	Possible Responses
AT+ECHO? Note: Read current settings	+ECHO: 0 OK
AT+ECHO=0 Note: Set Echo Cancellation Off	OK
AT+ECHO=1 Note: Set Echo Cancellation to Ear Seal	OK
AT+ECHO=2 Note: Set Echo Cancellation to Headset	OK
AT+ECHO=4 Note: Set Echo Cancellation to Handset	OK

Side Tone Modification +SIDET

Description: This command is used to set the level of **audio feedback** in the speaker (microphone feedback in the speaker).

Values:

<val1>

0 Sidetone is disabled
1 Sidetone is enabled

<val2>

0 No side tone
1 Handset Sidetone levels
2 Headset Sidetone levels
3 Max Sidetone level

Syntax: **Command syntax:** AT+SIDET=<val1>,<val2>

Command	Possible Responses
AT+SIDET=1,0	OK Note: Command valid
AT+SIDET? Note: Current value	+SIDET: 1,0 OK Note: Command valid

Initialize Voice Parameters +VIP

Description: This command allows voice parameters to be restored from NV memory.

Values: Gain controls are restored (+VGT and +VGR)
Voice path selection is restored (+SPEAKER)
Echo cancellation is restored (+ECHO)
Sidetone values are restored (+SIDET)

Syntax: **Command syntax:** AT+VIP

Command	Possible Responses
AT+VIP	OK Note: Command valid

TTY Mode +WTTY

Description: This command enables TTY mode on the headset audio path. The modem must be in a voice call to set this command, and when the call ends it goes back to standard audio mode.

Syntax: **Command syntax:** AT+WTTY

Command	Possible Responses
AT+WTTY	OK Note: Command valid

Chapter 5 – Network Service Commands

Signal Quality +CSQ

Description: This command is used to ascertain the *received signal strength indication* (<rssi>) and the *channel frame error rate* (<fer>).
Note: See Chapter 24 for Sprint® specific version of this command.

Values:
<rssi> The lowest value is 0 and the highest value is 31.
0 = -110dBm, 31 = -76dBm. 1.09375dBm per step.
Note: Certain models use a range other than 0 – 31.
10-31 Sufficient ranges.
0-9 Weak or insufficient
99 No signal.
<fer>
99 Not known or not detectable. Currently always returns 99.

Syntax: **Command syntax:** AT+CSQ

Command	Possible Responses
AT+CSQ	+CSQ: <rssi>,<fer> OK Note: <rssi> and <fer> as defined above

Mode Preference +COPS

Description: The Mode Preference of a CDMA modem governs the basic system acquisition behavior of the MS in conjunction with the PRL (Preferring Roaming List). It's important to note that the PRL takes precedence over mode preference when guiding the phone to a band or system. The PRL must allow a particular band first, before the mode preference can take effect. In other words, a mode preference change is simply a request; the PRL decides whether or not to allow it. After execution of the +COPS command, an unsolicited +COPS: <mode> will follow soon to confirm the new mode selection, but not in all cases. See Unsolicited Result Codes in Chapter 21. All changes to +COPS are automatically saved in NV RAM**.**
Note 1: AMPS selection is available only in modems that support AMPS mode.
Note 2: Refer to Chapter 20 for AT commands that are applicable to AMPS operation.
Note 3: This command is not available in Sprint®. and Verizon. software versions.
Note 4: CDMA Only (<mode> 1) is the only available mode in RUIM software versions. An attempt to select any other mode in RUIM software versions will result in an error return.

Values: The parameter values are the following ones:
<mode>
0 Automatic.
1 CDMA Only.
2 CDMA or AMPS only.
3 Analog only.
<term>
0 Permanent – this mode persists until another +COPS command is issued
1 Power cycle – this mode persists until power cycle is performed
Note: AT+COPS by itself is a short-hand equivalent to AT+COPS=0,0.

Syntax on next page.

Syntax: **Command syntax:** AT+COPS=<mode>,<term>

Command	Possible Responses
AT+COPS? Note: Ask for current Mode Preference	+COPS: 0,0 OK Note: Automatic mode, use PRL order, Permanent
AT+COPS=?	+COPS: (0-3),(0-1) OK Note: Modes: Automatic, CDMA Only, CDMA or AMPS only; Term: Permanent, Power Cycle.
AT+COPS=0,0 Note: Ask for Automatic mode	OK +COPS: 0,0 Note: Unsolicited +COPS result confirms Automatic mode, Permanent term is requested.
AT+COPS=1,1 Note: Ask for CDMA Only mode	OK +COPS: 1,1 Note: Unsolicited +COPS result confirms CDMA Only mode, Power Cycle term is requested.
AT+COPS=2,0 Note: Ask for CDMA or AMPS only mode	OK +COPS: 2,0 Note: Unsolicited +COPS result confirms CDMA or AMPS only mode, Permanent term is requested.
AT+COPS=3,0 Note: Ask for Analog only mode	OK +COPS: 3,0 Note: Unsolicited +COPS result confirms Analog only mode, Permanent term is requested.

Band Preference +WBND

Description: The Band Preference of a CDMA modem governs the basic system acquisition behavior of the MS in conjunction with the mode preference (+COPS) and the PRL (Preferring Roaming List). It's important to note that the PRL takes precedence over band preference when guiding the phone to a band. The PRL must allow a particular band first, before the band preference can take effect. In other words, a band preference change is simply a request; the PRL decides whether or not to allow it. If the setting is accepted by the MS, the value will be written to non-volatile RAM and persist after a power-cycle.
Note 1: This command is not available in Sprint® and Verizon software versions.
Note 2: <band> 1 (PCS) is not available in RUIM software versions.

Values: The parameter values are the following ones:
<band>
- **0** Any
- **1** PCS
- **2** Cellular A or B
- **3** Cellular A
- **4** Cellular B

Syntax: **Command syntax:** AT+WBND=<band>

Command	Possible Responses
AT+WBND? Note: Ask for current Band Preference	+WBND: 0 OK Note: Any
AT+WBND=?	+WBND: (0-4) OK Note: Any, PCS, Cell, Cell A, Cell B
AT+WBND=0 Note: Allow Any Band	OK

Roam Preference +WRMP

Description: 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. The determination of what is a foreign or home network is programmed into the PRL (Preferring Roaming List). This command simply enables or disables the capability of the MS to roam, based on the PRL configuration. If the setting is accepted by the MS, the value will be written to non-volatile RAM and persist after a power-cycle. After execution of the +WRMP command, the MS may change roaming states. The unsolicited result +WROM: <mode> will indicate the new state. See *Unsolicited Result Codes* in Chapter 21.
Note: This command is not available in Sprint® and Verizon software versions.

Values: The parameter values are the following ones:
<mode>
- **0** Home Networks only, as defined in the PRL (default value)
- **1** Roaming on Affiliated networks, as defined in the PRL
- **2** Roaming on Any Network, as defined in the PRL.

Syntax: **Command syntax:** AT+WRMP=<mode>

Command	Possible Responses
AT+WRMP? Note: Ask for current Mode Preference	+WRMP: 0 OK Note: Home only
AT+WRMP=?	+WRMP: (0-2) OK Note: Home, Affiliated, Any
AT+WRMP=0 Note: Allow Home only networks	OK +WROM: 0 Note: Unsolicited +WROM may or may not appear based on current circumstances
AT+WRMP=1 Note: Allow Roaming Affiliated Networks	OK +WROM: 1 Note: Unsolicited +WROM may or may not appear based on current circumstances
AT+WRMP=2 Note: Allow Roaming on Any Network	OK +WRMP: 2 Note: Unsolicited +WROM may or may not appear based on current circumstances

Network Registration & Roaming +CREG

Description: This command is used by the application to ascertain the registration and roaming status of the product.
Note: Also see +WROM unsolicited response for CDMA roaming status.

Values:
<mode>
- **0** Disable network registration unsolicited result code (**default**)
- **1** Enable network registration unsolicited code result code +CREG: <stat>

<stat>
- **0** not registered, MS is not currently searching for a new operator.
- **1** registered, home network.
- **2** not registered, MS currently searching for a base station.
- **4** unknown.
- **5** registered, roaming

Syntax: **Command syntax:** AT+CREG= <mode>
Response syntax: +CREG: <mode>, <stat>

Command	Possible Responses
AT+CREG=0 Note: Disable network registration unsolicited result code.	+CREG: 0,1 OK Note: Command valid
AT+CREG=1 Note: Enable network registration unsolicited result code	+CREG: 1,1 OK Note: Command valid
AT+CREG?	+CREG: 1,5 OK Note: Unsolicited enabled, MS currently roaming.
AT+CREG=?	+CREG: (0-1) OK Note: 0,1 <mode> values are supported
Note: Example of the unsolicited result code. MS is searching for a base station.	+CREG: 2

Change NAM Selection +WNAM

Description: This command is used to request a change in the NAM (Number Assignment Modem) selection. The modem supports up to 4 NAMs. However, if a NAM is not fully programmed, the modem will not switch to the requested NAM. The default NAM for the modem is 1. The response to this command is only OK, and is no guarantee that the NAM will change. If the NAM selection request is accepted, the unsolicited command +WNAM: <nam> will be returned. If or when the actual NAM changes, the unsolicited command +WCNM: <nam> will be returned. See *Unsolicited Result Codes* in Chapter 21.

Values: **<nam>**

- **1** NAM 1
- **2** NAM 2
- **3** NAM 3
- **4** NAM 4
- **5** Auto NAM

Syntax: **Command syntax:** AT+WNAM=<nam>

Command	Possible Responses
AT+WNAM=2 Note: Use NAM 2, if programmed	OK +WNAM: 2 +WCNM: 2
AT+WNAM=3 Note: Use NAM 3, if programmed	OK Note: No unsolicited response indicates that NAM 3 is not valid, thus no change in NAM.
AT+WNAM=5 Note: Try Auto NAM	OK +WNAM: 5 +WCNM: 1 Note: Auto NAM is selected, NAM 1 chosen.
AT+WNAM?	+WNAM: 1
AT+WNAM=?	+WNAM: (1-5)

Read Current NAM +WCNM

Description: This command is used to read the current NAM (Number Assignment Modem). The modem supports up to 4 NAMs. Also, note that there exists an unsolicited response +WCNM: <nam> that is returned any time the NAM changes. See *Unsolicited Result Codes* in Chapter 21.

Syntax: **Command syntax:** AT+WCNM

Command	Possible Responses
AT+WCNM Note: Ask for the current NAM	+WCNM: 1 OK Note: NAM 1 in use

Emergency Mode +WSOS

Description: In the event of an emergency call, the modem will automatically put itself into emergency mode. After the call has ended and/or emergency mode is no longer desired, this command must be sent to exit the modem out of emergency mode.
Note: Changing the mode preference using +COPS while emergency mode is in effect will exit the modem out of Emergency Mode.
Note: For RUIM capable modems, the emergency numbers 110, 112, 119, and 120 are also supported by the modem software in addition to 911.

Values: The parameters values are the following ones:
<flag>
0 Exit Emergency Mode
1 Manually enter Emergency Mode (not supported)
Note: AT+WSOS by itself is a short-hand equivalent to AT+WSOS=0.

Syntax: **Command syntax:** AT+WSOS=<flag>

Command	Possible Responses
AT+WSOS? Note: Ask for current Emergency Mode status	+WSOS: 1 OK
AT+WSOS=?	+WSOS: (0-0) OK
AT+WSOS Note: Exit Emergency Mode. Note2: This is the same as AT+WSOS=0	OK +WSOS:0 Note: Unsolicited +WSOS result confirms Emergency Mode exit
AT+WSOS=0 Note: Exit Emergency Mode.	OK +WSOS:0 Note: Unsolicited +WSOS result confirms Emergency Mode exit
AT+WSOS=1 Note: Try to manually enter Emergency Mode. This is not allowed.	ERROR Note: This is not allowed. Emergency Mode will only be entered as a result of an emergency call
ATD911; Note: Emergency Mode entered as the result of an emergency call	+WSOS: 1 +WORG: 911
AT+COPS=0,0 Note: Changing the mode preference while in Emergency Mode, will result in Emergency Mode being exited	+WSOS: 0 +COPS: 0,0 Note: An unsolicited response for both +WSOS and +COPS are returned when mode preference is changed while in Emergency Mode.

Extended Roam Indication +WRMW

Description: This command is used to suppress output of non-standard Extended Roam Indicators (64 through 127) that are displayed by the +WROM unsolicited response. This setting is written to NV and is persistent across resets.
Note: This command is not available in Sprint® and Verizon® software versions.

Values: **<value>**
- **0** Suppress output of ERI indicators 64 through 127.
- **1** Enable output of ERI indicators 64 through 127.

Syntax: **Command syntax:** AT+WRMW=<value>

Command	Possible Responses
AT+WRMW=?	+WRMW: (0-1) OK
AT+WRMW? Note: Display current setting.	+WRMW: 0 OK Note: ERI 64 through 127 suppressed.
AT+WRMW=1 Note: Enable output of ERI 64 through 127.	OK
AT+WRMW? Note: Display current setting.	+WRMW: 1 OK Note: ERI 64 through 127 displayed.

Chapter 6 – SIM Card Operational Commands

This section details the commands that are available when a SIM card is present. These commands are available only in RUIM software versions.
Note that the PIN codes used in this section are for example purposes only and do not reflect the actual PIN codes programmed into the modem. Contact your service provider to obtain the actual PIN codes used by your modem.

Enter PIN +CPIN

Description: This command is used to enter the ME (Mobile Equipment) passwords (CHV1 / CHV2 / PUK1 / PUK2, etc.), that are required before any ME functionality can be used. CHV1/CHV2 must be 4 to 8 digits long, PUK1/PUK2 must be 8 digits long. The application is responsible for checking the PIN after each reset or power on if the PIN was enabled.

Syntax: **Command syntax:** AT+CPIN=<pin>

Command	Possible Responses
AT+CPIN=1234	OK Note: PIN code is correct

After 3 unsuccessful attempts to enter the PIN (Personal Identification Number), the PUK (Personal Unblocking Key) will be required. PUK validation forces the user to enter a new PIN code as a second parameter and this will be the new PIN code if PUK validation succeeds. CHV1 is then enabled if PUK1 is correct. The application therefore uses this command:

Command syntax: AT+CPIN=<PUK>,<NewPin>

Command	Possible Responses
AT+CPIN=00000000,1234 Note: Enter PUK and new PIN	+CME ERROR: 16 Note: Incorrect PUK
AT+CPIN=12345678,1234 Note: Enter PUK and new PIN, 2nd attempt	OK Note: PUK correct, new PIN stored

To ascertain which code must be entered (or not), the following query command can be used: AT+CPIN?

The possible responses are:

+CPIN: READY	ME is not pending for any password
+CPIN: UIM PIN	CHV1 is required
+CPIN: UIM PUK	PUK1 is required
+CPIN: UIM PIN2	CHV2 is required
+CPIN: UIM PUK2	PUK2 is required
+CPIN: PH-UIM PIN	UIM lock (phone-to-UIM) is required
+CPIN: PH-NET PIN	Network personalization is required
+CME ERROR: <err>	SIM failure (13) absent (10) etc.

Note: that in this case the mobile equipment does not end its response with the OK string. The response '+CME ERROR: 13' (SIM failure) is returned after 10 unsuccessful PUK attempts. The SIM card is then out of order and must be replaced by a new one.

Enter PIN2 +CPIN2

Description: This command is used to validate the PIN2 code (CHV2), or to validate the PUK2 code (UNBLOCK CHV2) and to define a new PIN2 code. Of course, the +CPIN command allows PIN2 or PUK2 codes to be validated, but only when the last command executed resulted in PIN2 authentication failure. PIN2 length is between 4 and 8 digits. The PUK2 length must be 8 digits.

Syntax: **Command syntax:** AT+CPIN2=<pin2>

Command	Possible Responses
AT+CPIN2=1234	OK Note: PIN2 code is correct

After 3 unsuccessful attempts, PUK2 will then be required. PUK2 validation forces the user to enter a new PIN2 code as a second parameter and this will be the new PIN2 code if PUK1 validation succeeds. The application therefore uses this command:

Command syntax: AT+CPIN2=<puk2>,<NewPin2>

Command	Possible Responses
AT+CPIN2=00000000,1234 Note: Enter PUK2 and new PIN2	+CME ERROR: 16 Note: Incorrect PUK2
AT+CPIN2=12345678,1234 Note: Enter PUK2 and new PIN2, 2nd attempt	OK Note: PUK2 correct, new PIN2 stored

To ascertain which code must be entered (or not), the following query command can also be used:
AT+CPIN2?

The possible responses are:

+CPIN: READY	ME is not pending for any password
+CPIN: UIM PIN2	CHV2 is required
+CPIN: UIM PUK2	PUK2 is required
+CME ERROR: <err>	SIM failure (13) absent (10) etc.

The product requires that the PIN2 code be successfully entered in order to write a entry into the Fix Dialing Phonebook (FDN).

Command	Possible Responses
AT+CPBS=”FD” Note: Select Phonebook FDN	OK
AT+CPBW=5,”12345678”,145”test1” Note: Write entry 5 in the FDN	+CME ERROR: 17 Note: PIN2 not yet entered
AT+CPIN2=1234 Note: Enter PIN2	OK Note: PIN2 successfully entered
AT+CPBW=5,”12345678”,145”test1” Note: Write entry 5 in the FDN	OK Note: Command now successful

PIN Remaining Attempt Number +CPINC

Description: This command is used to get the number of valid attempts for PIN1 (CHV1), PIN2 (CHV2), PUK1 (UNBLOCK CHV1) and PUK2 (UNBLOCK CHV2) identifiers.

Values: **<n1>, <n2>** are the attempts left for PIN1, PIN2 (0 = blocked, 3 max)
<k1>, <k2> are the attempts left for PUK1, PUK2 (0 = blocked, 10 max)
For this to work, the card should be present at the time of initialization. Otherwise, an error will be sent (+CME ERROR: 10).

Syntax: **Command syntax:** AT+CPINC
Response syntax: +CPINC: <n1>,<n2>,<k1>,<k2>

Command	Possible Responses
AT+CPINC Note: Get the number of attempts left	+CPINC: 2,3,10,10 OK Note: First CHV1 attempt was a failure
AT+CPINC? Note: Get the number of attempts left	+CPINC: 2,3,10,10 OK Note: First CHV1 attempt was a failure

Facility Lock +CLCK

Description: This command is used by the application to lock, unlock or interrogate an ME or network facility <fac>. The call barring facilities "A0" and "AI" require that a password value be included in the command even though passwords are not currently enforced for these facilities. The "SC" and "FD" facilities are available only in builds, which include UIM support.
This command is also used for the control of the call barring supplementary service. Functions for the barring of data and voice calls is provided as well as querying the status of call barring. Note that emergency voice calls cannot be barred.

Values:

<fac>
- **"SC"** SIM PIN enabled (<mode> = 1) / disabled (<mode> = 0)
- **"FD"** SIM FDN feature enabled (<mode> = 1) / disabled (<mode> = 0)
- **"AO"** BAOC; Barr Outgoing Calls
- **"AI"** BAIC; Barr Incoming Calls

<mode>
- **0** Unlock the facility (<passwd> required)
- **1** Lock the facility (<passwd> required)
- **2** Query status

<passwd>
Use PIN1 for the "SC" facility
Use PIN2 for the "FD" facility
Use any four digit value for the "AO" and "AI" facilities

Syntax: (for Facility Lock):

Command syntax: AT+CLCK= <fac>,<mode>[,<passwd>]
Response syntax: +CLCK: <status>

Command	Possible Responses
AT+CLCK="SC",1,1234 Note: Enable SIM PIN	OK Note: SIM PIN enabled
AT+CLCK? Note: Get current facility lock status	+CLCK:("SC",1),("FD",0),("AO",1),("AI",1) OK Note: SIM PIN is enabled, SIM FDN feature is disabled, Outgoing call barring is enabled, Incoming call barring is enabled
AT+CLCK="SC",0,5555 Note: Disable SIM PIN	+CME ERROR: 16 Note: Incorrect password used
AT+CLCK="AO",1,1234 Note: Bar Outgoing Calls	OK Note: Outgoing calls are barred
AT+CLCK="AI",1,1234 Note: Bar Incoming Calls	OK Note: Incoming calls are barred
AT+CLCK="AO",2 Note: Query outgoing call barring status	+CLCK: 1 OK Note: Outgoing calls are barred

Change Password +CPWD

Description: This command is used by the application to change a password, PIN1or PIN2. The “SC” and “P2” facilities are available only in builds, which include UIM support.

Values:

<fac>
“SC” PIN1
“P2” 7.6.2 PIN2
<oldpwd>
Current PIN1 or PIN2 password
<newpwd>
Desired PIN1 or PIN2 password

Syntax: **Command syntax:** AT+CPWD= <fac>, <oldpwd>, <newpwd>

Command	Possible Responses
AT+CPWD=”SC”,1234,5555 Note: Change UIM PIN1	OK Note: PIN1 now 5555
AT+CPWD=”SC”,1234,5555 Note: Change UIM PIN1	+CME ERROR: 16 Note: PIN incorrect
AT+CPWD? Note: Get status	+CPWD:(“SC”,8),(“P2”,8) OK Note: PIN1 & PIN2 passwords are supported with 8 digit maximum

Card Identification +CCID

Description: This command is used to display the SIM card ESN. The data is output in hexadecimal format. If there is no ESN present on the SIM card, only the OK portion of the message will be output.

Syntax: **Command syntax:** AT+CCID

Command	Possible Responses
AT+CCID Note: Get card ID	+CCID: C3729F82 Note: ESN is presented in hexadecimal format.
AT+CCID? Note: Get current value	+CCID: C3729F82 Note: Same result as +CCID
AT+CCID=? Note: Get possible value	OK Note: No parameter but this command is valid.

Chapter 7 – Short Messages Commands

For SMS messages, in the CDMA system, the PDU mode will not be supported; instead, the UCS-2 Unicode format message is supported. The UCS-2 Unicode header code will start at 0x80 and above.

Parameters Definition

<cbn>	Call Back Number
<da>	Destination Address
<dcs>	Data Coding Scheme, coded like in document [5].
<dt>	Discharge Time in string format : "yy/mm/dd,hh :mm :ss"(Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second
<encod>	Encoding
<fo>	First Octet, coded like SMS-SUBMIT first octet in document [4], default value is 17 for SMS-SUBMIT
<index>	Place of storage in memory.
<lang>	Language
<length>	Length of SMS User Data field.
<mem1>	Memory used to list, read and delete messages (+CMGL, +CMGR and +CMGD).
<mem2>	Memory used to write and send messages (+CMGW, +CMSS).
<mid>	CBM Message Identifier.
<mr>	Message Reference.
<oa>	Originator Address.
<pid>	Protocol Identifier.
<priority>	Message Priority
<ra>	Recipient Address.
<sca>	Service Center Address
<scts>	Service Center Time Stamp in string format : "yy/mm/dd,hh :mm :ss" (Year/Month/Day,Hour:Min:Seconds)
<sn>	CBM Serial Number
<st>	Status of a SMS-STATUS-REPORT
<stat>	Status of message in memory.
<tooa>	Type-of-Address of <oa>.
<tora>	Type-of-Address of <ra>.
<tosca>	Type-of-Address of <sca>.
<total1>	Number of message locations in <mem1>.
<total2>	Number of messages locations in <mem2.
<ts>	Timestamp for MT SMS.
<used1>	Total number of messages locations in <mem1>.
<used2>	Total number of messages locations in <mem2.
<vp>	Validity Period of the short message, default value is 167

Select Message Service +CSMS

Description: This command is used to display the supported SMS services. The supported services are originated (SMS-MO) and terminated short message (SMS-MT) + Cell Broadcast Message (SMS-CB) services.

Values:

<MO>
- **0** Mobile Originated SMS not supported.
- **1** Mobile Originated SMS supported.

<MT>
- **0** Mobile Terminated SMS not supported.
- **1** Mobile Terminated SMS supported.

<CB>
- **0** Broadcast SMS not supported.
- **1** Broadcast SMS supported.

Syntax: **Command syntax:** AT+CSMS?

Command	Possible Responses
AT+CSMS? Note: Display current values	+CSMS: <MO>,<MT>,<CB> OK Note: SMS-MO, SMS-MT and SMS-CB support

New Message Acknowledgement +CNMA

Description: This command allows reception of a new message routed directly to the TE to be acknowledged.

In TEXT mode, only positive acknowledgement to the network (RP-ACK) is possible.

Acknowledge with +CNMA is possible only when a +CMT or +CDS indication is shown (see +CNMI command).

Note: This AT command is not designed for input of the command into the HyperTerminal by hand since the acknowledgement will not be quick enough to be received by the network. However, it is possible for the client system to automatically send this command when the +CNMI is set to “2,2,0,0,0”.

Syntax: **Command syntax:** AT+CNMA

Command	Possible Responses
AT+CNMI=2,2,0,0,0	OK
	+CMT:”8587351530”,”02/04/03,11 :06 :38”,129,7,0<CR><LF> Testing Note: Message received
AT+CNMA Note: Acknowledge the message received	OK Note: Send positive acknowledgement to the network
AT+CNMA Note: Try to acknowledge again	+CMS ERROR : 340 Note: No +CNMA acknowledgment expected

Preferred Message Storage +CPMS

Description: This command allows the message storage area to be selected (for reading, writing, etc). The total storage area size is: 30 for "MT", "MO", "BC" and 10 for "SR". For RUIM software loads, these sizes vary and are dependent on the configuration of the SIM card.

Values:

<mem1> Memory area to be used to list, read and delete messages. It can be:
- **"MT"** SMS Mobile Terminated message storage in NV (default)
- **"BC"** CBM message storage in NV.
- **"SR"** Status Report message storage in NV.

<mem2> Memory used to write and send messages.
- **"MO"** Mobile Originated SMS message storage.

Each reported memory area includes information about the current used and total storage locations.
- **<used>** the number of used storage locations in the reported area.
- **<total>** the total number of available storage locations.

When <mem1> is selected, all following +CMGL, +CMGR and +CMGD commands are related to the type of SMS stored in this memory.

Syntax: **Command syntax:** AT+CPMS=<mem1>,<used>,<total>,[<mem2>,<used>,<total>]

Command	Possible Responses
AT+CPMS=? Note: Display available message storage areas.	+CPMS: ("MT","BC","SR"),("MO") OK Note: Read, list, delete: SMS, CBM or SMS Status Report. Write, send: SMS
AT+CPMS? Note: Display currently selected area information.	+CPMS: "MT",3,30,"MO",3,30 OK
AT+CPMS="AM" Note: Select invalid message storage area.	+CMS ERROR: 302
AT+CPMS="BC" Note: Select CBM message storage	+CPMS: 2,30,3,30 OK Note: Read, list, delete CBM from NV RAM

Show Text Mode Parameters +CSDH

Description: This command gives additional information on text mode result codes. This information is given in brackets in the +CMTI, +CMT, +CDS, +CMGR, +CMGL commands. This setting currently cannot be changed.

Syntax: **Command syntax:** AT+CSDH

Command	Possible Responses
AT+CSDH? Note: Current value	+CSDH: 0 OK Note: Do not show header values

New Message Indication +CNMI

Description: This command selects the procedure for message reception from the network.

Values

<mode>

The <mode> value controls the processing of unsolicited result codes. Only mode 2 is supported at this time. The other mode values are accepted and return *OK* but the processing of unsolicited result codes will be the same as with mode value 2.

- **0** Buffer unsolicited result codes in the TA. If the TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications
- **1** Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE
- **2** Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation. Otherwise forward them directly to the TE
- **3** Forward unsolicited result codes directly to the TE. TA-TE link specific in band used to embed result codes and data when TA is in on-line data mode

<mt> Sets the result code indication routing for SMS-DELIVERs. Default is 1.

- **0** No SMS-DELIVER indications are routed.
- **1** SMS-DELIVERs are routed using unsolicited code: +CMTI: “MT”, <index>
- **2 or 3** SMS-DELIVERs (except class 2 messages) are routed using unsolicited code: +CMT: <oa>, <scts>, <tooa>, <lang>, <encod>, <priority>[,<cbn>],<length><CR><LF><data> (text mode)

<bm> Sets the result code indication routing for received Cell Broadcast Messages. Default is 1.

- **0** No CBM indications are routed to the TE. The CBMs are stored.
- **1** The CBM is stored and an indication of the memory location is routed to the customer application using unsolicited result code: +CBMI: “BC”, <index>
- **2 or 3** New CBMs are routed directly to the TE using unsolicited result code (format matches that of +CBM: <oa>, [<alpha>,] <scts> [,<tooa>, <length>] <CR><LF><data> (text mode)

<ds> sets the routing for SMS-STATUS-REPORTs. Default is 1.

- **0** No SMS-STATUS-REPORTs are routed.
- **1** SMS-STATUS-REPORTs are routed using unsolicited code: +CDS: <fo>, <mr>, [<ra>] , [<tora>], <scts>, <dt>, <st> (Text mode)
- **2** SMS-STATUS-REPORTs are stored and routed using the unsolicited result ode: +CDSI: “SR”, <index>

<bfr> Default is 0.

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

Syntax: **Command syntax:** AT+CNMI=<mode>,<mt>,<bm>,<ds>,<bfr>

Command	Possible Responses
AT+CNMI=2,1,0,0,0 Note: <mt>=1	OK
	AT+CMTI : “MT”,1 Note: message received
AT+CNMI=2,2,0,0,0 Note: <mt>=2	OK
	+CMT : “8585551212”,”98/10/01,12 :30 00”,129,1,2,0,5<CR><LF> Hello Note: message received
AT+CNMI=2,0,0,1,0 Note: <ds>=1	OK
AT+CMGS=”8585551212”<CR> Message to send <ctrl-Z> Note: Send a message in text mode	+CMGS : 7 OK Note: Successful transmission
	+CDS : 2, 116, ”8585551212”, 129, “98/10/01,12 :30 :07”, “98/10/01 12 :30 :08”, 32768 Note: message was correctly delivered

Read Message +CMGR

Description: This command allows the application to read stored messages. The messages are read from the memory selected by **+CPMS** command. A message read with status "REC UNREAD" will be updated in memory with the status "REC READ".

Values:

<stat> Status of message in memory. <stat> parameter for SMS Status Reports is always "READ".

Text Mode Possible Values	Status of Messages in Memory
"UREAD"	received unread messages
"READ"	received read messages
"USENT"	stored unsent messages
"SENT"	stored sent messages
"ALL"	all messages

Note: For SMS Status Reports, only "ALL" and "READ" values of the <stat> parameter will list messages; other values will only return OK.

<oa/da> Origination/destination address value in string format.
<mr>: Message Reference
<scts>: Service Center Time Stamp in string format : "yy/MM/dd,hh :mm :ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<dt> Discharge Time in string format: "yy/MM/dd,hh :mm :ss±zz" (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<st> Status of a SMS-STATUS-REPORT
<lang> Language (network specific)
<encod> Encoding (network specific)
<priority> Message priority:
- **0** Normal
- **1** Interactive
- **2** Urgent
- **3** Emergency

<cbn> Call Back Number
<length> Length of the text message (in bytes).
<data> Message text

Syntax:

Command syntax: AT+CMGR=<index>
Response syntax: +CMGR: <stat> [,<oa>], <scts>, <lang>, <encod>, <priority>[,<cbn>], <length> <CR><LF> <data> (for **SMS-DELIVER** only)

+CMGR: <stat> [,<da>], <dt>, <lang>, <encod>, <priority>[,<cbn>], <length> <CR><LF> <data> (for **SMS-SUBMIT** only)

+CMGR: <stat>,<mr>,<scts>,<dt>,<st> (for **SMS-STATUS-REPORT** only)

Command	Possible Responses
	+CMTI: "MT",1 Note: New message received
AT+CMGR=1 Note: Read the message	+CMGR: "REC UNREAD","8585551212", "98/10/01,18 :22 :11+00",1,2,0,"8585550000",9<CR><LF> ABCdefGHI OK
AT+CMGR=1 Note: Read the message again	+CMGR: "REC READ","8585551212", "98/10/01,18 :22 :11",1,2,0,"8585550000",9<CR><LF> ABCdefGHI OK Note: Message is read now
AT+CMGR=2 Note: Read at a wrong index	+CMS ERROR: 321 Note: Error : invalid index
AT+CPMS="SR";+CNMI=,,,2 Reset to text mode, set read memory to "SR", and allow storage of further SMS Status Report into "SR" memory	+CPMS:0,10,0,10 OK
AT+CMSS=3 Send an SMS previously stored	+CMSS: 160 OK
	+CDSI: "SR",1 New SMS Status Report stored in "SR" memory at index 1
AT+CMGR=1 Read the SMS Status Report	+CMGR: "READ",160, "8585551212",129,"01/05/31,15:15:09", "01/05/31,15:15:09",0 OK

Note: For the RUIM software edition using some SIM cards, the maximum supported message text length is 99 characters. Longer message texts will be truncated to 99 characters.
The maximum message text length for all other software editions is 160 characters.

List Message +CMGL

Description: This command allows the application to read stored messages, by indicating the type of the message to read. The messages are read from the memory selected by the **+CPMS** command.

Values:

<index> Place of storage in memory.

<stat> Possible values, the status of messages in memory, are as follows:

Text Mode Possible Values	Status of Messages in Memory
"UREAD"	received unread messages
"READ"	received read messages
"USENT"	stored unsent messages
"SENT"	stored sent messages
"ALL"	all messages

Note: For SMS Status Reports, only "ALL" and "READ" values of the <stat> parameter will list messages; other values will only return OK.

<oa/da> Origination/destination address value in string format.

<fo> First Octet, coded like SMS-SUBMIT first octet in document [4], default value is 17 for SMS-SUBMIT

<mr> Message Reference

<dt> Discharge Time in string format: "yy/MM/dd,hh :mm :ss±zz" (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])

<st> Status of a SMS-STATUS-REPORT

<lang> Language

<encod> Encoding

<length> Length of the text message (in bytes).

<data> Message text

Syntax:

Command syntax: AT+CMGL=<stat>

Response syntax: +CMGL: <index>,<stat>,<da/oa>,<lang>, <encod>,<length><CR><LF><data> (for **SMS-DELIVER and SMS-SUBMIT**, may be followed by other <CR><LF>+CMGL:<index>…)

+CMGL: <index>,<stat>,<fo>,<mr>,<scts>,<dt>,<st> (for **SMS-STATUS-REPORT** only, may be followed by other <CR><LF>+CMGL:<index>…)

Command	Possible Responses
AT+CMGL="UREAD" Note: List unread messages in text mode	+CMGL: 1,"REC UNREAD","8585551212",1,2,15 <CR><LF>Unread message! +CMGL: 3,"REC UNREAD", "8585551212", 1,2,5<CR><LF>Hello OK Another message unread! Note: 2 messages are unread
AT+CMGL="READ" Note: List read messages in text mode	+CMGL: 2,"REC READ","8585551212",1,2,9<CR><LF> Keep cool OK
AT+CMGL="SENT" Note: List stored and sent messages in text mode	OK Note: No message found

Note: For the RUIM software edition using some SIM cards, the maximum supported message text length is 99 characters. Longer message texts will be truncated to 99 characters.
The maximum message text length for all other software editions is 160 characters.

Send Message +CMGS

Description: This command is used to send a SMS message. This is a two line command. The first line includes the command and its associated parameters. The second line of this command is the SMS message content. A message terminator character <term> is specified as the last character of the message text and servers to initiate message transmission or abort the +CMGS command.

Note: If the "FD" facility is enabled, only the <da> entries in the FDN phonebook can be sent.

Syntax: **Command syntax:** AT+CMGS=<da> [,<length>] [,<priority>] [,<privacy>] [,<reply>] [,<cbn>] <cr><message text> [<term>]

Command	Possible responses
AT+CMGS="8585551212"<cr> Please call me soon, Fred. <ctrl-Z> Note: Send a message	+CMGS:<mr> OK Note: Message reference output.
AT+CMGS="8585551212",2,1,1"5550000"<cr> Please call ASAP<ctrl-Z> Note: Send a message with the specified priority, privacy, reply option and call back number. Note that the <length> parameter is omitted.	+CMGS:<mr> OK Note: Message reference output.
AT+CMGS="8585551212",19<cr> <ESC>Call me at 5551212 Note: Send a nineteen byte message that includes the <ESC> character.	+CMGS:<mr> OK Note: Message reference output.
AT+CMGS="8585551212"<cr> <Unicode message><0x00 0x1A> Note: Unicode message. Two byte Unicode message <ctrl-Z> terminator.	+CMGS:<mr> OK Note: Message reference output.

Values:

<da> Destination address value; ASCII digit character phone number.

<length> Length of the text message (in bytes). If specified, the message is automatically sent when this number of message bytes have been entered. Terminator characters that are part of the message text are ignored. If not specified, a message terminator character <term> must be used.

<priority> The priority level of the message.
- **0** Normal (default)
- **1** Interactive
- **2** Urgent
- **3** Emergency

<privacy> The privacy level of the message.
- **0** Not restricted (default)
- **1** Restricted
- **2** Confidential
- **3** Secret

<reply> The reply options for the message.
- **0** No acknowledge requested (default)
- **1** Positive user acknowledge request
- **2** Delivery acknowledge request
- **3** Request both user acknowledge and delivery acknowledge

<cbn> The call back number; ASCII digit character phone number.

<cr> Required first line terminator; ASCII carriage return character (0x0d).

<message text> Message text; ASCII or UCS2 Unicode formatted. See section 20.11 for more information on Unicode formatting.

<term> Message terminator. Ignored if <length> is specified.
- ASCII message:
  - <ctrl Z> (0x1A) to send the message
  - <ESC> (0x1B) to abort the message
- Unicode message:
  - 0x00 0x1A to send the message
  - 0x00 0x1B to abort the message

Note: For the RUIM software edition using some SIM cards, the maximum supported message text length is 99 characters. Longer message texts will be truncated to 99 characters when read.
The maximum message text length for all other software editions is 160 characters.

Write Message to Memory +CMGW

Description: This command stores a message in memory (SMS-SUBMIT). The memory location <index> is returned (no choice possible as with phonebooks +CPBW). A text or Unicode message is entered as described for the Send Message +CMGS command.

Syntax: **Command syntax:** AT+CMGW=<da> [,<length>] [,<priority>] [,<privacy>] [,<reply>] [,<cbn>] <cr><message text> [<term>]

Response syntax: +CMGW: <index> or +CMS ERROR: <err> if writing fails

Command	Possible responses
AT+CMGW="8585551212"<cr> Hello how are you ?<ctrl-Z> Note: Write a message	+CMGW: 4 OK Note: Message stored in index 4
AT+CMGS="8585551212",19<cr> <ESC>Call me at 5551212 Note: Write a nineteen byte message that includes the <ESC> character.	+CMGW: 5 OK Note: Message stored in index 5
AT+CMGW="8585551212",2,1,1"5550000"<cr> Please call ASAP<ctrl-Z> Note: Write message with the specified priority, privacy, reply option and call back number. Note that the <length> parameter is omitted.	+CMGW: 6 OK Note: Message stored in index 6

Values:

<da> Destination address value; ASCII digit character phone number.

<length> Length of the text message (in bytes). If specified, the message is automatically sent when this number of message bytes have been entered. Terminator characters that are part of the message text are ignored. If not specified, a message terminator character <term> must be used.

<priority> The priority level of the message.
- **0** Normal (default)
- **1** Interactive
- **2** Urgent
- **3** Emergency

<privacy> The privacy level of the message.
- **0** Not restricted (default)
- **1** Restricted
- **2** Confidential
- **3** Secret

<reply> The reply options for the message.
- **0** No acknowledge requested (default)
- **1** Positive user acknowledge request
- **2** Delivery acknowledge request
- **3** Request both user acknowledge and delivery acknowledge

<cbn> The call back number; ASCII digit character phone number.

<cr> Required first line terminator; ASCII carriage return character (0x0d).

<message text> Message text; ASCII or UCS2 Unicode formatted. See section 20.11 for more information on Unicode formatting.

<term> Message terminator. Ignored if <length> is specified.
- ASCII message:
  - <ctrl Z> (0x1A) to send the message
  - <ESC> (0x1B) to abort the message
- Unicode message:
  - 0x00 0x1A to send the message
  - 0x00 0x1B to abort the message

Note: For the RUIM software edition using some SIM cards, the maximum supported message text length is 99 characters. Longer message texts will be truncated to 99 characters when read.
The maximum message text length for all other software editions is 160 characters.

Send Message From Storage +CMSS

Description: This command sends a message stored at location value <index>.

Syntax: **Command syntax:** AT+CMSS=<index>[,<da> [,<toda>]]
Response syntax: +CMSS: <mr> or +CMS ERROR: <err> if sending fails
If a new recipient address <da> is given, it will be used instead of the one stored with the message.

Command	Possible Responses
AT+CMGW=”8585551212”<CR> Today is my birthday <CTRL-Z> Note: Store message in phonebook.	+CMGW : 5 OK Note: Message stored with index 5
AT+CMSS=5,8582221212 Note: Send message 5 to a destination number	+CMSS: 1 OK Note: Successful transmission. One SMS message sent since power up.
AT+CMSS=5,8583331212 Note: Send message 5 to a different destination number	+CMSS: 2 OK Note: Successful transmission. Two SMS messages sent since power up.

For response mode, <mr> is the number of SMS messages that have been sent since power up. The maximum count is 65,535 messages.

Note: If the “FD” facility is enabled, only the <da> entries in the FDN phonebook can be set.

Delete Message +CMGD

Description: This command is used to delete one or several messages from preferred message storage.

Values: **<index>**
0-9
When the preferred message storage is “BC”. Integer type values in the range of location numbers of Message memory when the preferred message storage is “MT” or “SR”.

<DelFlag>
0 Delete message at location <index>
1 Delete All READ messages
2 Delete All READ and SENT messages
3 Delete All READ, SENT and UNSENT messages
4 Delete All messages.

Note: When the preferred message storage is “SR”, as SMS status reports are assumed to have a “READ” status, if <DelFlag> is greater than 0, all SMS status reports will be deleted.

Syntax: **Command syntax:** AT+CMGD=<Index> [,<DelFlag>]

Command	Possible Responses
	+CMTI:”MT”,3 Note: New message received
AT+CMGR=3 Note: Read it	+CMGR: “REC UNREAD”,”8585551212”, “98/10/01,18 :19 :20”,1,2,0,17 <CR><LF> Message received! OK Note: Unread message received from 8585551212 on the 01/10/1998 at 18H19m 20s
AT+CMGD=3 Note: Delete it	OK Note: Message deleted
AT+CMGD=1,0	OK Note: The message from the preferred message storage at the location 1 is deleted
AT+CMGD=1,1	OK Note: All READ messages from the preferred message storage are deleted
AT+CMGD=1,2	+CMS ERROR:321 Note: NV Error deleting READ messages and SENT (no messages to delete)
AT+CMGD=1,3	OK Note: All READ, SENT and UNSENT messages are deleted
AT+CMGD=1,4	OK Note: All messages are deleted

Select Broadcast Messages +CSCB

Description: This command turns on/off the reception of Broadcast SMS messages.

Values: **<bm>** The parameter of +CNMI command controls the indication of an incoming BC SMS message.
<mode>
0 Activates reception of BC SMS.
1 Turns off reception of BC SMS. Emergency BC SMS will be received in this mode.

