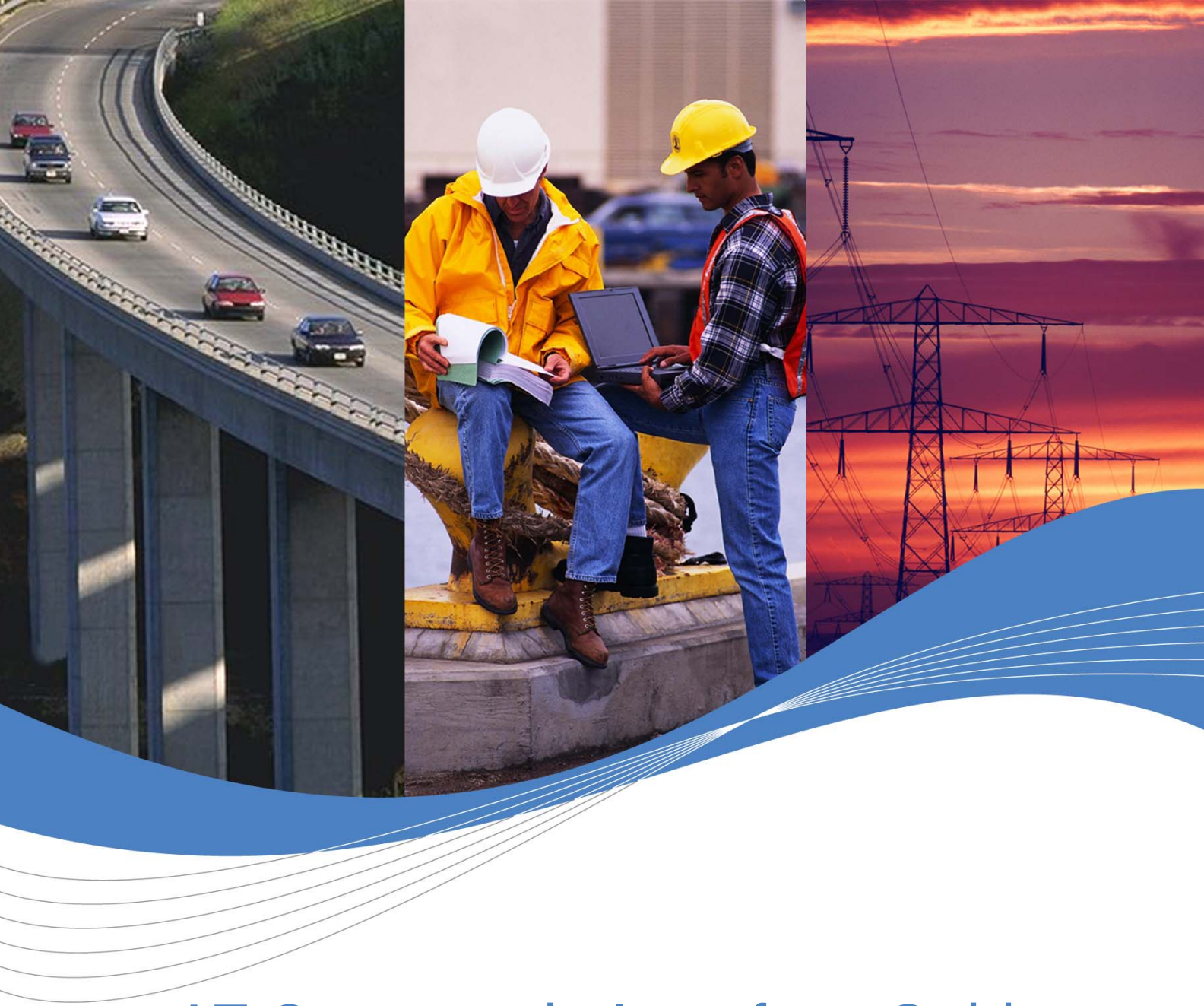

AT Commands Interface Guide for OS 6.61 release

Revision: 004
Date: September 2006

OPEN AT

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AT COMMANDS INTERFACE GUIDE FOR OS 6.61

Reference: WM_DEV_OAT_UGD_014
Revision: 004
Date: September 21, 2006

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Overview

The aim of this document is to provide Wavecom customers with a full description of the AT commands associated with OS 6.61 AT software release.

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Document History

Revision	Date	History	
001	February 1, 2006	Creation	
002	June 8, 2006	Update	
003	July, 2006	Update	
004	September 21, 2006	Update	

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AT COMMANDS INTERFACE GUIDE FOR OS 6.61

VOLUME 1

Reference: WM_DEV_OAT_UGD_014
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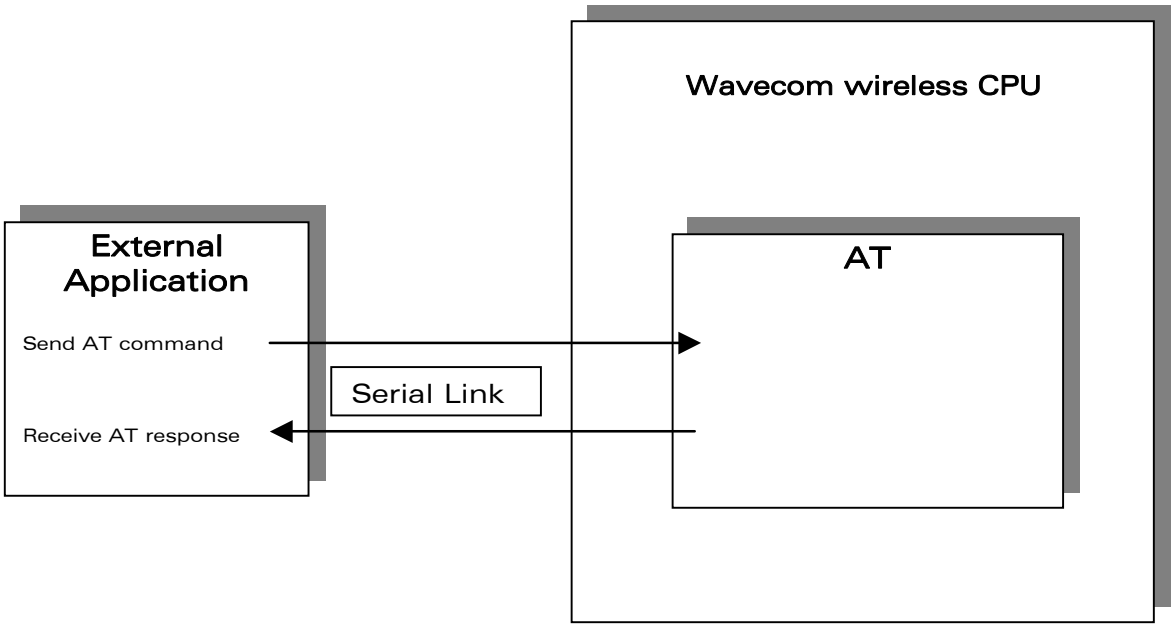
1 Introduction

1.1 Scope of this Document

This document describes the AT-command based messages exchanged between an application and Wavecom products in order to manage GSM/GPRS related events or services.