Syntax: **Command syntax:** AT+CSCB=<mode>

Command	Possible Responses
AT+CSCB=0 Note: Turn on reception of BC SMS	OK Note: BC SMS can be received
+CBMI: "BC",5 Note: A BC SMS was received, and stored in slot 5	
AT+CSCB=1 Note: Turn off reception of BC SMS	OK Note: Only Emergency BC SMS can be received. Reception of all other BC SMS will be stopped.

Message Status Modification +WMSC

Description: This command is used to change the status of one message from preferred message storage.

Values: **<loc>** Location number of the stored message (integer)
<status> New status to be stored, as for +CMGL command :

Text Mode
"UREAD"
"READ"
"USENT"
"SENT"

Possible Responses:

OK	Location is valid and has been changed
+CMS ERROR: 341	Non-volatile memory error
+CMS ERROR: 321	Invalid index (out of range or no SMS stored)
+CMS ERROR: 302	if attempting to change Status Report SMS or if syntax is incorrect

Note: Status of SENT or USENT indicate changing MO memory SMS. Status of READ or UREAD implies using preferred memory. Changes are not accepted when preferred memory is set to Status Report (all status reports are always assumed to be READ and cannot be changed).

Syntax: **Command syntax:** AT+WMSC= <loc>, <status>

Command	Possible Responses
AT+WMSC=4,"UREAD"	OK Note: Message stored in preferred memory index 4 status changed to NOT READ
AT+WMSC=8,"USENT"	+CMS ERROR: 321 Note: Invalid index, no message at location 8 of MO memory
AT+CPMS="SR" Note: Change preferred memory to Status Report	+CPMS:1,10,4,10 OK
AT+WMSC=0,"UREAD"	+CMS ERROR: 302 Note: Cannot change Status Report messages

Message Overwriting +WMGO

Description: The +CMGW command writes an SMS to the first location available. To write an SMS to a specified location, the +WMGO command forces the product to write an SMS (with the +CMGW command) to the location specified with +WMGO, but for just one +CMGW command.

Values: **<loc>** Location number of the record to write or overwrite

Syntax: **Command syntax:** AT+WMGO= <loc>

Command	Possible Responses
AT+WMGO=0	OK Note: Next MSG write will be to index 0
AT+WMGO=30	+CMS ERROR: 302 Note: Invalid index (out of range)

On the next AT+CMGW command, the record number used will be the one specified by the AT+WMGO command. The location is forgotten and, in order to perform a second overwrite, +WMGO has to be used again.

If the external application specifies a free location, and if an incoming message is received before the AT+CMGW command, the product may store the incoming message at a location available. This could be the one specified by +WMGO (the product does not prevent from this). If the user then issues an AT+CMGW command without changing the AT+WMGO location, the new message will be overwritten!

Note: that this location number is not kept over a software reset.

Change SMS Status +WUSS

Description: The +WUSS command enables or disables a change of the SMS message status following a +CMGR or +CMGL command.

Values: **<mode>**

0 The SMS Status will change.
1 The SMS Status will not change.

Syntax: **Command syntax:** AT+WUSS = <mode>

Command	Possible Responses
AT+WUSS=1	OK
AT+WUSS=0	OK Note: If lower layer failure, +CMS ERROR: 513

Set SMS Compose Language and Encoding +WSCL

Description: The +WSCL command sets the SMS composition language and encoding types. When composing a message (+CMGS, +CMGW), the SMS language and encoding fields will be set using the current +WSCL value.

Values:

<lang>
- **0** Unspecified
- **1** English
- **2** French
- **3** Spanish
- **4** Japanese
- **5** Korean
- **6** Chinese
- **7** Hebrew

<enc>
- **0** Octet (or Unspecified)
- **1** IS91EP
- **2** ASCII
- **3** IA5
- **4** USC-2 UNICODE

Syntax: **Command syntax:** AT+WSCL = <lang>, <encod>

Command	Possible Responses
AT+WSCL=1,2	OK Note: Set language to English, encoding to ASCII
AT+CMGW=”8585551212”<CR> Hello how are you ?<ctrl-Z> Note: Write a message in English	+CMGW: 4 OK Note: Message stored in index 4
AT+WSCL=6,4	OK Note: Set language to Chinese, encoding to USC-2 UNICODE
AT+CMGS=”8585551212”<CR> Ãû×Ö<ctrl-Z> Note: Send a message in Chinese	+CMGS: <mr> OK Note: Message sent

Set Timestamp of MT SMS +WSTM

Description: The +WSTM command sets the timestamp that will be used when the modem receives a Mobile Terminated SMS. When a new MT SMS message is received the setting of this command determines if the timestamp that was received with the message is kept, or modem’s CDMA time, which represents the actual time of message arrival is used. When choosing to use modem’s CDMA time, the command gives the option of using local or GMT time.

Values:

<ts>
- **0** Original Time Stamp of the received MT SMS
- **1** Time of arrival – GMT Time
- **2** Time of arrival – Local Time

Syntax: **Command syntax:** AT+WSTM = <ts>

Command	Possible Responses
AT+WSTM=2	OK Note: Set MT SMS timestamp to time of arrival (local time zone)

Chapter 8 – Supplementary Services Commands

Supplementary Service commands are specialized call processing commands used to control carrier features on the modem such as caller ID, call forwarding, call waiting, 3-way calls, and specialized CDMA test calls.

Call Forwarding +CCFC

Description: This command allows control of the call forwarding supplementary service, if supported by the carrier. All calls will be forwarded unconditionally to the phone number specified. The modem will make a brief call to the CDMA network using an ATD specified prefix number (country and carrier specific) to setup or cancel call forwarding. An audio tone will be produced in the audio path to confirm the change of the call forwarding state.

Values: **<number>** The phone number to forward all calls to.

Note 1: Country and carrier specific call forwarding services (e.g. *68, *72, etc.) may also be available to the host application in addition to the modem provided +CCFC functionality. The host application can utilize these enhanced services for call forwarding with the modem ATD command (e.g. ATD*72).

Note 2: If the "FD" facility is enabled, only the entries in the FDN phonebook can be forwarded.

Syntax: **Command syntax**: AT+CCFC= <number>

Command	Possible Responses
ATD*72 Note: Specify the call forwarding prefix number.	OK Note: Prefix number set.
AT+CCFC=8585551212 Note: Register to an unconditional call forwarding.	OK +WORG:*728585551212 +WCNT:3 Note: Call forwarding active for all incoming calls to phone number 858-555-1212
AT+CCFC=0 Note: Cancel unconditional call forwarding	OK +WORG:*720 +WCNT:3 Note: Call forwarding cancelled.

Calling Line Identification Restriction +CLIR

Description: This command allows control of the outgoing caller ID restriction supplementary service.

Values: **<mode>** Sets the caller ID restriction for outgoing calls
- **0** Outgoing Caller ID works normally, according to the subscription of the Caller ID service.
- **1** Outgoing Caller ID is restricted. The called party will see 'Restricted' on their Caller ID display.

Note: This command works by automatically pre-pending a *67 to the outgoing dialing string. Thus, this command will only work on CDMA networks that recognize a *67 to suppress outgoing caller ID. Also, the original dialing string cannot be longer than 29 characters in length.

Syntax: **Command syntax:** AT+CLIR=<mode>

Command	Possible Responses
AT+CLIR=1 Note: Restrict outgoing caller ID.	OK Note: Command valid
AT+CLIR? Note: Ask for current functionality	+CLIR :<mode> OK Note: <mode> as defined below

Calling Line Identification Presentation +CLIP

Description: This command allows control of the incoming caller ID presentation supplementary service. When presentation of the CLI (Calling Line Identification) is enabled (and the carrier allows), +CLIP response is returned after the RING unsolicited result code. By default, +CLIP is enabled.

Values: **<mode>** This parameter enable or disables the caller ID unsolicited command
- **0** Disable
- **1** Enable

Syntax: **Command syntax:** AT+CLIP=<mode>

Command	Possible Responses
AT+CLIP=1 Note: Enable CLIP	OK Note: CLIP is enabled
AT+CLIP? Note: Ask for current functionality	+CLIP:<mode> OK Note: <mode> defined as below
	RING Note: Incoming call +CLIP: "8585551212",129 Note: Incoming call with number presentation
AT+CLIP=0 Note: Disable CLIP presentation	OK Note: Command valid

Send Flash to Base Station +WFSH

Description: 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+WFSH) to toggle between the two different call parties. The +WFSH 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 (see ATD). Then send a flash with information (AT+WFSH=18005551212) 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+WFSH) to connect all 3 parties. Send another flash (AT+WFSH) to disconnect party # 2, or End call (see ATH) to end the call with all parties.

Syntax: **Command syntax:** AT+WFSH

Command syntax AT+WFSH= < phone_number > (for a flash with information)

Unsolicited result syntax: +WFSH (confirms a flash was sent to the base station)

Command	Possible Responses
ATD8585551212; Note: Make a voice call	OK +WORG:8585551212 +WCNT:3 Note: Conversation… +CCWA:"8582701234",129 Note: Indication of another incoming call
AT+WFSH Note: Send a flash to the Base Station (toggle to the second call). Note: Conversation with second call.	OK +WFSH Note: Flash sent to the Base Station. Call to the second call. However, this is not 100% guaranteed because there is no confirmation from the Base Station.
AT+WFSH Note: Send a flash to the Base Station (toggle to the first call).	OK +WFSH Note: Flash sent to the Base Station. Call switches to the first call. However, this is not 100% guaranteed because there is no confirmation from the Base Station.
ATH Note: Release the all calls	OK +WEND:10 Note: All Calls End
ATD858551212 Note: Make a voice call	OK +WORG:858551212 +WCNT:3 Note: Conversation...
AT+WFSH=6195552121 Note: Place first call on hold, connect to second party.	OK +WFSH Note Modem now places first call on hold and attempts connection to second call.
AT+WFSH Note: Connect all 3 parties.	OK +WFSH Note: All 3 parties now connected.
AT+WFSH	OK +WFSH Note: Disconnect second party, connected to first party only.
ATH	OK +WEND:10

List Current Call State +CLCC

Description: This command is used to return the current call state of the modem.
Note that when dormant mode is active, a "no call" status will be returned even though a data call may still be in progress.

Values:

<state> (state of the call):
- **0** no call
- **1** traffic
- **2** dialing (MO call)
- **3** incoming (MT call)

<mode> (teleservice) :
- **0** voice
- **1** data
- **3** sms
- **4** otasp
- **5** markov or loopback
- **9** unknown or not applicable

<termination>
- **0** unknown or not applicable
- **1** mobile terminated (MT) call
- **2** mobile originated (MO) call

Syntax:

Command syntax: AT+CLCC
+CLCC: <state>, <mode>, <termination>

Command	Possible Responses
AT+CLCC Note: Seek current phone state	+CLCC: 0,9,0 OK Note: Command valid

Chapter 9 – Data Commands

Using AT Commands During a Data Connection

To use AT Commands during a data connection (e.g. while the product is in online mode), it is necessary either to switch to offline mode, or to use the +WMUX command to enable Commands / Data multiplexing.
Note: currently the +WMUX command is not supported yet.

Switch From Online to Offline Mode +++

During a circuit data call, the "+++" command can be used to suspend the data call and switch from online mode to offline mode. The "OK" response is returned when the modem has completed the transition to offline mode and is ready to accept AT commands.

Note: The "+++" sequence only works with the **+ICF** command using the following settings:

- 8 data bits, with no parity
- 7 data bits, with even parity

Switch From Offline to Online Mode

See the **ATO** command description.

Select Mode +FCLASS

Description: This command puts the product into a particular operating.

Values: **<n>**

0 Data

Syntax: **Command syntax:** AT+FCLASS= <n>

Command	Possible Responses
AT+FCLASS=? Note: Test command	+FCLASS: 0 OK Note: fax not supported
AT+FCLASS=0 Note: Data mode requested	OK Note: Command valid
AT+FCLASS? Note: Current value	+FCLASS: 0 OK Note: Command valid

Cellular Result Codes +CRC

Description: This command gives more detailed ring information for an **incoming call**. Instead of the string "RING", an extended string is used to indicate which type of call is ringing (e.g. +CRING:VOICE).

These extended indications are:

+CRING:VOICE	for normal voice calls
RING ASYNC	for all types of data calls
+CRING:OTAPA	for OTAPA calls
+CRING:TEST	for markov, loopback, and test calls
+CRING:UNKNOWN	for unknown/undefined calls types

Syntax: **Command syntax:** AT+CRC

Command	Possible Responses
AT+CRC=0 Note: Extended reports disabled	OK Note: Command valid
AT+CRC=1 Note: Extended reports enabled	OK Note: Command valid

DTE-DCE Local Rate Reporting +ILRR

Description: This command controls whether or not the extended-format "+ILRR:<rate>" information text is transmitted from the DCE to the DTE. Currently the product only supports 0 = OFF.

Values: **<value>**
Decimal number corresponding to the selected option. Currently, only 0 is supported (disables reporting of local port rate).

Syntax: **Command syntax:** AT+ILRR=<value>

Command	Possible Responses
AT+ILRR=0 Note: Local port rate report disabled	OK Note: Command valid

V.42 bis Data Compression +DS

Description: This command enables or disables V.42bis data compression if this feature is provided on the PSTN in the IWF.

Values: Four numeric sub-parameters are accepted:

<dir> specifies the desired direction(s) of operation of the data compression function; from the DTE point of view. **Default is 3**.
- **0** Negotiated … no compression
- **1** Transmit only
- **2** Receive only
- **3** Both directions, accept any direction

<neg> specifies whether or not the DCE should continue to operate if the desired result is not obtained. **Default is 0**
- **0** Do not disconnect if V.42 bis is not negotiated by the remote DCE as specified in <dir>
- **1** Disconnect if V.42 bis is not negotiated by the remote DCE as specified in <dir>

<P1>
- **512-4096** Specifies the maximum number of dictionary entries that should be negotiated. **Default is 4096**.

<P2>
- **6-250** Specifies the maximum string length to be negotiated. **Default is 250**.

Syntax: **Command syntax:** AT+DS=<dir>,<neg>,<P1>,<P2>

Command	Possible Responses
AT+DS=3,0,4096,250 Note: Set new parameters	OK Note: Command valid
AT+DS? Note: Current values	+DS: 3,0,4096,250 OK Note: Command valid

V.42 bis Data Compression Report +DR

Description: This command returns the results of data compression capability. If data reporting is enabled, this command returns the data compression type of an incoming or outgoing data call. Otherwise, the command returns NONE.

The intermediate result code represents current DCE-DCE data compression type. The syntax for +DR reporting is: +DR<result>, and the result code is defined as follows:

+DR: NONE	Data compression is not in use
+DR: V42B	Rec. V.42 bis is in use in both directions
+DR: V42B RD	Rec. V.42 bis is in use in receive direction only
+DR: V42B TD	Rec. V.42 bis is in use in transmit direction only

The +DR intermediate result code, if enabled, is issued before the final result code, before the +ILRR intermediate report and after the service report control +CR.

Values: This syntax is for setting the +DR reporting method.

<val>
- **0** Disable reporting
- **1** Enable reporting

Syntax: **Command syntax:** AT+DR=<val>

Command	Possible Responses
AT+DR=1 Note: Reporting enabled	OK Note: Command valid
AT+DR? Note: Display the current value	+DR: 1 OK Note: Command valid
AT+DR=? Note: Display the supported values	+DR: (0,1) OK Note: Command valid

Chapter 10 – V.24-V.25 Commands

Refer to ITU-T Recommendation V.25 specifications if you desire more details about the following commands.

Fixed DTE Rate +IPR

Description: This command is used to specify the baud rate for the module DATA port. The factory default value is 115200. When autobaud is specified (AT+IPR=0), the module sets the DATA port operating baud rate to the detected DTE baud rate. The AT&F command restores the baud rate value that was active when the last AT&W command was used.

Note: The use of baud rates below 9600 may affect the operability of some module software features; e.g., TCP App.

Syntax: **Command syntax:** AT+IPR

Command	Possible Responses
AT+IPR? Note: Read syntax.	+IPR: 9600 OK Note: Current rate is 9600 bps
AT+IPR=? Note: List of supported <rate> values,[(list of fixed-only <rate> values)]	+IPR: (0,1200,2400,4800,9600,19200), (45,50,75, 110,150,300,600,38400,57600,115200,230400) OK Note: Possible value (*)
AT+IPR=38400 Note: Disable autobaud and set rate to 38400 bps	OK
AT+IPR=0 Note: Enable autobaud	OK

(*) The first list of values are the baud rates that are detectable by the module autobaud feature. The second list of values are the module DATA port supported baud rates.

DTE-DCE Character Framing +ICF

Description: This command is used to specify the UART start-stop (asynchronous) character framing for the module DATA port. The factory default value is 3,3. The AT&F command restores the value that was active when the last AT&W command was used.

Values:

<format>

0	Autodetect	(Not supported)
1	8 Data 2 Stop	(Not supported)
2	8 Data 1 Parity 1 Stop	(Not supported)
3	8 Data 1 Stop	(Supported)
4	7 Data 2 Stop	(Not Supported)
5	7 Data 1 Parity 1 Stop	(Not Supported)
6	7 Data 1 Stop	(Not Supported)

<parity>

0	Odd	(Supported)
1	Even	(Supported)
2	Mark	(Supported)
3	None	(Supported)

Note: The supported format values are software release specific. Use the +ICF=? command to display the valid format values for the software release in use.

Syntax: **Command syntax:** AT+ICF= <format>, <parity>

Command	Possible Responses
AT+ICF=3,3 Note: Set values.	OK Note: New values set
AT+ICF? Note: Display current settings.	+ICF: 3,3 OK Note: Current values
AT+ICF=? Note: Display valid parameter ranges.	+ICF: (3-5),(0-3) OK Note: Possible values

DTE-DCE Local Flow Control +IFC

Description: This command is used to specify the module DATA port flow control method. The factory default values are 2,2. The AT&F command restores the value that was active when the last AT&W command was used.

Values:

<Tx>

0	None	Transmit data flow control disabled.
1	XON/XOFF	Remove Xon (0x19) and Xoff (0x17) characters from data stream.
2	Hardware	Use RTS (Request To Send) signal (default)
3	XON/XOFF	Leave Xon (0x19) and Xoff (0x17) characters in data stream.

<Rx>

0	None	Receive data flow control disabled.
1	XON/XOFF	Remove Xon (0x19) and Xoff (0x17) characters from data stream.
2	Hardware	Use CTS (Clear To Send) signal (default)

Syntax: **Command syntax:** AT+IFC=<Tx>,<Rx>

Command	Possible Responses
AT+IFC=? Note: Display valid parameter ranges.	+IFC: (0-3),(0-2) OK Note: Valid parameter ranges
AT+IFC? Note: Display current settings.	+IFC: 2,2 OK Note: Default values are 2,2 (hardware flow control).
AT+IFC=3 Note: Set Tx flow control to XON/XOFF.	OK Note: New Tx flow control value set.
AT+IFC=,1 Note: Set Rx flow control to XON/XOFF.	OK Note: New Rx flow control value set.
AT+IFC? Note: Display current settings.	+IFC: 3,1 OK Note: Settings displayed.
AT+IFC=2,2 Note: Set Tx and Rx flow control to hardware.	OK Note: New Tx and Rx flow control values set.

Set DCD Signal &C

Description: This command is used to specify the behavior of the Data Carrier Detect (DCD) signal on the module DATA port. The factory default value is 2. The AT&F command restores the value that was active when the last AT&W command was used.

Values: **<n>**

0 The DCD signal is always asserted.
1 The DCD signal is asserted in a call and de-asserted when not in a call.
2 The DCD signal is always asserted except at the end of a call. At the end of a call, the DCD signal is de-asserted for 1 second. **Default is 2**

Syntax: **Command syntax:** AT&C<n>

Command	Possible Responses
AT&C0 Note: DCD always on	OK Note: Command valid
AT&C1 Note: DCD matches the true state of the call.	OK Note: Command valid
AT&C2 Note: Wink DCD signal on call disconnect	OK Note: Command valid

Set DTR Signal &D

Description: This command controls the interpretation of the Data Terminal Ready (DTR) signal on the module DATA port. The factory default value is 2. The AT&F command restores the value that was active when the last AT&W command was used .

Values: **<n>**

0 The DTR signal is ignored.
1 Enter online command state following ON-to-OFF transition of circuit 108/2
2 Enter command state following ON-to-OFF transition of circuit 108/2.

Syntax: **Command syntax:** AT&D<n>

Command	Possible Responses
AT&D0 Note: The DTR signal is ignored	OK Note: Command valid
AT&D1 Note: Enter online command state following ON-to-OFF transition of circuit 108/2	OK Note: Command valid
AT&D2 Note: Enter command state following ON-to-OFF transition of circuit 108/2	OK Note: Command valid

Set DSR Signal &S

Description: This commands controls the Data Set Ready (DSR) signal on the module DATA port.

Values: **<n>**

0 The DSR signal is always on. (Default)
1 The DSR signal is always off.

Syntax: **Command syntax:** AT&S<n>

Command	Possible Responses
AT&S0 Note: The DSR signal always on.	OK Note: Command valid
AT&S1 Note: The DSR signal is always off.	OK Note: Command valid

Back to Online Mode O

Description: If a data call is active and the MS is in command mode (+++ command issued; data call suspended), the ATO command causes the module to exit command mode and resume online data mode.

Values: **<n>**

0 Result codes returned. (Default)
1 Result codes suppressed.

Syntax: **Command syntax:** ATO

Command	Possible Responses
ATO Note: Return to online mode from offline mode	OK
ATO Note: Return to online mode from offline mode	NO CARRIER Note: Not in a call

Result Code Suppression Q

Description: This command is used to control the suppression of AT command result codes.

Syntax: **Command syntax:** ATQ <n>

Command	Possible Responses
ATQ0 Note: Result codes are returned	OK Note: Command valid
ATQ1 Note: Result codes are suppressed	(none) Note: No response

DCE Response Format V

Description: This command is used to specify the result code format. Refer to section 21 for a list of result codes. Numeric result codes are only available for Hayes standard AT commands. All other AT command results are returned in word format. Result codes, both word and numeric, can be suppressed by the ATQ command.
Unsolicited responses are not affected by the ATV command and will always be displayed in word format as documented . The unsolicited response +RING is not affected by the ATV command. The +RING response can be formatted by the +CRC command.

Values: <n>
- **0** Numeric result codes
- **1** Word result codes. (default)

Syntax: **Command syntax:** ATV<n>

Command	Possible Responses
ATV0 Note: Display result codes as numbers	0 Note: Command is valid (0 means OK)
ATV1 Note: Display result codes as words (Default)	OK Note: Command valid

Audio Loopback &T

Description: This command is used to perform audio loop back of the current audio path. This command can be used to validate the audio loop. This is a standard Hayes® modem AT command.

Values: **<num>**
- **0** Not defined; returns OK.
- **1** Audio loopback on for current path.
- **2** Audio loopback is off.

Syntax: **Command syntax:** AT&T<num>

Command	Possible Responses
AT&T1	OK Note: Audio loopback is on.
AT&T2	OK Note: Audio loopback is off.

Echo E

Description: This command is used to determine whether or not the modem echoes characters received by an external application (DTE). This is a standard Hayes® modem AT command.

Syntax: **Command syntax:** ATE

Command	Possible Responses
ATE0 Note: Characters are not echoed	OK Note: Done
ATE1 Note: Characters are echoed	OK Note: Done

Display Configuration &V

Description: This command is used to display the modem configuration. It lists all the commands supported by the modem and their possible parameters. This is a standard Hayes® modem AT command.

Syntax: **Command syntax:** AT&V

Command	Possible Responses
AT&V Note: Display the active parameter settings	&C: 2; &D: 2; … … OK

Request Identification Information I

Description: This command causes the product to transmit one or more lines of information from the DCE.

Values: **<num>**

- **0** Manufacturer data
- **1** Not used
- **2** Not used
- **3** Software revision data
- **4** Not used
- **5** Configuration data
- **6** Capability data
- **7** Not used

Note: For the data returned by the ATI6 command, the use of the IS-707 +GCAP command is preferred.

Syntax: **Command syntax:** ATI<num>

Command	Possible Responses
ATI0 Note: Display manufacturer data	MODEM 800 1900 OK
ATI3 Note: Display software revision data	S/W VER: WISMOQ … OK
ATI6 Note: Display capability data	+CGSM, +CIS707, … OK

Restore Factory Setting &F

Description: This command is used to restore the factory setting from NV memory. See Chapter 19. This command will reset the modem as the very last part of its operation.

Note: There is a remote chance of NVRAM corruption of a modem reset or power loss occurs during the processing of this command. This command should be used only during initial setup of the modem's operating characteristics.

Syntax: **Command syntax:** AT&F

Command	Possible Responses
AT&F	OK Note: Command valid, modem resets

Save Configuration &W

Description: This command writes the current configuration to NV. See table in Chapter 19 for a list of items.

Syntax: **Command syntax:** AT&W

Command	Possible Responses
AT&W	OK Note: Command valid

Chapter 11 – Phone Book Commands

In this chapter, the AT commands are used to operate on mobile phonebook. These phonebook commands adhere to the set defined in GSM 07.07 specification. Please refer to GSM 07.07 for further AT command usage and description.

For all phonebook read commands (+CPBR, +CPBF, +CPBP), the TON/NPI MSB of each number is set to 1 (ex: a TON/NPI stored as 17 is displayed as 145).

When accessing numbers in the call history phonebooks (“LD”, “MC”, or “RC”), if a matching number is found in one of the other phonebooks, the text portion of the matching entry is copied to the call history entry.

The phone book “SM” is only supported in an RUIM capable modem.

When an RUIM is present, the “MT” phonebook is a combination of two phonebooks as shown in the example below. This must be taken into account when using a phone book AT command index to access an entry in this phonebook.

ME →	Index range 1 to 100
SM →	Index range 1 to 150 (SIM card)
MT →	ME start at 1, SM start at 101 (SIM card)

```
< - - - - - - - ME - - - - - - -> < - - - - - - - SM - - - - - - - - ->
1                          100   101                          250
```

Select Phonebook Memory Storage +CPBS

Description: This command selects the type of memory where the phonebook will be stored. Possible phone books are listed below under the **<bk>** section. If there’s no RUIM card present, selecting “SM” phonebook returns ERROR.

Values: **<bk>**

- **“SM”** ADN (RUIM phonebook)
- **“ME”** ME (ME NV phonebook)
- **“LD”** LND (ME or RUIM last dialed phonebook; depending on presence of RUIM)
- **“EN”** EN (ME NV emergency numbers)
- **“MC”** MSD (ME missed calls list)
- **“MT”** MT (combined ME and RUIM phonebook)
- **“RC”** LIC (ME received calls list)
- **“FD”** FDN (SIM Fix Dialing, restricted phonebook)

Syntax: **Command syntax:** AT+CPBS=”<bk>”

Command	Possible responses
AT+CPBS=? Note: Possible values, not all may be supported	+CPBS: (“ME”,”MC”,”LD”,”RC”,”EN”) Note: Not all may be supported
AT+CPBS=”EN” Note: Select the emergency phonebook	OK Note: Emergency phonebook selected
AT+CPBS? Note: Return the currently selected phonebook	+CPBS: EN,0,9 OK Note: EN phonebook selected, 0 locations used, 9 available
AT+CPBS=”MT” Note: Select the MT phonebook (RUIM present). AT+CPBS?	OK Note: MT phonebook selected +CPBS: MT,5,300
Note: Display MT phonebook information. Combination of ME and SM phonebooks.	OK Note: 5 locations used, 300 available (combination of ME and RUIM phonebooks).

Return Selected Phonebook Locations +CPBU

Description: This command returns information about the currently selected phonebook. This includes the starting entry location, the total number of locations, maximum length of the phone number, the TON/NPI value range, and the maximum number of characters for the text portion of each entry.

The format of the returned data for the "MT" phonebook is different. It is a combination of the "ME" and "SM" phonebooks with values that describe each.

Syntax: **Command syntax:** AT+CPBU?

Command	Possible Responses
AT+CPBS="ME" Note: Select the ME phonebook. AT+CPBU? Note: Display ME phonebook information.	OK Note: ME phonebook selected +CPBU: (1 –100),32,(0-255),12 OK Note: 100 locations starting at 1, 32 digits maximum, TON/NPI value range is 0-255, and 12 characters for the text.
AT+CPBS="MT" Note: Select the MT phonebook. AT+CPBU? Note: Display MT phonebook information.	OK Note: MT phonebook selected +CPBU: (1-100,101-180),(32,20),(0-255),(12,12) OK Note: 100 locations starting at 1 for the ME phonebook, 80 locations starting at 101 for the SM phonebook, 32 digits maximum for the ME phonebook and 20 digits maximum for the SM phonebook, TON/NPI value range is 0-255, and 12 characters for the text in both the ME and SM phonebooks.

Find Phonebook Entries +CPBF

Description: This command returns the first ten phonebook entries with alphanumeric fields starting with a given string. The user can use a string that is more exact to ensure that the entry they are looking for is found. The string search is case sensitive.

When the "MT" phonebook is selected, the find operation searches the "ME" portion first followed by the "SM" portion. The returned values may be a combination of entries from both the "ME" and "SM" phonebooks.

Note: This command is functional for the "ME", "EN", "SM", and "MT" phonebooks only.

Syntax: **Command syntax:** AT+CPBF="string"

Command	Possible Responses
AT+CPBF="TES"	+CPBF: 1,"6195551212",145,"test1" OK Note: Displays location starting with "TES"
AT+CPBF="NEXT" Note: Find entries that start with "NEXT"	+CME ERROR: 22 Note: Entry not found

Write Phonebook Entry +CPBW

Description: This command writes a phonebook entry to location <*index*> in the current phonebook selected with the +CPBS command.

If the "MT" phonebook is selected, <index> is in the range of the combined "ME" and "SM" phonebooks. When using auto address mode (<index> not specified in the command), the "ME" phonebook is accessed first for an available location. If a location is not available in the "ME" phonebook, the "SM" phonebook is accessed.

The +WSPC command must be issued with a valid SPC code value before entries in the "EN" phonebook can be changed.

Values:

<index>	Integer type value depending on the capacity of the currently selected phonebook.
<phoneNumber>	Phone number is in ASCII format. Valid characters are 0-9 and *, #, -.
<TON/NPI>	Type of address in integer form. The MSB of this will *always* be set high.
<text string>	Text string or Unicode formatted record.

Note: PIN2 verification is required to do this command on the FDN. If the PIN2 authentication has been performed during the current session, the +CPBW command with FDN is allowed.

Command	Possible Responses
AT+CPBS="FD" Note: Select FDN phonebook	OK
AT+CPBW=5,"8585551212",145,"test" Note: Write in FDN at location 5	+CME ERRO: 17 Note: PIN2 is required
AT+CPIN2?	RUIM PIN2 Note: SIM PIN2 is required
AT+CPIN2=1234 Note: Example PIN2 entered	OK Note: PIN2 successfully entered
AT+CPBW=5,"8585551212",145,"test" Note: Write in FDN at location 5	OK Note: Write in FDN successful

Syntax: **Command syntax:** AT+CPBW=<index>,"<phoneNumber>",<TON/NPI number>,"<text string>"

Command	Possible Responses
AT+CPBW=1,"6195551212",145,"test1" Note: Write location 1. Message cannot begin with the characters '80', '81', or '82' (Unicode message record identifiers).	OK Note: Data stored in location 1.
AT+CPBW=5,"6195551212",145,"8000410042" Note: Write location 5 using Unicode format for the <text string>; character input mode.	OK Note: Data stored in location 5.
AT+CPBW=5,"6195551212",145,"<bytes>" Note: Write location 5 using Unicode format for <bytes>; binary input mode. Message cannot contain byte values 0x00 (null) or 0x22 (“); message truncation will result.	OK *Note: Data stored in location 5.*
AT+CPBW=6,"6195551234",145,"80xyz" Note: Write location 6.	OK Note: Data stored in location 6. The string "80xyz" is invalid UCS2 format and is interpreted as a non-Unicode string.
AT+CPBW=2 Note: Erase location 2	OK
AT+CPBW=1,"8585551212",145,"test1" Note: Location 1 overwritten	OK
AT+CPBW=80,"8585551212",145,"test80 Note: Error left off trailing quotes	ERROR
AT+CPBW=,"8585551212",145,"test" Note: Write to the first open location	OK
AT+CPBW=,"8585551212",145,"FullBook" Note: Phonebook is full	+CME ERROR: 20 Note: Phonebook full
AT+CPBW=,"8585551212",145,"Text is too long for this " Note: Write string to the first open location.	+CME ERROR: 24 Note: Text string exceeds the maximum character length

Phonebook Read +CPBR

Description: This command returns phonebook entries from a range of locations from the currently selected phonebook.

When the "MT" phonebook is selected, a request for the range 95 through 105 will return locations 95 through 100 of the "ME" phonebook and locations 1 through 5 of the "SM" phonebook ("MT" phonebook locations 101 through 105).

Note: There are only 9 entries total in the Emergency Numbers phonebook (1 – 9).

Syntax: **Command syntax:** AT+CPBR=<first>[,last]

Command	Possible Responses
AT+CPBR=1 Note: Read entry 1	+CPBR:1,"6185551212",145,"test" OK Note: Display location 1
AT+CPBR=10 Note: Read entry 10 which was stored in Unicode format.	+CPBR:10,"6185551212",145,"8005310532" OK Note: Display location 10 (Unicode format).
AT+CPBR=1,3 Note: Read location 1 to 3 and return and data they may contain. Only 10 entries starting at the first entry are displayed. User can enter command multiple times with different indices.	+CPBR:1,"6185551212",145,"test1" +CPBR:2,"6185551212",129,"test2" +CPBR:3,"6185551212",115,"test3" Note: The MSB of the TON/NPI is ALWAYS set high
AT+CPBR=12,1 Note: <x,y> where x<y	ERROR Note: Invalid range x>y
AT+CPBR=300	+CMEE:21 Note: Invalid index

Note: For the LD, MC, and RC phonebooks, the TON/NPI number will not be displayed.

Phonebook Search +CPBP

Description: This searches the currently selected phonebook for a phone number match and returns the entry if found. If the specified number exists in multiple locations within the selected phonebook, only the first entry found will be returned. The search looks for the exactly number string match.

When the "MT" phonebook is selected, the search operation searches the "ME" portion first followed by the "SM" portion.

Syntax: **Command syntax:** AT+CPBP= "<phone number>"

Command	Possible Responses
AT+CPBP= "8585551212" Note: Find "8585551212" in current phonebook if it exists.	+CPBP=1,"8585551212",145,"FullBook" OK Note: ME phonebook previously selected. Display entry that matches.
AT+CPBP="123"	+CME ERROR: 22 Note: Entry not found

Note: The phone number to search must match that stored in phone book. Partial number searching is not supported and will return an error.

Avoid Phonebook Initialization +WAIP

Description: This command controls access to the available phonebooks. If +WAIP is set to 1, phonebook initialization at module startup is not performed and phonebook functions are not available. When +WAIP is set to 0, normal phonebook functionality is available. A change to the WAIP <mode> value is saved to NV and becomes active following a module reset.

Values: **<mode>**

0 Enabled - Normal operating mode.
1 Disabled - No phonebook initialization.

Syntax: **Command syntax:** AT+WAIP=<mode>

Command	Possible responses
AT+WAIP=? Note: Display valid command parameters.	+WAIP: (0-1) OK
AT+WAIP? Note: Display current WAIP setting.	+WAIP: 1 OK Note: No phonebook commands are allowed. If entered, "+CMEE ERROR: 3" is returned.
AT+WAIP=1 Note: Disable phonebook access.	OK Note: Access is denied following module reset.
AT+WAIP=0 Note: Enable phonebook access.	OK Note: Access is permitted following module reset.

Delete Calls From Phonebook +WDCP

Description: This command will delete all entries from a selected phonebook if it supports this feature. Typically, +WDCP is used to delete the calls stored in LD, MC, and RC phonebooks.

Values: **<call phonebook>**

LD, MC, or RC

Syntax: **Command syntax:** AT+WDCP="<call phonebook>"

Command	Possible Responses
AT+WDCP?	+WDCP: "LD" Note: Returns phonebook(s) that support deleting calls.
AT+WDCP=?	+WDCP: ("LD","MC","RC") Note: Possible supported phonebooks
AT+WDCP="LD"	OK Note: Erase call history for last dialed phone book

Chapter 12 – Position Determination (GPS) Commands

The position determination AT commands are supported on gpsOne equipped CDMA modules. GpsOne is a wireless-assisted hybrid solution that utilizes both GPS and base-station trilateration to determine the mobile position. A high degree of position accuracy is possible using gpsOne due to the inclusion of CDMA system timing information in the position calculation.

The gpsOne feature includes a number of AT commands that are used to configure, start, stop, and report position data. The reported position data is used by the user or application software host to provide the desired features. GpsOne functionality is dependent on the carrier and network configurations. A number of gpsOne session examples are included in section 21 to aide in the understanding of the gpsOne AT commands.

Position Determination Session Type +WPDST

Description: This command sets the desired position determination session type. The session type specifies how the next PD session is to function. An attempt to change the session type while a PD session is in progress will result in an error.

Values: **<type>**

- **0** Session to provide the last position info available. Position fix not performed.
- **1** Session to provide single-shot fix. Perform a new position fix.
- **2** Tracking mode independent fixes; session to provide continuous independent position fixes.
- **3** Tracking mode; session to provide continuous position fixes.
- **4** Data download; session to download ephemeris/almanac data only. Used for MS-based fix determination. Download data is valid for 30 to 120 minutes.

Note: When a tracking mode is requested (continuous position fixes) and the TCP/IP transport layer is used, a data call will interrupt the reception of position fixes. The modem will store up to 10 of the most current position fixes and present them when the data call ends.

Syntax: **Command syntax:** AT+WPDST=<type>

Command	Possible Responses
AT+WPDST? Note: Request current setting type	+WPDST: 0 OK
AT+WPDST=0 Note: Select the last position info available	OK Note: Command accepted.
AT+WPDST=1 Note: Select single-shot fix	+CME ERROR: 600 Note: PD session already active.
AT+WPDST=? Note: Display valid command parameter range.	+WPDST: (0-4) OK

Position Determination Operating Mode +WPDOM

Description: This command sets the desired position determination session operating mode. The mode specifies how the next PD session position data is to be derived and calculated. An attempt to change the session mode while a PD session is in progress will result in an error.

Values: **<mode>**

- **0** Standalone only; MS uses internal GPS functions.
- **1** Network (PDE-based) only; MS obtains all position determination data from the PDE.
- **2** Speed optimal (minimize time-to-fix, MS-based first, PDE-based later if failed).
- **3** Accuracy optimal (PDE preferred, MS in case of failure) .
- **4** Data optimal– minimize data exchanged between MS and PDE.
- **5** MS-based only; MS performs all position determination functions.

Syntax: **Command syntax:** AT+WPDOM=<mode>

Command	Possible responses
AT+WPDOM? Note: Request current setting mode	+WPDOM: 5 OK Note: Current mode displayed.
AT+WPDOM=1 Note: Use PDE provided data.	OK Note: Command valid.
AT+WPDOM=? Note: Display valid command parameter range.	+WPDOM: (0-5) OK

Position Determination Data Download +WPDDD

Description: This command specifies configuration parameters that are used in a position determination data download session. The default is zero for both parameters if the +WPDDD command is not used. The appropriate parameters must be set prior to starting a PD data download session.

Values: **<type>**

- **0** Single-shot download of ephemeris/almanac data
- **1** Periodically download ephemeris/almanac data. <duration> specifies time between downloads.

<duration>

Number of minutes between ephemeris/almanac data downloads when <type> is set to 1. Range of this parameter is 0 to 255 minutes. The download duration parameter is currently ignored.

Note: The GPS almanac data is valid for 3 to 4 days and GPS ephemeris data is valid for 30 to 120 minutes.

Syntax : **Command syntax:** AT+WPDDD=<type>,<duration>

Command	Possible responses
AT+WPDDD=? Note: Display valid parameter ranges.	+WPDDD: (0-1),(0-255) OK
AT+WPDDD? Note: Display current settings	+WPDDD: 0,0 OK
AT+WPDDD=0,60 Note: Request single-shot data download	OK Note: Duration value currently ignored.
AT+WPDDD=1,30 Note: Request continuous data download	OK Note: Duration value currently ignored.

Position Determination Fix Rate +WPDFR

Description: This command specifies the position determination session fix rate. This setting is used in tracking sessions only and specifies the number and interval for the unsolicited position data responses (+WPDSS). The default value for the +WPDFR parameters is zero. The appropriate parameters must be set prior to starting a PD tracking session.

Values: **<num>** Number of fixes. Valid range is 0 to 400.
<time> Time between fixes in seconds. Valid range is 0 to 1800.

Syntax: **Command syntax:** AT+WPDFR=<num>,<time>

Command	Possible responses
AT+WPDFR=? Note: Display valid parameter ranges.	+WPDFR: (0-400),(0-1800) OK
AT+WPDFR? Note: Display current settings.	+WPDFR: 10,100 OK
AT+WPDFR=10,100 Note: Specify 10 fixes with 100 seconds between fixes	OK Note: Command accepted.

Position Determination Privacy Level +WPDPL

Description: This command is used to set the position determination session privacy level. The privacy level is used to control what mobile station position information is made available to the PDE during a PD session.

Values: **<level>**

0 Low (no restrictions) – Permits sending of pilot phase measurements, GPS pseudo-ranges, and MS position information to the PDE.

1 Medium – Pilot phase measurements can be sent to the PDE. Disables sending of MS position information and GPS pseudo-ranges. Allows only MS-based position calculated fixes. Allows AFLT-only MS-assisted fixes.

2 Highest – No information that could be used to locate the mobile will be sent to the PDE. Allows only MS-based position calculation fixes. Disables PDE-based position calculation/MS-assisted fixes.

Note: If the MS is in emergency mode (e911), the module will provide all available position data (level 0) when requested by the PDE.

Syntax: **Command syntax:** AT+WPDPL=<level>

Command	Possible responses
AT+WPDPL=? Note: Display valid parameter range.	+WPDPL: (0-2) OK
AT+WPDPL? Note: Display current setting.	+WPDPL: 0 OK
AT+WPDPL=2 Note: Select highest level of security.	OK Note: Command accepted.

Position Determination NV Privacy Level +WPPRV

Description: This command is used to specify the NV Privacy level for the position determination session. This setting controls how the PD session responds to PDE originated location requests. The new value is committed to NV and is persistent following a module power cycle.

Values: **<level>**

0 Lowest level of privacy. The module puts no restrictions on position data shared with the network. (Default)

1 Medium level of privacy. The module will only perform mobile based position fixes, PDE based fixes are disallowed. Mobile terminated sessions not are allowed, except E911 position fixes.

2 Highest level of privacy. The module will not send any information to the network that could allow the network to estimate the current user location. Note that depending on the level of PDE sophistication, this could impede the module's GPS performance. The module will only perform mobile based position fixes, PDE based fixes are disallowed. Mobile terminated sessions not are allowed, except E911 position fixes.

Syntax: **Command syntax:** AT+WPPRV=<level>

Command	Possible responses
AT+WPPRV=? Note: Display valid parameter range.	+WPPRV: (0-1) OK
AT+WPPRV? Note: Display current setting.	+WPPRV: 0 OK
AT+WPPRV=1 Note: Set to medium privacy level	OK Note: Command accepted.

Position Determination Transport Setting +WPTLM

Description: This command specifies the transport layer to be used for the position determination session. The transport layer is carrier specific and may require other PD parameters (IP address, IP port) to also be configured.