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1.2 Related Documents

This interface specification is based on the following recommendations:

[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] 3GPP 05.02: 3rd Generation Partnership Project; Technical Specification Group GSM/EDGE- Radio Access Network; Multiplexing and multiple access on the radio path – 3GPP TS 05.02 V6.9.2 (2001-04)

[8] 3GPP 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3

[9] 3GPP TS 11.11 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface

[10] 3GPP TS 05.08 Radio subsystem link control

[11] 3GPP TS 23.040 Technical realization of the Short Message Service (SMS);

[12] 3GPP TS 22.042 Network Identity and Time Zone (NITZ) service description; Stage 1

[13] 3GPP TS 51.011 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface

[14] 3GPP TS 27-010 Terminal Equipment to User Equipment (TE-UE) multiplexer protocol

[15] 3GPP 23.014 Support of Dual Tone Multi Frequency (DTMF) signaling

[16] ISO 639 Langages Codes

[17] 3GPP 27 060 Packet domain; Mobile Station (MS) supporting Packet Switched services

[18] 3GPP TS 23.038 Alphabets and language-specific information

[19] 3GPP TS 27.005 Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)

[20] ETSI GSM 11.14 Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface

[21] 3GPP TS 23.003 Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification

[22] ETSI GSM 02.24 Digital cellular telecommunications system (Phase 2+) (GSM);Description of Charge Advice Information (CAI)

[23] ETSI GSM 02.86 Digital cellular telecommunications system (Phase 2+) (GSM);Advice of Charge (AoC) Supplementary Services - Stage 1

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[24] ETSI GSM 02.90 Digital cellular telecommunications system (Phase 2+) (GSM);Unstructured Supplementary Service Data (USSD) - Stage 1

[25] ETSI GSM 02.85 Digital cellular telecommunications system (Phase 2+) (GSM);Closed User Group (CUG) Supplementary Services - Stage 1

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1.3 ETSI Secretariat

The following addresses may be of use in obtaining the latest GSM/GPRS recommendations:

Postal address: F-06921 Sophia Antipolis CEDEX – France

Office address: 650 Route des Lucioles – Sophia Antipolis – Valbonne – France

Web address: http://www.etsi.org/

Tel: +33 4 92 94 42 00

Fax: +33 4 93 65 47 16

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1.4 Abbreviations and Definitions

1.4.1 Abbreviations

ACM	Accumulated Call Meter
ADC	Analog Digital Converter
ADN	Abbreviated Dialing Number (Phonebook)
AMR	Adaptive Multi-Rate
AMR-FR	AMR Full Rate (full rate speech version 3)
AMR-HR	AMR Half Rate (half rate speech version 3)
AOC	Advice Of Charge
APN	Access Point Name
ASCII	American Standard Code for Information Interchange, Standard characters table (1 byte coding)
AT	ATtention Hayes Standard AT command Set
BCCH	Broadcast Channel
BER	Bit Err Rate
BM	Broadcoast Message Storage
CBM	Cell Broadcast Message
CB	Cell Broadcast
CCK	Corporate Control Key
CCM	Current Call Meter
CHV	Card Holder Verification
CI	Cell Identifier
CLI	Client Line Identification
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CNL	Cooperative Network List
CODEC	Coder Decoder
COLP	Connected Line Identification Presentation
CPHS	Common PCN Handset Specification
CPU	Central Processing Unit
CSD	Circuit Switched Data
CSP	Customer Service Profile
CTM	Cellular Text telephone Modem
CTS	Clear To Send signal

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CUG	Closed User Group
DTR	Data Terminal Ready
DCS	Digital Cellular System
DCE	Data Circuit Equipment
DCD	Data Carrier Detect
DLC	Data Link Connection
DLCI	Data Link Connection Identifier
DSR	Data Set Ready
DTE	Date Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
ECC	Emergency Call Codes
ECM	Error Correction Mode
ECT	Explicit Call Transfer
EDGE	Enhanced Data rates for GSM Evolution
EEPROM	Electrically Erasable Programming Only Memory
EF	Elementary Files
EFR	Enhanced Full Rate (full rate speech version 2)
EGPRS	Enhanced GPRS
E-ONS	Enhanced Operator Name Service
ERMES	European Radio Messaging System
ETSI	European Telecommunications Standards Institute
FDN	Fixed Dialing Number (Phonebook)
FR	Full Rate (full rate speech version 1)
GPIO	General Purpose Input Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
HDLC	High-level Data Link Control
HFR	High Frequency Regeneration
HLR	Home Location Register
HR	Half Rate (half rate speech version 1)
ID	IDentifier
IETF	Internet Engineering Task Force
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity

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I/O	Input/Output
IP	Internet Protocol
LAC	Local Area Code
LED	Light Emitting Diode
LND	Last Number Dialed
LP	Language Preferred
LPI	Lines Per Inch
MCC	Mobile Country Code
ME	Mobile Equipment
MMI	Man Machine Interface
MNC	Mobile Network Code
MNP	Microcom Networking Protocol
MO	Mobile Originated
MOC	Mobile Originated Call (outgoing call)
MS	Mobile Station
MSB	Most Significant Bit
MSISDN	Mobile Station International ISDN Number
MT	Mobile Terminal
MTC	Mobile Terminated Call (incoming call)
NCK	Network Control Key
NITZ	Network Information and Time Zone
NSCK	Network Subset Control Key
NTC	Negative Temperature Coefficient
OA	Outgoing Access
OPL	Operator PLMN List
OS	Operating System
PAD	Portable Application Description
PC	Personal Computer
PCCP	PC character set Code Page
PCK	Personalization Control Key
PCM	Protection Circuit Module
PCN	Personal Communication Network
PCS 1900	Personal Communication Service (GSM system offering 148 full duplex voice channels per cell)
PDP	Packet Data Protocol
PDU	Protocol Description Unit

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PIN	Personal Identification Number
PLMN	Public Land Mobile Networks
PNN	PLMN Network Name
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
PTS	Product Technical Specification
PUCT	Price per Unit and Currency Table
PUK	PIN Unlock Key
QOS	Quality of Service
RAM	Random Access Memory
RI	Ring Indicator
RIL	Radio Interface Layer
RLP	Radio Link Protocol
RSSI	Received Signal Strength Indication
RTS	Ready To Send signal
RX	Reception
SC	Service Center
SIM	Subscriber Information Module
SMSR	Short Message Status Report
SMS	Short Message Service
SS	Supplementary Services
SPCK	Service Provider Control Key
SPN	Service Provider Name
STK	Sim ToolKit
SVN	Software Version Number
TA	Terminal Adaptor
TBF	Temporary Block Flow
TE	Terminal Equipment
TTY	TeleTYpe
TON/NPI	Type Of Number/Numbering Plan Identification
TX	Transmission
UART	Universal Asynchronous Receiver Transmitter
UCS2	Universal Character Set 2 Character table (2-byte coding)
UDUB	User Determined User Busy
UIH	Unnumbered Information with Header check

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USB	Universal Serial Bus
USSD	Unstructered Supplementary Service Data

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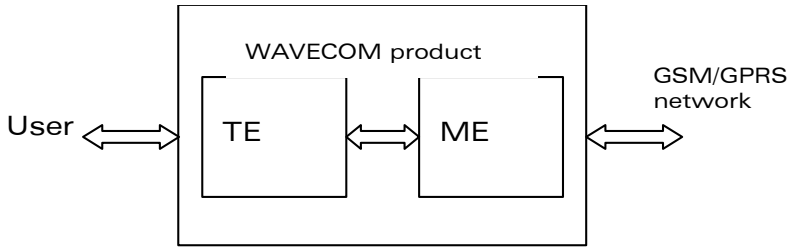
1.4.2 Definitions

The words "Mobile Station" (MS) or "Mobile Equipment" (ME) are used for mobile terminals supporting GSM/GPRS services.