Values: **<setting>**

0 TCP/IP - Use a TCP/IP based socket for PDE/MS PD data exchanges.

1 DBM - Use data burse messages for PDE/MS PD data exchanges.

Note: For software versions earlier than v3.0, when a tracking mode is requested (continuous position fixes) and the TCP/IP transport layer is used, position fixes will not be delivered until the data call ends. Then, only the last 10 position fixes will be presented.

Syntax: **Command syntax:** AT+WPTLM=<setting>

Command	Possible responses
AT+WPTLM=? Note: Display valid parameter range.	+WPTLM: (0-1) OK
AT+WPTLM? Note: Display current setting.	+WPTLM: 1 OK
AT+WPTLM=0 Note: Set the transport setting to TCP/IP	OK Note: Command accepted.

Set Position Determination IP Address +WPDIP

Description: This command is used to set the IP address for the position determination session. A valid IP address is required if the TCP/IP transport layer is used.

Values: **<ip_address>**

Specified in standard IP address format xxx.xxx.xxx.xxx where xxx is 000 to 255. This is a carrier specific value.

Syntax: **Command syntax:** AT+WPDIP=<ip_address>

Command	Possible responses
AT+WPDIP? Note: Query current PD IP address.	+WPDIP:192.168.135.124 OK
AT+WPDIP=192.168.135.124 Note: Set PD IP address.	OK Note: New PD IP address set.

Set Position Determination Port ID +WPDPT

Description: This command is used to set the port ID value for the position determination session. A valid port ID value is required if the TCP/IP transport layer is used.

Values: **<port_id>**

Numeric value in the range 0 to 65535. Value is carrier specific.

Syntax : **Command syntax:** AT+WPDIP=<port_id>

Command	Possible responses
AT+WPDPT? Note: Query current PD port id value.	+WPDPT: 4911 OK
AT+WPDPT=4911 Note: Set PD port id value.	OK Note: New PD port id value set.

Position Determination Start Session +WPDSS

Description: This command is used to start a position determination session. Configuration settings, either default or as set by a PD related AT command, will be used. For an ephemeris/almanac data download session, the data is returned to the module PD software and not displayed. For all other PD session types, position data will be returned using +WPDSS unsolicited responses. The content of the unsolicited +WPDSS responses is dependent on the service requested by the +WPDSS command. Only one PD session may be active at a time.

Values:

<service>

"P" Position only
"PV" Position and Velocity; velocity includes heading data.
"PH" Position and Elevation
"PVH" Position, Velocity, and Elevation; velocity includes heading data.
Note: Multiple letter codes for the service parameters must be ordered as shown.

<performance>

0 No time allowed for GPS search. Use Advanced Forward Link Trilateration (AFLT) only.
1-255 Upper bound of permitted GPS search time in seconds. Note that this does not correspond to overall *session* time, but only the amount of time spent searching in GPS mode.

<accuracy>

Accuracy threshold in meters; only used in MS-based position determination sessions. If the position uncertainty is higher than the accuracy threshold, the session will fall back to PDE-calculated fixes if permitted by the current privacy setting (+WPDPL <level> not 2). The PDE-calculated fixes will not be checked to the accuracy threshold. If the privacy setting prohibits PDE-calculated fixes, the accuracy threshold exceeded fix will be used.

Syntax: **Command syntax:** AT+WPDSS=<service>,<performance>,<accuracy>

Command	Possible responses
AT+WPDSS="PV" Note: Start a PD session for position and velocity. Use AFLT with no accuracy threshold.	OK Note: Command accepted.
AT+WPDSS="PVH",20,50 Note: Start a PD session for position, velocity, and elevation. GSP search time limited to within 20 seconds. Desired accuracy within 50 meters.	OK Note: Command accepted.
AT+WPDSS?	+WPDSS: "PVH",20,50 OK Note: "PVH" session in progress. +WPDSS: OK Note: No active session.

Position Determination End Session +WPDES

Description: This command is used to end a position determination session prior to its normal termination. For example, the termination of a PD session before the +WPDFR command specified number of fixes have been returned.

Syntax: **Command syntax:** AT+WPDES

Command	Possible responses
AT+WPDES Note: End current PD session	OK Note: Command accepted. PD session ended. +CME: ERROR: 604 Note: No active session.

gpsOne Session Consent +WPDCT

Description: This command is used to set the default user consent for network initiated gpsOne sessions. The specified value will be saved to NV after each AT+WPDCT command and is module reset persistent.

Values: **<n>**

- **0** Always accept (factory default)
- **1** Always refuse
- **2** Prompt

Syntax: Command syntax: AT+WPDCT=<n>

Command	Possible Responses
AT+WPDCT=? Note: Show available options.	+WPDCT: (0-2) OK
AT+WPDCT? Note: Show current setting.	+WPDCT: 0 OK
AT+WPDCT=2 Note: Set default consent to prompt.	OK

gpsOne Session Prompt Input +WPDUC

Description: This command is used to enter a value in response to a +WPUST prompt. This command is available only for a 20 second period following output of the +WPUST unsolicited response. If this command is used at any other time, ERROR will be returned.

Values: **<response>**

- **0** Accept network initiated gpsOne session.
- **1** Refuse network initiated gpsOne session.

Syntax: Command syntax: AT+WPDUC=<response>

Command	Possible Responses
AT+WPDUC=? Note: Show available options.	+WPDUC: (0-1) OK
AT+WPDUC? Note: Show last response.	+WPDUC: 0 OK
AT+WPDUC=1 Note: Refuse network initiated gpsOne session.	

IP Server Address +WMPC

Description: This command is used to read or set the MPC server IP and port address. This command is available only in the China Unicom software edition. This command will return ERROR in all other software editions.

Values: **<ip1 - ip4>** The IP address to be used. The valid range for each portion of the IP address is 0 – 255. Ip1 is the MSB and ip4 is the LSB of the IP address. Note that the four IP address parts must be comma separated.

<port> The port number to be used. Valid port number values are in the range 0 to 65535.

Syntax: Command syntax: AT+WMPC=<ip1 - ip4>,<port>

Command	Possible responses
AT+WMPC=12,192,20,210,8888 Note: Set to MPC server IP address 12.192.20.210 and port 8888.	OK Note: Command accepted.
AT+WMPC? Note: Show current settings.	+WMPC: 12,192,20,210,8888 OK Note: Current settings displayed.
AT+WMPC=? Note: Display command parameter ranges.	+WMPC: (0-255),(0-255),(0-255),(0-255),(0-65535) OK

Chapter 13 - Specific AT Commands

Manufacturer Identification +WGMI

Description: This command gives the manufacturer identification.

Syntax: **Command syntax:** AT+WGMI

Command	Possible Responses
AT+WGMI Note: Get manufacturer identification	+WGMI: MODEM OK Note: Command valid, modem

Request Model Identification +WGMM

Description: This command is used to get the supported frequency bands. With multi-band products the response may be a combination of different bands.

Syntax: **Command syntax:** AT+WGMM

Command	Possible Responses
AT+WGMM Note: Get supported bands	+WGMM: 800 1900 OK Note: CDMA 800 MHz band and 1900 (PCS)

Cell Environment and RxLev Indication +CCED

Description: This command can be used by the application to retrieve information about the main cell and up to six neighboring cells. This is an extended command that may be used in two different settings:

1. Interrogation of the cell environment information
2. Interrogation of the *received signal strength indication* (RSSI)

The +CCED command supports two modes of operation: on request by the application or automatically by the product every 5 seconds.

Values: **<mode>**

0 Requests a single snapshot of cell data

1 Start automatic snapshot mode

2 Stop automatic snapshot mode

Automatic snapshot mode will not return a terminating "OK". The unsolicited responses +CCED and/or +CSQ will be used to return the requested information.

<requested dump>

1 Main Cell: <mode>, <band class>, <Channel #>, SID, NID, <Base Station P Rev>, [<Pilot PN offset>], <Base Station ID>, [<Slot cycle index>], [<Ec/Io>], <Rx power>, <Tx power>, <Tx Adj>

2 Neighbor1 to Neighbor20 (max): The first value is the <number of neighbor entries> in the response. Each neighbor entry consists of the following values: <band class>, [<Pilot PN>], <Frequency Assignment>

4 Timing Advance: Always zero for CDMA

8 Main cell RSSI indication (RxLev) from 0 to 31.

If the <requested dump> parameter is not specified, the <requested dump> value from the previous +CCED command will be used. If no previous +CCED <requested dump> value is available, a default value of 13 (8, 4, and 1) will be used.

For <requested dump> 4, 2, and 1, the requested information is output using the unsolicited +CCED response. Place holders are used in the +CCED output for fields that cannot be measured or are not meaningful in the current mode of operation. In this case, consecutive commas will be present in the output. There are also several optional parameters ([]) that are not displayed in analog mode and will result in place holders in the +CCED command output. Automatic snapshots of these dumps is not supported during communication or registration.

For <requested dump> 1, the first value output in the unsolicited +CCED response is the +CCED command specified <mode> (0, 1, or 2). The value displayed for Ec/Io is the index of the Active set in 0.5dB steps from 0 (0dB) to 63 (-31.5dB). For example: 0 = 0dB, 1 = 0.5dB, 2 = 1dB, … 62 = 31dB, 63 = 31.5dB. The value displayed for <Rx power>, <Tx power>, and <Tx Adj> is in terms of dBm.

For <requested dump> 8, the information is output using the unsolicited +CSQ response. The 07.07 format of the +CSQ response is respected. However, the <fer> portion of the +CSQ response is not evaluated by this dump request so the <fer> value will always be 99. Automatic snapshots are supported in idle mode and during communication.

The combination of multiple <requested dump> values (addition of the values) in a single +CCED command is supported with the exception of <requested dump> 2. The <requested dump> 2 value must be use by itself and not in combination with other dump request values.

Either or both the +CCED and +CSQ responses are used for output depending upon the <requested dump> value. Activation or deactivation of a +CCED response flow will not affect an existing +CSQ response flow. Likewise, activation or deactivation of a +CSQ response flow will not affect an existing +CCED response flow.

Syntax: **Command syntax:** AT+CCED=<mode>[, <requested dump>]

Command	Possible Responses
AT+CCED=?	+CCED: (0-2),(1-15) OK
AT+CCED?	+CCED: 0,13 OK
AT+CCED=0 Note: one time, dump default (8, 4, and 1)	+CSQ: 15, 99 +CCED: 0,0,1,125,4,65535,6,,0,,,-107,-32,-63 OK
AT+CCED=0,1 Note: one time, dump main cell	+CCED: 1,725,4,65535,6,,0,,,-104,-35,-63 OK
AT+CCED=1,8 Note: Start automatic snapshots and dump <rssi>.	+CSQ: 18, 99 Note: No OK response. New +CSQ response output every 5 seconds.
AT+CCED=2,8	OK Note: Stop automatic snapshots of <rssi>.
AT+CCED=0,2 Note: one time, dump neighbor cells. Neighbor cells must be dumped separately.	+CCED:18,0,268,384,0,272,384,0,296,384,0,8,384,0,48,384,0,248,384,0,164,384,0,16,384,0,12,384,0,224,384,0,108,384,0,476,384,0,472,384,0,76,384,0,292,384,0,300,384,0,312,384,0,308,384 OK Note: 18 neighbor cells are present. The first neighbor cell band class is 0, its PilotPN is 268, and its frequency assignment is 384.

If the <requested dump> parameter is not specified, the <requested dump> value from the previous +CCED command will be used. If no previous +CCED <requested dump> value is available, a default value of 13 (8, 4, and 1) will be used.

For <requested dump> 4, 2, and 1, the requested information is output using the unsolicited +CCED response. Place holders are used in the +CCED output for fields that cannot be measured or are not meaningful in the current mode of operation. In this case, consecutive commas will be present in the output. There are also several optional parameters ([]) that are not displayed in analog mode and will result in place holders in the +CCED command output. Automatic snapshots of these dumps are not supported during communication or registration.

For <requested dump> 1, the first value output in the unsolicited +CCED response is the +CCED command specified <mode> (0, 1, or 2). The value displayed for Ec/Io is the index of the Active set in 0.5dB steps from 0 (0dB) to 63 (-31.5dB). For example: 0 = 0dB, 1 = 0.5dB, 2 = 1dB, … 62 = 31dB, 63 = 31.5dB. The value displayed for <Rx power>, <Tx power>, and <Tx Adj> is in terms of dBm.

For <requested dump> 8, the information is output using the unsolicited +CSQ response. The 07.07 format of the +CSQ response is respected. However, the <fer> portion of the +CSQ response is not evaluated by this dump request so the <fer> value will always be 99. Automatic snapshots are supported in idle mode and during communication.

The combination of multiple <requested dump> values (addition of the values) in a single +CCED command is supported with the exception of <requested dump> 2. The <requested dump> 2 value must be use by itself and not in combination with other dump request values.

Either or both the +CCED and +CSQ responses are used for output depending upon the <requested dump> value. Activation or deactivation of a +CCED response flow will not affect an existing +CSQ response flow. Likewise, activation or deactivation of a +CSQ response flow will not affect an existing +CCED response flow.

Analog Digital Converters Measurements +ADC

Description: This command returns the current raw value of the specified ADC data item. Two external and four internal items can be queried.

VBATT	Battery voltage (+Vbatt) being supplied to the Modem.
THERM	Thermistor level (internal temperature) of the Modem.
HDET	Internal test use only.
ADC_0	External general-purpose user defined input (pin 33).
ADC_1	External general-purpose user defined input (pin 38).
ADC_CHG_MON	Battery charger monitor (CHG_IN).

Values: **<item>**

0	VBATT:	0 to 2.5 volts. Returned value = (+V_BAT*256)/(2.5*2.5) Range: 0-255. Examples: 172 returned for 4.2 volts, 156 returned for 3.8 volts, 135 returned for 3.3 volts. Value range 0-255.
1	THERM:	100 °C (68) to –40 °C (240). Returned value = (vt*256)/2.5 vt = -0.012*T + 1.864 "T" is thermistor temperature in °Celsius. Range: 68-240 or -1.2288 °C per step.
2	HDET:	Internal use. Value range: 0-255
3	ADC_0:	0 to 2.5 volts. Value = (Vadc*256)/2.5 Value range: 0-255 or ~.00977 volt per step.
4	ADC_1:	Same value, range, and step as ADC 0.
5	ADC_CHG_MON:	0 to 4.2 volts. Value = (CHG_IN*256)/4.2 Value range: 0-255 or ~ .0165 volt per step.

Syntax: **Command syntax:** AT+ADC=<item>

Command	Possible Responses
AT+ADC=0 Note: Select VBATT	+ADC: 164 OK Note: raw value for VBATT (~4.00 volts)
AT+ADC=1 Note: Select THERM	+ADC: 94 OK Note: raw thermistor temperature (~34 ° C)
AT+ADC=? Note: Ask for the list of possible values	+ADC: (0-5) Note: possible values 0 –5
AT+ADC? Note: Ask for the current item selected	+ADC: 1 OK Note: THERM selected

Mobile Equipment Event Reporting +CMER

Description: This command enables or disables the sending of unsolicited result codes in the case of a key press.

Values: **<keyp>** (keypad) :

0 No keypad event reporting.

1 Keypad events are reporting using the unsolicited response: +CKEV: <key>, <press>.

See Chapter 21 regarding *Key Press or Release*, for more information on +CKEV.

Syntax: **Command syntax:** AT+CMER=<keyp>

Command	Possible Responses
AT+CMER? Note: Display current setting.	+CMER: 0 OK Note: Keypad event reporting disabled.
AT+CMER=1 Note: Enable keypad event reporting.	OK Note: Keypad event reporting enabled.

Read GPIO Value +WIOR

Description: Set the I/O port as an input and read the I/O pin value.

Values:
<index>
The GPIO to read.
<value>
Value of the GPIO pin.

Syntax:
Command syntax: AT+WIOR=<index>
Response syntax: +WIOR: <value>

Command	Possible Responses
AT+WIOR=32 Read GPIO 32 value	+WIOR: 0 OK GPIO 32 value is 0

Write GPIO Value +WIOW

Description: Set the I/O port as an output and set the requested I/O pin value.
Valid GPIO pins for 23xx are: 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 16, 20, 21, 22, 23, 30, 36, 40, 42, 43, 44, 45, 46, 47.
Valid GPIO pins for the V5 24xx module are: 3, 4, 6, 15, 16, 17, 18, 19, 37, 48.

Values:
<index>
The GPIO to write.
<value>
0 I/O bit is set to 0.
1 I/O bit is set to 1.

Syntax:
Command syntax: AT+WIOW=<index>,<value>

Command	Possible Responses
AT+WIOW=16,1 Set GPIO 16 to 1	OK GPIO value is written

Play Tone +WTONE

Description: This specific command allows a tone to be played on the current speaker or on the buzzer. Frequency, volume and duration can be set.

Values:

<mode>
0 Stop playing.
1 Play a tone

<dest> This parameter sets the destination (mandatory if <mode>=1)
1 Speaker
2 Buzzer

<freq> This parameter sets tone frequency (in Hz) (mandatory if <mode>=1). The range is between 1 and 4000Hz. However, for handset and a person to hear, the effective range may be 150-4000Hz.

<volume>(0-3) This parameter sets the tone volume. The default value is 1. Values are the same as +CRSL.

<duration> (0-50) This parameter sets tone duration (unit of 100 ms). When this parameter is equal to 0 (default value), the duration is infinite, and the tone can be stopped by AT+WTONE=0.

Syntax:
Command syntax: AT+WTONE=<mode>[,<dest>,<freq>,<volume>,<duration>]

Command	Possible Responses
AT+WTONE=1,1,300,2,50 Note: Play a tone	OK Note: Done
AT+WTONE? Note: Current value	+WTONE: 1,1,300,2,50 OK
AT+WTONE=0 Note: Stop playing	OK Note: Done
AT+WTONE=? Note: Test command	+WTONE: (0-1),(1-2),(1-4000),(0-3),(0-50) OK Note: Done

Play DTMF Tone +WDTMF

Description: This specific command allows a DTMF tone to be played on the current speaker. DTMF, volume and duration can be set. This command is only used to play a DTMF tone. To send a DTMF over the CDMA network, use the +VTS command.

Values: **<mode>**

0 Stop playing.

1 Play a DTMF tone

<dtmf> This parameter sets the DTMF to play in {0-9,*,#,A,B,C,D} (mandatory if **<mode>=1)**

<volume> (0-3) This parameter sets tone gain. The values are identical to those of the +WTONE (speaker) command (mandatory if <mode>=1).

<duration> (0-50) This parameter sets the tone duration (unit of 100 ms). When this parameter is 0 (default value), the duration is infinite, and the DTMF tone can be stopped by AT+WDTMF=0.

Syntax: **Command syntax:** AT+WDTMF=<mode>[,<dtmf>,<volume>,<duration>]

Command	Possible Responses
AT+WDTMF=1,"*",2,10 Note: Play a DTMF tone	OK Note: Done
AT+WDTMF? Note: Current value	+WDTMF: 1,"*",2,10 Note:
AT+WDTMF=0 Note: Stop playing	OK Note: Done
AT+WDTMF=? Note: Test command	ERROR Note: Done

Hardware Version +WHWV

Description: This command displays the MSM version along with hardware version number.
MSM version display format: Major.Minor; e.g., 5.1

Major: PCB version
Minor: Minor hardware change

The three-digit production hardware version is written to the modem during manufacturing. First digit represents PCB version (ex: 5. as in V5). The second and third digits represents a minor hardware change to the PCB (ex. 04).

Syntax: **Command syntax:** AT+WHWV

Command	Possible Responses
AT+WHWV Note: Request MSM Version	+WHWV: 5.1 OK Note: MSM version is 5.1
AT+WHWV Note: Request MSM Version	+WHWV: 6.0 OK Note: MSM version is 6.0

Select Voice Gain +WSVG

Description: The product has 2 voice gain paths. This command provides a means for selecting the desired voice path.

Values: **<n> Path**
- **0** HANDSET (Default)
- **1** HEADSET

Syntax: **Command syntax:** AT+WSVG=<n>

Command	Possible Responses
AT+WSVG=0 Note: Select Path 1 (Default)	OK Note: Path 1 selected
AT+WSVG=1 Note: Select Path 2	OK Note: Path 2 selected
AT+WSVG=? Note: Get the list of possible values	+WSVG: (0-1) Note: possible values 0 or 1
AT+WSVG? Note: Get the current value	+WSVG: 1 Note: Path 1 is selected

Status Request +WSTR

Description: This command returns additional information for the initialization sequence and network status.

Values: If **<status>** is 1 (initialization sequence), then:

<value>
- **0** Not started
- **1** On going
- **2** Finished

If **<status>** is 2 (Network status), then:

<value>
- **0** No network
- **1** Network available

Syntax: **Command syntax:** AT+WSTR=<status>
Response syntax: +WSTR: <status>,<value>

Command	Possible Responses
AT+WSTR=1 Note: Select the status 1 (INIT SEQUENCE)	+WSTR: 1,2 OK Note: Init finished
AT+WSTR=2 Note: Select the status 2 (NETWORK STATUS)	+WSTR: 2,1 OK Note: The network is available
AT+WSTR=? Note: Ask the list of possible values	+WSTR: (1-2) Note: possible values : 1, 2

Ring Indicator Mode +WRIM

Description: This specific command sets or returns the state of the Ring Indicator Mode. In pulse RI mode, an electrical pulse lasting approximately 10µs is sent on the Ring Indicator signal just before sending any unsolicited AT response in order not to lose AT responses when client tasks are in sleep state. Still in RI mode, when receiving incoming calls, electrical pulses are sent on the RI signal.

In up-down RI mode, no pulses are sent before unsolicited AT response, and up-down signals are sent when receiving an incoming call.

Values: **<n>**

0 up-down RI mode
1 pulse RI mode

Syntax: **Command syntax:** AT+WRIM=<n>

Command	Possible Responses
AT+WRIM=0 Note: Select up-down RI mode	OK Note: up-down RI mode selected
AT+WRIM=1 Note: Select pulse RI mode	OK Note: pulse RI mode selected
AT+WRIM=? Note: Ask the list of possible values	+WRIM: (0-1) OK Note: possible values 0 or 1
AT+WRIM? Note: Ask the current value	+WRIM: 1 OK Note: current RI mode is pulse RI.

32kHz Sleep Mode +W32K

Description: This specific command allows the 32kHz sleep mode to be enabled or disabled. When sleep mode is entered, the product uses a 32kHz internal clock during inactivity stages. When enabled, sleep mode is active after 1 to 15 seconds.

Values: **<mode>**

0 Disable 32kHz power down mode
1 Enable 32kHz power down mode

Syntax: **Command syntax:** AT+W32K=<mode>

Command	Possible Responses
AT+W32K=1 Note: Enable 32kHz sleep mode	OK Note: 32kHz sleep mode is enabled
AT+W32K=0 Note: Disable 32kHz sleep mode	OK Note: 32kHz sleep mode is disabled

Change Default Melody +WCDM

Description: This specific command allows a manufacturer specific melody to be selected. This melody will be played for any incoming voice call, either on the buzzer or on the speaker.

Note: Selection of the player will have an effect on the setting of the WCDP command.

Values: **<melody>**
0…10 Desired melody (**Default is 0**)
<player>
0 Play specified melody on the buzzer for any incoming voice call. (**default**)
1 Play specified melody on the speaker for any incoming voice call.

Syntax: **Command syntax:** AT+WCDM=<melody>,<player>

Command	Possible Responses
AT+WCDM=0 Note: Select no melody	OK
AT+WCDM=5 Note: Select melody n°5	OK
AT+WCDM? Note: Indicate the current melody	+WCDM: 5,0 OK Note: Melody n°5 is currently selected, and the buzzer is selected to play it.
	RING Note: An incoming call occurs, and the melody n°5 is played on the buzzer.
AT+WCDM=,1 Note: Select the speaker to play the melody on.	OK
AT+WCDM?	+WCDM: 5,1 OK Note: Now the speaker is selected to play the melody if an incoming call occurs.

Software Version +WSSW

Description: This command displays the internal software version.

Syntax: **Command syntax:** AT+WSSW

Command	Possible Responses
AT+WSSW Note: Get Software version	+WSSW: WQ1.6 OK Note: internal software information

Custom Character Set Tables +WCCS

Description: This command provides the ability to edit and display the custom character set tables. The "CUSTOM" mode of the +CSCS command uses the custom character set tables. In this mode, when the user enters a string, this string is translated into the CDMA character set using the 'Custom To CDMA' table. In a similar way, when the user requests a string display, the string is translated from CDMA character set using the 'CDMA To Custom' table.

In edit mode, the edit session is terminated by <ctrl-Z> (0x1A), or aborted by <ESC> (0x1B). Only hexadecimal characters ('0'…'9', 'A'…'F') can be used; two hexadecimal digits per character. The number of characters entered must equal the edit range requested, otherwise the command will terminate with a "+CME ERROR: 3" result.

Values:

<mode>
- **0** Display the table
- **1** Edit the table

<table>
- **0** Custom To CDMA conversion table
- **1** CDMA To Custom conversion table

<char 1>, <char 2> Character range to display/edit. If only <char 1> is present, only this char is displayed/edited.
- **0…127** for CDMA To Custom conversion table
- **0…127** for Custom To CDMA conversion table

Syntax: **Command syntax:** AT+WCCS=<mode>,<table>,<char 1>[,<char 2>]

Command	Possible Responses
AT+WCCS=0,0,20,30 Note: Display character locations 20 through 30 of the Custom To CDMA conversion table	+WCCS: 11, 78797A2020202020097E05 OK Note: 11 characters displayed
AT+WCCS=1,0,115<CR> 20<ctrl-Z> Note: Edit character 115 of the Custom To CDMA conversion table	OK Note: Edit successful
AT+WCCS=1,1,0,4<CR> 40A324A5E8<ctrl-Z> Note: Edit the 5 first characters of the CDMA To Custom conversion table	OK Note: Edit successful
AT+WCCS=1,1,200 Note: Edit character 200 of CDMA To Custom conversion table	+CME ERROR: 3 Note: Index out of range

CPHS Command +CPHS

Description: This command is used to activate, deactivate or interrogate a CPHS feature (e.g. Voice Mail Indicator). When performing an interrogation (mode = 2), the selected <FctId> CPHS feature is automatically enabled (status = 1).

Note: This command will return +CME ERROR: 3 if the CPHS feature is disabled.

Values:

<Mode>
- **0** Deactivate a CPHS feature
- **1** Activate a CPHS feature
- **2** Interrogate a CPHS status

<FctId>
- **1** Voice Mail Indicator

<Status>
- **0** CPHS feature disabled
- **1** CPHS feature enabled

Syntax: **Command syntax:** AT+CPHS=<Mode>,<FctId>

Command	Possible Responses
AT+CPHS=<Mode>,<FctId>	OK
AT+CPHS?	+CPHS: <Status>,<FctId1><CR<LF> OK
AT+CPHS=? Note: display the range of values	+CPHS: (0-2),(1-1) OK

Change Default Player +WCDP

Description: This command is used to select the default destination for the melody player. Selection of the player will have effect on the setting of the WCDM command.

Note: This command is diminished and included for backwards compatibility only. Use +WCDM command instead.

Values: **<player>**
0 Speaker
1 Buzzer

Syntax: **Command syntax:** AT+WCDP = <player>

Command	Possible Responses
AT+WCDP=?	+WCDP : (0-1) OK
AT+WCDP=0 Select the speaker.	OK
AT+WCDP?	+WCDP: 0 OK

Reset +WRST

Description: This command is used to reset the modem after the specified <delay> time period. The <delay> value is entered in terms of hours and minutes.

Values: **<mode>**
0 timer reset is disabled
1 timer reset is enabled
<Delay> specify the time for reset (hrs:mins)
"000:00"- "199:59"
<RemainTime> time before next reset
"000:00"- "199:59"

Syntax: **Command syntax:** +WRST =<Mode>,<Delay>
Response Syntax: +WRST: <Mode>,<Delay>,<RemainTime>

Command	Possible Responses
AT+WRST=?	ERROR
AT+WRST=0 Note: Disable timer	OK
AT+WRST=1,"001:03" Note: Enable timer and put delay at 1 hour 3 minutes	OK
AT+WRST?	+WRST: 1,"001:03","001:01" OK Note: Timer activated to reset after 1 hour and 3 minutes. Actually 1 hour and 1 minute remaining before next reset.

Set Standard Tone +WSST

Description: This command is used to set/get the sound level of the Standard Tones.

Values: **<sound level>**
- **0** Max volume (**default**)
- **4** Min volume (muted)

Syntax: **Command syntax:** AT+WSST=<sound level>

Command	Possible Responses
AT+WSST=0 Note: Set volume to Max.	OK
AT+WSST=4 Note: Set the volume to Min (muted)	OK Note: Standard Tones are muted
AT+WSST? Note: get current standard tones sound level	+WSST: 4 OK Note: Current level is 4
AT+WSST=? Note: Display valid parameter range.	+WSST: (0-4) OK

Set Voice Privacy Level +WPRV

Description: This command requests the CDMA voice privacy level. CDMA voice privacy is an optional feature of CDMA networks. Therefore, voice privacy will only become enabled during a voice call if the base station supports voice privacy; otherwise this feature is unavailable on your CDMA carrier. Thus, this command enables a request from the modem to the base station for voice privacy. If voice privacy is activated by the base station, the unsolicited command +WPRV:1 will appear indicating the long code PN mask for the traffic channel has been scrambled by the base station (also see Chapter 18). This command may be issued before or during a voice call.

Note: When voice privacy is enabled, an audible alert will be generated if the state of voice privacy changes (loss or establishment).

Values: **<voice privacy level>**
- **0** Normal (**default**)
- **1** Private

Syntax: **Command syntax:** AT+WPRV=<voice privacy level>

Command	Possible Responses
AT+WPRV=0 Note: Set to normal voice call	OK
AT+WPRV=1 Note: Request a secure voice call ATD18005551212;	OK OK +WORG:18005551212 +WCNT:3 +WPRV:1 Note: Voice Privacy is now ON

Security PIN +WPIN

Description: This command sets, enables, or disables the security PIN. When this PIN is enabled, only ATD (emergency numbers only), ATH, and +WPIN commands will be accepted.

Note 1: The default value of the WPIN will be the last four digits of the mobile directory number if configured (+WMDN). See the +WMDN command.

Note 2: When the security PIN is enabled, the unit will power-up in the "locked" state.

Note 3: For RUIM software loads, the default value for WPIN is '0000' even if an MDN is present.

Values:

<mode>

0 Disable modem lock
1 Enable modem lock
2 Change the PIN number
3 Verify the PIN. Unlock the modem until reset. Does not change NV enable/disable setting.
4 Enable modem lock upon power up

<current val> & <new val>

0000 – 9999

Syntax: **Command syntax:** AT+WPIN=<mode>,<current val>,<new val>

Command	Possible Responses
AT+WPIN=0,1111 Note: Disable the security PIN	OK
AT+WPIN? Note: Query the current state	+WPIN: 0 OK Note: PIN disabled
AT+WPIN=1,2222 Note: Enable the security PIN	+CME ERROR: 44 Note: Invalid PIN
AT+WPIN=1,1111 Note: Enable the security PIN	OK
AT+WPIN? Note: Query the current state	+WPIN: 1 OK Note: PIN enabled
AT+WPIN=2,1111,5555 Note: Change the security PIN code from 1111 to 5555	OK
AT+CSQ?	+CME ERROR: 44 Note: Modem is locked, only ATD & +WPIN commands will be accepted
ATD8585551212;	+CME ERROR: 44 Note: Modem is locked, only emergency numbers accepted using ATD.
AT+WPIN=0,5555 Note: Disable the security PIN	OK
AT+WPIN=3,5555 Note: Verify the security PIN	+CME ERROR: 44 Note: Wrong PIN value entered. Modem locked.
AT+WPIN=3,0000 Note: Verify the security PIN	OK Note: Correct PIN value entered. Modem unlocked.
AT+WPIN=4,0000 Note: Power up modem lock	OK Note: Modem locked at power up.

Request PRL Version Information +WPRL

Description: This command requests PRL Version information for the currently selected NAM.

Syntax: **Command syntax:** AT+WPRL?

Command	Possible Responses
AT+WPRL? Note: Request current NAM's PRL version	+WPRL: 1024 OK
AT+WPRL? Note: Request current NAM's PRL version	+CME ERROR: 41 Note: PRL request invalid because there's no PRL loaded.

Note: The range for PRL is a 16-bit type.

Minute Alert +WMBP

Description: This command is used to set the minute alert while in a voice conversation.

Values:
<mode>
0 Disable alert
1 Enable alert
<interval>
1 – 30 Time in minutes

Syntax: **Command syntax:** AT+WMBP=<mode>,<interval>

Command	Possible Responses
AT+WMBP=0 Note: Turn off the alert	OK
AT+WMBP=1,4 Note: Turn on the alert and set 4 minutes apart	OK
AT+WMBP? Note: Request current setting	+WMBP: 1,4
AT+WMBP=? Note: Display valid parameter ranges.	+WMBP: (0-1),(1-30)

Configure LED Indicator +CLED

Description: This command is used to configure GPIO 41 and GPIO 54 for general purpose use. The default use of these two GPIO's is to drive LED indicators on the Developer Kit board. This command allows a user application to disable this default behavior. When disabled, the user application has full control over the state of these GPIO's. The modem operating software will be prevented from change them for operational status indications.

The byte value specified with the +CLED command is a bitmap where bit 0 configures LED1/GPIO 41 and bit 1 configures LED2/GPIO 54. Bit positions 2 through 7 are ignored.

The state of the +CLED specified control bits is not persistent. Both bit positions are always set active (1) during boot resulting in LED status indicator operation. The +CLED command must be used by the user application after each boot if GPIO 41 or GPIO 54 are used for other purposes.

Values:
<bitmap value>
bit 0 0 = GPIO 41 selected; 1 = LED1 selected.
bit 1 0 = GPIO 54 selected; 1 = LED2 selected.
bit 2 – bit7 Reserved

Syntax: **Command syntax:** AT+CLED=<bitmap value>

Command	Possible Responses
AT+CLED? Note: Display current settings.	CLED: 3 OK Note: Both GPIO's are used for modem operational status indicators.
AT+CLED=? Note: Display valid parameter range.	CLED: (0-3) OK
AT+CLED=1 Note: Set bit 1 to inactive and bit 0 to active. AT+WIOW=54,0 Note: Set GPIO state. AT+WIOR=41 Note: Read state of LED1 indicator.	OK Note: GPIO 54 available, LED1 used for modem status. OK Note: Set GPIO 54 to 0. +WIOR: 1 OK Note: Read current state of LED1 indicator
AT+CLED=2 Note: Set bit 1 to active and bit 0 to inactive. AT+WIOW=41,1 Note: Set GPIO state. AT+WIOW=54,1 Note: Set LED2 state.	OK Note: LED2 used for modem status, GPIO 41 available. OK Note: Set GPIO 41 to 1. OK Note: LED2 indicator set to "on". LED on/off state may change due to modem status indication.

Keypad Enable/Disable +WPAD

Description: This command is used to enable or disable the keypad functionality. When enabled, keypad functionality supports a 5 by 5 keypad matrix of Row and Column lines. When disabled, the GPIO's associated with the keypad (57 through 66) are available for custom use.

Note: The setting established by the AT+WPAD command is not persistent unless saved to NV by the AT&W command.

Values: **<mode>**

0 Keypad disabled
1 Keypad enabled

Syntax: **Command syntax:** AT+WPAD=<mode>

Command	Possible Responses
AT+WPAD=? Note: Display valid parameter range.	+WPAD (0-1) OK
AT+WPAD? Note: Display current setting.	+WPAD: 1 OK Note: Keypad enabled.
AT+WPAD=0 AT&W Note: Disable keypad and write to NV.	OK OK

Chapter 14 - SIM ToolKit for RUIM Software Version

Overview of SIM Application ToolKit

Note: The SIM ToolKit features and functionality are available only in the RUIM software version.

Summary

SIM ToolKit, also known as .SIM Application ToolKit, introduces new functionalities which open the way to a broad range of value added services. The principle is to allow service providers the ability to develop new applications (e.g. banking, travel, ticket booking, etc.) for subscribers and to download them into the SIM. This solution allows new services to be accessible to the user by adding new SIM-based applications without modifying the handset.

Functionality

SIM Toolkit refers to the functionalities described in the GSM Technical specification 11.14. It introduces about 25 new commands for the SIM. Three classes of ToolKit functionalities have been defined with class 1 offering a subset of commands and class 3 offering the full range of commands.
The SIM Application Toolkit supports:

- Profile Download
- Proactive SIM
- Data Download into SIM
- Menu Selection
- Call Control by SIM

Profile Download

The Profile Download instruction is sent by the customer application to the SIM as part of the initialization. It is used to indicate which SIM Application Toolkit features the customer application supports.

The AT command used for this operation is **+STSF** *(SIM ToolKit Set Facilities)*.

Proactive SIM

A proactive SIM provides a mechanism whereby the SIM can ask the customer application to perform certain actions.
These actions include:

- display menu
- display given text
- get user input
- send a short message
- play the requested tone
- set up a call
- provide location information

This mechanism allows SIM applications to generate powerful menu-driven sequences on the customer application and to use services available in the network.
The commands used for this operation are:

+STIN (SIM Toolkit Indication)
+STGI (SIM Toolkit Get Information)
+STGR (SIM Toolkit Give Response)

Data Download to SIM

Data downloading to the SIM allows data *(SMS, phonebook)* or programs *(Java applets)* received by SMS or by Cell Broadcast to be transferred directly to the SIM Application.

This feature does not need any AT command. It is transparent to the customer application.

Menu Selection

A set of menu items is supplied by the SIM Application ToolKit. The menu selection command can then be used to inform the SIM Application which menu item is selected.
The commands used for this operation are:

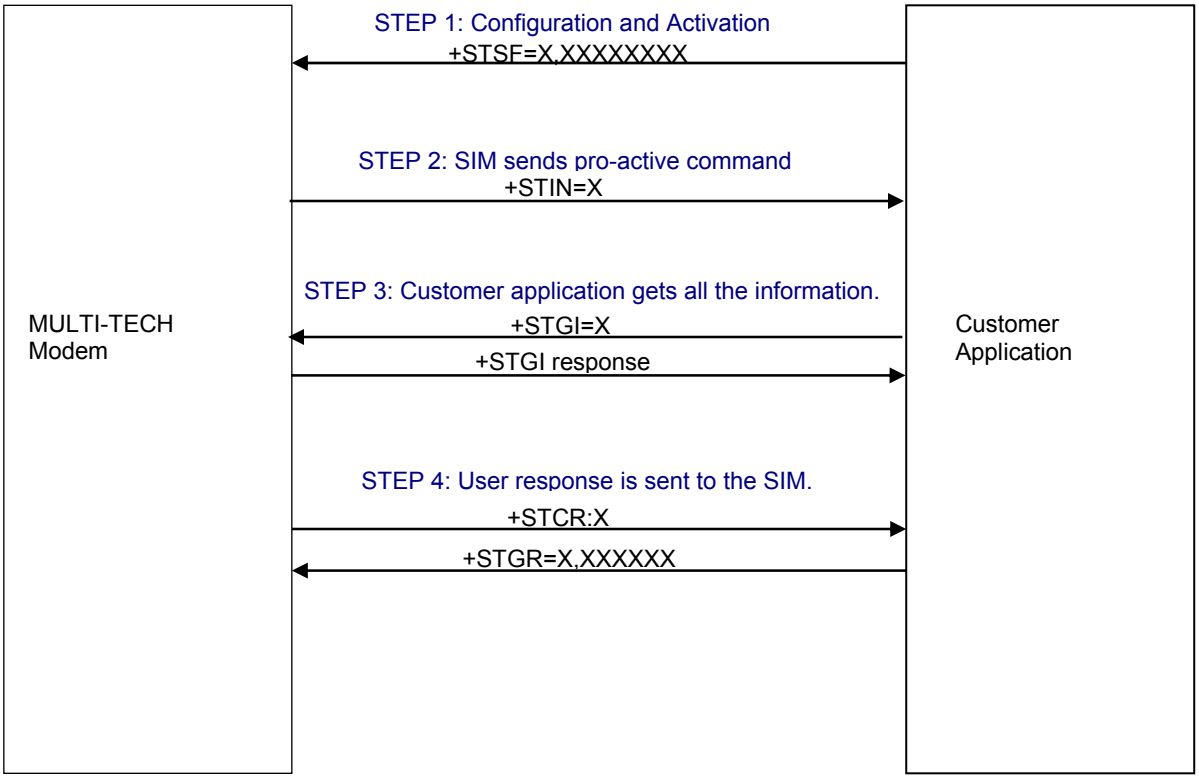
+STIN (SIM Toolkit Indication)
+STGI (SIM Toolkit Get Information)
+STGR (SIM Toolkit Give Response)

Call control by SIM

The call control mechanism allows the SIM to check all dialed numbers, supplementary service control strings and USSD strings before connecting to the network. This gives the SIM the ability to allow, bar or modify the string before the operation starts.
The commands used for this operation are:
+STCR (SIM Toolkit Control Response)
+STGR (SIM Toolkit Give Response)

Messages Exchanged During a SIM ToolKit Operation

The following scheme shows the SIM Toolkit commands and unsolicited results that are exchanged.



Step One

The customer application informs the modem which facilities are supported. This operation is performed with the **+STSF** *(SIM ToolKit Set Facilities)* command, which is also used to activate or deactivate the SIM Toolkit functionality.

Step Two

An unsolicited result **+STIN** *(SIM ToolKit indication)* is sent by the product to indicate the customer application which command type the SIM Application Toolkit is running on the SIM card. The last SIM Toolkit indication can be requested by the **+STIN?** command.

Step Three

The customer application uses the **+STGI** *(SIM ToolKit Get Information)* command to get all the information about the SIM ToolKit command, given by **+STIN**.

Step Four

The customer application uses the **+STGR** *(SIM Toolkit Give Response)* to send its response *(if any)* to the SIM ToolKit Application.

The **+STCR** *(SIM Toolkit Control response)* indication is an unsolicited result sent by the SIM when call control functionality is activated and before the customer application has performed any outgoing call, SMS, SS, or USSD.

SIM ToolKit Set Facilities +STSF

Description: This command allows SIM ToolKit facilities to be activated, deactivated or configured.

Values:

<mode>

0 Deactivates the SIM Toolkit functionalities.

1 Activates the SIM Toolkit functionalities.

2 Configures the SIM Toolkit functionalities.

The **activation or deactivation** of the SIM Toolkit functionalities requires the use of the +CFUN (Set phone functionality) command to reset the product. +CFUN is not necessary if PIN is not entered yet.

<Config>

(160060C01F . 5FFFFFFF7F) (hex format)

The **<Config>** parameter gives the coding of the TERMINAL PROFILE, precisely the list of SIM Application Toolkit facilities that are supported by the customer application.

<Timeout>

1-255: Timeout for user responses (multiple of 10 seconds).

The **<Timeout>** parameter (multiple of 10 seconds) sets the maximum time the user has for reacting (to select an item, to input a text, etc).

<Autoresponse>

0 Automatic response is not activated

1 Automatic response is activated

When the **<Autoresponse>** is activated, the +STIN indication for Play Tone (5), Refresh (7), Send SS (8), Send SMS (9) or Send USSD (10) is automatically followed by the corresponding +STGI response.