Terminal Equipment is the Man-Machine Interface of a GSM/GPRS device (modem or handset). A TE can be a handset MMI or the AT command line interface.



A call from a GSM/GPRS mobile station to the PSTN is called a "mobile originated call" (MOC) or "outgoing call", and a call from a fixed network to a GSM/GPRS mobile station is called a "mobile terminated call" (MTC) or "incoming call"

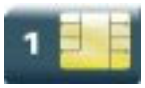
In this document, the word "product" refers to any Wavecom product supporting the AT commands interface.

1.4.3 Logos

This picture indicates the +WIND indication from which the AT command is allowed. X values can be: 1, 3, 4, 16.

This picture indicates that a SIM card must be inserted to support the AT command.

This picture indicates that an AT command is supported even if the SIM card is absent.



This picture indicates that the PIN 1 /CHV 1 code must be entered to support the AT command.

This picture indicates that an AT command is supported even if the PIN 1 /CHV 1 code is not entered.

This picture indicates that the PIN 2 /CHV 2 code must be entered to support the AT command.

This picture indicates that an AT command is supported even if the PIN 2/CHV 2 code is not entered.

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1.5 AT Commands Presentation Rules

The AT commands are presented in the present documentation as follows:

- A "Description" section provides general information on the AT command (or response) behavior.
- A "Syntax" section describes the command and response syntaxes and all parameters description.
- A "Parameters and Defined Values" section describes all parameters and values.
- A "Parameter Storage" presents the command used to store the parameter value and/or the command used to restore the parameter default value.
- An "Examples" section presents the real use of the described command.
- A "Note" section can also be included indicating some remarks about the command use.

Figures are provided where necessary.

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2 AT Commands Features

2.1 Wavecom Line Settings

A serial link handler is set with the following default values (factory settings):

- speed according to customer choice at order time,
- 8 bits data,
- 1 stop bit,
- no parity,
- RTS/CTS flow control.

Please use the +IPR, +IFC and +ICF commands to change these settings.

2.2 Command Line

Commands always start with AT and finish with a <CR> character, excepted A/ command.

2.3 Information Responses and Result Codes

Responses start and end with <CR><LF>, except for the ATV0 DCE response format and the ATQ1 (result code suppression) commands.

- If command syntax is incorrect, the "**ERROR**" string is returned.
- If command syntax is correct but transmitted with wrong parameters, the "**+CME ERROR:** <Err>" or "**+CMS ERROR:** <SmsErr>" strings is returned with adequate error codes if CMEE was previously set to 1. By default, CMEE is set to 0, and the error message is only "ERROR".
- If the command line has been executed successfully, an "OK" string is returned.

In some cases, such as "AT+CPIN?" or (unsolicited) incoming events, the product does not return the "OK" string as a response.

In the following examples <CR> and <CR><LF> are intentionally omitted.

2.4 Proprietary Commands

When a command is Wavecom proprietary, the information is indicated in the command description.

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2.5 SIM Insertion and Removal

SIM card insertion and removal procedures are supported. There are software functions relying on positive reading of the hardware SIM detect pin. This pin state (open/closed) is permanently monitored.

When the SIM detect pin indicates that a card is present in the SIM connector, the product tries to set up a logical SIM session. The logical SIM session will be set up or not depending on whether the detected card is a SIM card or not. The AT+CPIN? command delivers the following responses:

- If the SIM detect pin indicates "absent", the response to AT+CPIN? is "+CME ERROR: 10" (SIM not inserted).
- If the SIM detect pin indicates "present", and the inserted card is a SIM card, the response to AT+CPIN? is "+CPIN: xxx" depending on SIM PIN state.
- If the SIM detect pin indicates "present", and the inserted card is not a SIM card, the response to AT+CPIN? is "+CME ERROR: 10".
- These last two states are not provided immediately due to background initialization. Between the hardware SIM detect pin indicating "present" and the final results, the AT+CPIN? sends "+CME ERROR: 515" (Please wait, init in progress).

When the SIM detect pin indicates card absence, and if a SIM card was previously inserted, an IMSI detach procedure is performed, all user data is removed from the product (phonebooks, SMS etc.). The product then switches to emergency mode.

2.6 Background Initialization

After entering the PIN 1/CHV 1, some SIM user data files are loaded into the product (phonebooks, SMS status, etc.). Please be aware that it might take some time to read a large phonebook.

The AT+CPIN? command response occurs after PIN checking. After this response user data is loaded in background. This means that some data may not be available just when PIN entry is confirmed by "OK". The reading of phonebooks will then be refused by "+CME ERROR: 515" or "+CMS ERROR: 515" meaning, "Please wait, service is not available yet, init in progress".

This type of answer may be sent by the product at several points:

- when trying to execute another AT command before the previous one is completed (before response),
- when switching from ADN to FDN (or FDN to ADN) and trying to read the relevant phonebook immediately,
- when asking for +CPIN? status immediately after SIM insertion and before the product has determined if the inserted card is a valid SIM card.

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2.7 Length of Phone Numbers

Phone numbers can be made of up to 80 digits. The 20 first digits are stored in SIM, in the phonebook file (EF_{ADN}, EF_{FDN} or EF_{LND}) corresponding to the selected phonebook. The next digits are stored in other extension SIM files (EF_{EXT1} or EF_{EXT2}).

As an example:

Number of digits	Nb of records in EF_{ADN}	Nb of free records in EF_{EXT1}
1 to 20	1	0
21 to 40	1	1
41 to 60	1	2
61 to 80	1	3

If there is no more free records in the EF_{EXT1}, the behavior is:

- if user tries to store an entry of more than 20 digits: +CME ERROR: 20,
- if user tries to dial a number of more than 20 digits: +CME ERROR: 20.

As the maximum length for the numbers (in ADN, FDN, LND) phonebooks is 80 digits:

- if user tries to dial a number of more than 80 digits: +CME ERROR: 26.

Before performing a call, the number of free records in the EF_{EXT1} is checked, to be able to store the dialed number.

- if there are free records left, the call is setup
- otherwise, +CME ERROR: 20 errors are returned (memory full).

Please refer to Recommendation 3GPP 11.11 [9] for more details.

2.8 Bad Software Message

The Wavecom Wireless CPU is designed to be downloaded with specific software. When the user has to take in charge the software download, it is necessary to be sure that the compatible software is downloaded. If the software downloaded is either corrupt or non-compatible, the message BAD SOFTWARE is displayed. To remedy, reinstall the initial specific software version.

Note:

If the Wireless CPU is still displaying BAD SOFTWARE, only Wavecom or a distributor can recover it.

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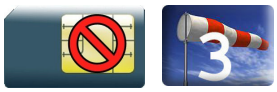
3 Basic commands

3.1 Attention Command



3.1.1 Description

This command always returns OK.

3.1.2 Syntax

Action command

AT

OK

Read command

None

Test command

None

3.1.3 Parameters and Defined Values

None

3.1.4 Parameter Storage

None

3.1.5 Examples

Command	Responses
AT	OK

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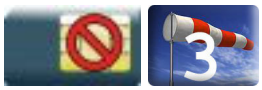
3.2 Repeat Last Command A/



3.2.1 Description

This command repeats the last command of the open session. Only the A/ command itself cannot be repeated.

If this command is the first one of the open session, the response is OK without any treatment.

3.2.2 Syntax

Action command

A/

Note: the response depends on the previous command

Read command

None

Test command

None

3.2.3 Parameters and Defined Values

None.

3.2.4 Parameter Storage

None.