Note: Some bits are related to the product only and not to the customer application. The product automatically sets these bits to either 0 or 1 whatever the user enters with the +STSF command. Each facility is coded on 1 bit:

- .bit = 1: facility is supported by the customer application.
- .bit = 0: facility is not supported by the customer application.

Only the first five bytes of the TERMINAL PROFILE (Class 2) can be configured; the other are set to 0.

Syntax: **Command syntax:** AT+STSF=<mode>[,<config>][,<Timeout>][,<AutoResponse>]

Command	Possible Responses
AT+STSF=<Mode>[,<Config>][,<Timeout>][,<AutoResponse>]	OK +CME ERROR: <err>
AT+STSF?	+STSF: <Mode>,<Config>,<Timeout>,<Autoresponse>

Error Codes: +CME ERROR: 3 Operation not allowed. This error is returned when a wrong parameter is entered.

Example:

```
AT+CMEE=1                                   Enable the reporting of mobile equipment errors
OK
AT+WIND=15                                  Set indications
OK
AT+CPAS                                     Query ME Status
+CPAS: 0                                    ME is ready.
OK
AT+STSF=?                                   Test command SIM ToolKit Set Facilities
+STSF: (0-2), (160060C01F . 5FFFFFFF7F),(1-255)
OK
AT+STSF?
+STSF: 0,”160060C000”,3                     No activation of SIM ToolKit functionality
OK
AT+STSF=2,”5FFFFFFF7F”                      Set all SIM ToolKit facilities (class 3).
OK
AT+STSF=3                                   Syntax Error
+CME ERROR: 3
AT+STSF=1                                   Activation of SIM ToolKit functionality
OK
AT+CFUN=1                                   Reboot Software.
OK
AT+CPIN?                                    Is the ME requiring a password?
+CPIN: SIM PIN                              Yes, SIM PIN required
AT+CPIN=0000
OK PIN Ok
+WIND: 4                                    Init phase is complete
AT+STSF?
+STSF: 1,”5FFFFFFF7F”,3                     SIM ToolKit functionality activated with all facilities
OK
```

SIM ToolKit Indication +STIN

Unsolicited Result:

In order to allow the customer application to identify the pro-active command sent via SIM ToolKit, a mechanism of unsolicited SIM ToolKit indications ***(+STIN)*** is implemented.

Syntax: +STIN: <CmdType>

Option: <CmdType>

0	Indicates that a .Setup Menu. Pro-active command has been sent from the SIM.
1	Indicates that a .Display Text. Pro-active command has been sent from the SIM.
2	Indicates that a .Get Inkey. Pro-active command has been sent from the SIM.
3	Indicates that a .Get Input. Pro-active command has been sent from the SIM.
4	Indicates that a .Setup Call. Pro-active command has been sent from the SIM.
5	Indicates that a .Play Tone. Pro-active command has been sent from the SIM. (*)
6	Indicates that a .Sel Item. Pro-active command has been sent from the SIM.
7	Indicates that a .Refresh. pro-active command has been sent from the SIM. (*)
9	Indicates that a .Send SMS. Pro-active command has been sent from the SIM. (*)
11	Indicates that a SETUP EVENT LIST. Pro-active command has been sent from the SIM.
98	Indicates the timeout when no response from user.
99	Indicates that a .End Session. Has been sent from the SIM.

(*) if the automatic response parameter is activated, this indication is followed by the corresponding +STGI response.

Last SIM Toolkit Indication:

The last SIM toolkit indication sent by the SIM can be requested by the AT+STIN? command. This command is only useable between the sending of the STIN indication by the SIM (Step 2 in Chapter 14 diagram "Messages Exchanged During an SIM ToolKit Operation") and the response of the user with the +STGI command (Step 3 in the same diagram).

Command syntax: AT+STIN?

Command	Possible Responses
AT+STIN? Note: Ask for the last SIM toolkit indication sent by the SIM.	+STIN: 0 OK Note: the last SIM toolkit indication was a Setup Menu
AT+STGI=0 Note: Display the SIM toolkit application Menu.	OK
AT+STIN? Note: Ask for the last SIM toolkit indication sent by the SIM.	+CME ERROR: 4 Note: operation not supported, the +STGI command has been already used.

SIM ToolKit Get Information +STGI

Description: This command allows you to get the information (text to display, Menu information, priorities.) of a pro-active command sent from the SIM. The information is returned only after receiving a SIM Toolkit indication (+STIN).

Syntax: **Command syntax:** +STGI=<Cmd>

Command	Possible Responses
+STGI=<Cmd>	See following table. +CME ERROR: <err>
+STGI=? Note: Display valid parameter range.	+STGI: (0-11) OK

Cmd	Description	Possible Responses
0	Get information about 'Setup Menu' pro-active command.	+STGI: <Alpha Identifier menu> +STGI: <Id1>,<NbItems>,<Alpha Id1 Label>,<Help Info>[,<NextActionId>]<CR><LF> +STGI: <Id2>,<NbItems>,<Alpha Id2 Label>,<Help Info>[,<NextActionId>]<CR><LF> [.]] No action expected from SIM.
1	Get information about 'Display text' pro-active command.	+STGI: <Prior>,<Text>,<ClearMode> No action expected from SIM.
2	Get information about 'Get Inkey' pro-active command.	+STGI: <Format>,<HelpInfo>[,<TextInfo>] SIM expects key pressed (+STGR).
3	Get information about 'Get Input' pro-active command.	+STGI: <Format>,<EchoMode>,<SizeMin>,<SizeMax> <HelpInfo>[,<TextInfo>] SIM expects key input (+STGR).
4	Get information about 'Setup call' pro-active command.	+STGI: <Type>,<CalledNb>,<SubAddress>,<Class> SIM expects user authorization (+STGR).
5	Get information about 'Play Tone' pro-active command.	+STGI: <ToneType>[,<TimeUnit>,<TimeInterval>,<TextInfo>] No action.
6	Get information about 'Sel Item' pro-active command.	+STGI: <DefaultItem>, <Alpha Identifier menu><CR><LF> +STGI: <Id1>,<NbItems>,<Alpha Id1 Label>,<Help Info>[,<NextActionId>]<CR><LF> +STGI: <Id2>,<NbItems>,<Alpha Id2 Label>,<Help Info>[,<NextActionId>]<CR><LF> [.]] SIM expects an item choice (+STGR).
7	Get information about 'Refresh' pro-active command.	+STGI: <RefreshType> No action (Refresh done automatically by product).
8	Get information about 'Send SS' pro-active command.	Currently not supported
9	Get information about 'Send SMS' pro-active command.	+STGI: <TextInfo> No action (Send SMS done automatically by product).
10	Get information about 'Send USSD' pro-active command	Currently not supported
11	Get information about 'SETUP EVENT LIST' pro-active command.	+STGI: <Evt>

Values:

Values when Cmd=0 (Setup menu)

Compared to other commands, the customer application can always get information about setup menu after having received the +STIN:0 indication.

<Alpha Identifier menu>	Alpha identifier of the main menu
<Idx> (1 –255)	Menu item Identifier
<NbItems> (1 –255)	Number of items in the main menu
<Alpha Idx Label>	Alpha identifier label of items in ASCII format
<HelpInfo>	
0	No help information available
1	Help information available
<NextActionId>	Contains a pro-active command identifier.

Values when Cmd=1 (Display text)

<Prior>	
0	Normal priority of display
1	High priority of display
<Text>	Text to display in ASCII format
<ClearMode>	
0	Clear message after a delay (3 seconds)
1	Wait for user to clear message

Values when Cmd=2 (Get Inkey)

<Format>	
0	Digit (0-9, *, #,and +)
1	SMS alphabet defaults
2	UCS-2 Unicode
3	Yes/No
<HelpInfo>	
0	No help information available
1	Help information available
<TextInfo>	Text information in ASCII format

Values when Cmd=3 (Get Input)

<Format>	
0	Digit (0-9, *, #,and +)
1	SMS alphabet defaults
2	UCS-2 Unicode
3	Unpacked format
4	Packed format
<EchoMode>	
0	Echo off
1	Echo on
<SizeMin> (1 –255)	Minimum length of input
<SizeMax> (1 –255)	Maximum length of input
<HelpInfo>	
0	No help information available
1	Help information available
<TextInfo>	Text information in ASCII format

Values when Cmd=4 (Setup Call)

<Type>	
0	Set up call but only if not currently busy on another call
1	Set up call, putting all other calls (if any) on hold
2	Set up call, disconnecting all other calls (if any)
<CalledNb>	Called party number in ASCII format
<SubAdress>	Called party sub-address in ASCII format
<Class>	
0	Voice call
1	Data call

Values when Cmd=5 (Play tone)

<ToneType>	
0	Tone Dial
1	Tone Busy
2	Tone Congestion
3	Tone Radio ack
4	Tone Dropped
5	Tone Error
6	Tone Call waiting
7	Tone Ringing
8	Tone General beep
9	Tone Positive beep
10	Tone Negative beep
<TimeUnit>	
0	Time unit used is minutes
1	Time unit used is seconds
2	Time unit used is tenths of seconds
<TimeInterval> (1 –255)	Time required expressed in units
<TextInfo>	Text information in ASCII format

Values when Cmd=6 (Sel Item)

<DefaultItem> (1 –255)	Default Item Identifier
<Alpha Identifier menu>	Alpha identifier of the main menu
<Idx> (1 –255)	Identifier items
<NbItems> (1 –255)	Number of items in the menu
<Alpha Idx Label>	Alpha identifier label of items in ASCII format
<HelpInfo>	
0	No help information available
1	Help information available
<NextActionId>	Contains a pro-active command identifier.

Values when Cmd=7 (Refresh)

<RefreshType>	
0	SIM initialization and full file change notification
1	File change notification
2	SIM initialization and file change notification
3	SIM initialization
4	SIM reset

Values when Cmd=8 (Send SS)

<TextInfo>	Text information in ASCII format.

Values when Cmd=9 (Send SMS)

<TextInfo>	Text information in ASCII format.

Values when Cmd=10 (Send USSD)

<TextInfo>	Text information in ASCII format

Values when Cmd=11 (Setup Event List)

<Evt>	
1	Reporting asked for an.Idle Screen. Event
2	Reporting asked for an User Activity. Event
3	Reporting asked for .Idle Screen .And .User Activity .Events
4	Cancellation of reporting event

Note: For the Unicode format, texts are displayed in Hexadecimal ASCII format. For example, when the SIM sends a Text String containing 0x00 0x41, the text displayed is .0041.

Error Codes:

+ CME ERROR: 3	Operation not allowed . This error is returned when a wrong parameter is detected.
+CME ERROR: 4	Operation not supported . This error is returned when the user wants to get information about a SIM ToolKit pro-active command (with SIM ToolKit functionality not activated.)
+CME ERROR: 518	SIM ToolKit indication not received . This error is returned when the SIM Toolkit indication (+STIN) has not been received.

Example:
Initially, all facilities are activated, the PIN is not required and SIM toolkit functionality is activated.

AT+CMEE=1	Enable the reporting of mobile equipment errors
OK	
AT+WIND=15	Set indications
OK	
AT+STSF?	
+STSF: 1,"5FFFFFFF7F",3	SIM ToolKit functionality activated with all facilities.
OK	
+STIN: 0	The main menu has been sent from the SIM.
AT+STIN?	
+STIN: 0	
OK	
AT+STGI=0	Get information about the main menu
+STGI: "SIM TOOLKIT MAIN MENU"	Main menu contains 3 items.
+STGI: 1,3,"BANK",0	
+STGI: 2,3,"QUIZ",0	
+STGI: 3,3,"WEATHER",0	
OK	
AT+STIN?	
+CME ERROR: 4	

Unsolicited Result: SIM ToolKit Control Response +STCR)

Description: When the customer application makes an outgoing voice or SMS call when the call control facility is activated, CALL CONTROL and SMS CONTROL responses can be identified. This is also applicable to SS calls.

Response syntax: +STCR: <Result>[,<Number>,<MODestAddr>,<TextInfo>]

<Result>

0	Control response not allowed
1	Control response with modification
<Number>	Called number, Service Center Address or SS String in ASCII format
<MODestAddr>	MO destination address in ASCII format
<TextInfo>	Text information in ASCII format

SIM ToolKit Give Response +STGR

Description: This command allows the application/user to select an item in the main menu or to answer the following proactive commands:

GET INKEY	Key pressed by the user.
GET INPUT	Message entered by the user.
SELECT ITEM	Selected item.
SETUP CALL	User confirmation.
DISPLAY TEXT	User confirmation to clear the message.

It is also possible to terminate the current proactive command session by sending a Terminal Response to the SIM with the following parameters:

BACKWARD MOVE	Process a backward move
BEYOND CAPABILITIES	Command beyond ME capabilities
UNABLE TO PROCESS	ME is currently unable to process command
NO RESPONSE	No response from the user
END SESSION	User abort.

Values: **<CmdType>**

- **0** Item selection in the main menu
- **1** User confirmation to clear displayed Text.
- **2** Response for a '**Get Inkey**'
- **3** Response for a '**Get Input**'
- **4** Response for a '**Setup call**'
- **6** Response for a '**Sel Item**'
- **95** Backward move
- **96** Command beyond ME capabilities
- **97** ME currently unable to process command
- **98** No response from the user
- **99** User abort

Values when CmdType=0 (Select an item from the main menu)

<Result>

- **1** Item selected by the user
- **2** Help information required by user

<Data> Contains the item identifier of the item selected by the user

Values when CmdType=1 (Confirm the display text clearing)

No values

Values when CmdType=2 (Get Inkey)

<Result>

- **0** Session ended by user
- **1** Response given by the user
- **2** Help information required by user

<Data> Contains the key pressed by the user

Values when CmdType=3 (Get Input)

<Result>

- **0** Session ended by user
- **1** Response given by the user
- **2** Help information required by user

<Data> Contains the string of characters entered by the user. For inputs in Unicode format, the data are entered in ASCII format. Example: 8000410042FFFF entered, the SIM receives 0x00 0x41 0x00 0x42 with UCS2 DCS.

Values when CmdType=4 (Setup call)

<Result>

- **0** User refuses the call
- **1** User accepts call

Values when CmdType=6 (Select Item)

<Result>

- **0** Session terminated by the user
- **1** Item selected by the user
- **2** Help information required by the user
- **3** Return to the back item

<Data> Contains the item identifier selected by the user

Sending a Terminal Response to the SIM:

Values when CmdType=95 (Backward Move)
Values when CmdType=96 (Command beyond ME capabilities)
Values when CmdType=97 (ME currently unable to process command)
Values when CmdType=98 (No response from the user)
Values when CmdType=99 (SIM Toolkit Session aborting by the user)

No values. It is possible to send a Terminal Response after the +STIN indication or after the +STGI command.

For the SETUP MENU Proactive Command, it is only possible to send a Terminal Response after the +STIN: 0 indication, not after a +STGI=0 request. All of the Terminal Responses are not possible with all of the Proactive Commands. If a Terminal Response is attempted during an incompatible Proactive Command session, a +CME ERROR: 3 will be returned.

Possible Error Codes:

+ CME ERROR: 3	Operation not allowed. This error is returned when a wrong parameter is detected.
+CME ERROR: 4	Operation not supported. This error is returned when the user gives a response with SIM ToolKit functionality not activated. Or if the SIM Toolkit indication (+STIN) has not been received.

Syntax: **Command syntax:** +STGR=<CmdType>[,<Result>,<Data>]

Command	Possible Responses
+STGR=<CmdType>[,<Result>,<Data>]	OK +CME ERROR: <err>
For Get Input with <Result>=1: +STGR=3,1<CR> <Data><Ctrl Z>	OK +CME ERROR: <err>
For GetInkey with <Result>=1 +STGR=2,1<CR> <Data><Ctrl Z>	OK +CME ERROR: <err>
+STGR=? Note: Display valid parameter range.	OK

Example:

Initially, all facilities are activated, the PIN is not required and the SIM toolkit functionality is activated.

+STIN: 0	The main menu has been sent from the SIM.
AT+STGI=0	Get information about the main menu
+STGI: 1,3,"BANK",0	The main menu contains 3 items.
+STGI: 2,3,"QUIZ",0	
+STGI: 3,3,"WEATHER",0	
OK	
AT+STGR=0,1,1	The item 2 of the main menu has been selected.
OK	
+STIN: 6	The Sel item menu has been sent from the SIM.
AT+STGI=6	Get information about the BANK menu
+STGI: 1,"BANK".	The BANK menu contains two items.
+STGI: 1,2,"PERSONAL ACCOUNT ENQUIRY",1	
+STGI: 2,2,"NEWS",0	
OK	
AT+STGR=6,1,1	Select Item 1.
OK	
+STIN: 3	User request to enter Password sent.
AT+STGI=3	Get information about this request.
+STGI: 0,0,4,4,0"	Enter Account Password:"
OK	
AT+STGR=3,1<CR>	The user enters the Password.
>0000<Ctrl Z>	
OK	
+STIN:1	A text info has been sent from the SIM.
AT+STGI=1	Get information about this text.
+STGI: 0,"	Password correct, please wait for response",0
OK	
+STIN: 9	SIM requests a bank account update from bank
server via the network (SEND SMS)	
AT+STGI=9	Get all information about the SEND SMS
+STGI:	"Send account balance of user, authorization ok"
OK	
********* After a short period of time. ********	
+STIN: 5	Transaction is complete: BEEP
+STGI=5	Get information about the Tone
+STGI: 9,1,1	
+STIN: 1	Display text indication
AT+STGI=1	
+STGI: 0,"	Your account balance is 1000 $",0
OK	

Chapter 15 – Provisioning AT Commands

Introductory Note

This chapter covers general CDMA provisioning commands; provisioning commands let you setup your service programming code, your mobile directory number, your browser gateway, your service options, etc. Some of the commands that follow will be useful for the average wireless user; others will be useful to programmers only.
Some parameters or commands discussed in this chapter may be re-defined by your network carrier. Your carrier will provide these commands for you. See also the printed Activation Notices that accompany the Multi-Tech wireless products.

What is Provisioning?

The Difference Between a Pre-Provisioned CDMA Module and a Generic CDMA Module

Pre-Provisioned CDMA Modules

Multi-Tech offers several pre-provisioned CDMA modules. Pre-provisioned builds are pre-programmed to operate only on a designated CDMA carrier's network; for example, the *MTSMC-C-N2* is pre-programmed (provisioned) for use on the Sprint network in the USA.

Generic CDMA Modules

Multi-Tech also offers generic CDMA modules, for example, the *MTSMC-C-N1 (Random A-Key)* and *MTSMC-C-N9 (Zero A-Key)*. These generic SocketModems are not pre-programmed to operate on any designated CDMA carrier's network.

Overview of the Provisioning Process

Requirements

- A generic CDMA module.
- ***CDMA AT Commands Reference Guide***, Chapter 15.
- A developer software tool called ***WPST***.

Procedures

Step 1. Get the PRI and PRL from your wireless carrier.
Step 2. Set the provisioning commands, which are described in the ***AT Commands Reference Guide*** using the provisioning information provided by the CDMA wireless network carrier.
Step 3. Using the WPST tool, download the carrier's specific PRI (Provisioning Information) and PRL (Preferred Roaming List) into the CDMA module.

The wireless modem is now provisioned and can be activated on your wireless carrier's network, according to the carrier's activation instructions.
See the Activation directions that accompany Multi-Tech wireless modems.

Provisioning Terminology

A-Key

The A-Key is a 64-bit cryptographic key variable stored in the semi-permanent memory of the mobile station and also known to the Authentication Center of the wireless carrier's system. The generation of the A-Key is the responsibility of the wireless service provider. It is established and entered when the mobile station is first put into service.

The CDMA network carrier you choose for you CDMA product will let you know whether it uses the Random A-Key or the Zero A-Key in its authentication process. That will determine whether you purchase the -N1 or the –N9 build.

Provisioning

Provisioning is the programming of a CDMA wireless modem to set the **PRI** and **PRL** provided by wireless network carrier that you are have chosen as your CDMA wireless network carrier. After the modem is provisioned, it can then be activated on the wireless network for which it is provisioned.

PRI stands for Provisioning Information. Provisioning Information is your wireless network carrier's profile of parameter settings that must be programmed into your wireless modem in order for it to operate on the carrier's wireless network.

PRL stands for Preferred Roaming List. The PRL is a list of the wireless network service provider's preferred roaming partners. This list is downloaded from your network service provider during the provisioning process.

Service Programming Code +WSPC

Description: This command allows for entry of the service programming code (either MSL or OTKSL). Upon successful entry of this code, all other service provisioning AT commands may be used. If this code is not properly entered prior to attempting other provisioning AT commands, all provisioning commands will return ERROR. If the OTKSL is used to enter provisioning mode, only the +WIMI, +WMDN, and +WCMT commands will be allowed. All other commands will return ERROR.

This command supports five attempts to enter the correct service programming code. If five incorrect attempts are performed, the ME will power down.

Once the correct SPC code is entered, the modem transitions to the Service Programming state. This state is not exited until a commit is done (+WCMT). While in the Service Programming state, subsequent validations of the SPC code are ignored until the Service Programming state is reset.

Values: **<lock type>**

0 OTKSL – One Time Key Subsidy Lock

1 MSL – Master Subsidy Lock

<code> Six character programming code.

Syntax: **Command syntax:** AT+WSPC=<lock type>,<code>

Command	Possible Responses
AT+WSPC? Note: Service programming code request	ERROR Note: Invalid request
AT+WSPC=?	ERROR Note: Invalid request
AT+WSPC=1,111111 Note: Enter service programming code 111111	ERROR Note: Code invalid
AT+WSPC=1,000000 Note: Enter service programming code 000000	OK Note: Code valid

Mobile Directory Number +WMDN

Description: This command is used to enter a new mobile directory number. Valid numbers are between 10 and 15 digits in length. For support of Wireless Number Portability in all non-RUIM software versions, changes to the MDN will update the IMSI_M portion (least significant 10 digits) of the IMSI. Changes to the MDN will also automatically update the Access Overload Class values unless specifically modified using the +WAOC command. Also, for non-RUIM software loads, the lock code value (+WPIN) is updated to the last 4 digits of the specified MDN value. The new IMSI_M and Access Overload Class values will not be visible in the WIMI and WAOC commands until after the changes are committed with the WCMT command.

Syntax: **Command syntax:** AT+WMDN=<number>

Command	Possible Responses
AT+WMDN? Note: Get current mobile directory number	+WMDN: 8581111111 OK
AT+WMDN=8585551212 Note: Set mobile directory number to 8585551212	OK

Note: For RUIM software releases, this command can be used without the need to have previously entered the SPC (+WSPC command). The value for <number> can be up to 15 digits and does not effect the IMSI.

Set IMSI +WIMI

Description: This command is used to set the IMSI. Valid IMSI is 15 digits in length, MCC (3), MNC (2), MIN2 (3), MIN1 (7). For support of Wireless Number Portability, changes to the IMSI will **NOT** update the MDN. Changes to the IMSI will automatically update Access Overload Class values unless specifically modified using +WAOC.

Syntax: **Command syntax:** AT+WIMI=<number>

Command	Possible Responses
AT+WIMI? Note: Get current IMSI	+WIMI: 310008581111111 OK
AT+WIMI=310008585551212 Note: Set IMSI to 310008585551212	OK

Note: For RUIM software releases, this command is not valid and will return “Error 3”.

SID and NID +WSID

Description: This command is used to set the home SID and NID for 800Mhz CDMA operation only. The new SID/NID values are committed to NV with the +WCMT command.

Values: **<index>** The location in the SID/NID list to store the values. A maximum of 20 entries (0-19) are supported. Error 22 is returned if the specified index value is not in the valid range.
<SID number> SID value range – 0 to 32767.
<NID number> NID value range – 0 to 65535. Defaults to 65535 if not specified.

Syntax: **Command syntax:** AT+ WSID=<index>,<SID number>,<NID number>

Command	Possible Responses
AT+WSID? Note: Get current SID and NID	+WSID: 1, 45, 84 OK Note: The SID/NID pair 45,84 in location 1 is selected.
AT+WSID=3, 4145, 2102 AT+WSID? Note: Set SID to 4145 and NID to 2102. Store in location 3 of the SID/NID list.	OK +WSID: 3, 4145, 2102 OK Note: The SID/NID pair 4145,2102 in location 3 is selected.
AT+WSID=2 AT+WSID? Note: Set SID to 0 and NID to 0. Store in location 2 of the SID/NID list.	OK +WSID: 2, 0, 0 OK Note: The SID/NID pair 0,0 in location 2 is selected.
AT+WSID=4, 64 AT+WSID? Note: Set SID to 64 and NID to 0. Store in location 4 of the SID/NID list.	OK +WSID: 4, 64, 0 OK Note: The SID/NID pair 64,0 in location 4 is selected.
AT+WSID=, 64, 1024 AT+WSID? Note: Set SID to 64 and NID to 1024. Store in the currently selected location of the SID/NID list.	OK +WSID: 4, 64, 1024 OK Note: The SID/NID pair 64,1024 in location 4 is selected.

Access Overload Class +WAOC

Description: This command is used to set the Access Overload Class.

Values: **<number>** Access overload value range – 0 to 15.

Syntax: **Command syntax:** AT+WAOC=<number>

Command	Possible Responses
AT+WAOC? Note: Get current Access Overload Class	+WAOC: 5 OK
AT+WAOC=7 Note: Set Access Overload Class to 7	OK

Note: For RUIM software releases, this command is not valid and will return “Error 3”.

Slot Cycle Index +WSCI

Description: This command is used to set the slot cycle index.

Values: **<number>** Slot cycle index, ranges from 0 to 7.

Syntax: **Command syntax:** AT+WSCI=<number>

Command	Possible Responses
AT+WSCI? Note: Read the current slot cycle index	+WSCI: 2 OK
AT+WSCI=1 Note: Set the slot cycle index	OK

Primary Browser Gateway +WBGP

Description: This command is used to set the primary browser gateway IP address (Ipv4). If a browser is not natively supported by the modem, this command will return ERROR.

Values: **<num>**
0-255

Syntax: **Command syntax:** AT+WBGP=<num>,<num>,<num>,<num>

Command	Possible Responses
AT+WBGP? Note: Get current gateway	+WBGP: 127,0,0,1 OK
AT+WBGP=255,255,255,0 Note: Set primary gateway to 255.255.255.0	OK

Secondary Browser Gateway +WBGS

Description: This command is used to set the secondary browser gateway IP address (Ipv4). If a browser is not natively supported by the modem, this command will return ERROR.

Values: **<num>**
0-255

Syntax: **Command syntax:** AT+WBGS=< num >,< num >,< num >,< num >

Command	Possible Responses
AT+WBGS? Note: Get current primary gateway	+WBGS: 127,0,0,1 OK
AT+WBGS=255,21,255,0 Note: Set secondary gateway to 255.21.255.0	OK

Packet Dial String +WPDS

Description: This command is used to set the packet dial string.

Values: **<string>** A string of length 1 to 15 characters.

Syntax: **Command syntax:** AT+WPDS=<string>

Command	Possible Responses
AT+WPDS? Note: Get current Packet Dial String	+WPDS: ”#777” OK Note: Current Packet Dial String is #777
AT+WPDS=”#999” Note: Set the Packet Dial String to #999	OK

Primary CDMA Channels +WPCC

Description: This command is used to set the primary CDMA channels for 800Mhz CDMA operation only. Values entered must be valid CDMA 800Mhz Channel numbers.

Values: **<channel a number>** Value range: 0 – 2047
<channel b number> Value range: 0 – 2047

Syntax: **Command syntax:** AT+WPCC=<channel a number>,<channel b number>

Command	Possible Responses
AT+WPCC? Note: Get current primary CDMA channels	+WPCC: 283,384 OK
AT+WPCC=211,432 Note: Set the primary CDMA channels	OK

Secondary CDMA Channels +WSCC

Description: This command is used to set the secondary CDMA channels for 800Mhz CDMA operation only. Values entered must be valid CDMA 800Mhz Channel numbers.

Values: **<channel a number>** Value range: 0 – 2047
<channel b number> Value range: 0 – 2047

Syntax: **Command syntax:** AT+WSCC=<channel a number>,<channel b number>

Command	Possible responses
AT+WSCC? Note: Get current secondary CDMA channels	+WPCC: 691,777 OK
AT+WPCC=511,632 Note: Set the secondary CDMA channels	OK

Service Option Management +WSOM

Description: This command is used to manage Service Options for EVRC. It will allow the user to enable EVRC, set home page, home origination, and roam origination voice service options for the current NAM. It is only available for software builds, which include EVRC Service Option Management feature.

Values:
<enable>
0 disable EVRC
1 enable EVRC
<home page SO>
0 IS96A
1 EVRC
2 13k
3 IS96
4 WILDCARD
<home orig SO> & <roam orig SO>
0 IS96A
1 EVRC
2 13k
3 IS96

Syntax: **Command syntax:** AT+WSOM=<enable>,<home page SO>,<home orig SO>,<roam orig SO>

Command	Possible Responses
AT+WSOM? Note: Get the Service Options of the current NAM	+WSOM: 0, 1, 2, 0 OK Note: EVRC disabled, home page is set to EVRC, home orig is set to 13k, roam orig is set to IS96A
AT+WSOM=1,4,2,2 Note: Set current NAM Service Options	OK Note: EVRC enabled, set home page to WILDCARD, set home orig to 13k, set roam orig to 13k

Commit Changes +WCMT

Description: This command is used to commit or to undo/revert any changes done during the service programming session. Changes performed during this session will not take place until a commit command has been sent (AT+WCMT=1). Commission of these changes will force a software reset of the modem. Sending this command indicates this service provisioning session is complete. In order to perform any subsequent provisioning, the service programming code must be entered using the +WSPC command.

Values: **<val>**
- **0** undo changes
- **1** commit changes

Syntax: **Command syntax:** AT+WCMT=<val>

Command	Possible Responses
AT+WCMT=0 Note: Undo any changes performed during this provisioning AT session	OK
AT+WCMT=1 Note: Commit all changes performed during this provisioning AT session to non-volatile memory.	OK Note: software reset is performed

Read SID/NID Entries +WSNR

Description: This command is used to read the current SID/NID list entries. The displayed entry will always be the current value; including those changes made with the +WSID command prior to being committed to NV with the +WCMT command.

Values: **<index>**
- **0-19**: Location in SID/NID list to read.

Syntax: **Command syntax:** AT+WSNR=<index>

Command	Possible Responses
AT+WSNR=5 Note: Display entry 5 of SID/NID list. AT+WSPC=1,000000 AT+WSNR=5 Note: Display entry 5 of SID/NID list.	ERROR Note: Service provisioning code not yet entered. OK Note: Service code successfully entered. +WSNR: 5, 123, 65535 OK Note: Entry 5 of SID/NID list contains 123,65535.
AT+WSNR? Note: Show last read SID/NID list index. Default: 0.	+WSNR: 5 OK
AT+WSNR=? Note: Show SID/NID list index range.	+WSNR: (0-19) OK

Download PRL +DPRL

Description: This command is used to download a Preferred Roamer List (PRL) to the module. The PRL must be formatted in accordance with TIA/EIA-683-A. The PRL download process consists of a sequence of one or more +DPRL commands. Each command appends its associated PRL data to an internal buffer where it is held until the +WCMT command is issued. The maximum PRL size that is supported by the Q24x8 module is 8192 bytes.

The +DPRL command is part of the Wavecom suite of service programming commands. The module service programming code must be successfully entered (see +WSPC) prior to using this command.

The +DPRL command consists of parameters, a carriage return (0x0d) character, and PRL data bytes. Required parameters include the target NAM number, current sequence number, last sequence number, and length of the PRL data in the sequence.

The host application must not use other AT commands until the number of bytes specified by the length parameter has been sent to the module and an OK or ERROR response is returned. There is no mechanism available to abort an in progress +DPRL command once it is started. The <length> specified number of <PrlData> bytes must be sent.

An error will occur if the <nam> number changes or the sequence number is out of order. The <PrlData> associated with a failed +DPRL command is discarded. However, the <PrlData> associated with previously sent sequences remains valid. If the PRL is downloaded using a single +DPRL command, <cur_seq> and <last_seq> should be set to zero.

Once the PRL has been successfully downloaded to the module, the +WCMT=1 command must be used to save the PRL to NV Ram and activate it. The PRL is validated as part of the commit operation and the results of this validation is returned using the +DPRL unsolicited response. A downloaded PRL that fails validation is not activated and the old PRL, if any, remains in effect.

To discard download PRL data prior to final commit, use the AT+WCMT=0 command. To re-start the download sequence, set the current sequence number (<cur_seq>) to zero. 16.15.2

Syntax: **Command syntax:** AT+DPRL=<nam>,<cur_seq>,< last_seq>,<length><cr><PrlData>

Command	Possible responses
AT+WSPC=1,0000 Note: Enter service programming code. AT+DPRL=1,0,0,4096<cr><byte1 … byte4096> Note: Send complete Nam1 PRL. AT+WCMT=1 Note: Activate new Nam1 PRL.	OK Note: Code successfully entered. OK Note: PRL stored in module. +DPRL:0 Note: PRL validated. OK Note: Module software reset begins. +WIND: 8 Note: Module software reset complete.
AT+WSPC=1,0000 Note: Enter service programming code. AT+DPRL=2,0,2,99<cr><byte1 … byte99> Note: Send Nam2 PRL part 1 of 3. AT+DPRL=2,1,2,99<cr><byte1 … byte99> Note: Send Nam2 PRL part 2 of 3. AT+CGSN Note: Other AT commands permitted after +DPRL OK or ERROR response. AT+DPRL=2,2,2,57<cr><byte1 … byte57> Note: Send Nam2 PRL part 3 of 3. AT+WCMT=1 Note: Activate new Nam2 PRL.	OK Note: Code successfully entered. OK Note: Part 1 (99 bytes) stored in module. OK Note: Part 2 (99 bytes) stored in module. +CGSN: FE7A7704 OK OK Note: Part 3 (57 bytes) stored in module. +DPRL:0 Note: PRL validated. OK Note: Module software reset begins. +WIND: 8 Note: Module software reset complete.
AT+DPRL=? Note: Display parameter ranges.	+DPRL: (1-2),(0-255),(0-255),(1-4096) OK Note: Valid parameter ranges.
AT+DPRL? Note: Display last used parameter values.	+DPRL: 1,0,0,57 OK Note: Parameter values displayed.

Defined values :

<nam>	NAM to receive the <PrlData>.
<cur_seq>	Sequence number of this PRL data packet. An error is returned if this value is greater than <last_seq> or is non-sequential with the previous <cur_seq> value. When set to zero, the current internal buffer contents is discarded prior to appending the <PrlData> bytes.
<last seq>	Sequence number of the last PRL data packet. The PRL is considered complete when <cur_seq> is equal to <last_seq>. If the +WCMT=1 command is issued prior to <cur_seq> equal to <last_seq>, the downloaded PRL data will be discarded.
<length>	Length of <PrlData> expressed as a decimal number.
<cr>	Carriage return character. Value 13 decimal or 0x0d hexadecimal.
<PrlData>	PRL binary data. Once <length> bytes have been received by the module, the OK response is returned.

Service Programming Example

Command	Response
AT+WBGP=255,255,255,255 Note: Attempt to set the primary browser gateway	ERROR Note: Service Programming code not yet entered
AT+WPDS? Note: Get current Packet Dial String	ERROR Note: Service Programming code not yet entered
AT+WSPC=1,000000 Note: Enter service programming code	OK Note: Service Programming code entered properly
AT+WPDS? Note: Get current Packet Dial String	+WPDS: ”#777” OK Note: Current Packet Dial String is #777
AT+WPDS=”#999” Note: Set the Packet Dial String to #999	OK
AT+WCMT=1 Note: Commit all changes performed during this provisioning AT session to non-volatile memory.	OK Note: software reset is performed
AT+WSPC=1,000111 Note: Enter service programming code	ERROR Note: Service Programming code incorrect
AT+WSPC=1,000000 Note: Enter service programming code	OK Note: Service Programming code entered properly
AT+WPDS? Note: Get current Packet Dial String	+WPDS: ”#999” OK Note: Current Packet Dial String is #999
AT+WPDS=”#555” Note: Set the Packet Dial String to #555	OK
AT+WSCI? Note: Read the current slot cycle index	+WSCI: 2 OK
AT+WSCI=1 Note: Set the slot cycle index	OK
AT+WCMT=0 Note: Undo any changes performed during this provisioning AT session.	OK Note: No software reset since this is an undo command.
AT+WSPC=1,000000 Note: Enter service programming code	OK Note: Service Programming code entered properly
AT+WPDS? Note: Get current Packet Dial String	+WPDS=”#999” OK Note: Current Packet Dial String is #999 (changes not committed from last write)
AT+WSCI? Note: Read the current slot cycle index	+WSCI: 2 OK Note: Slot cycle index is 2 (changes not committed from last write)
AT+WMDN=8585551212 Note: Set mobile directory number to 8585551212	OK
AT+WCMT=1 Note: Commit all changes performed during this provisioning AT session to non-volatile memory.	OK Note: software reset is performed

Chapter 16 – Extended AT Commands in IS707.3

Multi-Tech CDMA modem also implements the CDMA AT commands as specified in the TIA/EIA/IS-707.3. Refer to IS707.3 for more information about these commands (range, parameter definition, result codes, etc.).
Note: Some of the AT commands may not be supported by the network; please verify with your carrier as to its support of IS707.3 commands.

Remote Async Command X

Description: This command sends a CONNECT message when a connection is established by blind dialing and enables the additional result codes.

Syntax: **Command syntax:** ATX<n>

Command	Possible Responses
ATX0 Note: Ignores dial tone and busy signal.	OK Note: Command is valid
ATX1 Note: Disable dial tone and busy detection.	OK Note: Command is valid
ATX2 Note: Disable busy detection & enable dial tone detection.	OK Note: Command is valid
ATX3 Note: Enable busy detection & disable dial tone detection.	OK Note: Command is valid
ATX4 Note: Enable busy and dial tone detection.	OK Note: Command is valid

Reset to Default Configuration Z0

Description: This command is used to reset to the default configuration.

Syntax: **Command syntax:** ATZ0

Command	Possible Responses
ATZ0 Note: reset to default configuration.	OK Note: Command is valid

Select Tone Dialing T

Description: This command is used to select tone dialing. Not relevant to CDMA data services; “T” is not sent in dial string.

Syntax: **Command syntax:** ATT

Command	Possible Responses
ATT Note: select tone dialing.	OK Note: Command is valid

Select Pulse Dialing P

Description: This command is used to select pulse dialing. Not relevant to CDMA data services; "P" is not sent in dial string.

Syntax: **Command syntax:** ATP

Command	Possible Responses
ATP Note: select pulse dialing.	OK Note: Command is valid

Basic S-Registers S

Description: The S-registers store configuration parameters that are used for dialing or during an established call. The value of an S-register may be set by using the syntax: ATSn=<value> where n is the register number and <value> is a decimal value.

Values: **<n>** ATS command index. Ranges from 0-11.
<value> Value for the ATS command.

Syntax: **Command syntax:** ATS<n>=<value>

Command	Possible Responses
ATS<n>=<value> Note: set S-registers value	OK
ATS0? Note: Disable or enable automatic answering (value: 0-255) 0: Disable; 1-255: Enable after [(value-1)x6 sec.]	002 OK Note: always 3 characters padded with zeros
ATS3? Note: Carriage return character	013 OK
ATS4? Note: Line feed character	010 OK
ATS5? Note: Backspace character	008 OK
ATS6? Note: Pause before blind dialing (value: 2-10)	002 OK
ATS7? Note: Number of seconds to establish end-to-end data connection (value: 1-255)	050 OK
ATS8? Note: Number of seconds to pause when "," is encountered in dial string (value: 0-255)	002 OK
ATS9? Note: Carrier detect threshold in increments of 0.1 seconds (value: 0-255)	006 OK
ATS10? Note: Number of tenths of a second from carrier loss to disconnect (value: 1-254) Value 255: disable carrier detect	014 OK
ATS11? Note: DTMF tone duration and spacing in milliseconds (value: 50-255)	095 OK

Error Control Operation +EB

Description: This command is used for break handling in error control operations. The extended-format compound parameter is used to control the manner of V.42 operation on the PSTN line (if present in IWF). The command is not relevant for packet service.

Values:

<Break_selection>
- **0** Ignore break (do not signal to remote DCE)
- **1** Non-expedited, non-destructive
- **2** Expedited, non-destructive
- **3** Expedited and destructive

<timed>
- **0** Any transmitted V.42 L-SIGNAL shall not indicate break signal length
- **1** Any transmitted V.42 L-SIGNAL shall indicate break signal length

<default_length>
- **0** Do not deliver break to DTE
- **1-254** Default break length of .01 to 2.54 seconds

Syntax: **Command syntax:** AT+EB=[<Break_selection>[,<timed>[,<default_length>]]]

Command	Possible Responses
AT+EB? Note: Display the current setting.	+EB: 1,0,30 OK Note: This is the default setting
AT+EB=2 Note: Set value to 2.	OK Note: Command is valid

Numeric Parameter Control +EFCS

Description: The extended-format numeric parameter is used to control the use of 32-bit frame check sequence option in V.42 on the PSTN link (if present in IWF). The command is not relevant for packet service.

Values:

<Val>
- **0** Use 16-bit FCS
- **1** Use 32-bit FCS if available in remote DCE; otherwise use 16-bit FCS
- **2** Use 32-bit FCS if available in remote DCE; otherwise disconnect

Syntax: **Command syntax:** AT+EFCS=[<Val>]

Command	Possible Responses
AT+EFCS? Note: Display the current setting.	+EFCS: 0 OK Note: Command is valid
AT+EFCS=2 Note: Set value to 2.	OK Note: Command is valid

Error Control Report +ER

Description: The extended-format numeric parameter is used to control whether the extended-format +ER intermediate result code is transmitted from the IWF over the interface.

Values:

<Val>
- **0** Error control reporting disabled
- **1** Error control reporting enabled

Syntax: **Command syntax:** AT+ER=[<Val>]

Command	Possible Responses
AT+ER? Note: Display the current setting.	+ER: 0 OK Note: Command is valid
AT+ER=1 Note: Set value to 1.	OK Note: Command is valid

Error Control Selection +ES

Description: The extended-format compound parameter is used to control the manner of operation of the V.42 protocol on the PSTN link (if present in IWF). The command is not relevant for packet service.

Values:

<orig_rqst>
- **0** Direct mode
- **2** Initiate V.42 Detection Phase
- **3** Initiate Alternative Protocol

<orig_fbk>
- **0** Error control optional; If error control not established maintain DTE-DCE data rate
- **1** Error control optional; If error control not established change DTE-DCE data rate to match line rate
- **2** Error control required; If error control not established, disconnect
- **3** Error control required (only LAPM acceptable); If error control not established, disconnect
- **4** Error control required (only alternative protocol acceptable); If error control not established, disconnect

<ans_fbk>
- **0** Direct mode
- **1** Error control disabled, use Buffered mode
- **2** Error control optional; If error control not established maintain DTE-DCE data rate
- **3** Error control optional; If error control not established change DTE-DCE data rate to match line rate
- **4** Error control required; If error control not established, disconnect
- **5** Error control required (only LAPM acceptable); If error control not established, disconnect
- **6** Error control required (only alternative protocol acceptable); If error control not established, disconnect

Syntax: **Command syntax:** AT+ES=[<orig_rqst>[,<orig_fbk>[,<ans_fbk>]]]

Command	Possible Responses
AT+ES? Note: Display the current setting.	+ES: 3, 0, 2 OK Note: Command is valid
AT+ES=1 Note: Set value to 1.	OK Note: Command is valid
AT+ES? Note: Display the setting after change.	+ES: 1, 0, 2 OK Note: Command is valid

Error Control Selective Repeat +ESR

Description: The extended-format numeric parameter is used to control the use of selective repeat (SREJ) option in V.42 on the PSTN link (if present in IWF). The command is not relevant for packet service.

Values:

<Val>
- **0** Do not use SREJ
- **1** Use SREJ if available in remote DCE; continue without it if not
- **2** Use SREJ if available in remote DCE; disconnect if SREJ is not available

Syntax: **Command syntax:** AT+ESR=[<Val>]

Command	Possible Responses
AT+ESR? Note: Display the current setting.	+ESR: 0 OK Note: Command is valid
AT+ESR=1 Note: Set value to 1.	OK Note: Command is valid

Error Control Selection +ETBM

Description: The extended-format compound parameter is used to control the handling of data remaining in IWF buffers upon service termination. The command is not relevant for packet service.

Values:

<pending_TD>
- **0** Discard all buffered data immediately and disconnect
- **1** Attempt until all data is delivered and acknowledged (ignore timer)
- **2** Attempt until all data is delivered and acknowledged; If timer expires, discard remainder

<pending_RD>
- **0** Discard all buffered data immediately and disconnect
- **1** Attempt until all data is delivered (ignore timer)
- **2** Attempt until all data is delivered; If timer expires, discard remainder

<timer>
- **0-30** Deliver timer value in seconds
- **Other:** Higher values may be supported at manufacture's option

Syntax: **Command syntax:** AT+ETBM=[<pending_TD>[,<pending_RD>[,<timer>]]]

Command	Possible Responses
AT+ETBM? Note: Display the current setting.	+ETBM: 0, 1, 20 OK Note: Command is valid
AT+ETBM=1 Note: Set value to 1.	OK Note: Command is valid
AT+ETBM? Note: Display the current setting.	+ETBM: 1, 1, 20 OK Note: Command is valid

Request Manufacture Identification +GMI

Description: The command is used to cause the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the manufacturer.

Syntax: **Command syntax:** AT+GMI

Command	Possible Responses
AT+GMI? Note: Display the current setting.	ERROR Note: Command is not valid
AT+GMI Note: Display the manufacturer	+GMI: MODEM OK Note: Command is valid

Request Manufacture Identification +GMM

Description: The command is used to cause the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the specific model of device.

Syntax: **Command syntax:** AT+GMM

Command	Possible Responses
AT+GMM? Note: Display the current setting.	ERROR Note: Command is not valid
AT+GMM Note: Display the model	+GMM: Model 72 OK Note: Command is valid

Request Revision Identification +GMR

Description: The command is used to cause the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the version, revision level or date, or other pertinent information of the device.
Note: When there is no stored PRL, the value displayed for the PRL ID will be 0.

Syntax: **Command syntax:** AT+GMR

Command	Possible Responses
AT+GMR? Note: Display the current setting.	ERROR Note: Command is not valid
AT+GMR Note: Display the revision	+GMR: S/W VER: WISMOQ WQ1.8, 10015 OK Note: Command is valid

Request Product Serial Number Identification +GSN

Description: The command is used to cause the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the individual alphanumeric string.

Syntax: **Command syntax:** AT+GSN

Command	Possible Responses
AT+GSN? Note: Display the current setting.	ERROR Note: Command is not valid
AT+GSN Note: Display the serial number.	+GSN: F607A117 OK Note: Command is valid

Request Global Object Identification +GOI

Description: The command is used to cause the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the device, based on the ISO system for registering unique object identifiers.

Syntax: **Command syntax:** AT+GOI

Command	Possible Responses
AT+GOI? Note: Display the current setting.	ERROR Note: Command is not valid
AT+GOI Note: Display the responses to the command	+GOI: OK Note: Command is valid

Note: Currently, no information text is provided.

Modulation Selection +MS

Description: The extended-format compound parameter is used to control the manner of operation of the modulation capabilities in the DCE.

Values:
<carrier>
manufacturer specific
<automode>
0 Disabled
1 enabled with V.8 or V.32bis Annex where applicable
<min_rate> & <min_rx_rate>
set to 0 if unspecified
<max_rate> & <max_rx_rate>
set to 0 if unspecified

Syntax: **Command syntax:** AT+MS=[<carrier>[,<automode>[,<min_rate>[,<max_rate>[,<min_rx_rate>[,<max_rx_rate>]]]]]]

Command	Possible Responses
AT+MS? Note: Display the parameter information.	+MS: V32B,1,1200,14400 Note: Command is valid
AT+MS=? Note: Display the range of parameters	+MS: (V21,V22),(0,1,),(0,300-14400),(0,300-14400) Note: Command is valid
AT+MS=V21,1,1200,2400,1200,2400 Note: Display the range of parameters	OK Note: Command is valid

Modulation Automode Control +MA

Description: The extended-format compound parameter is a list of modulations that the DCE may use to connect with the remote DCE in automode operation, for answering or originating data calls.

Syntax: **Command syntax:** AT+MA=[<carrier>[,<carrier>[,<carrier>[,…]]]]

Command	Possible Responses
AT+MA? Note: Display the parameter information.	+MA: V32, V32B Note: Command is valid
AT+MA=? Note: Display the range of parameters	+MA: (V32B,V32,V26B,V22B,V22,V21) Note: Command is valid
AT+MA=V32 Note: Set to V32	OK Note: Command is valid

Modulation Reporting Control +MR

Description: The extended-format numeric parameter controls whether the extended-format +MCR:<carrier> and +MRR:<rate> intermediate result codes are transmitted from the IWF to the mobile station.

Values:
<Val>
0 Disables reporting of modulation connection
1 Enables reporting of modulation connection (+MCR and +MRR are transmitted)

Syntax: **Command syntax:** AT+MR=[<Val>]

Command	Possible Responses
AT+MR? Note: Display the current setting.	+MR: 0 Note: Command is valid
AT+MR=? Note: Display the range of setting.	+MR: (0,1) Note: Command is valid
AT+MR=1 Note: Enable reporting.	OK Note: Command is valid

V.18 Reporting Control +MV18R

Description: The extended-format numeric parameter controls whether the extended-format +MV18R: result code is transmitted from the IWF to the mobile station.

Values: **<Val>**
- **0** Disables reporting of V.18 connection
- **1** Enables reporting of V.18 connection

Syntax: **Command syntax:** AT+MV18R=[<Val>]

Command	Possible Responses
AT+MV18R? Note: Display the current setting.	+MV18R: 0 OK Note: Command is valid
AT+MV18R=1 Note: Enable reporting.	OK Note: Command is valid

V.18 Selection +MV18S

Description: The extended-format numeric parameter is used to control the manner of operation of the V.18 capabilities (if present) in the DCE.

Values: **<mode>**
- **0** Disables V.18 connection
- **1** V.18 operation, auto detect mode
- **2** V.18 operation, connection in 5-bit mode
- **3** V.18 operation, connect in DTMF mode
- **4** V.18 operation, connect in EDT mode
- **5** V.18 operation, connect in V.21 mode
- **6** V.18 operation, connect in V.23 mode
- **7** V.18 operation, connect in Bell 103-type mode

<dflt_ans_mode>
- **0** disables V.18 answer operation
- **1** no default specified (auto detect)
- **2** V.18 operation, connect in 5-bit mode
- **3** V.18 operation, connect in DTMF mode
- **4** V.18 operation, connect in EDT mode

<fbk_time_enable>
- **0** disable
- **1** enable

Syntax: **Command syntax:** AT+MV18S=[<mode>[,<dflt_ans>[,<fbk_time_enable>]]]

Command	Possible Responses
AT+MV18S? Note: Display the current setting.	+MV18S: 0, 0, 0 OK Note: Command is valid
AT+MV18S=1,1,1 Note: Set mode value to 1.	OK Note: Command is valid
AT+MV18S? Note: Display the current setting.	+MV18S: 1, 1, 1 OK Note: Command is valid

Cellular Extension +CXT

Description: The numeric parameter is used for cellular extension.

Values: **<Val>**

0 Do not pass unrecognized commands to the IWF

1 When detecting an unrecognized AT command, open transport layer connection and pass unrecognized command to the IWF.

Syntax: **Command syntax:** AT+CXT=<Val>

Command	Possible Responses
AT+CXT? Note: Display the current setting.	+CXT: 0 OK Note: Command is valid
AT+CXT=? Note: Display the range of setting.	+CXT: (0-1) OK Note: Command is valid
AT+CXT=1 Note: Enable extension.	OK Note: Command is valid

Configuration String +CFG

Description: The string command is used to set configuration string. The string will be stored by the DCE and sent to the base station prior to dialing. Each transmission of an AT+CFG command from DTE replaces the contents of the previous string. The string may be up to 248 characters in length.

Syntax: **Command syntax:** AT+CFG=<string >

Command	Possible Responses
AT+CFG? Note: Display the current setting.	+CFG: “” OK
AT+CFG=”” Note: Reset the configuration string.	OK Note: Command is valid
AT+CFG=”data” Note: Set the configuration string.	OK Note: Command is valid

Query Service +CAD

Description: The numeric parameter is used to query analog or digital service.

Values: The command should return one of the following codes:

0 If no service is available

1 If CDMA digital service is available

2 If TDMA digital service is available

3 If analog service is available (values 4 to 255 reserved)

Syntax: **Command syntax:** AT+CAD

Command	Possible Responses
AT+CAD? Note: Display the current service.	+CAD: 1 OK Note: Command is valid
AT+CAD=1 Note: Set the current service.	ERROR Note: Command is not valid
AT+CAD=? Note: Display the available service values.	+CAD: OK Note: Command is valid but no value ranges are returned.

Note: This is a read-only command.

U_m Interface Data Compression Reporting +CDR

Description: The extended-format numeric parameter is used to control whether the extended-format +CDR: intermediate result code is transmitted by the DCE. The result code is the same as for the TIA/EIS/IS-131 +DR:<result code>.

Values: **<val>**
- **0** Disable reporting.
- **1** Enable reporting.

Syntax: **Command syntax:** AT+CDR=<val>

Command	Possible Responses
AT+CDR? Note: Display the current code	+CDR: 0 OK Note: Command is valid
AT+CDR=1 Note: Reporting enabled	OK Note: Command valid
AT+CDR=? Note: Display the range of code	+CDR: (0-1) OK Note: Command is valid

U_m Interface Data Compression +CDS

Description: This command is an overloaded command that serves as an unsolicited SMS command and also as a data compression command (the unsolicited SMS command is explained in Chapter 21). This command has an extended-format numeric parameter that is used to control the V.42bis data compression function on the U_m interface. The command format is the same as for the TIA/EIS/IS-131 +DS command.

Syntax: **Command syntax:** AT+CDS=<Val>

Command	Possible Responses
AT+CDS? Note: Display the current setting.	+CDS: 0, 1, 2048, 6 OK Note: Command is valid
AT+CDS=0,1,1024,10 Note: Set the data compression.	OK Note: Specified values beyond the initial one are validated but ignored.
AT+CDS=? Note: Display the range of setting.	+CDS: (0-0),(1-1),(512-65535),(6-250) OK Note: Command is valid

Note: Currently, modem accepts only 0 as a valid setting.

Set Rm Interface Protocol +CRM

Description: The numeric parameter is used for set the Rm interface protocol. The Rm interface protocol value is effected by the current $QCMIP setting. The Rm interface protocol can be set by the +CRM command only if $QCMIP is set to zero (Mobile IP disabled, Single IP only).

Values: **<Val>**
- **0** Asynchronous Data
- **1** Packet data service, Relay Layer Rm interface
- **2** Packet data service, Network Layer Rm interface, PPP

Note: The values 3 and 4 are currently not supported.
- **3** Packet data service, Network Layer Rm interface, SLIP
- **4** STU-III Service

Syntax: **Command syntax:** AT+CRM=<Val>

Command	Possible Responses
AT+CRM? Note: Display the current setting.	+CRM: 0 OK Note: Command is valid
AT+CRM=? Note: Display the range of setting.	+CRM: (0-2) OK Note: Command is valid
AT+CRM=1 Note: Set to 1.	OK Note: Command is valid

Note: This default value for the +CRM parameter shall be 0 if this value is supported by the DCE.

Battery Charge +CBC

Description: This command is used to query the current state of the modem power source. An estimate of the remaining capacity is included if a battery connection is in use.

Values: **<BCS>** Battery Charge Status:
- **0** Mobile powered by battery; followed by <BCL>, percent of battery remaining
- **1** Mobile connected to external power
- **2** Battery status not available
- **3** Recognized power fault. Calls inhibited.

<BCL> Battery Charge Level:
- **0 – 100** Remaining battery capacity is 0 – 100%.

Syntax: **Command syntax:** AT+CBC Read-only. Returns <BCS>,<BCL>

Command	Possible Responses
AT+CBC? Note: Display the current status	+CBC: 0, 77 OK Note: Command is valid
AT+CBC	ERROR Note: Command is not valid

Command State Inactivity Timer +CQD

Description: The numeric parameter is used to query and set the Command State Inactivity Timer.

Values: **<val>**
- **0** Ignored
- **1-255** Release call after 5x<val> seconds have elapsed without activity.

Note: The default <val> shall be 10, corresponding to 50 seconds.

Syntax: **Command syntax:** AT+CQD=<val>

Command	Possible Responses
AT+CQD? Note: Display the current setting.	+CQD: 10 OK Note: Command is valid
AT+CQD=0 Note: Set the value to 0.	OK Note: Command is valid

Mobile Station IP Address +CMIP

Description: This read-only command is used to display the mobile station's temporary IP address. The value displayed is in standard IP address format.

Note: This command returns an IP value only during a data call when a temporary IP address has been assigned. When not in a data call, this command returns "OK".

Syntax: **Command syntax:** AT+CMIP

Command	Possible Responses
AT+CMIP? Note: Display the current setting	+CMIP: 198.229.142.90 OK Note: Command is valid
AT+CMIP? Note: Display the current setting	OK Note: When no IP address assigned.
AT+CMIP	ERROR Note: Command is not valid

Base Station IP Address +CBIP

Description: This read-only command is used to display the base station's temporary IP address. The value displayed is in standard IP address format.

Note: This command returns an IP value only during a data call when a temporary IP address has been assigned. When not in a data call, this command returns "OK".

Syntax: **Command syntax:** AT+CBIP

Command	Possible Responses
AT+CBIP? Note: Display the current setting	+CBIP: 198.229.142.65 OK Note: Command is valid
AT+CBIP? Note: Display the current setting	OK Note: No IP address assigned.
AT+CBIP	ERROR Note: Command is not valid

Serving System +CSS

Description: The numeric parameter is used to query the serving system.

Values:

<Class>
- **0** No service
- **1** 800Mhz
- **2** 1900Mhz PCS

<Band>
- **A – C** Cellular 800
- **PA – PF** PCS 1900
- **Z** The mobile station is not registered
- **Note** For the <Band> parameter, the value will be two letters for PCS. The first will be 'P' and the second will be the block ('A' – 'F').

<SID>
- **0 – 32767** The mobile station is registered with the system indicated.
- **99999** The mobile station is not registered.

<BS_P_REV> (Base Station Protocol Revision In Use – Band Class 0/Cellular)
- **1** IS-95
- **2** IS-95A
- **3** TSB74
- **4** N/A
- **5** IS-95B
- **6** IS-2000
- **7** IS-2000A

<BS_P_REV> (Base Station Protocol Revision In Use – Band Class 1/PCS)
- **1** J-STD-008C
- **2** N/A
- **3** N/A
- **4** N/A
- **5** IS-95B
- **6** IS-2000
- **7** IS-2000A

<CHANNEL>
- 0 – Max RF Channel Number

Syntax: **Command syntax:** AT+CSS Returns: <Class>,<Band>,<SID>,<BS_P_REV>,<CHANNEL>

Command	Possible Responses
AT+CSS? Note: Display the current setting.	+CSS: 2, PA, 4, 6, 384 OK Note: Command is valid
AT+CSS=? Note: Display the parameter range.	+CSS: OK Note: Command is valid however range display is not supported for this command due to carrier-specific requirements.

Select Multiplex Option +CMUX

Description: The numeric parameter is used to select multiplex option. This command is used to set the maximum number of multiplex options on the forward and reverse links for MDR calls. If a reverse parameter value is not specified, it is set to the forward parameter value.

Values:

<forward>
Hexadecimal value: 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, F

<n>
1 Multiplex Option 1
2 Multiplex Option 2

Syntax: **Command syntax:** AT+CMUX=<forward>,[<reverse>]

Command	Possible Responses
AT+CMUX? Note: Display the current setting.	+CMUX: C, 2 OK Note: Command is valid
AT+CMUX=? Note: Display valid parameter range.	+CMUX: (1-9,A-D,F), (1,2) OK Note: Command is valid
AT+CMUX=1 Note: Set multiplex option 1.	OK Note: Command is valid

Hang-up Voice +CHV

Description: The numeric parameter is used to Hang-up a voice call. It terminates a voice connection previously established up +CDV (dial voice) or $QCCAV (answer voice). The only valid parameter is zero, which is optional.

Values:

<n>
0 Hang-up voice call
1-255 Reserved.

Syntax: **Command syntax:** AT+CHV<n>

Command	Possible Responses
AT+CHV Note: Display the current setting.	OK Note: Command is valid
AT+CHV0 Note: Hang up the call.	OK Note: Command is valid

Dial Command for Voice Calls +CDV

Description: The numeric parameter is used to dial command for voice calls. The format of <dialstring> is identical to that for the ATD command. This command does not cause the DCE to change to the online state.

Syntax: **Command syntax:** AT+CDV=<dial_string>

Command	Possible Responses
AT+CDV? Note: Display the current setting.	ERROR Note: Command is not valid
AT+CDV=8583693450 Note: Dial for voice call.	OK +WORG: 8583693450 +WCNT: 3 Note: Command is valid

U_m Packet Data Inactivity Timer +CTA

Description: This command is used to Set, Read, and Test the U_m packet data inactivity timer.

Values: **<val>**

0 Traffic Channel not released during inactivity periods.

1-255 Release the Traffic Channel after <value> 1-second intervals have elapsed since last sending or receiving RLP data frames on the U_m interface.

Syntax: **Command syntax:** AT+CTA=<val>

Command	Possible Responses
AT+CTA ? Note: Display the current setting.	+CTA: 0 OK Note: Command is valid
AT+CTA=? Note: Display valid parameter range.	+CTA: (0-255) OK Note: Command is valid
AT+CTA=1 Note: Set to one second.	OK Note: Command is valid

Chapter 17 – Qualcomm Defined AT Commands for CDMA Operation

This section contains AT commands that are specified and developed by Qualcomm.
Note: Mobile IP related AT commands work only on the modems that supported the MIP features.

Transition to Diagnostics Monitor $QCDMG

Description: This command returns "OK" and then transitions the phone serial port to DM mode. DM mode runs at 38.4 Kbps and uses a proprietary half-duplex protocol.

Syntax: **Command syntax:** AT$QCDMG

Command	Possible Responses
AT$QCDMG Note: Transition to DM port	OK Note: Command is valid

Quick Net Connect $QCQNC

Description: This command is used to enable or disable the Quick Net Connect (QNC) feature.

Values: **<Val>**

- **0** Disable QNC capability. This means that packet Originations will use the Packet Data Service Option number.
- **1** Enable QNC capability. This means that Packet Originations will use the Async Data Service Option number.

Syntax: **Command syntax:** AT$QCQNC=<Val>

Command	Possible Responses
AT$QCQNC? Note: Display the current setting	$QCQNC: 0 OK Note: Command is valid
AT$QCQNC=? Note: Display the range of values	$QCQNC: (0-1) OK Note: Command is valid
AT$QCQNC=1 Note: Enable QNC compatibility	OK Note: Command is valid

Protocol Revision in Use $QCPREV

Description: This command is used to query the protocol revision in use.

Values: The command will return one of the following codes:

- **1** JST008
- **3** IS-95A
- **4** IS-95B
- **6** IS-2000

Syntax: **Command syntax:** AT$QCPREV

Command	Possible Responses
AT$QCPREV? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCPREV Note: Display the of value	$QCPREV: 6 OK Note: Command is valid

Originate M-to-M Packet Data Call $QCMTOM

Description: This command is used to originate a Mobile-to-Mobile Packet Data call using the QUALCOMM proprietary Service Option number.

Values: **<number>**
where **<number>** is the phone number to dial. This command will originate a Mobile-to-Mobile Packet data call using the QUALCOMM-proprietary Service Option number 0x8003. This is a Rate Set 1 call.

Syntax: **Command syntax:** AT$QCMTOM = ‘’<number>’’

Command	Possible Responses
AT$QCMTOM? Note: Display the current setting	$QCMTOM: “” OK Note: Command is valid
AT$QCMTOM =? Note: Display the range of values	$QCMTOM: (20,21,23-7E) OK Note: Command is valid
AT$QCMTOM =”#777” Note: Packet data call to the number	OK Note: Command is valid

Dump RLP Protocol Statistics $QCRLPD

Description: This command is used to dump the RLP statistics in ASCII format to the DTE. This does not apply to RLP 3 statistics (see $QCRL3D).

Syntax: **Command syntax:** AT$QCRLPD

Command	Possible Responses
AT$QCRLPD? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCRLPD Note: Dump RLP statistics data	$QCRLPD: Rx Data Cnt :0000 Tx Data Cnt :0000 …. OK Note: Command is valid

Reset RLP Protocol Statistics $QCRLPR

Description: This command is used to zero all the RLP statistics counters. This does not apply to RLP 3 statistics (see $QCRL3R).

Syntax: **Command syntax:** AT$QCRLPR

Command	Possible Responses
AT$QCRLPR? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCRLPR Note: Reset RLP statistics counter	$QCRLPR: OK Note: Command is valid

Dump PPP Protocol Statistics $QCPPPD

Description: This command is used to dump the PPP statistics in ASCII format to the DTE.

Syntax: **Command syntax:** AT$QCPPPD

Command	Possible Responses
AT$QCPPPD? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCPPPD Note: Dump PPP statistics information	$QCPPPD: In LCP :0000 Out LCP :0000 …. OK Note: Command is valid

Reset PPP Protocol Statistics $QCPPPR

Description: This command is used to zero all of the PPP statistics counters.

Syntax: **Command syntax:** AT$QCPPPR

Command	Possible Responses
AT$QCPPPR? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCPPPR Note: Reset PPP statistics counter	$QCPPPR: OK Note: Command is valid

Dump IP Protocol Statistics $QCIPD

Description: This command is used to dump the IP statistics in ASCII format to the DTE.

Syntax: **Command syntax:** AT$QCIPD

Command	Possible responses
AT$QCIPD? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCIPD Note: Dump IP statistics information	$QCIPD: IP: InReceives :0000 InHdrErrors :0000 …. OK Note: Command is valid

Reset IP Protocol Statistics $QCIPR

Description: This command is used to zero all of the IP statistics counters.

Syntax: **Command syntax:** AT$QCIPR

Command	Possible Responses
AT$QCIPR? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCIPR Note: Reset IP statistics counter	$QCIPR: OK Note: Command is valid

Dump UDP Protocol Statistics $QCUDPD

Description: This command is used to dump the UDP statistics in ASCII format to the DTE.

Syntax: **Command syntax:** AT$QCUDPD

Command	Possible Responses
AT$QCUDPD? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCUDPD Note: Dump UDP statistics information	$QCUDPD: InDatagrams :0000 OutDatagrams :0000 …. OK Note: Command is valid

Reset UDP Protocol Statistics $QCUDPR

Description: This command is used to zero all of the UDP statistics counters.

Syntax: **Command syntax:** AT$QCUDPR

Command	Possible Responses
AT$QCUDPR? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCUDPR Note: Reset UDP statistics counter	$QCUDPR: OK Note: Command is valid

Dump TCP Protocol Statistics $QCTCPD

Description: This command is used to dump the TCP statistics in ASCII format to the DTE.

Syntax: **Command syntax:** AT$QCTCPD

Command	Possible Responses
AT$QCTCPD? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCTCPD Note: Dump TCP statistics information	$QCTCPD: ActiveOpens :0000 PassiveOpens :0000 …. OK Note: Command is valid

Reset TCP Protocol Statistics $QCTCPR

Description: This command is used to zero all of the TCP statistics counters.

Syntax: **Command syntax:** AT$QCTCPR

Command	Possible Responses
AT$QCTCPR? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCTCPR Note: Reset TCP statistics counter	$QCTCPR: OK Note: Command is valid

Set Data Service Option $QCSO

Description: This command is used to Set Data Service Option number set; saves to non-volatile memory.

Values: **<Val>**

- **0** pre-707 SO numbers (RS 1: Async 4, packet 7; RS 2: Async 12, packet 15)
- **1** proprietary SO numbers (RS 1: Async 4, packet 7; RS 2: Async 0x8021, packet 0x8020)
- **2** IS-707 SO numbers (RS 1: Async 0x1004, packet 0x1007; RS 2: Async 12, packet 15)

Syntax: **Command syntax:** AT$QCSO =<Val>

Command	Possible Responses
AT$QCSO? Note: Display the current setting	$QCSO: 2 OK Note: Command is valid
AT$QCSO =? Note: Display the range of values	$QCSO: (0-2) OK Note: Command is valid
AT$QCSO =1 Note: Set proprietary SO numbers.	OK Note: Command is valid

Clear Mobile Error Log $QCCLR

Description: This command is used to clear the mobile error log.

Syntax: Command syntax: AT$QCCLR

Command	Possible Responses
AT$QCCLR? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCCLR Note: Clear the mobile error log	$QCCLR: OK Note: Command is valid

Answer Incoming Voice Call $QCCAV

Description: This command is used to provide a means to answer an incoming voice call via an AT command.

Syntax: **Command syntax:** AT$QCCAV

Command	Possible Responses
AT$QCCAV Note: Answer incoming voice call	OK +WCNT: 3 Note: Command is valid

Automatic Packet Detection $QCPKND

Description: This command is used to enable or disable Automatic Packet Detection after a dial command.

Values: **<Val>**

0 Disable Packet No Dial. If a PPP packet is received by the mobile without a just prior dial command (that is, ATD#nnn e.g. ATD#777), then the mobile will originate a Packet (or QNC) data call.

1 Enable Packet No Dial. Reception of a PPP packet without a just prior dial command will NOT Originate a PPP packet (or QNC) call.

Syntax: **Command syntax:** AT$QCPKND=<Val>

Command	Possible Responses
AT$QCPKND? Note: Display the current setting	$QCPKND: 0 OK Note: Command is valid
AT$QCPKND=? Note: Display the range of values	$QCPKND: (0-1) OK Note: Command is valid
AT$QCPKND=1 Note: Enable Packet No Dial	OK Note: Command is valid

Pre-arrangement Setting $QCVAD

Description: This command is used to respond to a page message that has a voice service option with a page response that has a data service option.

Values: **<Val>**

0 Off

3 Async for next call

4 Async for all calls

Syntax: **Command syntax:** AT$QCVAD= <Val>

Command	Possible Responses
AT$QCVAD? Note: Display the current setting	$QCVAD: 0 OK Note: Command is valid
AT$QCVAD=? Note: Display the range of values	$QCVAD: (0-4) OK Note: Command is valid

Set DM Baud Rate $QCDMR

Description: This command is used to set the DM baud rate.

Values: **<Val>** value should be one of the following: 19200, 38400, 57600, 115200

Syntax: **Command syntax:** AT$QCDMR= <Val>

Command	Possible Responses
AT$QCDMR? Note: Display the current setting	$QCDMR: 19200 OK Note: Command is valid
AT$QCDMR=? Note: Display the range of values	$QCDMR: (19200, 38400, 57600, 115200, 230400, 460800) OK Note: Command is valid
AT$QCDMR=115200 Note: Set DM baud rate to 115200	OK Note: Command is valid

Set Medium Data Rate $QCMDR

Description: This command is used to Set Medium Data Rate (MDR); also known as HSPD setting.

Values: **<Val>**

- **0** MDR Service Only. The mobile will originate with SO 22 or SO 25. The mobile will not negotiate to any other service option if SO 22 and SO 25 are unavailable.
- **1** MDR Service, if available. The mobile will originate with SO 22 or SO 25, but will negotiate to a Low-Speed Packet service option if MDR is not available. The mobile will not negotiate to SO 33.
- **2** LSPD only. The mobile will originate a Low-Speed Packet call only. The mobile will not negotiate to SO 22, SO 25, or SO 33.
- **3** SO 33, if available. The mobile will negotiate to MDR or Low-Speed Packet service options if SO 33 is not available.

Syntax: **Command syntax:** AT$QCMDR=<Val>

Command	Possible Responses
AT$QCMDR? Note: Display the current setting	$QCMDR: 3 OK Note: Command is valid
AT$QCMDR=? Note: Display the range of values	$QCMDR: (0-3) OK Note: Command is valid
AT$QCMDR=1 Note: Set value to 1	OK Note: Command is valid

Dump RLP 3 Protocol Statistics $QCRL3D

Description: This command is used to dump the RLP 3 statistics in ASCII format to the DTE. This does not apply to other versions of RLP (see $QCRLPD).

Syntax: **Command syntax:** AT$QCRL3D

Command	Possible Responses
AT$QCRL3D? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCRL3D Note: Dump RLP 3 statistics information	$QCRL3D: Rx Data Cnt :00000000 Tx Data Cnt :00000000 …. OK Note: Command is valid

Reset RLP 3 Protocol Statistics $QCRL3R

Description: This command is used to reset the RLP 3 protocol statistics.

Syntax: **Command syntax:** AT$QCRL3R

Command	Possible Responses
AT$QCRL3R? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCRL3R Note: Reset TCP statistics counter	$QCRL3R: OK Note: Command is valid

SCRM'ing Selection $QCSCRM

Description: This command is used to enable or disable the mobile from SCRM'ing.

Values: **<Val>**

- **0** Mobile never SCRMs.
- **1** Mobile can SCRM as needed.

Note: Command only applies to SO 33 calls. This value is stored in NV. The default is 1.

Syntax: **Command syntax:** AT$QCSCRM= <Val>

Command	Possible Responses
AT$QCSCRM? Note: Display the current setting	$QCSCRM: 1 OK Note: Command is valid
AT$QCSCRM =? Note: Display the range of values	$QCSCRM: (0-1) OK Note: Command is valid
AT$QCSCRM =0 Note: Set value to 0	OK Note: Command is valid

R-SCH Throttling Selection $QCTRTL

Description: This command is used to enable or disable mobile R-SCH throttling.

Values: **<Val>**
0: Mobile never throttles R-SCH
1: Mobile can throttle R-SCH as needed.

Note: Command only applies to SO 33 calls. This value is stored in NV. The default is 1. For MSM500, MSM5105, and MSM5100 ASICs only.

Syntax: **Command syntax:** AT$QCTRTL=<Val>

Command	Possible Responses
AT$QCTRTL? Note: Display the current setting	$QCTRTL: 1 OK Note: Command is valid
AT$QCTRTL =? Note: Display the range of values	$QCTRTL: (0-1) OK Note: Command is valid
AT$QCTRTL =0 Note: Set value to 0	OK Note: Command is valid

R-SCH IP Selection $QCMIP

Description: This command is used to enable or disable mobile IP.
The default value is carrier-specific.

Values: **<Val>**
0 Mobile IP disabled, Simple IP only.
1 Mobile IP preferred. In the initial MIP registration, if the network does not support Mobile IP, then the mobile automatically reverts to Simple IP (force a PPP renegotiation by sending a LCP C-Req). However, if a Mobile IP session is registered, and then enters a network that does not support Mobile IP, the mobile will drop the session and inform the upper layers of the failure (for example, by dropping DCD to a laptop).
2 Mobile IP only. The mobile will make data calls only when Mobile IP is supported in the network. During a MIP session, if the mobile hands off to a network that does not support MIP, then the mobile will drop the session and inform the upper layers of the failure (for example, by dropping DCD to a laptop). This value is stored in NV. The default value is 0.

Note 1: When the AT$QCMIP value is changed to 1 or 2, this modifies the value of AT+CRM to 2. AT+CRM with a value of 2 enables network model operation. Changing the value to 0 will reset the AT+CRM to its original value.

Note 2: This change is *not* supported by DMSS 5105 Release 1.0 Commercial.

Note 3: When the AT$QCMIP value is changed to 1 or 2, this modifies the value of AT$QCMDR to 3. AT$QCMDR=3 means that the mobile tries Service Option 33 when it is in a cdma2000 network that advertises P_REV 6 or higher. When AT$QCMIP >0 and an attempt is made to set AT$QCMDR to less than 3, the mobile will return ERROR.

Note 4: When the AT$QCMIP value is set to 1 or 2, this changes the value of AT$QCPKND to 0. This means that the mobile must see a dial string (such as ATDT#777) on the serial interface before it will originate packet data calls. When AT$QCMIP >0 and an attempt is made to set AT$QCPKND to 1, the mobile returns ERROR.

Note 5: This AT command is for test purposes only and should not be changed by the mobile phone user.

Syntax: **Command syntax:** AT$QCMIP=<Val>

Command	**Possible Responses**
AT$QCMIP? Note: Display the current setting	$QCMIP: 1 OK Note: Command is valid
AT$QCMIP=? Note: Display the range of values	$QCMIP: (0-2) OK Note: Command is valid
AT$QCMIP=0 Note: Set value to 0	OK Note: Command is valid

MIP Selection $QCMIPP

Description: This command is used to select and activate an MIP user profile.

Syntax: **Command syntax:** AT$QCMIPP

Command	Possible Responses
AT$QCMIPP? Note: Display the current setting	$QCMIPP: 0 Note: User profile 1 is currently used
AT$QCMIPP=2 Note: Set to user profile 2	OK Note: Command is valid
AT$QCMIPP=? Note: Display the range of values	$QCMIPP: (0-5) OK Note: Command is valid

Note: Takes a profile number between 0 and 5. This value is stored in NV. This AT command is used to configure Dial-Up Networking.

RFC2002bis Selection $QCMIPT

Description: This command is used to enable or disable the use of rfc2002bis authentication.

Values: **<Val>**

0 Use of rfc2002bis authentication is disabled. Rfc2002 style authentication is used instead.

1 Use of rfc2002bis authentication is enabled.

Note: This AT command is for test purposes only and should not be changed by the mobile phone user.

Syntax: **Command syntax:** AT$QCMIPT=<Val>

Command	Possible Responses
AT$QCMIPT? Note: Display the current setting	$QCMIPT: 1 OK Note: Command is valid
AT$QCMIPT=? Note: Display the range of values	$QCMIPT: (0-3) OK Note: Command is valid
AT$QCMIPT=0 Note: Set value to 0	OK Note: Command is valid

Current Active Profile $QCMIPEP

Description: This command is used to enable or disable the currently active profile.

Values: **<Val>**

0 Disable the currently active profile (profile is unavailable until it is re-enabled.

1 Enable the currently active profile.

Syntax: **Command syntax:** AT$QCMIPEP=<Val>

Command	Possible Responses
AT$QCMIPEP? Note: Display the current setting	$QCMIPEP: 1 OK Note: Command is valid
AT$QCMIPEP=? Note: Display the range of values	$QCMIPEP: (0-1) OK Note: Command is valid
AT$QCMIPEP=0 Note: Set value to 0	OK Note: Command is valid

Return Profile Information $QCMIPGETP

Description: This command is used to return all information corresponding to the specified profile number.

Values: **<Val>**
(0-5) Profile #

Note: If no profile number is entered, all information corresponding to the currently active profile is returned. If there is no profile associated with the specified number, an error is returned.

Syntax: **Command syntax:** AT$QCMIPGETP=<Val>

Command	Possible Responses
AT$QCMIPGETP? Note: Display the current setting	ERROR Note: Command is not valid
AT$QCMIPGETP=? Note: Display the range of values	$QCMIPGETP: (0-5) OK Note: Command is valid
AT$ CMIPGETP=0 Note: Set value to 0	Profile:0 Enabled ….. OK Note: Command is valid

Set NAI for Active Profile $QCMIPNAI

Description: This command is used to set the network access identifier (NAI) for the currently active profile.

Values: **<String>** The network access identifier text to be stored.
<Val>
0 Do not commit to NV
1 Commit to NV

Note 1: Double quotes are only required if the string contains a command.
Note 2: If the value provisioned is not committed to NV, the temporary value will be deleted at the end of the following call if $QCMIPP is called.

Syntax: **Command syntax:** AT$QCMIPNAI=<String>,<Val>

Command	Possible Responses
AT$QCMIPNAI? Note: Display the current setting	User1@myprovider.com,1 OK Note: Command is valid
AT$QCMIPNAI=? Note: Display the range of accepted character values.	$QCMIPNAI: (20,21,23-7E),(0-1) OK Note: ASCII hexadecimal character range supported by this command. (All non-control codes.)
AT$QCMIPNAI=myName@myDomain.com,0 Note: Non-committed value set	OK Note: NAI is now: myName@MyDomain.com

Set Reverse Tunneling $QCMIPRT

Description: This command is used to set the reverse tunneling currently active profile.

Values: **<Val1>**
0 Do not request reverse tunneling
1 Request reverse tunneling
<Val2>
0 Do not commit to NV
1 Commit to NV

Note: f the value provisioned is not committed to NV, the temporary value will be deleted at the end of the following call if $QCMIPP is called.

Syntax: **Command syntax:** AT$QCMIPRT=<Val1>, <Val2>

Command	Possible Responses
AT$QCMIPRT? Note: Display the current setting	$QCMIPRT: 1,1 OK Note: Command is valid
AT$QCMIPRT=? Note: Display the range of values	$QCMIPRT: (0-1), (0-1) OK Note: Command is valid
AT$QCMIPRT=1,1 Note: Set value to 1 and commit	OK Note: Command is valid

Set MN-AAA Shared Secrets in Active Profile $QCMIPMASS

Description: This command is used to set MN-AAA shared secrets for the currently active profile.

Values: **<String>** The shared secret text to be stored.
<Val>
0 Do not commit to NV
1 Commit to NV

Note 1: Double quotes are only required if the string contains a command.
Note 2: If the value provisioned is not committed to NV, the temporary value will be deleted at the end of the following call if $QCMIPP is called.

Syntax: **Command syntax:** AT$QCMIPMASS =<String>,<Val>

Command	Possible Responses
AT$QCMIPMASS? Note: Display the current setting	$QCMIPMASS: Set OK Note: Command is valid
AT$QCMIPMASS=? Note: Display the range of accepted character values.	$QCMIPMASS: (20,21,23-7E),(0-1) OK Note: ASCII hexadecimal character range supported by this command. (All non-control codes.)
AT$QCMIPMASS= my5ecretC0de,0 Note: Non-committed value set	OK Note: MN-AAA is now: my5ecretC0de

Set MN-HA Shared Secrets in Active Profile $QCMIPMHSS

Description: This command is used to set MN-HA shared secrets for the currently active profile.

Values: **<String>**The shared secret text to be stored.
<Val>
0 Do not commit to NV
1 Commit to NV

Note 1: Double quotes are only required if the string contains a command.
Note 2: If the value provisioned is not committed to NV, the temporary value will be deleted at the end of the following call if $QCMIPP is called.

Syntax: **Command syntax:** AT$QCMIPMHSS =<String>,<Val>

Command	Possible Responses
AT$QCMIPMHSS? Note: Display the current setting	$QCMIPMHSS: Set OK Note: Command is valid
AT$QCMIPMHSS=? Note: Display the range of values	$QCMIPMHSS: (20,21,23-7E),(0-1) OK Note: Command is valid
AT$QCMIPMHSS=20,0 Note: Set value to 20, 0	OK Note: Command is valid

Set MN-AAA Shared Secrets in HEX Active Profile $QCMIPMASSX

Description: This command is used to set MN-AAA shared secret for the currently active profile in HEX.

Values: **<HEX>** Hex value from 0 to FFFFFFFF
<Val>
0 Do not commit to NV
1 Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted at the end of the following call if $QCMIPP is called.

Syntax: **Command syntax:** AT$QCMIPMASSX =<HEX>,<Val>

Command	Possible Responses
AT$QCMIPMASSX? Note: Display the current setting	$QCMIPMASSX: Set OK Note: Command is valid
AT$QCMIPMASSX=? Note: Display the range of values	$QCMIPMASSX: (0-FFFFFFFF),(0-1) OK Note: Command is valid
AT$QCMIPMASSX=FF,0 Note: Set value to 0xFF, but not commit	OK Note: Command is valid

Set MN-HA Shared Secrets in HEX Active Profile $QCMIPMHSSX

Description: This command is used to set MN-HA shared secret for the currently active profile in HEX.

Values: **<HEX>** Hex value from 0 to FFFFFFFF
<Val>
0 Do not commit to NV
1 Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted at the end of the following call if $QCMIPP is called.

Syntax: **Command syntax:** AT$QCMIPMHSSX =<HEX>,<Val>

Command	Possible Responses
AT$QCMIPMHSSX? Note: Display the current setting	$QCMIPMHSSX: Set OK Note: Command is valid
AT$QCMIPMHSSX=? Note: Display the range of values	$QCMIPMHSSX: (0-FFFFFFFF),(0-1) OK Note: Command is valid
AT$QCMIPMHSSX=FF,0 Note: Set value to 0xFF, but not commit	OK Note: Command is valid

Set MN-AAA Shared Secrets in Active Profile $QCMIPMASPI

Description: This command is used to set MN-AAA SPIs for the currently active profile.

Values: **<SPI>** SPI value from 0 to 4294967295
<Val>
0 Do not commit to NV
1 Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted if the modem is power cycled or if the $QCMIPP command is used.

Syntax: **Command syntax:** AT$QCMIPMASPI =<SPI>,<Val>

Command	Possible Responses
AT$QCMIPMASPI? Note: Display the current setting	$QCMIPMASPI: 1234,1 OK Note: Command is valid
AT$QCMIPMASPI=? Note: Display the range of values	$QCMIPMASPI: (0-4294967295),(0-1) OK Note: Command is valid
AT$QCMIPMASPI=2300,0 Note: Set value to 2300, but not commit	OK Note: Command is valid

Set MN-HA Shared Secrets in Active Profile $QCMIPMHSPI

Description: This command is used to set MN-HA SPIs for the currently active profile. Two arguments – SPI value and one of the values: 0 and 1.

Values: **<SPI>** SPI value from 0 to 4294967295
<Val>
0 Do not commit to NV
1 Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted if the modem is power cycled or if the $QCMIPP command is used.

Syntax: **Command syntax:** AT$QCMIPMHSPI =<SPI>,<Val>

Command	Possible Responses
AT$QCMIPMHSPI? Note: Display the current setting	$QCMIPMHSPI: 1234,1 OK Note: Command is valid
AT$QCMIPMHSPI=? Note: Display the range of values	$QCMIPMHSPI: (0-4294967295),(0-1) OK Note: Command is valid
AT$QCMIPMHSPI=5500,0 Note: Set value to 5500, but not commit	OK Note: Command is valid

Set Primary HA IP Address $QCMIPPHA

Description: This command is used to set the primary HA address of the mobile for the currently active profile. The command takes two arguments, a string corresponding to the IP address of the HA to be stored and a number (either 0 or 1) indicating whether or not to commit this value to NV. The IP address should be formatted in standard dotted-decimal notation, e.g. “10.1.1.20”.