3.2.5 Examples

Command	Responses
AT+CGMI	WAVECOM MODEM OK
A/ *Note: Repeat last command*	WAVECOM MODEM OK

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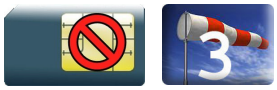
4 Identifications commands

4.1 Manufacturer Identification +CGMI



4.1.1 Description

This command gives the manufacturer identification.

4.1.2 Syntax

Action command
AT+CGMI
WAVECOM MODEM
OK

Read command
None

Test command
None

4.1.3 Parameters and Defined Values

None.

4.1.4 Parameter Storage

None.

4.1.5 Examples

Command	Responses
AT+CGMI *Note: Get manufacturer identification*	WAVECOM MODEM OK *Note: Command valid, WAVECOM modem*

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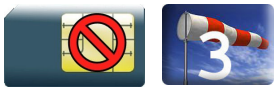
4.2 Request Model Identification +CGMM



4.2.1 Description

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

4.2.2 Syntax

Action command

AT+CGMM

<model>

OK

Read command

None

Test command

None

4.2.3 Parameters and Defined Values

<model>:		frequency bands selected
	G850	GSM 850
	900E	GSM 900 Extended
	1800	DCS 1800
	1900	PCS
	MULTIBAND 900E 1800	multi-band: GSM 900 extended band and DCS 1800
	MULTIBAND G850 1900	multi-band: GSM 850 and PCS

4.2.4 Parameter Storage

None.

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4.2.5 Examples

Command	Responses
AT+CGMM	MULTIBAND 900E 1800 OK *Note: Multi-band: GSM 900 extended band and DCS 1800 (default configuration)*
AT+CGMM	900E OK *Note: 900 extended*
AT+CGMM	1800 OK *Note: DCS*
AT+CGMM	1900 OK *Note: PCS*
AT+CGMM	G850 OK *Note: GSM 850*
AT+CGMM	MULTIBAND G850 1900 OK *Note: Multi-band: GSM 850 and PCS*

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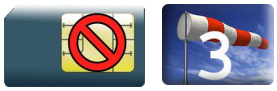
4.3 Hardware Version +WHWV



4.3.1 Description

This Wavecom proprietary command gets the hardware version.

4.3.2 Syntax

Action command
AT+WHWV
Hardware Version <version>
OK

Read command
None

Test command
AT+WHWV=?
OK

4.3.3 Parameters and Defined Values

<version>:	Wireless CPU hardware version string type

4.3.4 Parameter Storage

None.

4.3.5 Examples

Command	Responses
AT+WHWV *Note: Requests hardware version*	Hardware Version 4.14 OK

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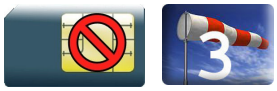
4.4 Date of Production +WDOP



4.4.1 Description

This Wavecom proprietary command gets the date of production.

4.4.2 Syntax

Action command
AT+WDOP
`Production Date (W/Y): <date>`
`OK`

Read command
`None`

Test command
AT+WDOP=?
`OK`

4.4.3 Parameters and Defined Values

<date>:	production date string format for date is: ww/yyyy where ww is the week number (range: 01-53) and yyyy the year.

4.4.4 Parameter Storage

None.

4.4.5 Examples

Command	Responses

AT+WDOP
 	
Note: Requests date of production
	`Production Date (W/Y): 01/2006`
	`OK`
	Note: Date of production is WEEK: 01/YEAR: 2006 (1st week of year 2006)

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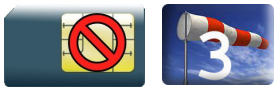
4.5 Write IMEI +WIMEI



4.5.1 Description

This Wavecom proprietary command downloads the IMEI. This operation is possible only if the Wireless CPU contains the default IMEI.

The IMEI can only be downloaded once.

No password is needed. If the download is not correct, only Wavecom can reset the IMEI.

4.5.2 Syntax

Action command

AT+WIMEI=<IMEI>

OK

Read command

AT+WIMEI?

+WIMEI: <IMEI>

OK

Test command

AT+WIMEI=?

OK

4.5.3 Parameters and Defined Values

<IMEI>:	IMEI 14 or 15 digits as defined in GSM 23.003 [21] When a 14 digits IMEI is written, the 15th digit is automatically added using Luhn algorithm.

4.5.4 Parameter Storage

None.

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4.5.5 Examples

Command	Responses
AT+WIMEI? *Note: Request IMEI*	+WIMEI: 123456789012345 OK
AT+WIMEI=123456789099998 *Note: First dowload on 15 digits*	OK
AT+CGSN *Note: Get stored IMEI*	123456789099998 OK
AT+WIMEI=35282000000005 *Note: First dowload on 14 digits*	OK
AT+CGSN *Note: Get stored IMEI*	352820000000054 OK
AT+WIMEI? *Note: Request IMEI*	+WIMEI: 352820000000054 OK

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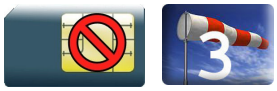
4.6 Wireless CPU Serial Number +WMSN



4.6.1 Description

This Wavecom proprietary command returns the serial number of the Wireless CPU.

4.6.2 Syntax

Action command

AT+WMSN

```
Serial Number <serial number>
OK
```

Read command

```
None
```

Test command

AT+WMSN=?

```
OK
```

4.6.3 Parameters and Defined Values

<serial number>:	Wireless CPU serial number integer type on 15 digits

4.6.4 Parameter Storage

None.

4.6.5 Examples

Command	Responses
AT+WMSN	Serial Number 123456789012345 *OK*

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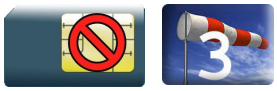
4.7 Product Serial Number +CGSN



4.7.1 Description

This command allows the user application to get the IMEI of the product.

4.7.2 Syntax

Action command
AT+CGSN
<IMEI>
OK

Read command
None

Test command
None

4.7.3 Parameters and Defined Values

<IMEI>:	Wireless CPU IMEI (15 digits number)

4.7.4 Parameter Storage

None.

4.7.5 Examples

Command	Responses
AT+CGSN *Note: Get the IMEI*	012345678901234 OK *Note: IMEI read from EEPROM*

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4.8 Request Revision Identification +CGMR

4.8.1 Description

This command is used to get the revised software version.

4.8.2 Syntax

Action command

AT+CGMR

<SW release>.<WCPU> <size> <date> <time>

OK

Read command

None

Test command

None

4.8.3 Parameters and Defined Values

Example:

661_09gg.Q2687H 1925308 092106 19:04

Software release | Software size | Date mmddyy | Hour hh:mm

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<revision>:		
6	first bit	major features embedded
6	second bit	software family
1	third	evolutive iteration step (from 1 to 9)
_	fourth	corrective iteration step (from "_" to "x"
09	fifth and sixth	mean AT product (always 09)
gg	seventh and eight	wireless protocol capabilities (gm = GSM, gg = GSM&GPRS
Q	ninth	wireless CPU family
2	tenth	hardware series
6	eleventh	wireless CPU generation
8	twelfth	frequency band
7	thirteenth	hardware technology capability
H	fourteenth	memory size

4.8.4 Parameter Storage

None.

4.8.5 Examples

Command	Responses
AT+CGMR	661_09gg.Q2687H 1925308 092106 19:04 OK *Note : Software release 6.61, generated on September 21, 2006*

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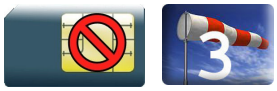
4.9 Request identification information I



4.9.1 Description

This command causes the product to transmit one or more lines of specific information text.

4.9.2 Syntax

Action command
ATI<n>
Depending on <n>
OK

Read command
None

Test command
None

4.9.3 Parameters and Defined Values

<n>:		information display control parameter
	0	display manufacturer followed by model identification (equivalent to +CGMI and +CGMM, refer to these commands for more precisions)
	3	display revision identification (equivalent to +CGMR)
	4	display modem configuration in RAM (equivalent to &V0)
	5	display modem configuration in EEPROM (equivalent to &V1)
	6	display modem data features. Lists the supported data rates, data modes and fax classes.
	7	display modem voice features
	other	"OK" string is sent back

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4.9.4 Parameter Storage

None.

4.9.5 Examples

Command	Responses
ATI0 *Note: Manufacturer and model identification*	WAVECOM MODEM MULTIBAND 900E 1800 OK *Note: See +CGMI and +CGMM commands*
ATI3 *Note: Revision identification*	661_09gg. Q2687H 1925308 092106 19:04 OK *Note : Software release 6.61, generated on September 21, 2006*
ATI6 *Note: Modem data features*	DATA RATES: AUTOBAUD,300,1200,1200/75,2400,4800,9600,14400 DATA MODES: T/TN,ASYNCHRONOUS FAX CLASS 1,2 OK
ATI7 *Note: Modem voice features*	SPEECH CODINGS: FR,EFR,HR,AMR OK

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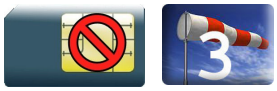
4.10 Write IMEI SVN +WSVN



4.10.1 Description

This Wavecom proprietary command updates the IMEI SVN.

4.10.2 Syntax

Action command

AT+WSVN=<IMEI SVN>

OK

Read command

AT+WSVN?

+WSVN: <IMEI SVN>

OK

Test command

AT+WSVN=?

+WSVN: (list of supported <IMEI SVN>s)

OK

4.10.3 Parameters and Defined Values

<IMEI SVN>:	IMEI SVN integer type range: 1-98

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4.10.4 Parameter Storage

None.

4.10.5 Examples

Command	Responses
AT+WSVN=?	+WSVN: (1-98) OK
AT+WSVN? *Note: Request IMEI SVN*	+WSVN: 10 OK
AT+WSVN=11 *Note: Update the IMEI SVN*	OK

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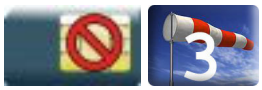
4.11 Capabilities List +GCAP



4.11.1 Description

This command returns the complete list of capabilities.

4.11.2 Syntax

Action command
AT+GCAP
+GCAP: (list of supported <name>s)
OK

Read command
None

Test command
None

4.11.3 Parameters and Defined Values

<name>:		supported capability
	+CGSM	CGSM command supported
	+FCLASS	fax command supported

4.11.4 Parameter Storage

None.

4.11.5 Examples

Command	Responses
AT+GCAP *Note: Get capabilities list*	+GCAP: +CGSM,+FCLASS OK *Note: Supports GSM and FAX commands*

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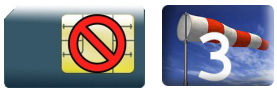
5 Open AT® Commands

5.1 Wavecom Downloading +WDWL



5.1.1 Description

This Wavecom proprietary command switches the product to download mode.

After downloading, the Wireless CPU should be reset using AT+CFUN=1.

5.1.2 Syntax

Action command
AT+WDWL
+WDWL: 0
Note: Downloading in progress

Read command
AT+WDWL?
+WDWL: <version>
OK

Test command
None

5.1.3 Parameters and Defined Values

<version>:	XModem downloader version string type

5.1.4 Parameter Storage

None.

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5.1.5 Examples

Com mand	Responses
AT+WDWL? *Note: Get downloader version.*	+WDWL: V02.12 OK
AT+WDWL	+WDWL: 0 *Note: Download mode started. File can be sent using the terminal application*
AT+CFUN=1	OK

5.1.6 Notes

+WDWL command allows to launch the download process only on the UART1 port.

Downloading is performed using the 1K-XMODEM protocol.

This command is unsupported when using a serial USB emulated port.

The flow control of the hyperterminal has to be set to "Hardware".

Caution:

Software damages may occur if power is lost or if a hardware reset occurs during the downloading phase. This would seriously affect Wireless CPU behavior.

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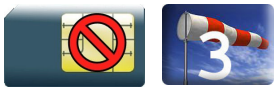
5.2 Wavecom Open AT® Control Command +WOPEN



5.2.1 Description

This Wavecom proprietary command performs the start, stop, delete, and get information about the current Open AT® embedded application.

This command also erases the Open AT® flash objects storage place, and configures the Application & Data (A&D) storage place size. Please refer to the Open AT® development guides for more information.

This command permits to configure the Open AT® Safe Boot, this service prevents the OAT application from starting when defined keys of the keyboard are pressed.

5.2.2 Syntax

- If <Mode>=0,1,3,4 or 5

Action command
AT+WOPEN=<Mode>
OK

- If <Mode>=2

Action command
AT+WOPEN=<Mode>
+WOPEN: <Mode>,<IntVersion>[,<ExtVersion>]
OK

- If <Mode>=6

Action command
AT+WOPEN=<Mode>[,<A&Dsize>]
+WOPEN: <Mode>,<A&DSize>,<OatSize>
OK

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- If <Mode>=7

Action command

AT+WOPEN=<Mode>

```
+WOPEN: <Mode>,<OatState>
OK
```

- If <Mode>=8

Action command

AT+WOPEN=<Mode>[,<SafeBootState>[,<Key1>[,<Key2>]]]

```
+WOPEN: <Mode>[,<SafeBootState>[,<Key1>[,<Key2>]]]
OK
```

Read command

AT+WOPEN?

```
+WOPEN: <Mode>
OK
```

Test command

AT+WOPEN=?

```
+WOPEN: (list of supported <Mode>s),(list of supported
<A&DSize>s),(list of supported <Key1>s),(list of supported
<Key2>s)
OK
```


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5.2.3 Parameters and Defined Values

<Mode>:		operating mode
	0	stop the Open AT® embedded application If the Open AT® application is running, the Wireless CPU resets.
	1	start the Open AT® embedded application If the Open AT® application is stopped, the Wireless CPU resets.
	2	get the Open AT® library versions
	3	erase the Open AT® embedded application flash objects
	4	erase the Open AT® embedded application
	5	suspend (in Wavecom OS) the Open AT® embedded application tasks
	6	If the <A&Dsize> parameter is used: configure the Application & Data storage size. If the <A&Dsize> parameter is not used: display the current A&D storage place size and Open AT® application space size.
	7	Open AT® application current state
	8	Configure the Open AT® Safe Boot: please refer to the <SafeBootState>, <Key1> & <Key2> parameters description for more information
<IntVersion>:		ASCII string giving the internal Open AT® library version
<ExtVersion>:		ASCII string giving the external Open AT® library version If no embedded application is loaded, the <ExtVersion> parameter is not displayed.
<A&DSize>:		Kbytes size allocated for the Application & Data storage place usable only with <Mode> = 6 range: 0–1344 (default value: 768 Kbytes). Provided parameter value will be rounded up to the nearest flash sector sub-division (64 Kbytes). For example, if a 100 Kbytes size is required, a 128 Kbytes size will effectively be set.
<OatSize>:		Open AT® application reserved size (in Kbytes) returned with <Mode> = 6 This size is calculated from the <A&Dsize> one, since the whole available size for Open AT® and A&D storage places is 1600 Kbytes (<OatSize> + <A&Dsize> = 1600).