Values: **<IP>** IP address in standard dotted-decimal notation, e.g. “10.1.1.20”.
<Val>
0 Do not commit to NV
1 Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted if the modem is power cycled or if the $QCMIPP command is used.

Syntax: **Command syntax:** AT$QCMIPPHA =<IP>,<Val>

Command	Possible Responses
AT$QCMIPPHA? Note: Display the current setting.	$QCMIPPHA: 10.1.1.20, 0 OK
AT$QCMIPPHA =? Note: Display the range of values.	$QCMIPPHA: ((0-255).(0-255).(0-255).(0-255)),(0-1) OK
AT$QCMIPPHA =10.1.2.15,1 Note: Set to 10.1.2.15, and commit to NV.	OK

Set Secondary HA IP Address $QCMIPSHA

Description: This command is used to set the secondary HA address of the mobile for the currently active profile. The command takes two arguments, a string corresponding to the IP address of the HA to be stored and a number (either 0 or 1) indicating whether or not to commit this value to NV. The IP address should be formatted in standard dotted-decimal notation, e.g. “10.1.1.20”.

Values: **<IP>** IP address in standard dotted-decimal notation, e.g. “10.1.1.20”.
<Val>
0: Do not commit to NV
1: Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted if the modem is power cycled or if the $QCMIPP command is used.

Syntax: **Command syntax:** AT$QCMIPSHA =<IP>,<Val>

Command	Possible Responses
AT$QCMIPSHA? Note: Display the current setting.	$QCMIPSHA: 10.1.1.20, 0 OK
AT$QCMIPSHA =? Note: Display the range of values.	$QCMIPSHA: ((0-255).(0-255).(0-255).(0-255)),(0-1) OK
AT$QCMIPSHA =10.1.2.15,1 Note: Set to 10.1.2.15, and commit to NV.	OK

Set Home HA IP Address $QCMIPHA

Description: This command is used to set the home HA address of the mobile for the currently active profile. The command takes two arguments, a string corresponding to the IP address of the HA to be stored and a number (either 0 or 1) indicating whether or not to commit this value to NV. The IP address should be formatted in standard dotted-decimal notation, e.g. “10.1.1.20”.

Values: **<IP>** IP address in standard dotted-decimal notation, e.g. “10.1.1.20”.
<Val>
0 Do not commit to NV
1 Commit to NV

Note: If the value provisioned is not committed to NV, the temporary value will be deleted if the modem is power cycled or if the $QCMIPP command is used.

Syntax: **Command syntax:** AT$QCMIPHA =<IP>,<Val>

Command	Possible Responses
AT$QCMIPHA? Note: Display the current setting.	$QCMIPHA: 10.1.1.20, 0 OK
AT$QCMIPHA =? Note: Display the range of values.	$QCMIPHA: ((0-255).(0-255).(0-255).(0-255)),(0-1) OK
AT$QCMIPHA =10.1.2.15,1 Note: Set to 10.1.2.15, and commit to NV.	OK

Chapter 18 – TCP/IP App AT Commands

This section details the AT commands that are available with the TCP App feature. This feature provides functionality for establishing multiple TCP and UDP compliant non-blocking socket connections over an IP network while retaining AT command level control of the modem.

The TCP App feature includes a set of AT commands and unsolicited responses for host application initialization and control of its functionality. The following table summarizes the AT commands and responses that are used with the TCP App feature.

Command	Description
AT+WPPP	Start or end a PPP session
AT+WOSK	Open a socket
AT+WCSK	Close a socket
AT+WSTX	Transmit socket data
AT+WSRX	Receive polled socket data
AT+WGSS	Display connection status
AT+WTMO	Configure socket transmit timeout
AT+WCRX	Configure receive data mode
AT+WIPC	Show current module IP address
AT+WDNS	IP address lookup
AT+WFDM	Force dormant mode

Response	Description
+WPPP	PPP session status
+WSKS	Socket state change
+WSKE	Socket open/close error
+WSTX	Socket data transmission status
+WSTE	Socket data transmission error
+WSRX	Received socket data
+WSRE	Socket data error
+WDOR	Dormant mode status change
+WDNS	DNS lookup indication

A number of standard AT commands are not available when the TCP App feature is in use; that is, an AT+WPPP session has been successfully started. See Chapter 20 for a list of these restricted AT commands. The ERROR result will be returned in their attempted use.

Start/End PPP Connection +WPPP

Description: This command is used to open or close a PPP session with the carrier. This includes the starting or stopping of the associated CDMA 1xRTT data call. The module must be in the idle state (no call in progress) when a new PPP session is requested; otherwise, an error will be returned. When closing the PPP session, all open sockets are also closed.

Values: **<mode>**

- **0** Initiates a 1xRTT data call, either MIP or SIP, with no userID or password. If SIP is used, then the userID and password provisioned in the module NVRAM are used.
- **1** Initiates a 1xRTT data call, either MIP or SIP, using the specified userID and password. If SIP is used, then the specified userID and password is used.
- **2** Closes the PPP session and ends the data call. All open TCP/UDP sockets must be closed prior to issuing this command.

<userID> The user identification string to be used to authenticate the SIP connection.
<password> The password string to be used to authenticate the SIP connection.

Note: A MIP data call does not require a userID or password.

Syntax: **Command syntax:** AT+WPPP=<mode>,<userID>,<password>

Command	Possible responses
AT+WPPP=0 Note: Start a data call and initiate a PPP session.	OK +WPPP:201 (negotiating) +WPPP:200 (connected) Note: PPP session started.
AT+WPPP=2 Note: End the PPP session.	OK +WPPP:203 (closing) +WPPP:202 (disconnected) Note: PPP session ended.
AT+WPPP=1,”johndoe”,”mypassword” Note: Start a PPP session using the specified account information.	OK +WPPP:201 (negotiating) +WPPP:202 (disconnected) Note: PPP session failed. Possible invalid account.
AT+WPPP? Note: Show last used command parameters.	+WPPP: 1,”johndoe”,”mypassword” OK Note: Last used command parameters displayed.

Open Socket +WOSK

Description: This command is used to open a socket connection to a server. A PPP session must be established prior to issuing this command using the AT+WPPP=0 command. The socket connection type, IP address, and IP port number must be specified. The +WOSK command returns an immediate response that indicates the socket number that will be associated with the connection request.

A total of four concurrent open socket connections are supported. Any combination of the supported socket types are permitted. The +WSKE unsolicited response is used to report errors associated with opening socket connections.

For TCP sockets, once the connection with the server is actually established or has failed, the +WSKS unsolicited response will be returned to the host application.

For UDP sockets, the +WSKS unsolicited response is returned immediately to the host application following socket initialization. UDP socket connections are open ended and connectivity with the target server is not verified as part of the open socket command. A subsequent application layer step is necessary to verify socket connectivity.

Values: **<type>**

- **0** TCP
- **1** UDP

<ip1 – ip4> The IP address to use for this socket connection. The valid range for each portion of the IP address is 0 – 255. Ip1 is the MSB and ip4 is the LSB of the IP address. Note that the four IP address parts must be comma separated.

<port> The port number to be used for this socket connection. Valid port number values are in the range 0 to 65535.

Response Values

<type>

- **0** TCP
- **1** UDP

<socket> The socket number of the potential connection.

Syntax: **Command syntax:** AT+WOSK=<type>,<ip1 – ip4>,<port>
Immediate response syntax: +WOSK: <type>,<socket>

Command	Possible responses
AT+WOSK=0,123,66,0,43,78 Note: Start a TCP socket connection to IP address 123.66.0.43 using port 78.	+WOSK: 0,0 OK +WSKS: 0,0,1 Note: TCP socket zero is open.
AT+WOSK=1,127,75,8,101,3298 Note: Start a UDP socket connection to IP address 127.75.8.101 using port 3298. Two other UDP sockets are already open.	+WOSK: 1,2 OK +WSKS: 1,2,1 Note: UDP socket two is open.
AT+WOSK? Note: Show last used command parameters.	+WOSK: 1,127,75,8,101,3298 OK Note: Last used command parameters displayed.
AT+WOSK=0,123,16,98,6,28 Note: Attempt a TCP socket connection.	+WOSK: 0,1 OK +WSKE: 0,1,115 Note: Connection refused.
AT+WOSK=? Note: Display command parameter ranges.	+WOSK: (0-1),(0-255),(0-255),(0-255),(0-255),(0-65535) OK

Close Socket +WCSK

Description: This command is used to close an open or initializing socket connection. A valid socket type and number must be specified. If a valid open socket is specified, shutdown of the specified socket is initiated. Once the socket is actually closed, the +WSKS unsolicited response will be returned.

Values: **<type>**
0 TCP
1 UDP
<socket> The number of an open or initializing socket.

Syntax **Command syntax:** AT+WCSK=<type>,<socket>

Command	Possible responses
AT+WCSK=0,1 Note: Close TCP socket connection one.	OK +WSKS: 0,1,4 Note: TCP socket closed.
AT+WCSK=1,2 Note: Close UDP socket connection two.	OK +WSKS: 1,2,4 Note: UDP socket closed.
AT+WCSK? Note: Show last used command parameters.	+WCSK: 1,2 OK Note: Last used command parameters displayed.
AT+WCSK=0,7 Note: Close TCP socket connection seven.	ERROR +WSKE: 0,7,100 Note: Invalid socket number specified.
AT+WCSK=? Note: Display command parameter ranges.	+WCSK: (0-1),(0-3) OK

Transmit Socket Data +WSTX

Description: This command is used to transmit data to a socket connection. The socket must be opened prior to issuing this command. The socket type, socket number, and the number of bytes to transmit must be specified. The maximum number for bytes for the payload portion of this command is dependent on the socket type; TCP sockets: 536 bytes, UDP sockets: 1330 bytes.

A carriage return character is required after the <type>, <socket>, and <length> parameters. The <cr> character (0x0d) causes the module to change modes and process <length> number of payload bytes from the serial port. Once <length> number of payload bytes have been processed, an OK is returned and the <payload> is then transmitted on the specified socket connection. All bytes received on the module serial port will be interpreted as payload until <length> bytes are processed. If <length> bytes are not sent, a timeout and ERROR return will occur after the AT+WTMO specified time value (default 500 milliseconds). Partial payload data for a timed out AT+WSTX command will be discarded.

Values: **<type>**
0 TCP
1 UDP
<socket> The number of an open socket.
<length> The number of bytes in the payload parameter not including the required <cr> character. This value is an ASCII character decimal number. TCP range 1 – 536, UDP range 1 – 1330.
<cr> Required separator character; value 0x0d.
<payload> The binary data to be transmitted on the specified socket.

Note: This command functions only when a traffic channel is present or the module is not dormant.

Syntax: **Command syntax:** AT+WSTX=<type>,<socket>,<length><cr><payload>

Example: Sending 4 bytes of data if you want to send the word "TEST" in plain text/ASCII:

Command	Possible responses
AT+WSTX=0,0,4<cr>**TEST** Note: Transmit “TEST” on TCP socket zero.	OK +WSTX: 0,0,4 Note: Payload transmitted.
AT+WSTX=0,1,4<cr>**TEST** Note: Transmit “TEST” on TCP socket one.	ERROR +WSTE: 0,1,114 Note: Socket not connected error.
AT+WSTX=1,2,4<cr>**TEST** Note: Transmit “TEST” on UDP socket two.	OK +WSTX: 1,2,4 Note: Payload transmitted.
AT+WSTX? Note: Show last used command parameters.	+WSTX: 1,2,4 OK Note: Last used command parameters displayed.

Read Receive Data +WSRX

Description: This command is used to read and clear the socket receive data buffer when received data polling has been specified by the +WCRX command for the socket type. A valid socket type and socket number must be specified and the socket must be open. The +WSRX unsolicited response is used to return the received socket data to the host application.

The software returns payload data up to approximately 600 bytes using a single +WSRX unsolicited response. This limit does not effect TCP sockets since the maximum TCP packet size is 536 bytes. For UDP sockets, where the payload packet size can be larger, multiple +WSRX unsolicited responses will be used as necessary to return the packet data to the host application. Each response will contain the next sequential part of the received UDP packet data. When using received data polling and a large UDP packet size, the host application must be designed to handle multiple +WSRX responses for each AT+WSRX command that is issued.

Values: **<type>**

0 TCP

1 UDP

<socket> The number of an open socket.

Syntax: **Command syntax:** AT+WSRX=<type>,<socket>

Command	Possible responses
AT+WSRX=0,1 Note: Read the pending TCP data.	+WSKS: 0,1,2 Note: Data available on TCP socket one. +WSRX: 0,1,536:TEST … OK Note: Data “TEST” read from TCP socket one input buffer. Input buffer cleared.
AT+WSRX=1,2 Note: Read the pending UDP data.	+WSKS: 1,2,2 Note: Data available on UDP socket two. +WSRX: 1,2,600:TEST … +WSRX: 1,2,300: … OK Note: A 900 byte packet beginning with “TEST” read from UDP socket two input buffer. Input buffer cleared.
AT+WSRX? Note: Show last used command parameters.	+WSRX: 1,2 OK Note: Last used command parameters displayed.
AT+WSRX=? Note: Display command parameter ranges.	+WSRX: (0-1),(0-3) OK

Display Connection Status +WGSS

Description: This command is used to display the current status of the specified socket type. This information includes the PPP link state, the receive data mode, and the connection state of each potential socket. **20.6.2**

Values: **<type>**
- **0** TCP
- **1** UDP

Response Values

<type>
- **0** TCP
- **1** UDP

<PPPstate>
- **0** PPP Closed
- **1** PPP Initializing
- **2** PPP Open

<RxMode>
- **0** Polled; received data must be read using the +WSRX command.
- **1** Unsolicited; the +WSRX response is sent when socket data is received.

<SocketState>
- **0** Socket Closed
- **1** Socket Initializing
- **2** Socket Open

Syntax: **Command syntax:** AT+WGSS=<type>
Immediate response: +WGSS: <type>,<PPPstate>,<RxMode>,<SocketState>[,<SocketState>, …]

Command	Possible responses
AT+WGSS=? Note: Display command parameter ranges.	+WGSS: (0-1) OK Note: Parameter ranges displayed.
AT+WGSS=0 Note: Display the TCP connection status.	+WGSS: 0,2,1,2,1,0,0 OK Note: PPP layer is open, unsolicited receive data mode, TCP socket zero is open, TCP socket one is initializing, TCP sockets 3 and 4 are closed.
AT+WGSS=1 Note: Display the UDP connection status.	+WGSS: 1,2,0,2,0,0,0 OK Note: PPP layer is open, polled receive data mode, UDP socket zero is open.

Configure Socket Transmit Timeout +WTMO

Description: This command is used to configure the socket transmit timeout value. This value is used whenever the AT+WSTX command is issued by the host application. The timeout value specifies the maximum amount of time to wait for the data portion of the AT+WSTX command. An ERROR is returned to the host application if the timer expires.

Values: **<time>** The number of milliseconds to wait. Default 500 milliseconds.

Syntax **Command syntax:** AT+WTMO=<time>

Command	Possible responses
AT+WTMO=? Note: Display command parameter ranges.	+WTMO: (500-65535) OK Note: Parameter ranges displayed.
AT+WTMO=1000 Note: Set timeout value to 1 second.	OK Note: Command accepted.
AT+WTMO? Note: Show configured timeout value.	+WTMO: 1000 OK Note: Timeout value set to 1 second.

Configure Receive Data Mode +WCRX

Description: This command is used to configure the receive data mode for each socket type. The specified configuration is used for all sockets of the specified type. This command may be used only when a PPP connection is not active.

Values:
<type>
0: TCP
1: UDP
<RxMode>
0: Polled; received data must be read using the +WSRX command.
1: Unsolicited; the +WSRX response is sent when socket data is received.

Syntax: **Command syntax:** AT+WCRX=<type>,<RxMode>

Command	Possible responses
AT+WCRX=? Note: Display command parameter ranges.	+WCRX: (0-1),(0-1) OK Note: Parameter ranges displayed.
AT+WCRX=0,0 Note: Set TCP receive data mode to polled.	OK Note: Command accepted.
AT+WCRX? Note: Show last used command parameters.	+WCRX: 1,1 OK Note: Last used command parameters displayed.

Force Dormant Mode +WFDM

Description: This command is used to immediately force the Q24x8 module into dormant mode. The module normally enters dormant mode after a carrier specific time of no traffic channel activity during a data call. In dormant mode, the module releases CDMA traffic channel resources to conserve power and minimize carrier network loading. For some applications, this command can help reduce carrier network charges.

Values: None.

Syntax: **Command syntax:** AT+WFDM

Command	Possible responses
AT+WFDM Note: Force module into dormant mode.	OK +WDOR: 1 Note: Command accepted.

IP Address Lookup +WDNS

Description: This command is used to display the IP address for a specified domain name. A DNS server is used to perform the lookup of the domain name and return its associated IP address. Since there is a variable time delay between the DNS server lookup request and the returned IP address, a multiple step process is used to display the results of the DNS lookup. Refer to the following examples. An open PPP session is required.

Note: The +WDNS command must be issued twice for each domain name lookup attempt.

Values **<domain name>** The domain name string to lookup. The quotes around the name are required. The same domain name must be specified in the second command.

Syntax: **Command syntax:** AT+WDNS=”<domain name>”

Command	Possible responses
AT+WDNS=”www.wavecom.com” Note: Lookup IP address for specified domain name. AT+WDNS=”www.wavecom.com” Note: Re-issue command to display results.	OK Note: Command accepted. … +WDNS: 0 Note: Lookup on DNS server completed. +WDNS: 213.41.30.26 OK Note: IP address displayed.
AT+WDNS? Note: Display last used domain name.	+WDNS: ”www.wavecom.com” OK
AT+WDNS=”bad.dns.name” Note: Lookup IP address. A/ Note: Re-issue last command.	OK Note: Command accepted. … +WDNS: 0 Note: Lookup on DNS server completed. ERROR +WDNS: 125 Note: Domain name not found.

Display IP Address +WIPC

Description: This command is used to display the IP address that is currently assigned to the module. An open PPP session is required.

Values: None.

Syntax: **Command syntax:** AT+WIPC

Command	Possible responses
AT+WIPC Note: Display current IP address.	+WIPC: 68.25.209.28 OK Note: IP address displayed.

PPP Session Status +WPPP

Description: This unsolicited response indicates a change in the PPP session status. The new PPP session status is included in this response.

Response Values:

<status> PPP session status.

- **200** PPP established and available.
- **201** PPP initialization in progress
- **202** PPP closed or unavailable
- **203** PPP is closing

Syntax: **Response syntax:** +WPPP: <status>

Possible responses
+WPPP: 200 Note: PPP Session established and available.

Socket State Change +WSKS

Description: This unsolicited response indicates a change in a socket state. This response is used to report socket "Receive data is available" only when the corresponding socket type receive data mode is set to 'polled' (+WCRX command).

Response Values:

<type> The socket type associated with this state change.
- **0** TCP
- **1** UDP

<socket> The socket number associated with this state change.

<status> The current socket state;
- **1** Socket is open.
- **2** Receive data is available.
- **4** Socket is closed.

Syntax: **Response syntax:** +WSKS: <type>,<socket>,<state>

Possible responses
+WSKS: 0,0,1 Note: TCP socket zero has opened.
+WSKS: 0,0,2 Note: TCP socket zero has received data available.
+WSKS: 1,0,2 Note: UDP socket zero has received data available.
+WSKS: 1,1,4 Note: UDP socket one has closed.

Socket Open/Close Error +WSKE

Description: This unsolicited response indicates that an error has occurred during a socket open or close operation.

Response Values:

<type> The socket type associated with this error.
- **0** TCP
- **1** UDP

<socket> The socket number associated with this error.

<error> The error indication of the socket. See sections 21.12 and 21.13 for a list of the returned codes and their meanings.

Syntax: **Response syntax:** +WSKE: <type>,<socket>,<error>

Possible responses
+WSKE: 0,0,100 Note: Invalid descriptor for TCP socket zero.
+WSKE: 1,1,117 Note: Connection reset on UDP socket one.

Socket Data Transmission Status +WSTX

Description: This unsolicited response indicates the number of bytes transmitted for the most recently used +WSTX command on the indicated socket.

Response Values:

<type> The socket type associated with this transmission status.
- **0** TCP
- **1** UDP

<socket> The socket number associated with this transmission status.

<length> The number of bytes transmitted. This value is an ASCII character decimal number.

Syntax: **Response syntax:** +WSTX: <type>,<socket>,<length>

Possible responses	
+WSTX: 0,0,536	Note: 536 bytes sent on TCP socket zero.
+WSTX: 1,1,600	Note: 600 bytes sent on UDP socket one.

Socket Data Transmission Error +WSTE

Description: This unsolicited response indicates that an error has occurred during a socket data transmission.

Response Values:

<type> The socket type associated with this error.
0 TCP
1 UDP
<socket> The socket number associated with this error.
<error> The error indication of the socket. See sections 21.12 and 21.13 for a list of the returned codes and their meanings.

Syntax: **Response syntax:** +WSTE: <type>,<socket>,<error>

Possible responses
+WSTE: 0,0,102 Note: Blocked transmission for TCP socket zero.
+WSTE: 1,1,117 Note: Connection reset on UDP socket one.

Received Socket Data +WSRX

Description: This unsolicited response returns received data from the indicated socket to the host application. Each +WSRX response contains the next sequential portion of the received socket data. Depending on network congestion, the payload size may vary from response to response.

Response Values:

<type> The socket type associated with this data reception.
0 TCP
1 UDP
<socket> The socket number associated with this data reception.
<length> An ASCII character decimal number indicating the number of bytes in the <payload> portion of the response.
: (colon) Length and payload field separator.
<payload> The binary data bytes received from the indicated socket.

Syntax: **Response syntax:** +WSRX: <type>,<socket>,<length>:<payload>

Possible responses
+WSRX: 0,0,536:0x54 0x45 0x53 0x54 … Note: 536 bytes received on TCP socket zero.
+WSRX: 1,1,300:TEST … Note: 300 bytes received on UDP socket one.

Socket Data Error +WSRE

Description: This unsolicited response indicates that an error has occurred during the reception of socket data.

Response Values

<type> The socket type associated with this error.
0 TCP
1 UDP
<socket> The socket number associated with this error.
<error> The error indication of the socket. See sections 21.12 and 21.13 for a list of the returned codes and their meanings.

Syntax: **Response syntax:** +WSRE: <type>,<socket>,<error>

Possible responses
+WSRE: 0,0,119 Note: Broken pipe for TCP socket zero.
+WSRE: 1,1,117 Note: Connection reset on UDP socket one.

Dormant Mode Status Change +WDOR

Description: This unsolicited response is used to indicate a change in the module dormant mode status. The module enters dormant mode after a carrier specific amount of time (about 10 seconds) of no activity during a data call. In dormant mode, the module releases CDMA traffic channel resources to conserve power and minimize carrier network loading. The module exits dormant mode when activity requiring CDMA traffic channel resources is again necessary.

Response Values:

<status>

0 Normal mode; CDMA traffic channel is active.

1 Dormant mode; CDMA traffic channel is inactive.

Syntax: **Response syntax:** +WDOR: <status>

Possible responses
+WDOR: 0 Note: Module not in dormant mode.
+WDOR: 1 Note: Module in dormant mode.

DNS Lookup Indication +WDNS

Description : This unsolicited response is used to indicate the result of each step of a domain name lookup operation using the +WDNS command. See the +WDNS command for more information. **20.20.2**

Response Values:

<status>

0 DNS lookup results available.

<ip address> DNS lookup result.

Syntax: **Response syntax:** +WDNS: <status>
+WDNS: <ip address>

Possible responses
+WDNS: 0 Note: DNS lookup step one complete.
+WDNS: 213.41.30.26 Note: DNS lookup step two complete.

Chapter 19 – Reference Information

MS Error Result Code : +CME ERROR: <err>

<err>	Meaning	Resulting from the following commands
1-2	Reserved	
3	Operation not allowed	All GSM 07.07 commands (+CME ERROR: 3)
4	Operation not supported	All GSM 07.07 commands (+CME ERROR: 4)
5-9	Reserved	
10	UIM not inserted	+CPIN
11	UIM PIN1 required	+CPIN
12	UIM PUK1 required	+CPIN, +CPIN2
13	UIM failure	+CPIN, +CPIN2
14-15	Reserved	
16	UIM wrong password	+CPIN, +CPIN2
17	UIM PIN2 required	+CPIN, +CPIN2
18	UIM PUK2 required	+CPIN, +CPIN2
19	Reserved	
20	Phone Book full	+CPBF, +CPBW
21	Invalid Index for Phone Book	+CPBF
22	Phone Book entry not found	+CPBF, +CPBP, CPBS
23	Reserved	
24	Text string too long	
25	Reserved	
26	Dial string too long	
27-29	Reserved	
30	No network service	
31-40	Reserved	
41	Software resource not available	For example: +WPRV, +CICB, +WFSH, +CCFC, +WNAM, +COPS, +WRMP, +WPRL
42	Invalid parameter	All commands
43	Non-Volatile Memory failure	All commands
44	Invalid WPIN code or WPIN required	All commands except ATD
45	Invalid WSPC provisioning code	+WSPC, +WMDN, +WIMI, +WSID, +WAOC, +WSCI, +WBGP, +WBGS, +WPDS, +WCMT
46	OTKSL provisioning code access restricted +	WMDN, +WSCI, +WBGP, +WBGS, +WPDS
47-49	Reserved	
50	Session already in progress	gpsOne
51	Invalid PD parameter	gpsOne
52	PD parameter not supported	gpsOne
53	Tracking mode requires +WPDFR setup	gpsOne
54	No active session	gpsOne

Message Service Failure Result Code: +CMS ERROR: ‹err›

<error>	Meaning	Resulting from the Following Commands
55-147	Reserved	
148	Unsupported serial port baud rate	+WPPP
149	Socket transmit timeout	+WSTX
150-239	Reserved	
240	FDN is active and number is not in FDN	+CMGS, +CMSS
241-301	Reserved	
302	Operation not allowed	All SMS commands (+CMSS, +CMGL, +CPMS…
303	Reserved	
304	Invalid mode parameter	+CMGS, +CMGW
305	Invalid text mode parameter	+CMGS, +CMGW, +CMSS
306-320	Reserved	
321	Invalid memory index	+CMGR, +CMSS, +CMGD
322-339	Reserved	
340	No +CNMA acknowledgement expected	+CNMA
341	Non Volatile Memory failure	All SMS commands
342-499	Reserved	

Specific Error Result Codes

<error>	Meaning	Resulting from the Following Commands
500	unknown error.	All commands
501-512	Reserved	
513	Lower layer failure (for SMS)	+CMGS, +CMSS (+CMS ERROR: 513)
514	Reserved	
515	Please wait. Initialization or command processing in progress.	Phonebook Initialization
516-518	Reserved	
519	Reset the product to activate or change a new echo cancellation.	+ECHO, +VIP
520-530	Reserved	
531	Only FDN phonebook entries can be sent when the FD facility is enabled.	+CMGS, +CMSS
532-599	Reserved	

Extended Error Report (+CEER) Call Processing Codes

Cause Value	Diagnostic
0	No error detected in call processing
1	No CDMA service detected
2	Modem is in a call, operation not allowed
3	Modem is not in a call, operation not allowed
4	Modem is in an unknown call state
5	Call Barring is ON
6	Invalid or Not allowed CDMA Service Option
7	Invalid Parameter
8	Operation only allowed during an incoming call
9	Invalid Mode Selection
10	Invalid Roam Selection
11	Invalid Band Selection

Final Result Codes

Verbose Result Code	Numeric (V0 set)	Description
+CME ERROR: <err>	As verbose	Error from GSM 07.05 commands
+CMS ERROR: <err>	As verbose	Error from SMS commands (07.07)
BUSY	7	Busy signal detected
ERROR	4	Command not accepted
NO ANSWER	8	Connection completion timeout
NO CARRIER	3	Connection terminated
OK	0	Acknowledges correct execution of a command line
RING	2	Incoming call signal from network

Intermediate Result Codes

Verbose Result Code	Numeric (V0 set)	Description
+COLP :<number>,<type>	as verbose	Outgoing Call Presentation
+CR : <type>	as verbose	Outgoing Call report control
+ILRR: <rate>	as verbose	Local TA-TE data rate
CONNECT 300	10	Data connection at 300 bauds
CONNECT 1200	11	Data connection at 1200 bauds
CONNECT 1200/75	12	Data connection at 1200/75 bauds
CONNECT 2400	13	Data connection at 2400 bauds
CONNECT 4800	14	Data connection at 4800 bauds
CONNECT 9600	15	Data connection at 9600 bauds
CONNECT 14400	16	Data connection at 14400 bauds
+CSSI: <code1>[,<index>]	As verbose	Supplementary service notification during a call setup

gpsOne Error Result Code: +WPDER: ‹code›

The following table lists the numeric status codes that can be returned by the +WPDER unsolicited response.

<code>	Description	<code>	Description
0	GPS session started	39	Wrong server Information parameters
1	Phone offline	40	Error in timeout parameter
2	No service	41	Error in quality of service parameter
3	No connection with PDE	42	No session active while trying to end session
4	No data available	43	Session active for this client
5	Session manager busy	44	Session busy status
6	Phone is CDMA locked	45	Phone is offline
7	Phone is GPS locked	46	Phone is CDMA locked
8	Connection failure with PDE	47	GPS is locked
9	PDSM ended session because of error	48	The command is invalid in this state.
10	User ended the session	49	Connection failure with PDE.
11	End key pressed	50	Internal software communication problem
12	Network session was ended	51	Communication problems with search engine
13	Timeout for GPS search	52	GPS results cannot be reported at this time
14	Conflicting info for session and privacy	53	Mode not supported
15	Error in fix	54	Unknown problem was found
16	Reject from PDE		
17	Ending session due to traffic channel exit	61	No buffers available
18	Ending session due to E911 call	62	Invalid client ID
19	Added protocol specific error type	63	Error in parameter to set
20	Ending because base station info is stale	64	Error in lock type
		65	Phone is offline state
31	Invalid client ID parameter	66	An active command is running
32	Bad service parameter	67	Wrong app info
33	Bad session type parameter	68	Unknown problem was found
34	Bad privacy parameter		
35	Bad download parameter	80	Begin a GPS session
36	Bad net access parameter	81	End of the GPS session
37	Bad operation parameter	82	Begin a data download session
38	Bad number of fixes parameter	83	End of the download session

Parameters Storage

The *Immediate Save* column denotes parameters that are saved to NVRAM when the associated command is issued.

Command	AT&W	Immediate Save	AT&F	Default Values
General commands				
+CMEE	X		X	0: disable
+CRSL	X	X	X	1
+CSCS	X		X	CDMA
+WIND		X	X	RUIM: 0xC9; TE:0xC8
Call Control Commands				
%D		X	X	0: disable
+CICB	X		X	2: speech
+CSNS	X		X	2: speech
+ECHO	X	X	X	5
+SIDET	X		X	0,3: disable/headset
+SPEAKER	X		X	1: handset
+VGR	X		X	3
+VGT	X		X	2
ATS0	X		X	0: no auto answer
Network Commands				
+COPS		X (n,0 mode)		0,0
+CREG	X		X	0: disable
SMS Commands				
+WUSS				0: status change
+WSCL		X	X	RUIM: 6,4
Supplementary Service Commands				
+CLIP	X	X	X	1: enable
+CLCK		X	X	AO:0, AI:0, PB:0, DT:0
Data Commands				
+CRC	X		X	0: disable
+DS	X		X	3,0,2048,6
+DR	X		X	0: disable
+ILRR	X		X	0: disable
V24-V25 Commands				
&C	X	X		2
&D	X	X		2
+ICF	X			3,3
+IFC	X			2,2
+IPR		X		115200
E	X			1: enable
Phonebook				
+WAIP	X	X	X	0
Specific AT Commands				
+ADC		X	X	0: Vbatt
+CMER	X		X	0: no report
+CPHS		X	X	1,1
+W32K		X	X	0: disable
+WCCS		X	X	No translation
+WCDM		X	X	0
+WPAD	X		X	0: disable
+WRIM		X	X	0: pulse
+WSVG		X	X	0: handset

Codes for SMS Status Report (+CDS and +CMGR)

Code	Meaning
Network Problems (IS-41D)	
0	Address vacant
1	Address translation failure
2	Network resource shortage
3	Network failure
4	Invalid Teleservice id
5	Other Network Problem
Terminal Problems (IS-41D)	
32	No page response
33	Destination busy
34	No acknowledgment
35	Destination resource shortage
36	SMS delivery postponed
37	Destination out of resources
38	Destination no longer at this address
39	Other terminal problem
Radio Interface Problems (IS-41D)	
64	Radio IF resource shortage
65	Radio IF incompatible
66	Other Radio IF problem
General problems (IS-41D)	
96	Unexpected parameter size
97	SMS Origination denied
98	SMS Termination denied
99	Supplementary service not supported
100	SMS not supported
101	Reserved
102	Missing expected parameters
103	Missing mandatory parameters
104	Unrecognized parameter value
105	Unexpected parameter value
106	User data size error
107	Other General problems
General Codes (Not defined in IS-41D)	
32768	SMS OK. Message successfully delivered to base station
32769	Waiting for transport layer acknowledgment
32770	Out of resources (e.g. out of memory buffer)
32771	Message too large to be sent over access channel
32772	Message too large to be sent over data traffic channel
32773	Network not ready
32774	Phone not ready
32775	Cannot send message in analog mode
32776	Cannot send broadcast message
32777	Invalid transaction id

AT Commands Supported When SIM Card Removed

The following lists the AT commands that are supported in a RUIM modem (the modem needs a SIM card to operate) when the SIM card is not present.

# List	AT Command	Note and Explanation
1	+IPR	Set modem fixed baud rate
2	+CMEE	Display the error code
3	+CCLK	Clock management
4	+CBC	Battery charge
5	+WIND	General status indication
6	ATE	Set modem local echo
7	+CPOF	Modem Offline mode
8	+CFUN	Reset the modem
9	+WGMI	Manufacturer identification
10	+WGMM	Model identification
11	+CGMR	Revision identification
12	+CGSN	Electronic serial number
13	+CSCS	TE character set selection
14	+CPAS	Phone activity status
15	+CRMP	Ring melody playback
16	+CRSL	Ringer sound level
17	+CSQ	Signal quality
18	+CREG	Network registration and roaming
19	$QCDMG	Transition to diagnostics monitor
20	ATIx	Request Modem Information (x = 0-7)

AT Commands for AMPS Operation

In the AMPS mode, only the voice call is applicable. Although you can issue almost all AT commands, most of the commands are not applicable for AMPS operation; e.g., data commands, SMS, RUIM commands, service programming etc.

The following table lists the AT commands that are meaningful for AMPS operation. Please note that these commands are also applicable in CDMA operations.

# List	AT command	Note and Explanation
1	+COPS	+COPS=2,n (n=0,1)
2	ATD	Making a voice call
3	ATA	Answer a voice call
4	ATDL	Redial last #
5	+VGR	Change the receiving voice volume
6	+VGT	Change the transmitting voice volume
7	+CMUT	Mute the microphone
8	A/	Repeat last command
9	ATS0	Set auto answer
10	ATH	Hang up a voice call
11	ATIx	Request Module Information (x = 0-7)
12	+IPR	Set module baud rate
13	+CNUM	Display module directory #
14	+CGSN	Display module ESN # (in hex format)
15	+CMEE	Display the error code
16	+WPRL	Read the PRL version
17	+CPOF	Module OFF mode
18	+CFUN	Reset the module

TCP App Socket Status Events

Code	Description
1	Socket is open
2	Receive data is available
4	Socket is closed

TCP App Socket Error Codes

Code	Description
0	End Of File (EOF); server is done sending data
100	Invalid socket descriptor
101	Invalid buffer or argument
102	Operation would block
103	Address family not supported
104	Wrong protocol for socket type
105	Socket parameter not supported
106	Protocol not supported
107	No more sockets available for opening
108	Operation not supported
109	Address already in use
110	Destination address required
111	Connection establishment in progress
112	Connection already established
113	IP address changed, causing TCP reset
114	Socket not connected
115	Connection attempt refused
116	Connection attempt timed out
117	Connection reset
118	Connection aborted
119	Broken pipe
120	Network subsystem unavailable
121	No more applications available
122	Invalid application ID
123	There are existing sockets
124	Invalid operation

TCP App DNS Server Codes

Code	Description
125	Domain Name Error or not found
126	Domain Name not found
127	Network is not opened
128	Out of memory
129	DNS Server busy
130	Reserved
131	Reserved
132	Unrecoverable error
133	No address for the domain name

TCP App PPP Network Codes

Code	Description
200	PPP established and available
201	PPP initialization in progress
202	PPP closed or unavailable
203	PPP is closing

TCP App Restricted AT Commands

The following table lists AT commands that should not be used when the TCP App feature is active; that is, a AT+WPPP session has been successfully started.

AT command	Note and explanation
+++	Switch online/offline mode
+CCFC	Call forwarding
+COPS	Mode preference
+ICF	DTE character framing
+IFC	DTE flow control
+IPR	DTE baud rate
+VTS	DTMF burst
+WBND	Band preference
+WFSH	Flash with/without information
+WIOTA	IOTA control
+WNAM	Set NAM
+WOSO	CDMA origination
+WRMP	Roam preference
+WSDT	DTMF continuous
+WSPC	Service programming code and all associated provisioning commands.
+WSSS	Sprint system selection
+WVSS	Verizon system selection
AT&F	Reset to factory defaults
ATA	Answer call
ATD	Call origination
ATDL	Call origination using last entered number
ATH	Call termination
ATZ	Reset to default configuration

Phonebook UCS2 Unicode

Text strings that contain UCS2 Unicode characters must be in one of the three supported record structures detailed in this section. If the ME supports Unicode formatted text strings in the SIM, the ME will support all three record structures for character sets that contain 128 or less characters. For Unicode character sets containing more than 128 characters, the ME will at a minimum support the '80' record structure. A record structure should not be used for non-Unicode character text strings. Within a text string only one scheme, either non-Unicode or one of the three supported record structures described in this section, shall be used.

In the following examples, an octet is 8 bits in length. The most significant bit is identified as bit 7 and the least significant bit is identified as bit 0. When two octets are combined to form a sixteen bit word value, the most significant bit is identified as bit 15 and the least significant bit is identified as bit 0.
Unicode character sets: http://www.unicode.org/charts/

Record Structure '80':

This record structure is identified by a value of '80' in the first octet of the text string. The remaining octets are interpreted as sixteen bit UCS2 Unicode characters with the most significant octet (MSO) preceding the least significant octet (LSO) for each UCS2 Unicode character in the string. An octet pair with a value of 'FFFF' is ignored.

Octet 1	Octet 2	Octet 3	Octet 4	Octet 5	Octet 6	Octet 7	Octet 8	Octet 9
'80'	Ch1MSO	Ch1LSO	Ch2MSO	Ch2LSO	Ch3MSO	Ch3LSO	'FF'	'FF'

In the above example, the text string contains four UCS2 Unicode characters. The final character in octets 8 and 9 is ignored.

Record Structure '81':

This record structure is identified by a value of '81' in the first octet of the text string. The second octet of this structure contains a value indicating the number of characters in the string. The third octet value is used to specify the Unicode character set base pointer. This base pointer is used with some or all of the remaining octets in the text string.

The fourth and subsequent octets in the text string are interpreted as follows. If bit 7 of the octet is zero, then bits 6 through 0 define a standard non-Unicode character. If bit 7 of the octet is one, then bits 6 through 0 are combined with the base pointer to define a UCS2 Unicode character.

Octet 1	Octet 2	Octet 3	Octet 4	Octet 5	Octet 6	Octet 7	Octet 8	Octet 9
'81'	'05'	'13'	'53'	'95'	'A6'	'8F'	'FF' '	FF'

In this example:

- Octet 2 indicates that there are five characters in the text string. The base pointer (octet 3) is not included in this count.
- Octet 3 is used to define bits 14 through 7 of a base pointer. This octet is inserted into the binary bit pattern 0xxx xxxx x000 0000 to become a sixteen bit value. In this example, '13' specifies the first UCS2 character of the Bengali character set which starts at code position 0980 (0000 1001 1000 0000).
- Octet 4 contains a value with bit 7 equal to zero. Bits 6 through 0 (101 0011) of this octet correspond to the character 'S'.
- Octet 5 contains a value with bit 7 equal to one. Bits 6 through 0 (001 0101) of this octet are combined with the base pointer value. The resulting sixteen bit value 0000 1001 1001 0101 ('0995') is the UCS2 Bengali letter 'KA'.
- Octet 8 contains the value 'FF' and since the string length is 5, this a valid character in the text string. Bit 7 of this character equals one. Bits 6 through 0 (111 1111) of this octet are combined with the base pointer value. The resulting sixteen bit value 0000 1001 1111 1111 ('09FF') is the last UCS2 Bengali character.
- Octet 9 is ignored since it is beyond the octet 2 specified number of characters.

Record Structure '82':

This record structure is identified by a value of '82' in the first octet of the text string. The second octet of this structure contains a value indicating the number of characters in the string. The third and fourth octets are used to specify the Unicode character set base pointer. This base pointer is used with some or all of the remaining octets in the string.
The fifth and subsequent octets in the string are interpreted follows. If bit 7 of the octet is zero, then bits 6 through 0 define a standard non-Unicode character. If bit 7 of the octet is one, then bits 6 through 0 are combined with base pointer to define a UCS2 Unicode character.

Octet 1	Octet 2	Octet 3	Octet 4	Octet 5	Octet 6	Octet 7	Octet 8	Octet 9
'82'	'05' '	05'$_{MSO}$	'30'$_{LSO}$	2D'	'82'	'D3'	'2D'	'31'

In this example:

- Octet 2 indicates that there are 5 characters in the text string. The base pointer (octets 3 and 4) are not included in this count.
- Octets 3 and 4 specify a sixteen bit base pointer '0530' which is the first UCS2 character of the Armenian character set.
- Octet 5 contains a value with bit 7 equal to zero. Bits 6 through 0 (010 1101) of this octet correspond to the character dash ' - '.

- Octet 6 contains a value with bit 7 equal to one. Bits 6 through 0 (000 0010) of this octet are combined with the base pointer value. The resulting sixteen bit value '0532' is the UCS2 Armenian character ‘capital BEN’.
- Octet 7 contains a value with bit 7 equal to one. Bits 6 through 0 (001 0011) of this octet are combined with the base pointer value. The resulting sixteen bit value '0583' is the UCS2 Armenian Character ‘small PIWR’.
- Octets 8 and 9 are processed in a manner similar to octet 5. The values in this example correspond the characters dash ‘ - ‘ and ‘ 1 ’.

Commands Over DM Port (MuxLite)

This functionality provides the ability to send a limited set of AT commands to the Q24x8 module over the diagnostic port. Referred to as MuxLite, this functionality is only available during a data call. The use of this functionality requires a host application capable of processing the HDLC protocol described in the MuxLite application note [13].

The diagnostic port is normally used for the transmission of unsolicited diagnostic messages during module operation. The MuxLite feature adds the supported AT commands and responses to this existing diagnostic message data stream. The host application is required to extract the AT command response data from the diagnostic message data stream.

The following table summarizes the AT commands that are currently supported by the MuxLite feature. Refer to the appropriate section in this manual for command usage details. Note that the parameter range display variation (=?) of these commands (e.g. AT+WSTR=?) are not available using MuxLite and will result in ERROR. With the exception of +CLCC, all AT commands in this table will result in ERROR if used with MuxLite and a data call is not active.