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<OatState>:	Open AT® application current state returned with <Mode> = 7 This state will be greater than 0 only if the current +WOPEN command state is 1 (except when OatState = 13, which can occur even if the application is not started on the target).	
	0	application is not started (current mode is AT+WOPEN=0)
	1	no downloaded application in the Wireless CPU
	2	bad checksum The application binary seems to be corrupted.
	3	bad header The downloaded file seems not to be an Open AT® application.
	4	version mismatch The application binary was built with an SDK version which is not compatible with the current OS.
	5	too many tasks The number of declared tasks in the application exceeds the maximum allowed.
	6	bad binary init function The application binary seems to be corrupted.
	7	bad task entry point The application binary seems to be corrupted.
	8	link issue The application global variables area initialization is impossible.
	9	bad memory configuration The RAM size required by the application is incorrect.
	10	application is not started, starting was cancelled by the OAT Safe Boot.
	11	reserved
	12	application started in target mode The application is now running on the target.
	13	application started in RTE mode The application is now running in debug mode.

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< SafeBootState >:		usable with <Mode> = 8
	0	stop the Open AT® Safe Boot.
	1	start the Open AT® Safe Boot. (default value: 1)
< Key1>:		usable with <Mode> = 8
	[0 – 24]	first key used for Open AT® Safe Boot. (default value: 19)
< Key2>:		usable with <Mode> = 8
	[0 – 24]	second key used for Open AT® Safe Boot. This key has to be on the same row or the same column of the keyboard that Key1. (default value: 24)

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5.2.4 Parameter storage

The <Mode> and <A&Dsize> parameters are stored in EEPROM without using the AT&W command. The default value can be restored using AT&F.

5.2.5 Examples

Command	Responses
AT+WOPEN=?	+WOPEN: (0-8),(0-1344),(0-24),(0-24) OK
AT+WOPEN?	+WOPEN: 0 OK
AT+WOPEN=2 *Note: Get the Open AT® library versions*	+WOPEN: 2,"AT v03.01","AT v02.10" OK *Note: Open AT® version 2.10 application downloaded.*
AT+WOPEN=7	+WOPEN: 7,0 OK *Note: Open AT® application not started*
AT+WOPEN=1	+CME ERROR: 541 *Note: since main versions do not match, the Open AT® application can not be started.*
AT+WOPEN=2 *Note: Get the Open AT® library versions*	+WOPEN: 2,"AT v2.00","AT v2.00" OK *Note: Open AT® v2.00 library version. An embedded application has been downloaded on this product..*
AT+WOPEN=3	OK *Note: The flash objects are erased*
AT+WOPEN=1 *Note: Start the embedded application.*	OK +WIND: 3 *Note: Product resets in order to start the embedded application.*

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Command	Responses
AT+WOPEN=7	+WOPEN: 7,12 OK *Note: Open AT® application started on the target.*
AT+WOPEN=8	+WOPEN: 8,1,19,24 OK *Note: Safe Boot is active and uses the keys 19 and 24*
AT+WOPEN=8,1,10,12	OK *Note: Safe Boot is active and uses the keys 10 and 12.*
AT+WOPEN=8,1,10,10	+CME ERROR: 3 *Note: Two different keys have to be supplied*
AT+WOPEN=8,1,10,16	+CME ERROR: 3 *Note: The two supplied keys have to be on the same row or on the same column*
AT+WOPEN=3	+CME ERROR: 532 *Note: the embedded application is activated so the flash objects are not erased.*
AT+WOPEN=4	+CME ERROR: 532 *Note: the embedded application is activated so it cannot be erased*
AT+WOPEN=0 *Note: Stop the embedded application.*	OK +WIND: 3 *Note: Product reset in order to stop the embedded application.*
AT+WOPEN=3	OK *Note: The flash objects are erased*
AT+WOPEN=4	OK *Note: The embedded application is erased*
AT+WOPEN=6	+WOPEN: 6,768,832 OK *Note: 768 Kbytes are reserved for the A&D storage place, and 832 for the Open AT® application*
AT+WOPEN=6,1280	+CME ERROR: 550 *Note: The current Open AT® application size is too big to allow this new A&D storage place size.*

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Command	Responses
AT+WOPEN=6,768	+WOPEN: 6,768,832 OK *Note: No product reset (same size used)*
AT+WOPEN=6,900	+WOPEN: 6,960,640 OK +WIND: 3 *Note: Size updated according to the nearest flash sector sub-division. Product reset in order to set the new A&D storage place size.*
AT+WOPEN=6	+WOPEN: 6,960,640 OK *Note: 960 Kbytes are reserved for the A&D storage place, and 640 for the Open AT® application*
AT+WOPEN=5 *Note: Suspend Open AT® tasks*	+CME ERROR: 3 *Note: The Open AT® application is not running*
AT+WOPEN=1 *Note: Start the embedded application*	OK +WIND: 3 *Note: Product reset in order to start the embedded application*
AT+WOPEN=5 *Note: Suspend Open AT® tasks*	OK
AT+WOPEN?	+WOPEN:5 OK

5.2.6 Notes

For mode = 1: if the main version numbers returned by the AT+WOPEN=2 command do not match, the command will reply "+CME ERROR: 541"

<Mode> = 3 and <Mode> = 4 are only available if the Open AT® embedded application is stopped (AT+WOPEN=0).

Open AT® embedded applications can be resumed with +WOPENRES command or the "INTERRUPT" feature (see +WCFM command).

The command returns an error when trying to use a key not available for OAT Safe Boot.

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Caution:

With <Mode> = 6, any A&D size change will lead to the area format process (this process will take some seconds on start-up, before the "+WIND: 3" indication display (up to 1.5 second per 64 Kbytes flash sector size can be considered as a maximum); all A&D cells data will be erased.

USB restrictions:

Starting or stopping an Open AT® application resets the Wavecom Wireless CPU. When these AT commands (AT+WOPEN=1 or AT+WOPEN=0) are sent to the Wavecom Wireless CPU by using the USB serial port, the user must:

1. Close the USB serial port as soon as the command is sent to the Wavecom Wireless CPU. This means that the OK response cannot be received by the user application.

2. Wait sufficient time to allow the Wavecom Wireless CPU to reset. Usually, the user must wait 1 second before reopening the USB serial port.

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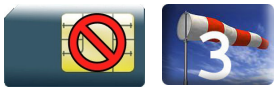
5.3 Open AT® Tasks Resume Command +WOPENRES



5.3.1 Description

This Wavecom proprietary command allows to resume the suspended Open AT® embedded application.

5.3.2 Syntax

Action command
AT+WOPENRES
OK

Read command
None

Test command
AT+WOPENRES=?
OK

5.3.3 Parameters and Defined Values

None.

5.3.4 Parameter Storage

None

5.3.5 Examples

None.

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6 Global Configuration Commands

6.1 Report Mobile Equipment Errors +CMEE

6.1.1 Description

This command defines the method for returning error messages. The simple ERROR message can be replaced by the verbose method to include the results codes +CME ERROR: <err>. (See section "ME error result code: +CME ERROR" in the "Appendixes" of the present document for "+CME ERROR" result codes description. See section "Message service failure result code: +CMS ERROR" in the "Appendixes" of the present document for "+CMS ERROR" result codes).

6.1.2 Syntax

Action command
AT+CMEE=<n>
OK

Read command
AT+CMEE?
+CMEE: <n>
OK

Test command
AT+CMEE=?
+CMEE: (list of supported <n>s)
OK

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6.1.3 Parameters and Defined Values

<n>:		error reporting method
	0	disable ME error reports, use only "ERROR" (default value)
	1	enable "+CME ERROR: <err>" or "+CMS ERROR: <err>"

6.1.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

6.1.5 Examples

Command	Responses
AT+CMEE=?	+CMEE: (0,1) OK
AT+CMEE=0 *Note: Disable ME error reports, use only "ERROR"*	OK
AT+CMEE=1 *Note: Enable "+CME ERROR: <err>" or "+CMS ERROR: <err>"*	OK
AT+CMEE?	+CMEE: 1 OK

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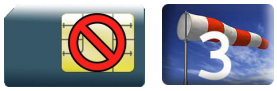
6.2 Hardware Configuration +WHCNF



6.2.1 Description

This Wavecom proprietary command allows to:

- activate or deactivate the keypad functionality in the Wireless CPU where available. When the keypad is deactivated, ten more I/0 pins will be free to be used (see PTS documentation for more information).

  The new setting will be taken into account immediately after the keypad activation or deactivation. With the keypad activation, ten GPIO pins are immediately used by the keypad and are not usable by other applications.

- activate or deactivate the flash LED (Activity status indication)

  The new setting will be taken into account after a restart.

  If the software downloaded is either corrupted or non-compatible, the flash LED is in "very quick flash" mode even if the flash LED is deactivated.

- This command allows the user to activate or deactivate the 32 kHz clock to output on a pin of the Wireless CPU. When the 32 kHz feature is deactivated, one more I/0 pin will be free to be used (see PTS documentation for more information).

  The new setting will be taken into account immediately after the 32 kHz feature activation or deactivation. With the 32 kHz feature activation, one I/O pin is immediately used to output the clock and this pin is no more usable as an I/O pin (until the 32 kHz feature will be deactivated).

6.2.2 Syntax

Action command

AT+WHCNF=<type>,<mode>

[+WHCNF: <type>,<status>[,<resetFlag>]]

OK

Read command

AT+WHCNF?

+WHCNF: <type>,<status>[,<resetFlag>]

[+WHCNF: <type>,<status>[,<resetFlag>][...]]

OK

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Test command **AT+WHCNF=?** +WHCNF: <type>,(list of supported <mode>s) [+WHCNF: <type>,(list of supported <mode>s)[...]] OK

6.2.3 Parameters and Defined Values

<type>:		hardware functionnality
	0	keypad
	1	flash LED
	2	32 kHz clock
<mode>:		requested operation
For <type> = 0		
	0	deactivate the keypad
	1	activate the keypad (default value)
	2	get the keypad status
For <type> = 1		
	0	deactivate the flash LED
	1	activate the flash LED (default value)
	2	get the flash LED status
For <type> = 2		
	0	deactivate the 32 kHz clock. The I/O pin is available (default value).
	1	activate the 32 kHz clock. The I/O pin is used to output the clock.
	2	interrogate the 32 kHz clock management status
<status>:		current status
For <type> = 0		
	0	deactivate the keypad
	1	activate the keypad

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For <type> = 1		
	0	deactivate the flash LED
	1	activate the flash LED
For <type> = 2		
	0	deactivate the 32 kHz clock management
	1	activate the 32 kHz clock management
<resetFlag>:		reset flag
For <type> = 1 only		
	0	The functionnality has not been modified since the last boot of the product.
	1	The functionnality has been modified since the last boot of the product: it has to be reset in order to take the modification into account.

6.2.4 Parameter storage

The <mode>parameter is stored in EEPROM without using At&W. The default value can be restored using AT&F.

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6.2.5 Examples

Command	Responses
AT+WHCNF=?	+WHCNF: 0,(0-2) +WHCNF: 1,(0-2) +WHCNF: 2,(0-2) ... OK
AT+WHCNF?	+WHCNF: 0,1 +WHCNF: 1,1,0 +WHCNF: 2,0 OK
AT+WHCNF=0,2	+WHCNF: 0,1 OK *Note: Keypad is activated*
AT+CMER=,1 *Note: Ask key press event report*	OK +CKEV: 12,1 +CKEV: 12,0 *Note: Key 12 has been pressed and released*
AT+WHCNF=0,0 *Note: The keypad is deactivated*	OK
AT+WHCNF=1,0 *Note: The flash LED is deactivated*	OK
AT+WHCNF=2,0 *Note: The 32 kHz output clock is deactivated*	OK
AT+WHCNF=0,2 *Note: Interrogate the keypad status*	+WHCNF: 0,0 OK
AT+CMER?	+CMER: 3,1,0,0,0 OK *Note: After the keypad is deactivated, no unsolicited result is sent when a key is pressed or released.*

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Command	Responses
AT&F *Note: Restore factory settings*	OK
AT+WHCNF=0,2	+WHCNF: 0,1 OK
AT+WHCNF=1,2	+WHCNF: 1,1,1 OK *Note: the third parameter <1> indicates a Wireless CPU reset is needed*
AT+WHCNF=2,2	+WHCNF: 2,0 OK
AT+WHCNF=0,1 *Note: Activate the keypad*	OK

6.2.6 Notes

This command returns OK when the command is proceeded correctly.
This command returns ERROR when:

- There is problem in activating the keypad or flash LED or 32 kHz clock output.
- There is problem in deactivating the keypad or flash LED or 32 kHz clock output.
- There is a syntax error.

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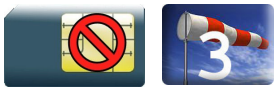
6.3 Wireless CPU Behavior Configuration +WBHV



6.3.1 Description

This Wavecom proprietary command allows the user to configure the behavior of the Wireless CPU.

6.3.2 Syntax

Action command

AT+WBHV=<parameter1>[,<parameter2>]

OK

Read command

AT+WBHV?

+WBHV: <parameter1>,<parameter2>[,<resetFlag>]

[+WBHV: <parameter1>,<parameter2>[,<resetFlag>][…]]

OK

Test command

AT+WBHV=?

+WBHV: <parameter1>,(list of supported <parameter2>s)
[,<resetFlag>]

[+WBHV: <parameter1>,(list of supported <parameter2>s)
[,<resetFlag>][…]]

OK

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6.3.3 Parameters and Defined Values

<parameter1>:		configuration mode
	0	configure Wireless CPU response on outgoing voice calls (default value)
	1	configure Wireless CPU working mode
	2	configure the response delay for a call
	3	active/deactive ENS feature
<parameter2>		configuration value
<parameter1>	<parameter2>	
0	0	Wireless CPU response is sent on call establishment (default value)
0	1	Wireless CPU response is sent when audio path is opened
0	/	Interrogate modem respond mode
1	0	fast idle mode is normal (default value)
1	1	fast standby mode
1	2	slow standby mode
1	/	interrogate modem init mode
2	0	response when the remote part hangs up (default value)
2	1	OK will be displayed immediately after the ATD command and +WIND: 5,x indication.
2	/	interrogate modem call respond mode
3	0	deactivate ENS feature
3	1	activate ENS feature
3	/	interrogate ENS feature mode

6.3.4 Parameter Storage

<parameter1> and <parameter2> are stored using AT&W command. The default values can be restored using AT&F.