MuxLite Supported AT Commands:

Command	Description
AT+CLCC	List current call state. Note: This is the only command that is not active data call dependent. It can be used at any time on the diagnostic port.
AT+WSTR	Wavecom status request
AT+CSQ	Signal quality
AT+CNMA	SMS message acknowledgement. This message will be acknowledged when accepted for processing. The resulting data will be returned in a separate unsolicited response.
AT+CNMI	SMS new message indication
AT+CPMS	Used to select the message storage area used by the +CMGR command. The “MT” area holds received SMS messages.
AT+CMGR	SMS read message. This message will be acknowledged when accepted for processing. The resulting data will be returned in a separate unsolicited response.
AT+CMGS	Send SMS message. Two HDLC packets are required. The first packet must contain the SMS message destination data (everything up to and not including the <cr> character in the normal +CMGS command). The second packet must contain the SMS message text; Unicode is supported. The +CMGS control characters (<cr>, <ctrl-Z>, and <ESC>) are not required and ignored if included. Do not send any other HDLC packets between the two +CMGS packets.
AT+CMGD	Delete SMS message
AT+CCED	Cell environment
AT+CREG	Registration and roaming
Unsolicited Messages	General unsolicited status or indication messages from the module.

MuxLite Example

The following provides a usage example for the MuxLite feature. It assumes that the module data port is connected to COM1 and the module diagnostic port is connected to COM2. Though individual AT commands are shown in this example, HDLC packet encoding/decoding must be performed on all diagnostic port (COM2) commands and responses as described in the MuxLite application note [13].

COM1:

AT+CMEE=1	Enable detailed reporting of mobile equipment errors.
OK	
…Host configured…	Host application configured for PPP dial up access.
ATD#777	Initiate a data call. Number string is carrier specific.
CONNECT	Data call connected.
…PPP negotiation…	PPP layer startup and data exchange.

COM2:

AT+CLCC	Display current call state.
+CLCC: 1,1,0	Active data call.
OK	
WROM: 1	Unsolicited response, roaming status has changed.
AT+CSQ?	Display signal quality and frame error rate.
+CSQ: 27,99	
OK	
AT+CNMI=2,2,0,0,0	Set SMS message reception procedure; acknowledge using +CNMA
OK	
AT+CPMS=”MT”	Set “Mobile Terminated” as preferred SMS memory storage
OK	
…	
+CMT:"8585551212","02/05/17,10 :43 :07",129,1,2,0,”5550000”,0	
	Unsolicited response, SMS message received.
AT+CNMA	Acknowledge received SMS message to the network.
OK	
AT+CMGR=0	Read the SMS message.
+CMGR:"REC UNREAD","8585552222","02/05/15,15 :54 :04",1,2,0,”5550000”,15	
Don, give me a call. Kathy	
OK	
AT+CMGS=”8585551212”	Send a SMS message (part in a separate HDLC packet)
I’ll be home in 5 minutes.	Message text (part in a separate HDLC packet)
OK	
…	
+CMGS: 1	Message accepted by SMS Service Center
…	
+CDS:2,1,"8582431439",129,"02/05/17,10 :14 :17","02/05/17,10 :14 :27",32768	
	Message delivery report.

COM1:

…PPP layer shutdown…	Host application terminates PPP session
NO CARRIER	Data call terminated
AT	Module re-enters command mode
OK	

COM2:

AT+CSQ?	Display signal quality and frame error rate.
+CME ERROR: 3	Error returned from module.
AT+CLCC	Display current call state.
+CLCC: 0,9,0	Error return cause; module not in an active data call.
OK	

Chapter 20 – Unsolicited AT Result Codes

This section describes unsolicited AT codes that are sent to the modem as the result of an AT command or network notification. These commands are used throughout the sections of this document. Refer to this section for an explanation on any unsolicited command that is mentioned in the subsequent sections for result code range and value definitions.

Cell Broadcast Message Directly Displayed +CBM

Description: This response indicates a Cell Broadcast message has been received and according to the message storage preferences (+CNMI), is to be directly displayed.

Values:

<oa>	Originator Address
<scts>	Service Center Time Stamp in string format : "yy/MM/dd,hh :mm :ss±zz" Year/Month/Day,Hour:Min:Seconds±TimeZone)
<tooa>	Type-of-Address of <oa>
<lang>	Language
<encod>	Encoding method
<length>	The number of characters in the following <data> field
<data>	Message contents

Syntax: Response syntax: +CBM: <oa>, <scts>, [<tooa>,]<lang>,<encod>[,<length>]
<CR><LF><data>

Example Result
+CBM: "123456","98/10/01,12 :3000+00",129,1,2,5<CR><LF> Hello Note: Cell broadcast message received

Cell Broadcast Message Stored in Memory +CBMI

Description: This response indicates a Cell Broadcast message has been received and according to the message storage preferences (+CNMI), is to be stored in memory.

Values:

<mem>	NVRAM storage area (always "BC" for this response)
<index>	Location of message within storage area

Syntax: Response syntax: +CBMI: <mem>,<index>

Example Result
+CBMI: "BC",5 Note: Cell broadcast message received and stored in "BC" memory at index 5

Cell Environment Description Indication +CCED

Description: This response is used to return to retrieve information that has been requested by the +CCED AT command. Refer to the +CCED AT command in Chapter 13 for more information and a definition of the returned values.

Syntax: Response syntax: +CCED: <requested dump>

Example Result
+CCED: 1,725,4,65535,6,,0,,,-104,-35,-63 Note: Cell environment description indication in response to AT+CCED=0,1

Call Waiting Indication +CCWA

Description: This response indicates that another incoming call is occurring during an existing call. See +WFSH for information about handling call-waiting situations

Values:
<caller_id> Caller identification number
<type> Always 129 for this response

Syntax: Response syntax: +CCWA: <caller_id>, <type>

Example Result
+CCWA: 18005551212,129 Note: Incoming call from 1-800-555-1212, type always equals 129.

SMS Status Report Indication Directly Displayed +CDS

Description: This response indicates an SMS status report has been received and according to the message storage preferences (+CNMI), is to be directly displayed. +CDS is also used in the data compression functionality as an active command. Refer to Chapter 16 (U_m Interface Data Compression) for an explanation of +CDS usage for data compression.

Values:
<mr> Message Reference
<ra> Recipient Address
<tora> Type-of-Address of <ra>
<scts> Service Center Time Stamp in string format : "yy/MM/dd,hh :mm :ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<dt> Discharge Time in string format: "yy/MM/dd,hh :mm :ss±zz" (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<st> Status of a SMS-STATUS-REPORT (See Chapter 19)

Syntax: Response Syntax: +CDS: <mr>, [<ra>] , [<tora>], <scts>,<dt>,<st> (Text mode)

Example Result
+CDS : 2, 116, "3146290800", 129, "98/10/01,12 :30 :07+04", "98/10/01 12 :30 :08+04", 0 Note: SMS status report received

SMS Status Report Indication Stored in Memory +CDSI

Description: This response indicates an SMS status report has been received and according to the message storage preferences (+CNMI), is to be stored in memory.

Values:
<mem> NVRAM storage area (always "SR" for this response)
<index> location of message within storage area

Syntax: Response syntax: +CDSI: <mem>,<index>

Example Result
+CDSI: "SR",5 Note: SMS status report received and stored in "SR" memory at index 5

Key Press or Release +CKEV

Description: This response indicates that a key has been pressed or released.
Values:
<key> Key input (0-9, *, #)
<press>
0: key release
1: key press

Syntax: Response syntax: +CKEV: <key>,<press>

Example Result
+CKEV: 9,0 Note: Indicates key 9 has been released

Caller ID Presentation +CLIP

Description: This response indicates that caller ID information is available for the current incoming call. See +CLIP, Calling Line Identification Presentation for enable and disabling this result.

Values:
<caller_id> Caller identification number
<type> Always 129 for this response

Syntax: Response syntax: +CLIP: <caller_id>, <type>

Example Result
+CLIP: 18005551212,129 Note: Incoming call from 1-800-555-1212, type always equals 129.

Incoming Message Directly Displayed +CMT

Description: This response indicates that an incoming message has been received and according to the message storage preferences (+CNMI), is to be directly displayed.

Values:
<oa> Originator Address.
<scts> Service Center Time Stamp in string format : "yy/MM/dd,hh :mm :ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<tooa> Type-of-Address of <oa>
<lang> Language
<encod> Encoding method
<priority> Message priority:
0 – Normal
1 – Interactive
2 – Urgent
3 – Emergency
<cbn> Call Back Number
<length> The number of characters in the following <data> field
<data> Message contents

Syntax: Response syntax: +CMT: <oa>, <scts>, <tooa>, <lang>, <encod>, <priority> [,<cbn>], <length> <CR><LF> <data> (text mode)

Example Result
+CMT: "123456","98/10/01,12 :3000+00",129,1,2,0,"5550000",5<CR><LF> Hello Note: Incoming message received

Incoming Message Stored in Memory +CMTI

Description: This response indicates that an incoming message has been received and according to the message storage preferences (+CNMI), is to be stored in memory.

Value:
<mem> NVRAM storage area (always "MT" for this response)
<index> location of message within storage area
<priority> Message priority
0 – Normal
1 – Interactive
2 – Urgent
3 – Emergency

Syntax: Response syntax: +CMTI: <mem>,<index>,<priority>

Example Result
+CMTI: "MT",5 Note: Normal priority incoming message received and stored in "MT" memory at index 5

Mode Preference +COPS

Description: This response indicates that a change in mode preference has taken place. See +COPS, Mode Preferences, in Chapter 5 for information about Changing Mode Preference.

Values: **<mode>** (For System Determination 2.0)

- **0** Automatic.
- **1** CDMA only.
- **2** CDMA or AMPS only.
- **3** Analog only.

<term>

- **0** Permanent – this mode persists until another +COPS command is issued
- **1** Power cycle – this mode persists until power cycle is performed

Syntax: Response syntax: +COPS: <mode>,<term>

Example Result
+COPS:0,0 Note: Unsolicited +COPS result confirms Automatic mode is requested. +COPS:2,0 Note: Unsolicited +COPS result confirms CDMA or AMPS only mode is requested.

Registration & Roaming +CREG

Description: This response indicates the current state of roaming. See +COPS, Mode Preferences, in Chapter 5 for information about Changing Mode Preference

Values: **<stat>**

- **0** not registered, MS is not currently searching for a new operator.
- **1** registered, home network.
- **2** not registered, MS currently searching for a base station.
- **4** unknown.
- **5** registered, roaming

Syntax: Response syntax: +CREG: <stat>

Example Result
+CREG: 1 Note: Modem has found the home network and is registered.

Incoming Call +CRING

Description: This response indicates an incoming call. See +CRC, Cellular Result Codes, in Chapter 9 for information about enabling this result.

Values: **<type>**

VOICE	normal voice call
DATA	all types of data calls
OTAPA	over the air parameter administration call
TEST	markov, loopback, or test call
UNKNOWN	unknown/undefined call type

Syntax: Response syntax: +CRING: <Type>

Example Result
+CRING:VOICE Note: Incoming normal voice call.

RxLev Indication +CSQ

Description: This response is used to return information that has been requested by the +CCED AT command. Refer to the +CCED AT command in Chapter 13 (Cell Environment and RxLev Indication) for command usage information.

Values:

<rssi>

0-31 Valid value ranges. The lowest value is 0 and the highest is 31. 0 = -110dBm, 31 = -75dBm. 1.09375dBm per step.
Note: Certain models use a range other than 0-31.

99 Represents an unknown signal quality.

<fer>

99 Not known or not detectable Currently always returns 99.

Syntax: Response syntax: +CSQ: <rssi>,<fer>

Example Result
+CSQ: 29, 99 Note: RSSI notification

Incoming Call +RING

Description: This response indicates an incoming call.

Syntax: Response syntax: +RING

Example Result
+RING +RING Note: Incoming Call

Call Answered +WANS

Description: This response indicates that a voice call has been answered.

Values:

<call type>

0 incoming call

1 outgoing call answered by other party (only available on networks supporting answering supervision for payphone applications)

Syntax: Response syntax: +WANS:<call type>

Command	Possible Responses
ATA	+RING OK +WANS:0 Note: Incoming call answered +WCNT:3

Call Connected +WCNT

Description: This unsolicited response indicates that an incoming or outgoing voice call has been connected into a traffic channel state. If the service option is not available, +WCNT: will output "NULL".

Values: **<so>** Service option of call**.**
Speech: 3, 17, 32768
Loopback: 2, 9, 55
OTAPA: 18, 19
Position Determination: 35, 36

Syntax: Response syntax: +WCNT: <so>

Command	Possible Responses
ATD18005551212;	OK +WORG:18005551212 +WCNT:3 Note: Call Connected with service option 3

Call Ended +WEND

Description: This response indicates that a voice call or attempt to establish a voice call has ended.

Values: **<reason>**
0: Phone is offline
20: Phone is CDMA locked
21: Phone has no service
22: Call Faded/Dropped
23: Received Intercept from Base Station
24: Received Reorder from Base Station
25: Received a Release from Base Station (This is a normal call termination).
26: Service Option rejected by Base Station
27: Received Incoming Call
28: Received an alert stop from Base Station
29: Software ended the call (Normal release).
30: Received End Activation – OTASP calls only.
31: Internal Software aborted the origination/call.
32: Maximum Access probes exhausted (The modem failed to contact the Base Station)
34: RUIM not present
35: Origination already in progress
36: General Access Failure
37: Received retry order (IS-2000 only).

Syntax: Response syntax: +WEND: <reason>

Command	Possible Responses
ATD18005551212; ATH	OK +WORG:18005551212 +WCNT:3 OK +WEND:29 Note: Call Ended with a normal release
ATD18005551212;	OK +WORG:18005551212 +WEND:22 Note: Call failed because the signal faded.

Feature Notification Message +WFNM

Description: This response displays a broadcast message that the carrier may send to all mobiles in an emergency. This event is required for CDMA specifications.

Syntax: Response Syntax: +WFNM="<message>"

Command	Possible Responses
	+WFNM="Help, I have fallen and I can't get up!"

Flash Indication +WFSH

Description: This response confirms that a flash has been sent to the base station. See +WFSH command for more information on using flash commands.

Syntax: Response Syntax: +WFSH

Command	Possible Responses
AT+WFSH	OK +WFSH

General Indicator +WIND

Description: This is a general mechanism to send unsolicited non-standardized indications to the application. The identified unsolicited non-standardized indications are:
Indication during mobile originated call setup that the calling party is ringing.
Indication of the availability of the product to receive AT commands after boot.
The +WIND is overloaded with two functionalities:

1. posts non-standardized indications and
2. allows the user to specify indication level. For each of these indications, a "bit flow" has to be indicated.

Values: **<IndLevel>**

1 (bit-0): R-UIM Presence
2 (bit-1): Reserved
4 (bit-2): Reserved
8 (bit-3): Indication that the product is ready to process all AT commands
16 (bit-4): Reserved
32 (bit-5): Reserved
64 (bit-6): Network service available indication
128 (bit-7): Network lost indication
256 (bit-8): Reserved
512 (bit-9): Reserved
1024 (bit-10): Corrupted RF calibration values (checksum mismatch)

Note 1: If <IndLevel> is equal to 0, no unsolicited "+WIND: <IndNb>" will occur.
Note 2: If <IndLevel> bit 10 is set, the modem will transition to OFFLINE mode.

A combination (addition of the values) is used to allow more than one indication flow.
0 ≤ Ind Level ≤ 2047
For example: 128 (network lost indication) + 64 (network service available indication) = 192.
The response is OK if the values are in the previous range.

The unsolicited response will then be: +WIND : <event>

Example Result
+WIND:8 Note: General indication that AT commands are ready to be accepted

The supported events are:
<event>

0: R-UIM not present
1: R-UIM present
2: Reserved
4: Reserved
8: Product is ready to process all AT commands
16: Reserved
32: Reserved
64: The network service is available for an emergency call.
128: The network is lost.
256: Reserved
512: Reserved
1024: Corrupted RF calibration values (checksum mismatch)

Syntax: Command syntax: AT+WIND=<IndLevel>

Command	Possible Responses
AT+WIND? Note: Show current setting.	WIND: 8 OK Note: Default 8. (9 if RUIM is present)
AT+WIND=? Note: Show <IndLevel> range.	+WIND: (0-2047) OK
AT+WIND=128 Note: Turn on Network lost indication only.	OK Note: Command accepted.

Call Originated +WORG

Description: This response indicates that an attempt to establish a voice call has occurred.

Syntax: Response Syntax: +WORG: <number>

Command	Possible Responses
ATD18005551212;	OK +WORG:18005551212 +WCNT:3 OK

Note: <number> is the dialing string sent to the base station. You may see extra numbers before the intended dialing string, this is a result of pre-pended numbers or other call options such as +CLIR.

Call Privacy Indication +WPRV

Description: This response confirms that the call privacy level has changed during a call.

Syntax: Response Syntax: +WPRV: <prv>

Command	Possible Responses
AT+WPRV=1	OK +WPRV: 1

<prv>
0: Indicates normal privacy
1: Indicates enhanced privacy

Roaming Indication +WROM

Description: This response indicates that the roaming status has changed.

Syntax: Response Syntax: +WROM: <roam>

Command	Possible Responses
	+WROM:1

<roam>
0: Home.
1: Roam Icon ON (affiliated network)
2: Roam Icon Blink (foreign network)
The following values apply to enhanced roaming:
3: Out of Neighborhood
4: Out of Building
5: Roaming - Preferred System
6: Roaming - Available System
7: Roaming - Alliance Partner
8: Roaming - Premium Partner
9: Roaming - Full Service Functionality
10: Roaming - Partial Service Functionality
11: Roaming Banner On
12: Roaming Banner Off
13 - 63: Reserved for Standard Enhanced Roaming Indicator Numbers
64 - 127: Reserved for Non-Standard Enhanced Roaming Indicator Numbers
128 - 255: Reserved

Emergency Mode +WSOS

Description: This unsolicited response indicates a change in the status of Emergency Mode has taken place. In the event that Emergency Mode is entered as the result of an emergency call, this response will be sent to indicate that the modem is now in emergency mode. After this point, to exit the modem out of Emergency Mode, an AT+WSOS or AT+COPS command must be sent, which will result in a +WSOS response to confirm that Emergency Mode has been exited. See +WSOS, section for more information about Emergency Mode.

Values: The parameters values are the following ones:

<flag>

0 Emergency Mode Exited
1 Emergency Mode Entered

Syntax: Response Syntax: +WSOS: <flag>

Command	Possible Responses
ATD911; Note: Make emergency call	OK +WSOS:1 +WORG:911 Note: Unsolicited +WSOS result confirms Emergency Mode is entered
AT+WSOS Note: Exit Emergency Mode	OK +WSOS:0 Note: Unsolicited +WSOS result confirms Emergency Mode is exited
AT+COPS=0,0 Note: While in Emergency Mode, the mode preference is changed, resulting in Emergency Mode being exited	OK +WSOS:0 +COPS:0,0 Note: Unsolicited +WSOS result confirms emergency mode exited and unsolicited +COPS result confirms Automatic mode is requested

Current NAM Change +WNAM

Description: This response indicates that the current NAM has changed.

Syntax: Response Syntax: +WNAM: <nam>

Command	Possible Responses
	+WNAM:2

<nam>

1 NAM 1
2 NAM 2
3 NAM 3
4 NAM 4

Voice Mail Indicator +WVMI

Description: This response indicates the status of the Voicemail Inbox.

Syntax: Response syntax: +WVMI: <LineId>,<Num>

Command	Possible Responses
	+WVMI: 1,2 OK Note: 2 messages are in your voicemail box.

Values:

<LineId>
- **1** Line 1

<Num> The number of messages waiting in the inbox. Maximum value is 99.
- **0** No message waiting.
- **1** One message is waiting
- **3** Three messages are waiting

Example:

AT+CPHS? Interrogate the status of CPHS functionality
+CPHS: 1,0 The voice mail indicator functionality is deactivated
OK
AT+CPHS=3,1 Syntax error
+CME ERROR: 3
AT+CPHS=1,1 Activate the voice mail indicator functionality
OK
AT+CPHS? Interrogate the status of CPHS functionality
+CPHS: 1,1 The voice mail indicator functionality is activated
OK
**** the message box contains 1 message *****
+WVMI: 1,1 A message is waiting on Line 1
AT+CPHS=2,1 Interrogate the status of voice mail indicator functionality
OK
+WVMI: 1,1 A message is waiting on LINE 1
AT+CPHS? Interrogate the status of CPHS functionality
+CPHS: 1,1 The voice mail indicator functionality is activated
OK

SMS Message Storage Full +WMGF

Description: This response indicates that the SMS Service Center has attempted to send an SMS message but it was rejected because SMS Message Storage is Full. No new SMS messages will be received until some room is created by deleting old messages from SMS storage. Message deletion can be done using AT+CMGD.

Syntax: Response Syntax: +WMGF

Example Result
+WMGF Note: Incoming message rejected. Message center notified with “out of resources” message. Message center will attempt to re-send the message at a later time.

Power Save +WSPS

Description: This response is output whenever a change occurs in the power save status. The +WSPS: 1 response indicates that the module is unable to obtain a radio network connection and is temporarily suspending its search. This suspend mode lasts for about 3 minutes. The +WSPS: 0 response indicates that the module is again actively searching for a radio network connection. This feature helps to conserve battery power in cases where coverage is marginal.

Note: This response is not used in Verizon software versions.

Syntax: Response Syntax: +WSPS: <state>

Command	Possible responses
	+WSPS: 1 Note: Entering power save mode.
	+WSPS: 0 Note: Leaving power save mode.
AT+WSPS? Note: Display current power mode state.	+WSPS: 0 OK Note: Not in power save mode.

<state>
- **0** Leaving power save
- **1** Entering power save

Position Determination Start Session Result +1

Description: This unsolicited response is used by the gpsOne feature to return position determination data. The content of this response is dependent on the services specified in the +WPDSS command.

Syntax: **Response Syntax:** +WPDSS: <latitude>,<longitude>,<timestamp>,<position uncertainty angle>, <axis uncertainty>,<perpendicular axis uncertainty>,<fix>,<mask>, <elevation>,<elevation uncertainty>,<heading>,<horizontal velocity>, <vertical velocity>

Response Syntax: +WPDSS:GPS Session Failed

Command	Possible responses
AT+WPDSS=”P” Note: Ask for position only.	+WPDSS:#,#,#,#,#,#,#,0,0,#,#,#,#,# Note: Unsolicited result with position only.
AT+WPDSS=”PH” Note: Ask for position and elevation.	+WPDSS:#,#,#,#,#,#,#,0,1,#,#,#,#,# Note: Unsolicited result with position and elevation.
.	+WPDSS:GPS Session Failed +WPDER:15 Note: gpsONE session failure.

Defined values:

<latitude> 32-bit signed integer.
This value represents the position North (positive) or South (negative) of the equator. The returned value must be divided by 186413.5111 to convert it to degrees.

<longitude> 32-bit signed integer
This value represents the position East (positive) or West (negative) of the Greenwich meridian. The returned value must be divided by 186413.5111 to convert it to degrees.

<timestamp> 64-bit integer
This value is the CDMA system time for the reported position data.

<position uncertainty angle> 4-bit integer
This value is the number of 5.625 degrees increments. The range is from 0 to 15 (84.375 degrees). A value of 0 is true north and the angle increases toward the east.

<axis uncertainty> 8-bit integer
This is the uncertainty value for the axis along the Position Uncertainty Angle. The value returned is a table lookup key that corresponds to the actual uncertainty value in meters.

<perpendicular axis uncertainty> 8-bit integer
This is the uncertainty value for the perpendicular axis along the Position Uncertainty Angle. The value returned is a table lookup key that corresponds to the actual uncertainty value in meters.

<fix> 1-bit integer
0 2D fix – no velocity
1 3D fix – velocity available

<mask> 3-bit integer. This value is used to indicate which fields contain valid information. Bits 3 through 7 are not used.

bit 0 elevation fields are valid when set to 1
bit 1 heading fields are valid when set to 1
bit 2 velocity fields are valid when set to 1

GPS position data is always valid.

<elevation> 16-bit signed integer. This value is the number of meters above or below the WGS-84 reference ellipsoid. The range of this value is -500 to 15883.

<elevation uncertainty> 8-bit integer. The value returned is a table lookup key that corresponds to the actual elevation uncertainty value in meters.

<heading> 16-bit unsigned integer. This value is the heading in units of 0.3515625 degree. A value of 0 is true north and the angle increases toward the east. The value is in the range 0 to 1024.

<velocity horizontal> 16-bit unsigned integer. This value is the horizontal speed in units of 0.25 meters per second. The value is in the range from 0 to 511 (127.75 meters per second).

<velocity vertical> 8-bit signed integer. This value is the vertical speed in units of 0.5 meters per second. The value is in the range 0 to 255 (-64 to +63.5 meters per second).

Uncertainty Lookup Table:

The value returned in a +WPDSS response uncertainty field is in the left hand column of the table. The corresponding uncertainty value in meters is contained in the right hand column.

Value	Uncertainty in Meters	Value	Uncertainty in Meters
0	0.5	**16**	128
1	0.75	**17**	192
2	1	**18**	256
3	1.5	**19**	384
4	2	**20**	512
5	3	**21**	768
6	4	**22**	1024
7	6	**23**	1536
8	8	**24**	2048
9	12	**25**	3072
10	16	**26**	4096
11	24	**27**	6144
12	32	**28**	8192
13	48	**29**	12288
14	64	**30**	>12288
15	96	**31**	Cannot be computed

Position Determination Error +WPDER

Description: This unsolicited response is used by the gpsOne feature to return an error code.

Syntax: Response Syntax: +WPDER:<code>

Example Result
+WPDSS:GPS Session Failed +WPDER:15 Note: gpsOne Session failure. Error in Fix reported.

Response Values:

Code	Description	Code	Description
0	GPS session started	39	Wrong server Information parameters
1	Phone offline	40	Error in timeout parameter
2	No service	41	Error in quality of service parameter
3	No connection with PDE	42	No session active while trying to end session
4	No data available	43	Session active for this client
5	Session manager busy	44	Session busy status
6	Phone is CDMA locked	45	Phone is offline
7	Phone is GPS locked	46	Phone is CDMA locked
8	Connection failure with PDE	47	GPS is locked
9	PDSM ended session because of error	48	The command is invalid in this state.
10	User ended the session	49	Connection failure with PDE.
11	End key pressed	50	Internal software communication problem
12	Network session was ended	51	Communication problems with search engine
13	Timeout for GPS search	52	GPS results cannot be reported at this time
14	Conflicting info for session and privacy	53	Mode not supported
15	Error in fix	54	Unknown problem was found
16	Reject from PDE		
17	Ending session due to traffic channel exit	61	No buffers available
18	Ending session due to E911 call	62	Invalid client ID
19	Added protocol specific error type	63	Error in parameter to set
20	Ending because base station info is stale	64	Error in lock type
		65	Phone is offline state
31	Invalid client ID parameter	66	An active command is running
32	Bad service parameter	67	Wrong app info
33	Bad session type parameter	68	Unknown problem was found
34	Bad privacy parameter		
35	Bad download parameter	80	Begin a GPS session
36	Bad net access parameter	81	End of the GPS session
37	Bad operation parameter	82	Begin a data download session
38	Bad number of fixes parameter	83	End of the download session

gpsOne Session Prompt +WPUST

Description: This unsolicited response is used to indicate that user input is required for a network initiated gpsOne session. This response is output when the AT+WPDCT specified value is 2 (prompt). User input must be entered with 20 seconds of this response output. If user input is not received, the network initiated gpsOne session is refused.

Syntax: Response Syntax: +WPUST: <message>

Example Result
+WPUST: GPS User Consent Required Note: User input requested to accept/reject network initiated gpsOne session.
+WPUST: GPS User Consent Timed Out Note: No user input within 20 seconds. gpsOne session rejected.

Download PRL Status +DPRL

Description: This response is used to report the validation status of a downloaded PRL. Validation of the downloaded PRL data is performed when the +WCMT=1 command is issued to save the PRL to NV Ram. See the 'Download PRL' command (+DPRL) in section 16 for additional information about the process used to download and activate a PRL using the AT command interface.

Syntax: Response Syntax: +DPRL: <status>

Example Result
+DPRL: 0 Note: Downloaded PRL validation successful.

<status>

0 Validation successful

1 Validation unsuccessful

Chapter 21 – AT Command Examples

This chapter gives illustrative examples of general AT command usage.

General Examples

Status and Module Information Commands

AT+WGMI	Display module manufacturer
+WGMI: WAVECOM MODEM	
OK	
AT+WHWV	Display module hardware revision information
+WHWV: 240.82,0	MSM 6050 chipset, hardware version not set
OK	
AT+CGMR	Display module software revision information
+CGMR: S/W VER: WISMOQ	WZ2.04V May 05 2004 15:43:21
OK	
AT+CGSN	Display module electronic serial number (ESN)
+CGSN: F6918AD6	
OK	
AT+CIMI	Display module IMSI number
+CIMI: 310008588354034	
OK	
AT+GCAP	Display module capabilities
+GCAP: +CGSM, +CIS707-A, +MS, +ES, +DS, +FCLASS	
OK	
AT+CMEE=1	Enable detail reporting of mobile equipment errors
OK	

Network and Capabilities Commands

AT+CPAS	Display module activity status
+CPAS: 0	Module is ready to receive commands
OK	
AT+WSTR	Display initialization status and network availability
+WSTR:1,2	Initialization in progress and network available
OK	
AT+CREG	Display network registration and roaming
+CREG:0,2	
OK	
AT+CSS?	Display serving system parameters
+CSS: 1,CB,4,6,510	
OK	
AT+CCED	Display cell environment information
+CSQ:99, 99	Signal quality and frame error rate
+CCED:0,1,738,0,0,6,,0,,,-99,-37,-63	Mode=0, Band Class=1, Channel=738, etc.
OK	
AT+WIND=200	Set module to display network and AT command ready indications
OK	

Voice/Data Call Examples

Originate Voice Call

AT+CLCC	Display current call state
+CLCC: 0,9,0	No call in progress
OK	
AT+CLIR=0	Enable out going caller id
OK	
ATD18001234567;	Make a voice call (final semicolon character required for voice call)
OK	ATD Command is being processed
+WORG:18001234567	Indication of call origination sent to the Base Station with dialing string 18001234567
+WCNT:3	Call connected with CDMA Service Option 3, Traffic channel established
....Conversation	
ATH	Release the call
OK	ATH command is being processed
+WEND:10	Call end, reason 10 (Normal Release)

Incoming Voice Call

AT+CLIP=1	Enable incoming caller id presentation
OK	
AT+CNUM	Display module phone number
+CNUM: “Phone”,”8585551212”,129	
OK	

…Incoming call…

+RING	Incoming call indication
+CLIP: "8585552323",129	Identification of the remote party
ATA	Answer the call
OK	ATA command is being processed
+WANS	Call has been answered
+WCNT:3	Call Connected with CDMA Service Option 3, Traffic channel established

…Conversation…

+WEND:6 Call ended, end reason 6 (Normal Release), call released by the remote party

Call Waiting

ATD8585551212;	Make a voice call (final semicolon character required for voice call)
OK	ATD Command is being processed
+WORG:8585551212	Indication of call origination sent to the Base Station with dialing string 18001234567
+WCNT:3	Call Connected with CDMA Service Option 3, Traffic channel established.
…Conversation…	Conversation with party
+CCWA:”8582701234”,129	Indication of another incoming call, Audio beep sound in the earpiece
AT+WFSH	Send a flash to the Base Station (toggle to the second incoming call).
OK	AT command is being executed.
+WFSH	Flash sent to the Base Station. Call switches to the second call; this is not 100% guaranteed because the there is no confirmation from the Base Station.
…Conversation…	Conversation with party
AT+WFSH	Send a flash to the Base Station (toggle back to the first call).
OK	AT command is being executed.
+WFSH	Flash sent to the Base Station. Call switches to the first call; this is not 100% guaranteed because the there is no confirmation from the Base Station.
…Conversation…	Conversation with party
repeat as necessary	
ATH	Release all of the calls
OK	ATH command is being executed
+WEND:10	Calls End

Originate Data Call

…Host configured…	Host application configured for PPP dial up access
ATD#777	Initiate data call (no final semicolon character), number string is carrier specific
CONNECT	Data call connected
…PPP negotiation…	PPP layer startup and data exchange
…	
…PPP layer shutdown…	Host application terminates PPP session
NO CARRIER	Data call terminated
AT	Module re-enters command mode
OK	

Originate Data Call Failure

…Host configured…	Host application configured for PPP dial up access
ATD#777	initiate data call (no final semicolon character), number string is carrier specific

Depending on the PPP session failure point, the module may not enter back into command mode until a network server timeout forces PPP session shutdown. For a broken data pipe situation, the “+++” command can be used to force the module back into command mode.

NO CARRIER	Data call terminated
AT	Module re-enters command mode
OK	

Short Message Examples

Receive Short Message

AT+CNMI=2,1,1,1,0	SMS-DELIVER stored in NV, SMS-STATUS-REPORT routed to TE
OK	
+CMTI:"MT",0	New message received and stored in “MT” memory at index 0
AT+CNMI=2,2,1,1,0	SMS-DELIVER routed to TE
OK	
+CMT:"8585551212","02/05/17,10 :43 :07",129,1,2,0,”5550000”,17	
Test SMS Message	Received message.
AT+CNMA	Acknowledge the received message to the network.
OK	

Send Short Message

AT+CMGS=”8585551212”	Send a SMS-SUBMIT to mobile phone <CR> (0x0D)
This is the first text line	Enter first line and press carriage return <CR> (0x0D)
This is the last text line	Enter last line and send message by press <ctrl-Z> (0x1A)
+CMGS: 1	Success: message reference 1 is returned from the SMS Service Center
+CDS:2,1,"8582431439",129,"02/05/17,10 :14 :17","02/05/17,10 :14 :27",32768	Success: report of successful message delivery received. Time of sending of the message and receiving of the acknowledgment from the SMS Service Center is reported along with the status code.

Send Unicode Short Message

AT+WSCL=6,4	Specify SMS in Chinese language and Unicode format
OK	
AT+CMGS=”8585551212”	Send a SMS-SUBMIT to mobile phone
<Unicode formatted record>	0x81 0x05 0x13 0x53 0x95 0xA6 0x8F 0xFF (See section 20.11)
<Unicode record terminator>	Record must end with 0x00 0x1A
+CMGS: 2	Success: message reference 2 is returned from the SMS Service Center
+CDS:2,1,"8585551212",129,"02/05/17,10 :14 :17","02/05/17,10 :14 :27",32768	Success: report of successful message delivery received. Time of sending of the message and receiving of the acknowledgment from the SMS Service Center is reported along with the status code.

Send Short Message with Priority and Call Back Number

AT+CMGW=”8585551212”,24,2,”2345678901”	Store SMS message in mobile phone, length 24 characters, priority 2, call back number “2345678901”
This is the message line	The SMS will be stored when 24 characters are entered
+CMGW: 0	The SMS message is stored in the first location
OK	
AT+CMSS=0 Send the SMS message stored at location index 0	
+CMSS: 3 Success: message reference 3 is returned from the SMS Service Center	
OK	
+CDS:2,1,"8582431437",129,"03/04/11,14 :10 :56","03/04/11,14 :11 :02",32768	Success: report of successful message delivery received. Time of sending of the message and receiving of the acknowledgment from the SMS Service Center is reported along with the status code.

Read Short Message

AT+CPMS=”MT”	Set Mobile Terminated as preferred memory storage
OK	
AT+CPMS?	Display current message status
+CPMS:2,10,1,10	There are 2 MT and 1 MO messages stored
OK	
AT+CMGL=”ALL”	List all stored messages
+CMGL:0,"REC READ","8585551111",1,2,15	
Test message #1	
+CMGL:1,"REC UNREAD","8585552222",1,2,15	
Test message #2	
+CMGL:0,"STO UNSENT","8585551212",1,2,24	
Test message to be sent.	
OK	
AT+CMGR=1	Read the first message in currently selected memory storage (previously set by AT+CPMS).
+CMGR:"REC UNREAD","8585552222","02/05/15,15 :54 :04",1,2,0,”5550000”,15	
Test message #2	
OK	

GpsOne Examples

Single-Shot Data Burst gpsOne

AT+WPDST=1	Session type is single-shot
OK	
AT+WPDOM=3	Accuracy optimal operation mode
OK	
AT+WPPRV?	Display privacy setting
+WPPRV: 0	Privacy is set to allow all
OK	
AT+WPTLM=1	Set gpsOne transport level (DBM); carrier specific capability
OK	
AT+WPDSS="PVH",60,50	Starts the gpsOne session
OK	
+WPDSS:#,#,#,#,#,#,#,1,7,#,#,#,#,#,#	The result is returned in a +WPDSS unsolicited response

Single-Shot TCPIP gpsOne

AT+WPDST=1	Session type is single-shot
OK	
AT+WPDOM=2	Speed optimal operation mode
OK	
AT+WPPRV?	Display privacy setting
+WPPRV: 0	Privacy is set to allow all
OK	
AT+WPTLM=0	Set gpsOne transport level (TCPIP); carrier specific capability
OK	
AT+WPDIP="xxx.xxx.xxx.xxx"	Set the IP address; carrier specific value
OK	
AT+WPDPT=xxxx	Set the IP port; carrier specific value
OK	
AT+WPDSS="P",60,50	Starts the gpsOne session
OK	
+WPDSS:#,#,#,#,#,#,#,0,0,#,#,#,#,#,#	The result is returned in a +WPDSS unsolicited response

Continuous Data Burst gpsOne

AT+WPDST=3	Session type is continuous
OK	
AT+WPDOM=3	Accuracy optimal operation mode
OK	
AT+WPPRV=0	Set privacy setting to allow all
OK	
AT+WPTLM=1	Set gpsOne transport level (DBM); carrier specific capability
OK	
AT+WPDFR=5,30	Configure the fix rate settings; five fixes at 30 second intervals
OK	
AT+WPDSS="PV",60,50	Starts the gpsOne session
OK	
+WPDSS:#,#,#,#,#,#,#,1,6,#,#,#,#,#,#	The results are returned in +WPDSS unsolicited responses
…	
+WPDSS:#,#,#,#,#,#,#,1,6,#,#,#,#,#,#	
AT+WPDES	Can be used to cancel the gpsOne session before all fix results are returned
OK	

Mobile Station Based gpsOne Session

The module receives data from the location server to aid in calculation of position. To perform a MS-based gpsOne session, a data download session must happen first (and periodically) to get the latest ephemeris and timing information from the network.

AT+WPPRV=0	Set privacy setting to allow all
OK	
AT+WPTLM=1	Set gpsOne transport level (DBM); carrier specific capability
OK	
AT+WPDOM=3	Accuracy optimal operation mode
AT+WPDFR=180,10	Configure the fix rate settings; 180 fixes at 10 second intervals; 30 minutes duration.
OK	Ephemeriis and timing information should be updated once every 30 to 120 minutes to maintain positioning accuracy.
< begin loop>	
AT+WPDST=4	Set data download session type
OK	
AT+WPDDD=0,10	Single-shot data download of latest ephemeris and timing information; 2nd parameter
OK	ignored
AT+WPDST=3	Set session type is continuous
OK	
AT+WPDSS="PVH",60,50	Starts the gpsOne session
OK	
+WPDSS:#,#,#,#,#,#,#,1,7,#,#,#,#,#,#	Host application processes the data of each +WPDSS unsolicited response. Repeat loop after last response (180th in this example) is processed.
…	
< end loop>	

TCP Connection, Polled Bi-Directional Data Transfer

AT+CMEE=1	Enable detailed reporting of mobile equipment errors.
OK	
AT+WGSS=0	Display TCP connection status.
+WGSS: 0,0,1,0,0,0,0	TCP status, PPPstate “closed”, RxMode “Unsolicited”, All sockets “closed”.
OK	
AT+WCRX=0,0	Set TCP receive mode; polled received data.
OK	
AT+WGSS=0	Display TCP connection status.
+WGSS: 0,0,0,0,0,0,0	TCP status, PPPstate “closed”, RxMode “Polled”, All sockets “closed”.
OK	
AT+WPPP=0	Start a MIP data call and open a PPP session.
OK	
+WPPP: 201	Unsolicited response; PPP session startup in progress.
+WPPP: 200	Unsolicited response; PPP session established and available.
AT+WGSS=0	Display TCP connection status.
+WGSS: 0,2,0,0,0,0,0	TCP status, PPPstate “open”, RxMode “Polled”, All sockets “closed”.
OK	
AT+WIPC	Display module IP address.
+WIPC: 68.25.209.28	
OK	
AT+WOSK=0,12,57,125,2,24	Open a TCP socket to IP address 12.57.125.2 port 24.
+WOSK: 0,0	TCP socket zero allocated.
OK	
+WSKS: 0,0,1	Unsolicited response; TCP socket zero is open.
AT+WGSS=0	Display TCP connection status.
+WGSS: 0,2,0,2,0,0,0	TCP status, PPPstate “open”, RxMode “Polled”, Socket zero “open”.
OK	
AT+WSTX=0,0,5,<cr>HELLO	Send “HELLO” to TCP socket zero.
OK	
+WSTX: 0,0,5	Unsolicited response; five bytes transmitted on TCP socket zero.
…	
+WSKS: 0,0,2	Unsolicited response; Received data available on socket zero.
AT+WSRX=0,0	Read and clear TCP socket zero data buffer.
+WSRX: 0,0,5:WORLD	Socket zero data “WORLD”.
OK	
...	
AT+WCSK=0,0	Close TCP socket zero.
OK	
+WSKS: 0,0,4	Unsolicited response; TCP socket zero is closed.
AT+WPPP=2	Close the PPP session and end the data call.
OK	
+WPPP: 203	Unsolicited response; PPP session shutdown in progress.
+WPPP: 202	Unsolicited response; PPP session closed.

TCP Connection, Unsolicited Received Data

For this example, we’ll assume that TCP socket zero has been previously opened for some other non-related purpose and TCP “Unsolicited” receive mode is set.

AT+WOSK=0,168,0,0,2,42	Open a TCP socket to IP address 168.0.0.2 port 42.
+WOSK: 0,1	TCP socket one allocated.
OK	
+WSKS: 0,1,1	Unsolicited response; TCP socket one is open.
AT+WGSS=0	Display TCP connection status.
+WGSS: 0,2,1,2,2,0,0	TCP status, PPPstate “open”, RxMode “Unsolicited”, Socket zero “open”,
OK	Socket one “open”.
AT+WSTX=0,1,5,<cr>HELLO	Send “HELLO” to TCP socket one.
OK	
+WSTX: 0,1,5	Unsolicited response; five bytes transmitted on TCP socket one.
…	
+WSRX: 0,1,5:WORLD	Unsolicited response; 5 bytes of data received on TCP socket one. “WORLD”
AT+WCSK=0,1	Close TCP socket one.
OK	
+WSKS: 0,1,4	Unsolicited response; TCP socket one is closed.
AT+WGSS=0	Display TCP connection status.
+WGSS: 0,2,1,2,0,0,0	TCP status, PPPstate “open”, RxMode “Unsolicited”, Socket zero “open”,
OK	Socket one “closed”.

UDP Connection, DNS Lookup, Unsolicited Received Data

AT+WCRX=1,1	Set UDP receive mode; unsolicited received data.
OK	
AT+WPPP=1,user,password	Start a SIP data call and open a PPP session.
OK	
+WPPP: 201	Unsolicited response; PPP session startup in progress.
+WPPP: 200	Unsolicited response; PPP session established and available.
AT+WGSS=1	Display UDP connection status.
+WGSS: 1,2,1,0,0,0,0	UDP status, PPPstate “open”, RxMode “Unsolicited”, All sockets “closed”.
OK	
AT+WDNS=”www.myurl.org"	Look up IP address on DNS server.
OK	
…	
+WDNS: 0	Unsolicited response; Communication with DNS server completed.
AT+WDNS=”www.myurl.org”	Display DNS server lookup result.
+WDNS : 216.37.68.117	IP address of ”www.myurl.org".
OK	
AT+WOSK=1,216,37,68,117,250	Open a UDP socket to IP address 216.37.68.117 port 250.
+WOSK: 1,0	UDP socket zero allocated.
OK	
+WSKS: 1,0,1	Unsolicited response; UDP socket zero is open.
AT+WGSS=1	Display UDP connection status.
+WGSS: 1,2,1,2,0,0,0	UDP status, PPPstate “open”, RxMode “Unsolicited”, Socket zero “open”.
OK	
AT+WSTX=1,0,5,<cr>HELLO	Send HELLO to UDP socket zero.
OK	
+WSTX: 1,0,5	Unsolicited response; Five bytes transmitted on UDP socket zero.
…	
+WSRX: 1,0,5:WORLD	Unsolicited response; 5 bytes of data received on UDP socket zero. “WORLD”
AT+WCSK=1,0	Close UDP socket zero.
OK	
+WSKS: 1,0,4	Unsolicited response; UDP socket zero is closed.
AT+WGSS=1	Display UDP connection status.
+WGSS: 1,2,1,0,0,0,0	UDP status, PPPstate “open”, RxMode “Unsolicited”, Socket zero “closed”.
OK	
AT+WPPP=2	Close the PPP session and end the data call.
OK	
+WPPP: 203	Unsolicited response; PPP session shutdown in progress.
+WPPP: 202	Unsolicited response; PPP session closed.

UDP Connection, Blocked Data Transmission

AT+WPPP=0	Start a MIP data call and open a PPP session.
OK	
+WPPP: 201	Unsolicited response; PPP session startup in progress.
+WPPP: 200	Unsolicited response; PPP session established and available.
AT+WOSK=1,216,37,68,117,250	Open a UDP socket to IP address 216.37.68.117 port 250.
+WOSK: 1,0	UDP socket zero allocated.
OK	
+WSKS: 1,0,1	Unsolicited response; UDP socket zero is open.
AT+WGSS=1	Display UDP connection status.
+WGSS: 1,2,1,2,0,0,0	UDP status, PPPstate “open”, RxMode “Unsolicited”, Socket zero “open”.
OK	
AT+WSTX=1,0,500,<data>	Send 500 bytes of data on UDP socket zero.
OK	
+WSTX: 1,0,500	Unsolicited response; 500 bytes transmitted on UDP socket zero.
…	Other +WSTX commands and +WSTX responses for data transfers.
AT+WSTX=1,0,500,<data>	Send 500 bytes of data on UDP socket zero.
+CME ERROR : 3	
+WSTE: 1,0,102	Blocked data transmission on UDP socket zero.
AT+WGSS=1	Display UDP connection status.
+WGSS: 1,2,1,2,0,0,0	UDP status: PPPstate “open” and Socket zero “open”. Blocking condition due
OK	to full socket buffer.
…	
+WSKS: 1,0,1	UDP socket zero available for data transmission.
AT+WSTX=1,0,500,<data>	Resend the failed 500 bytes of data on UDP socket zero.
OK	
+WSTX: 0,500	Unsolicited response; resend good. 500 bytes transmitted on UDP socket zero.

…	Other +WSTX commands and +WSTX responses for data transfers.
AT+WSTX=1,0,500,<data>	Send 500 bytes of data on UDP socket zero.
+CME ERROR : 3	
+WSTE: 0,114	Lost UDP socket zero connection.
AT+WGSS=1	Display UDP connection status.
+WGSS: 1,2,1,0,0,0,0	UDP status: PPPstate “open” and Socket zero “closed”.
OK	
AT+WOSK=1,216,37,68,117,250	Re-open a UDP socket to IP address 216.37.68.117 port 250.
+WOSK: 1,0	UDP socket zero allocated.
OK	
+WSKS: 1,0,1	Unsolicited response; UDP socket zero is open.
…	Host application specific recovery process.

Chapter 22 – Verizon® Specific AT Commands

This chapter details AT commands that are Verizon® specific. The detail presented in this chapter should replace the referenced section in the main document.

SMS Status Report Indication Directly Displayed +CDS

Description: This response indicates an SMS status report has been received and according to the message storage preferences (+CNMI), is to be directly displayed. +CDS is also used in the data compression functionality as an active command. Refer to Chapter 16 for an explanation of +CDS usage for data compression.

For Verizon®, the +CDS response has a secondary format that is used to indicate that a SMS message was delivered to the recipient (SMS message delivery ACK on). This form of the +CDS message is not stored in NV memory. In the case of delivery acknowledgement, the +CNMI setting will not have an effect and delivery acknowledgements will always be reported with the +CDS response.

Values:

<ind>	Message type indicator
0	Status report
1	MO delivery acknowledge message
<mr>	Message Reference
<ra>	Recipient Address
<tora>	Type-of-Address of <ra>
<scts>	Service Center Time Stamp in string format : “yy/MM/dd,hh :mm :ss±zz” (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<dt>	Discharge Time in string format: “yy/MM/dd,hh :mm :ss±zz” (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<st>	Status of a SMS-STATUS-REPORT (See chapter 19)
<msg id>	Message reference. The Id of the sent message.
“<date>,<time>”	Timestamp of the acknowledge receipt.
<delivery ack body>	MO message delivery acknowledgment.

Syntax: **Response Syntax:** +CDS: <ind>, <mr>, [<ra>], [<tora>], <scts>, <dt>, <st> (Text mode)
+CDS: <ind>, <msg id>,”<date>,<time>”,<delivery ack body>

Example Result
+CDS: 0, 2, 116, ”3146290800”, 129, “98/10/01,12 :30 :07+04”, “98/10/01 12 :30 :08+04”, 0 Note: SMS status report received
+CDS: 1, 3, "03/09/11,14 :52 :53", Message to 8582431438 delivered Note: SMS acknowledge report received. "Message to 8582431438 delivered" is the ack message body.

Incoming Message Directly Displayed +CMT

Description: This response indicates that an incoming message has been received and, according to the message storage preferences (+CNMI), is to be directly displayed.

Values:

<oa>	Originator Address. <oa> will be displayed only if the message <privacy> value is normal (0).
<scts>	Service Center Time Stamp in string format : “yy/MM/dd,hh :mm :ss±zz” (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<tooa>	Type-of-Address of <oa>
<lang>	Language
<encod>	Encoding method
<priority>	Message priority:
0	Normal
1	Interactive
2	Urgent
3	Emergency
<cbn>	Call Back Number
<length>	The number of characters in the following <data> field
<data>	Message contents

Syntax: **Response syntax:** +CMT: <oa>, <scts>, <tooa>, <lang>, <encod>, <priority> [,<cbn>], <length> <CR><LF> <data> (text mode)

Example Result
+CMT: “123456”,”98/10/01,12 :3000+00”,129,1,2,0,”5550000”,5<CR><LF> Hello Note: Incoming message received

Roaming Indication +WROM

Description: This response indicates that the roaming status has changed.

Values: **<roam>**

- **0** Roam Icon On (affiliated network)
- **1** Roam Icon Off (Home)
- **2** Roam Icon Blink (foreign network)

The following values apply to enhanced roaming:

- **3** Out of Neighborhood
- **4** Out of Building
- **5** Roaming - Preferred System
- **6** Roaming - Available System
- **7** Roaming - Alliance Partner
- **8** Roaming - Premium Partner
- **9** Roaming - Full Service Functionality
- **10** Roaming - Partial Service Functionality
- **11** Roaming Banner On
- **12** Roaming Banner Off
- **13 – 63** Reserved for Standard Enhanced Roaming Indicator Numbers
- **64 – 93** Enhanced Roaming Indicator (+WERI response)
- **94 – 255** Reserved

Syntax: **Response Syntax:** +WROM: <roam>

Possible Responses
+WROM:1

Enhanced Roaming Indication +WERI

Description: This response indicates that the enhanced roaming status has changed.

Values: **<indicator>**

- **64-93** Index number identifying the roaming indicator entry.

<icon image>

- **0-15** Verizon®. defined value that specifies the Icon Image that is displayed.

<icon mode>

- **0-3** Verizon®. defined value that specifies how the Icon Image is displayed (On, Off, Flashing).

<call prompt>

- **0-3** Verizon®. defined value that identifies the Call Prompt that is displayed for each roaming indicator. This field is set to a value of ZERO when no call prompt is used. Note that this field is currently not implemented in the Verizon®. user interface specs. It may be used in the future.

<alert/call id>

- **0-7** Verizon®. defined value that identifies the Alert Sound that is used for the indicator. The value in this field reflects the ID of the Alert Sound that the mobile annunciates to the end user.

<chari type>

- **0-31** Character Encoding Type (Ref TSB58E table 9.1-1). Identifies the character code table used for the **<text>** field. (Usually set to 2.)

Type	Bit Length	Character Encoding
0	8	Octet, unspecified
1	see IS-91	IS-91 Extended Protocol Message
2	7	7-bit ASCII (ANSI x3.4)
3	7	IA5 (Table 11 of ITU-T T.50)
4	16	UNICODE (ISO/IEC 10646-1:1993)
5	8 or 16	Shift-JIS
6	8 or 16	Korean (KS x 1001:1998)
7	8	Latin/Hebrew (ISO 8859-8:1988)
8	8	Latin (ISO 8859-8:1988)
9	7	GSM 7-bit default alphabet
10-31	x	Reserved

<text> Verizon® defined variable length field that contains the text data used for the banner. The text format is specified in the Character Encoding Type. Text field limit: 32 character max length.

Syntax: **Response Syntax:** +WERI: <indicator>, <icon image>, <icon mode>, <call prompt>, <alert/call id>, <chari type>, <text>

Command	Possible Responses
Note: Example of acquiring service with enhanced roaming.	+WERI: 69,2,0,0,4,2,"Extended Network" +WROM:2 Note: Both +WERI and +WROM responses.
Note: Example of acquiring service without enhanced roaming.	+WROM:1 Note: No +WERI response.

Emergency Mode +WSOS

Description: This unsolicited response indicates that a change in the status of Emergency Mode has taken place. In the event that Emergency Mode is entered as the result of an emergency call, this response will be sent to indicate that the modem is now in emergency mode. After this point, to exit out of Emergency Mode, an AT+WSOS or AT+COPS command must be sent, which will result in a +WSOS response to confirm that Emergency Mode has been exited. See +WSOS, section for more information about Emergency Mode.

Values: **<flag>**

0 Emergency Mode Exited

1 Emergency Mode Entered

For Verizon® releases, the +WSOS:0 result code will also be sent to indicate that emergency mode has been exited in the following cases:
After an emergency call is released and five minutes have passed without another emergency call.
After an emergency call is released and the user dials a non-emergency number.

Syntax: **Response Syntax:** +WSOS: <flag>

Command	Possible Responses
ATD911; Note: Make emergency call	OK +WSOS:1 +WORG:911 Note: Unsolicited +WSOS result confirms Emergency Mode is entered
AT+WSOS Note: Exit Emergency Mode	OK +WSOS:0 Note: Unsolicited +WSOS result confirms Emergency Mode is exited
AT+COPS=0,0 Note: While in Emergency Mode, the mode preference is changed, resulting in Emergency Mode being exited	OK +WSOS:0 +COPS:0,0 Note: Unsolicited +WSOS result confirms emergency mode exited and unsolicited +COPS result confirms Automatic mode is requested

Read Message +CMGR

Description: This command allows the application to read stored messages. The messages are read from the memory selected by **+CPMS** command. A message read with status "REC UNREAD" will be updated in memory with the status "REC READ".

Note: The <stat> parameter for SMS Status Reports is always "READ".

Values: **tat>** Status of message in memory. Possible values are as follows:

Possible Values	Status of Messages in Memory
"UREAD"	received unread messages
"READ"	received read messages
"USENT"	stored unsent messages
"SENT"	stored sent messages
"ALL"	all messages

Note: For SMS Status Reports, only "ALL" and "READ" values of the <stat> parameter will list messages ; other values will only return OK.

<oa/da> Origination/destination address value in string format. <od/da> will be displayed only if the message <privacy> value is 0 (Normal).

<mr> Message Reference

<scts> Service Center Time Stamp in string format : "yy/MM/dd,hh :mm :ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)

<dt> Discharge Time in string format: "yy/MM/dd,hh :mm :ss±zz" (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])

<st> Status of a SMS-STATUS-REPORT (See Chapter 19)

<lang> Language

<encod> Encoding

<priority> Message priority:

0 Normal
1 Interactive
2 Urgent
3 Emergency

<privacy> Message privacy:

0 Normal
1 Restricted
2 Confidential
3 Secret

<reply> Message reply option:
0 No Acknowledge
1 Delivery Acknowledge
<cbn> Call Back Number
<length> Length of the text message (in bytes).
<data> Message text

Syntax: **Command syntax:** AT+CMGR=<index>
Response syntax: +CMGR :<stat> [,<oa>], <scts>, <lang>, <encod>, <priority>, <privacy>, <reply> [,<cbn>], <length> <CR><LF> <data> (for **SMS-DELIVER** only)
+CMGR: <stat> [,<da>], <dt>, <lang>, <encod>, <priority>, <privacy>, <reply>, <cbn>], <length> <CR><LF> <data> (for **SMS-SUBMIT** only)
+CMGR: <stat>,<mr>,<scts>,<dt>,<st> (for **SMS-STATUS-REPORT** only)

Command	Possible Responses
	+CMTI: “MT”,1 Note: New message received
AT+CMGR=1 Note: Read the message	+CMGR: “REC UNREAD”,”8585551212”, ”98/10/01,18 :22 :11+00”,1,2,0,0,0,”8585550000”,9<CR><LF> ABCdefGHI OK
AT+CMGR=1 Note: Read the message again	+CMGR: “REC READ”,”8585551212”, ”98/10/01,18 :22 :11”,1,2,0,0,0,”8585550000”,9<CR><LF> ABCdefGHI OK Note: Message is read now
AT+CMGR=2 Note: Read at a wrong index	+CMS ERROR: 321 Note: Error : invalid index
AT+CPMS=”SR”;+CNMI=,,,2 Note: Reset to text mode, set read memory to “SR”, and allow storage of further SMS Status Report into “SR” memory	+CPMS:0,10,0,10 OK
AT+CMSS=3 Note: Send an SMS previously stored	+CMSS: 160 OK
	+CDSI: “SR”,1 Note: New SMS Status Report stored in “SR” memory at index 1
AT+CMGR=1 Note: Read the SMS Status Report	+CMGR: “READ”,160, “8585551212”,129,”01/05/31,15:15:09”, “01/05/31,15:15:09”,0 OK

List Message +CMGL

Description: This command allows the application to read stored messages, by indicating the type of the message to read. The messages are read from the memory selected by the **+CPMS** command.

Values: **<index>** Place of storage in memory.
<stat> Possible values, the status of messages in memory, are as follows:

Possible Values	Status of Messages in Memory
“UREAD”	received unread messages
“READ”	received read messages
“USENT”	stored unsent messages
“SENT”	stored sent messages
“ALL”	all messages

Note: For SMS Status Reports, only “ALL” and “READ” values of the <stat> parameter will list messages; other values will only return OK.

<oa/da> Origination/destination address value in string format. <od/da> will be displayed only if the message <privacy> value is 0 (Normal).
<fo> First Octet, coded like SMS-SUBMIT first octet in document [4], default value is 17 for SMS-SUBMIT
<mr> Message Reference
<dt> Discharge Time in string format: “yy/MM/dd,hh :mm :ss±zz” (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<st> Status of a SMS-STATUS-REPORT
<lang> Language
<encod> Encoding
<length> Length of the text message (in bytes).
<data> Message text

Syntax: **Command syntax:** AT+CMGL=<stat>
Response syntax: +CMGL : <index>,<stat>,<da/oa>,<lang>, <encod>,<length><CR><LF><data> (for **SMS-DELIVER and SMS-SUBMIT**, may be followed by other <CR><LF>+CMGL:<index>…)
+CMGL: <index>,<stat>,<fo>,<mr>,<scts>,<dt>,<st> (for **SMS-STATUS-REPORT** only, may be followed by other <CR><LF>+CMGL:<index>…)

Command	Possible Responses
AT+CMGL="UREAD" Note: List unread messages in text mode	+CMGL: 1,"REC UNREAD","8585551212",1,2,15 <CR><LF>Unread message! +CMGL: 3,"REC UNREAD", "8585551212", 1,2,5<CR><LF>Hello OK Another message unread! Note: 2 messages are unread, these messages will then have their status changed to "REC READ" (+CSDH:0)
AT+CMGL="READ" Note: List read messages in text mode	+CMGL: 2,"REC READ","8585551212",1,2,9 <CR><LF> Keep cool OK
AT+CMGL="SENT" Note: List stored and sent messages in text mode	OK Note: No message found

Send Message +CMGS

Description: The <da> field is the address of the terminal to which the message is sent. To send the text message, type <ctrl-Z> (0x1A) as the final character of the message. This command can be aborted using the <ESC> (0x1B) character while entering the message text.
The <length> parameter is optional, it is used to set the length of the text string. When <length> is specified, the CMGS command will only process the number of bytes specified by <length> regardless of whether it

Values Note: The <priority>, <privacy>, <reply option>, and <cbn> parameters are optional.
Defaults are used when parameters are not specified.

Values:
<da> Destination address value in string format.
<length> Length of the text message (in bytes).
<priority> Message priority:
0 Normal (Default)
1 Interactive
2 Urgent
3 Emergency
<privacy> Message privacy:
0 Normal (Default)
1 Restricted
2 Confidential
3 Secret
<reply> Message reply option:
0 No Acknowledge (Default)
1 Delivery Acknowledge
<cbn> Call Back Number (not included by default)

Syntax: **Command syntax***:* AT+CMGS=<da> [,<length>] [,<priority>] [,<privacy>] [,<reply>] [,<cbn>] <CR> *entered text*<ctrl-Z / ESC>

Command	Possible Responses
AT+CMGS="8585551212"<cr> Please call me soon, Fred. <ctrl-Z> Note: Send a message	+CMGS:<mr> OK
AT+CMGS="8585551212",12 <cr> Please call.<ctrl-Z> Note: Send 12 byte message	+CMGS:<mr> OK
AT+CMGS="8585551212",,2,1,1,"5550000" <cr> Please call ASAP<ctrl-Z> Note: Send a message with the specified priority, privacy, reply option and call back number. Notice length field is omitted.	+CMGS:<mr> OK

Write Message to Memory +CMGW

Description: This command stores a message in memory (SMS-SUBMIT). The memory location <index> is returned (no choice possible as with phonebooks +CPBW). A text or Unicode message is entered as described for the Send Message +CMGS command.

Values Notes: The <length> parameter is optional, it is used to set the length of the text string. When <length> is specified, the CMGW command will only process the number of bytes specified by <length> regardless of whether it contains <ctrl-Z>, <ESC>, or <backspace> characters.

Defaults are used when parameters are not specified.

The <priority>, <privacy>, <reply option>, and <cbn> parameters are optional.

Values:

<oa/da> Origination/destination address value in string format.

<length> Length of the text message (in bytes).

<priority> message priority:

0	Normal (Default)
1	Interactive
2	Urgent
3	Emergency

<privacy> Message privacy:

0	Normal (Default)
1	Restricted
2	Confidential
3	Secret

<reply> Message reply option:

0	No Acknowledge (Default)
1	Delivery Acknowledge

<cbn> Call Back Number (not included by default)

Syntax: **Command syntax:** AT+CMGS= <oa/da> [,<length>] [,<priority>] [,<privacy>] [,<reply>] [,<cbn>] <CR>
entered text <ctrl-Z / ESC>

Response syntax: +CMGW: <index> or +CMS ERROR: <err> if writing fails

Command	Possible Responses
AT+CMGW="8585551212"<CR> Hello how are you ?<ctrl-Z> Note: Write a message	+CMGW: 4 OK Note: Message stored in index 4
AT+CMGW="8587777777",6<CR> ¥lÅàø?<ctrl-Z> Note: Write a message with specified length of 6 bytes	+CMGW: <index> OK Note: Message stored in <index>
AT+CMGW="8585551212",,2,1,1,"5550000" Please call ASAP<ctrl-Z> Note: Write message with the specified priority, privacy, reply option & call back number. Note length field is omitted.	+CMGW: 5 OK Note: Message stored in index 5

Service Programming Code +WSPC

Description: This command allows for entry of the service programming code (either MSL or OTKSL). Upon successful entry of this code, all other service provisioning AT commands may be used. If this code is not properly entered prior to attempting other provisioning AT commands, all provisioning commands will return ERROR. If the OTKSL is used to enter provisioning mode, only the +WIMI, +WMDN, and +WCMT commands will be allowed. All other commands will return ERROR.

This command supports fifteen attempts to enter the correct service programming code. If fifteen incorrect attempts are performed, the ME will report a message and go into offline mode.

Once the correct SPC code is entered, the modem transitions to the Service Programming state. This state is not exited until a commit is done (+WCMT). While in the Service Programming state, subsequent validations of the SPC code are ignored until the Service Programming state is reset.

Values:

<lock type>

0	OTKSL – One Time Key Subsidy Lock
1	MSL – Master Subsidy Lock

<code> Six character programming code.

Syntax: **Command syntax:** AT+WSPC=<lock type>,<code>

Command	Possible Responses
AT+WSPC? Note: Service programming code request	ERROR Note: Invalid request
AT+WSPC=?	ERROR Note: Invalid request
AT+WSPC=1,111111 Note: Enter service programming code 111111	ERROR Note: Code invalid
AT+WSPC=1,000000 Note: Enter service programming code 000000	OK Note: Code valid

Verizon® System Selection +WVSS

Description: This command is used to set the system selection and is persistent on reset. The values that are available with the +WVSS command are dependent upon the currently loaded PRL.

Values: **<pref>** Preferred only systems:
- **0** Home Only - Service on home systems
- **1** Automatic - Roaming allowed on affiliated systems

Non-preferred systems:
- **0** Home Only - Service on home systems
- **2** Automatic-A - Roaming allowed on affiliated systems and any A band system
- **3** Automatic-B - Roaming allowed on affiliated systems and any B band system

Syntax: **Command Syntax:** +WVSS: <pref>

Command	Possible Responses
AT+WVSS=? Note: Show supported parameters	+WVSS: (0-3) OK
AT+WVSS? Note: Get current setting	+WVSS: 1 OK
AT+WVSS=0 Note: Set home only	OK Note: Home only mode set.
AT+WVSS=3 Note: Set automatic-B mode	ERROR Note: Automatic-B mode not allowed in preferred only service.

Initial Programming Required +WOT0

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that initial device programming is required.

Syntax: **Response Syntax:** +WOT0: “Initial programming required!”

Possible Responses
+WOT0: “Initial programming required!”

Programming In Progress +WOT1

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that device programming is in progress.

Syntax: **Response Syntax:** +WOT1: “Programming in progress”

Possible Responses
+WOT1: “Programming in progress”

Programming Successful +WOT2

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that device programming has completed successfully. This response will be accompanied by three quick audio tones from the speaker.

Syntax: **Response Syntax:** +WOT2: “Programming Successful”

Possible Responses
+WOT2: “Programming Successful”

Programming Unsuccessful +WOT3

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that device programming has completed unsuccessfully. This response will be accompanied by three quick audio tones from the speaker.

Syntax: **Response Syntax:** +WOT3: “Programming Unsuccessful”

Possible Responses
+WOT3: “Programming Unsuccessful”

Commit Successful +WOTC

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that the programmed parameters have be successfully committed to NVRAM.

Syntax: **Response Syntax:** +WOTC: "Commit Successful"

Possible Responses
+WOTC: "Commit Successful"

SPL Unlocked +WOTS

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that the Software Provisioning Lock is in the unlocked state.

Syntax: **Response Syntax:** +WOTS: "SPL unlocked"

Possible Responses
+WOTS: "SPL unlocked"

NAM Download OK +WOTN

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that the NAM download has completed successfully.

Syntax: **Response Syntax:** +WOTN: "NAM Download OK"

Possible Responses
+WOTN: "NAM Download OK"

MDM Download OK +WOTM

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that the MDM download has completed successfully.

Syntax: **Response Syntax:** +WOTM: "MDM Download OK"

Possible Responses
+WOTM: "MDM Download OK"

MSI Download OK +WOTI

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that the IMSI download has completed successfully.

Syntax: **Response Syntax:** +WOTI: "IMSI Download OK"

Possible Responses
+WOTI: "IMSI Download OK"

PRL Download OK +WOTP

Description: This Over-The-Air Service Provisioning (OTASP) response indicates that the PRL download has completed successfully.

Syntax: **Response Syntax:** +WOTP: "PRL Download OK"

Possible Responses
+WOTP: "PRL Download OK"

Excess SPC Failures +WLCK

Description: This response indicates that 15 failed attempts have been made to enter the service programming code. If the modem is not in emergency mode, any active call will be terminated and the modem will go into offline mode.

Note: A successfully entered service programming code grants access to modem configuration data.

Syntax: **Response Syntax:** +WLCK: "Excess SPC failures!"

Command	Possible Responses
AT+WSPC=0,123456 Note: 15th attempt to enter the SPC.	+WLCK: "Excess SPC failures!" Note: Modem now in offline mode.

Position Determination Lock Level +WPLCK

Description: This command specifies and returns the position determination lock setting. If the lock is set to 'lock all', then only E911-related position determination events are allowed and all other position determination requests are denied.

Values: **<level>**

- **0** No lock (allow all)
- **1** Lock mobile initiated location services
- **2** Lock mobile terminated location services
- **3** Lock all

Syntax: **Command syntax:** AT+WPLCK=<level>

Command	Possible Responses
AT+WPLCK=? Note: Display valid parameter range	+WPLCK: (0-3) OK
AT+WPLCK? Note: Request current setting type	+WPLCK: 0 OK
AT+WPLCK=3 Note: Select lock all	OK Note: Command successful

Chapter 23 – Sprint® Specific AT Commands

This chapter details AT commands that are Sprint® specific. The command presented in this chapter should replace the corresponding general commands in the main document.

SMS Status Report Indication Directly Displayed +CDS

Description: This response indicates an SMS status report has been received and according to the message storage preferences (+CNMI), is to be directly displayed. +CDS is also used in the data compression functionality as an active command. Refer to Chapter 16 for an explanation of +CDS usage for data compression.
For Sprint®, the +CDS response has a secondary format that is used to indicate that a SMS message was delivered to the recipient (SMS message delivery ACK on). This form of the +CDS message is not stored in NV memory. In the case of delivery acknowledgement, the +CNMI setting will not have an effect and delivery acknowledgements will always be reported with the +CDS response.

Values:

<ind>	Message type indicator
0	Status report
1	MO delivery acknowledge message
<mr>	Message Reference
<ra>	Recipient Address
<tora>	Type-of-Address of <ra>
<scts>	Service Center Time Stamp in string format : “yy/MM/dd,hh :mm :ss±zz” (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<dt>	Discharge Time in string format: “yy/MM/dd,hh :mm :ss±zz” (Year [00-99], Month [01-12], Day [01-31], Hour, Minute, Second and Time Zone [quarters of an hour])
<st>	Status of a SMS-STATUS-REPORT (See Chapter 19)
<msg id>	Message reference. The Id of the sent message.
“<date>,<time>”	Timestamp of the acknowledge receipt.
<delivery ack body>	MO message delivery acknowledgment.

Syntax: **Response Syntax:**
+CDS: <ind>, <mr>, [<ra>], [<tora>], <scts>, <dt>, <st> (Text mode)
+CDS: <ind>, <msg id>,”<date>,<time>”,<delivery ack body**>**

Example Result
+CDS: 0, 2, 116, ”3146290800”, 129, “98/10/01,12 :30 :07+04”, “98/10/01 12 :30 :08+04”, 0 Note: SMS status report received
+CDS: 1, 3, "03/09/11,14 :52 :53", Message to 8582431438 delivered Note: SMS acknowledge report received. "Message to 8582431438 delivered" is the ack message body.

Set Phone Functionality +CFUN

Description: This command selects the mobile station’s level of functionality. AT+CFUN=0 is equivalent to AT+CPOF The AT+CFUN=1 (by default, AT+CFUN will act the same as AT+CFUN=1) command restarts the entire CDMA stack and CDMA functionality: **a complete software reset is performed**. In addition, the OK response will be sent at the last baud rate defined by the +IPR command.
If an emergency call is made in OFFLINE mode, the modem will reset and immediately after boot, originate the emergency call. The functionality of +WSOS is unchanged.

Values: **<functionality level>**

- **0** Set the phone to OFFLINE mode.
- **1** Set the phone to ONLINE mode and resets the phone.

Syntax: **Command syntax:** AT+CFUN=<functionality level>

Command	Possible Responses
AT+CFUN? Note: Ask for current functionality level	+CFUN: 1 OK Note: Full functionality
AT+CFUN=0 Note: Set phone offline	OK Note: Command valid
AT+CFUN=1 Note: Set phone ONLINE. A software reset is performed.	Note: Command valid

Signal Quality +CSQ

Description: This command will return the raw RSSI data, raw Ec/Io, and the channel frame error rate.

Values:

<raw rssi>
- **75-110** valid value range in units of -dBm
- **255** represents an unknown signal quality

<raw Ec/Io>
- **0-15** valid value range in units of -dB
- **255** represents an unknown signal quality

<fer>
- **0-100%** Traffic channel error rate
- **255** represents an unknown signal quality

Syntax: **Command syntax:** AT+CSQ

Command	Possible Responses
AT+CSQ	+CSQ: <raw rssi>,<raw Ec/Io>,<fer> OK Note: <raw rssi>, <raw Ec/Io>, and <fer> as defined above

Facility Lock +CLCK

Description: This command is used by the application to lock, unlock, or interrogate an ME or network facility <fac>. When changing a lock state, a password value must be included in the command even though passwords are not currently enforced for these facilities. Any 4-digit sequence can be entered for the password value. This command is also used to allow control of the call barring supplementary service. Barring calls or querying the status of call barring is possible for Data and Voice Calls, except Emergency Voice Calls.

Values:

"AO" BAOC (Bar Outgoing Calls)

<mode>
- **0** Allow all outgoing calls
- **1** Allow outgoing calls only for phonebook entries (use ATD> command) and emergency voice calls
- **2** Allow emergency voice calls only
- **9** Query status

"AI" BAIC (Bar Incoming Calls)

<mode>
- **0** Allow all incoming calls
- **1** Allow incoming calls only for phonebook entries (match number in phonebook) and emergency voice calls
- **2** Allow emergency voice calls only
- **9** Query status

Note: Setting this facility to 0 will force the "AO" facility to 0.

"PB" BAMC (Bar Outgoing Phonebook Match Calls)

<mode>
- **0** Allow all outgoing calls
- **1** Allow outgoing calls only for phonebook entries
- **9** Query status

Note: Setting this facility to 0 will force the "AO" facility to 0.

"DT" BADC (Bar Data Calls)

<mode>
- **0** Allow data calls
- **1** Barr data calls
- **9** Query status

<passwd> Use any four digit value. (e.g. 1234)

Syntax (for Facility Lock):

Command syntax: AT+CLCK= <fac>,<mode>[,<passwd>]

Response syntax: +CLCK: <status>

Command	Possible Responses
AT+CLCK? Note: Get facility lock status	+CLCK:("AO",1),("AI",1),("PB",1),("DT",1) OK Note: Outgoing call barring is enabled, Incoming call barring is enabled, match string from phonebook is enabled, Data calls are not allowed
AT+CLCK="AO",1,1234 Note: Bar Outgoing Calls	OK Note: Outgoing calls are barred
AT+CLCK="AI",1,1234 Note: Bar Incoming Calls	OK Note: Incoming calls are barred
AT+CLCK="AO",9 Note: Query outgoing call barring status	+CLCK: 1 OK Note: Outgoing calls are barred

Mobile Directory Number +WMDN

Description: This command is used to enter a new mobile directory number. Valid numbers are between 10 and 15 digits in length. For support of Wireless Number Portability, changes to the MDN will **ALWAYS** update the IMSI_M portion (least significant 10 digits) of the IMSI. Changes to the MDN will also automatically update the Access Overload Class values unless specifically modified using the +WAOC command. The new IMSI_M and Access Overload Class values will not be visible in the WIMI and WAOC commands until after the changes are committed with the WCMT command.

The security PIN (WPIN) is automatically updated using the following logic whenever the +WMDN command is used to change the mobile directory number (MDN).

```
If (Security PIN = Last 4 digits of MDNold) Then
Set Security PIN = Last 4 digits of MDNnew
Else
Don't Change Security PIN
EndIf
```

Example 1:

Current PIN = 1234
Current MDN = 5551234 (last 4 digits are the same as PIN digits)
If MDN is set to 5556789, then PIN changes to 6789.

Example 2:

Current PIN = 3456
Current MDN = 5551234 (last 4 digits and the PIN digits are different)
If MDN is set to 5556789, then PIN remains 3456.

Syntax: **Command syntax:** AT+WMDN=<number>

Command	Possible Responses
AT+WMDN? Note: Get current mobile directory number	+WMDN: 8581111111 OK
AT+WMDN=8585551212 Note: Set mobile directory number to 8585551212	OK

Serving System +CSS

Description: The numeric parameter is used to query the serving system.

Values:

<Class>

0	No service
1	800 MHz
2	900 MHz

<Band>

A – B	Cellular 800
PA – PF	PCS 1900
Z	The mobile station is not registered
Note	For the <Band> parameter, the value will be two letters for PCS. The first will be 'P' and the second will be the block ('A' - 'F').

<SID>

0	No service
1 – 32767	The mobile station is registered with the system indicated.
99999	The mobile station is not registered.

<BS_P_REV>	(Base Station Protocol Revision In Use – Band Class 0/Cellular)
1	IS-95
2	IS-95A
3	TSB74
4	N/A
5	IS-95B
6	IS-2000
7	IS-2000A
<BS_P_REV>	(Base Station Protocol Revision In Use – Band Class 1/PCS)
1	J-STD-008C
2	N/A
3	N/A
4	N/A
5	IS-95B
6	IS-2000
7	IS-2000A
<CHANNEL>	0 – Max RF Channel Number

Syntax: **Command syntax:** AT+CSS Returns: <Class>,<Band>,<SID>,<BS_P_REV>,<CHANNEL>

Command	Possible Responses
AT+CSS? Note: Display the current setting	+CSS: 2, A, 4145, 6, 334 OK Note: Command is valid
AT+CSS=? Note: Display the range of setting	+CSS: OK Note: Command is valid however range display is not supported for this command due to carrier-specific requirements.

Packet Zone Identifier +PZID

Description: This is a read-only command that displays the Packet Zone Id for the mobile IP.
Values: Numeric value in range 0 - 255
Syntax: **Command syntax**: AT+PZID

Command	Possible Responses
AT+PZID Note: Display the packet zone ID.	+PZID: 1 OK

Boot URL +WBURL

Description: This command is used to read and write the boot URL value. This value is required for IOTA connections.
Values: **<string>** 128 character maximum length string value.
Default: http://hcmci.iota.spcsdns.net:8080/ciip
Syntax: **Command syntax:** AT+WBURL=<string>

Command	Possible Responses
AT+WBURL? Note: Display the current boot URL value.	http://hcmci.iota.spcsdns.net:8080/ciip OK
AT+WBURL=http://hcmci.iota.spcsdns.net/ciip Note: Set the boot URL value.	OK Note: New value set.
AT+WBURL=”” Note: Set invalid URL value.	+CERROR: BAD REQUEST Note: Error message displayed.

Trusted Domain +WTDMN

Description: This command is used to read and write the trusted domain value. This value is required for IOTA connections and is used to verify the trusted server connection.
Values: **<string>** 32 character maximum length string value. Default: https:.iota.spcsdns.net
Syntax: **Command syntax:** AT+WTDMN=<string>

Command	Possible Responses
AT+WTDMN? Note: Display the current trusted domain value.	https:.iota.spcsdns.com OK
AT+WTDMN=https:.iota.spcsdns.net Note: Set the trusted domain value.	OK Note: New value set.
AT+ WTDMN =”” Note: Set invalid URL value.	+CERROR: BAD REQUEST Note: Error message displayed.

Proxy Address +WDPXY

Description: This command is used to read and write the proxy server address. The proxy server address is required for IOTA connections.
Values: **<string>** 32 character maximum length string value in URL format.
Default: 68.28.31.1
Syntax: **Command syntax:** AT+WDPXY=<address>

Command	Possible Responses
AT+WDPXY? Note: Display the current proxy server address value.	68.28.31.2 OK
AT+WDPXY=68.28.31.1 Note: Set the proxy server address value.	OK Note: New value set.
AT+ WDPXY =”” Note: Set invalid address value.	+CERROR: BAD REQUEST Note: Error message displayed.

WIOTA Connection Control +WIOTA

Description: This command is to start an IOTA session.

Values:
0 Reserved.
1 Start IOTA session to get profile.
2 Configure for Sprint commercial network.
3 Configure for Sprint STIC lab network.
4 Reserved.
5 Reserved.

Syntax: **Command syntax:** AT+WIOTA=<value>

Command	Possible responses
AT+WIOTA=? Note: Display available command options.	+WIOTA: (0-5) OK
AT+WIOTA=1 Note: Start IOTA session.	OK Note: Session started.
AT+WIOTA? Note: Display last used option.	+WIOTA: 1 OK

Sprint® System Selection +WSSS

Description: This command is used to set the system selection and is persistent on reset. The values that are available with the +WSSS command are dependent upon the currently loaded PRL. A few seconds of delay should occur before issuing subsequent AT commands to allow time for the module to reacquire the network.

Values:
<pref> Preferred only systems:
0 Home Only - Modem will operate on Sprint® PCS only.
1 Automatic - Roaming allowed on affiliated systems.
2 Analog only - Roaming rate applies.

Syntax: **Command syntax:** +WSSS: <pref>

Command	Possible Responses
AT+WSSS=? Note: Show supported parameters	+WSSS: (0-3) OK
AT+WSSS? Note: Get current setting	+WSSS: 1 OK
AT+WSSS=0 Note: Set home only	OK Note: Home only mode set.

IOTA Error +WOAE

Description: This response indicates that an IOTA failure has occurred. Refer to Sprint® document SEBU 3G NAI dual launch v131 sec 1.2 for additional details.

Syntax: **Response Syntax**: +WOAE: “IOTA error 1012”

Possible Responses
+WOAE: “IOTA error 1012”

Preparing Data Services +WOAP

Description: This response indicates that IOTA provisioning is in progress.

Syntax: **Response Syntax:** +WOAP: “Preparing Data Services”

Possible Responses
+WOAP: “Preparing Data Services”

Please Retry +WOAR

Description: This response indicates that the previous attempt to start a data session should be retried. When a data session is started without a valid profile, IOTA provisioning is initiated. Upon completion of profile provisioning, this response is displayed.

Syntax: **Response Syntax:** +WOAR: “Please Retry”

Possible Responses
+WOAR: “Please Retry”

Display PRI Checksum +WSUM

Description: This command is used to display the PRI checksum value. This checksum value is calculated and programmed into the modem at the time of manufacture. The checksum value is not updated or changed if a user modification is made to any of the PRI settings.

Syntax: **Command syntax:** +WSUM?

Command	Possible Responses
AT+WSUM? Note: Display checksum value.	+WSUM: 0004DDCF OK Note: The displayed value is a eight digit hexadecimal number.

Reset MIN and MDN to Factory Defaults +WRMM

Description: This command is used to reset MIN and MDN to their factory default values. The service programming code must be successfully entered using the +WSPC command prior to using the +WRMM command. The modem must be manually reset or power cycled following the use of the +WRMM command.

Syntax: **Command syntax:** +WRMM

Command	Possible Responses
AT+WRMM Note: Reset MIN and MDN to factory defaults.	OK Note: Command successful.

IOTA Feature Application Note

Description: This application note provides information on the use of the IOTA feature. This feature is available for use in Q2438 Sprint editions version WZ2.03S or higher. Use the command AT+CGMR to verify the software release identification data prior to performing any IOTA provisioning. Also ensure that the module has been provisioned with valid ESN and A-key.

Configuration Parameters:

IOTA configuration parameters are used to help launch an IOTA session on a Sprint commercial network or Sprint STIC lab network.

Commercial Network Defaults:

In a Sprint commercial network, the default values provisioned the module are sufficient to initiate an IOTA session. These values can also be set using the command AT+WIOTA=2.

Parameter	Value
Boot URL	http://hcmci.iota.spcsdns.net:8080/ciip
Proxy	68.28.31.1
Trusted Domain	https:.iota.spcsdns.net
Primary Home Agent	68.28.15.12
Secondary Home Agent	68.28.31.12

STIC Lab Network:

In a STIC lab network environment, the configuration should be changed by using the command AT+WIOTA=3. This command configures the following module parameter values.

Parameter	Value
Boot URL	http://10.30.141.20:8080/ciip
Proxy	10.30.141.20
Trusted Domain	https:.pcslab.com
Primary Home Agent	208.4.125.30
Secondary Home Agent	208.4.125.30

Manual Configuration:

In some cases, it may be necessary to manually set some or all of the configuration parameters using the associated individual AT command. The following table summarizes these AT commands. Refer to the appropriate section of this manual for further usage details for each command.

Parameter	Check Current Setting	Command Example
Data Profile Index	AT$QCMIPP?	AT$QCMIPP=0 (Set data profile index=0)
Boot URL	AT+WBURL?	AT+WBURL=http://10.30.141.20:8080/ciip
Proxy	AT+WDPXY?	AT+WDPXY=10.30.141.20
Trusted Domain	AT+WTDMN?	AT+WTDMN=https:.pcslab.com
Primary Home Agent	AT$QCMIPPHA?	AT$QCMIPPHA=208.4.125.30
Secondary Home Agent	AT$QCMIPSHA?	AT$QCMIPSHA=208.4.125.30

Client Initiated IOTA Provisioning (CIIP):

There are two ways to start Client Initiated IOTA Provisioning. A network account that supports both voice and data service options is required.

1. Issue the command: AT+WIOTA=1
2. If no device data profile is present, initiate a data call using dial-up.

Network Initiated IOTA Provisioning (NIIP):

No user action is necessary to start Network Initiated IOTA Provisioning. The network will send a trigger SMS message to the module to start NIIP.

IOTA Provisioning Results:

After the IOTA session is launched, the unsolicited response +WOAP: "Preparing Data Services" will be displayed. This response indicates that the IOTA provisioning session is in progress.

After about 4 minutes, the unsolicited response +WOAR: "Please Retry" will be displayed. This response indicates that the IOTA provisioning session has successfully completed and that 1xData calls can now be made.

If the IOTA provisioning session fails, the unsolicited response +WOEA: "IOTA error 1012" will be displayed. Verify that configuration parameter values have been properly entered and that appropriate PRI data is being used.

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