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6.3.5 Examples

Command	Responses
AT+WBHV=?	+WBHV: 0,(0-1) +WBHV: 1,(0-2) +WBHV: 2,(0-1) +WBHV: 3,(0-1),(0-1) OK
AT+WBHV=0,1 *Note: Set modem response when audio path is opened*	OK *Note: Modem response is sent on audio path opened*
AT+WBHV=0 *Note: interrogate modem respond mode*	+WBHV : 0,1 OK
AT+WBHV=1,1 *Note: Modem powerless mode*	OK
AT+WBHV=1 *Note: interrogate modem init mode*	+WBHV: 1,2 OK
AT+WBHV=2,1 *Note: Modem response mode on a call: OK just after +WIND: 5,x indication*	OK
AT+WBHV=2 *Note: interrogate modem call respond mode*	+WBHV: 2,1 OK
AT+WBHV=3,0 *Note: Deactivate ENS feature. The feature will be deactivated after reset*	OK
AT+WBHV=3,1 *Note: Activate ENS feature. The feature will be activated after reset*	OK *Note: OK if STK session already open, else +CME ERROR: 3*
AT+WBHV=3 *Note: interrogate ENS feature mode*	+WBHV : 3,1,1 OK *Note: third parameter <1> indicates that a Wireless CPU reset is needed*

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Command	Responses
AT+WBHV?	+WBHV: 0,1 +WBHV: 1,1 +WBHV: 2,1 +WBHV: 3,1,1 OK *Note: third parameter <1> indicates that a Wireless CPU reset is needed)*
AT+CFUN=1	OK
AT+WBHV=3	+WBHV: 3,1,0 OK *Note: third parameter <0> indicates that a Wireless CPU reset is not needed*
AT+WBHV?	+WBHV: 0,1 +WBHV: 1,1 +WBHV: 2,1 +WBHV: 3,1,0 OK *Note: third parameter <0> indicates that a Wireless CPU reset is not needed*
AT&F **Note: Restore factory settings**	OK
AT+WBHV=3	+WBHV: 3,0,1 OK *Note: third parameter <1> indicates that a Wireless CPU reset is needed since ENS feature before AT&F was 1*

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6.3.6 Notes

If <parameter1> value is 3, the command is used to activate/deactivate ENS feature.

If <parameter1> value is 3, new setting will be taken into account only after a Wireless CPU reset. To be able to activate ENS Feature, a STK session must be open (AT+STSF=1), otherwise +CME ERROR: 3 occurs.

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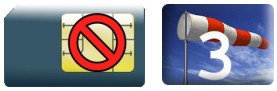
6.4 Features Management +WFM



6.4.1 Description

This Wavecom proprietary command enables or disables specific selected features.

Once a feature is successfully enabled or disabled, the product needs to be reset to take the modification into account.

6.4.2 Syntax

Action command

AT+WFM=<mode>[,<FtrID>]

[+WFM: <FtrID>,<status>,<resetFlag>

[+WFM: <FtrID>,<status>,<resetFlag>[…]]]

OK

Read command

None

Test command

None

6.4.3 Parameters and Defined Values

<mode>:		requested operation
	0	disable feature <FtrID>
	1	enable feature <FtrID>
	2	get the feature <ftrID> state If the <FtrID> parameter is not used, the status of all the features are listed (with several +WFM responses).

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<FtrID>: feature identification

The +WFM response only uses alphabetical values for the <FtrID> parameter.

For <FtrID> values with two digits (like 1x, 6x or 8x), the <mode> 0 value is not"allowed" When a "xa" feature is enabled, enabling an other "xb" feature will automatically disable the "xa" feature.

numerical	alphabetical	
11	"MONO900"	mono-band mode 900 MHz (default: 0)
12	"MONO1800"	mono-band mode 1800 MHz (default:0)
13	"MONO1900"	mono-band mode 1900 MHz (default:0)
14	"BI9001800"	dual-band mode 900/1800 MHz (default: 0)
15	"BI9001900"	dual-band mode 900/1900 MHz (default: 0)
16	"MONO850"	mono-band mode 850 MHz (default: 0)
17	"BI8501900"	dual-band mode 850/1900 MHz (default: 0)
18	"QUADBAND"	quad-band mode 850/900/1800/1900 MHz (default: 1)
2	"EFR"	enhanced full rate feature (default: 1)
3	"HR"	half rate feature (default: 1)
4	"DTXDATA"	data with DTX feature (default: 1)
5	"DATA144"	data 14.4 kbits/s feature (default: 1)
61	"SIM3VONLY"	3V SIM voltage mode (default: 0)
62	"SIM1V8ONLY"	1,8V SIM voltage mode (default: 0)
63	"SIM1V8AND3V"	1,8V and 3V SIM voltage mode (default: 0)
7	"SIMREMOVE"	SIM removal feature (default: 1)
81	"NOINTERRUPT"	no management of interruption (default: 0)
83	"OFFWHENUNPLUG"	off when unplug mode (default: 0)
84	"INTERRUPT"	interruption for customer (default: 1)
9	"SWITCHATT"	switch attenuation feature (default: 1)
A	"CPHS"	CPHS feature (default: 1)
B	"SIMSPEEDENH"	SIM speed enhancement feature (default:1)

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	C	"LOCA"	Location feature (default: 0)
	D	"AMR"	AMR feature (default: 1)
	E	"NT_6K"	NIRR bit management for network (default: 1)

<status>:		feature <FtrID> status
	0	disabled
	1	enabled
<resetFlag>:		reset flag
	0	The feature has not been modified since the last boot of the product.
	1	The feature has been modified since the last boot of the product; a reset must be performed to take the modifications into account.

6.4.4 Parameter Storage

The <status> parameter is stored in EEPROM without using AT&W.

6.4.5 Example

Command	Responses
AT+WFM=2,"BI9001800"	+WFM: "BI9001800",1,0 OK *Note: Dual-band mode 900/1800 is enabled*
AT+WFM=0,"EFR" *Note: Disable the Enhanced full rate feature*	OK

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Command	Responses
AT+WFM=2 *Note : Get all <FtrID> status*	+WFM: "MONO900",0,0 +WFM: "MONO1800",0,0 +WFM: "MONO1900",0,0 +WFM: "BI9001800",1,0 +WFM: "BI9001900",0,0 +WFM: "MONO850",0,0 +WFM: "BI8501900",0,0 +WFM: "QUADBAND",0,0 +WFM: "EFR",0,1 +WFM: "HR",1,0 +WFM: "DTXDATA",1,0 +WFM: "DATA144",1,0 +WFM: "SIM3VONLY",0,0 +WFM: "SIM1V8ONLY",0,0 +WFM: "SIM1V8AND3V",0,0 +WFM: "SIMREMOVE",1,0 +WFM: "NOINTERRUPT",0,0 +WFM: "OFFWHENUNPLUG",0,0 +WFM: "INTERRUPT",1,0 +WFM: "SWITCHATT",1,0 +WFM: "CPHS",1,0 +WFM: "SIMSPEEDENH",0,0 +WFM: "LOCA",0,0 +WFM: "AMR",0,0 +WFM: "NT_6K",1,0 OK *Note: The modified features have their <resetFlag> parameter set to 1.*

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6.4.6 Notes

- "MONO900", "MONO850", "MONO1800", "MONO1900", "BI9001900", "BI9001800", "BI8501900" and "QUADBAND" features are read-only. In order to change the band selection use the +WMBS command.
- The "SIMREMOVE" feature and AT+WIND=1 enable "+WIND: 1" and "+WIND: 2" unsollicited responses for SIM insertion and extraction.
- When the "NOINTERRUPT" feature is activated, if the pin interrupt is set, no action is taken.
- When the "OFFWHENUNPLUG" feature is activated, if the pin interrupt is set, an AT+CPOF is executed.
- When the "INTERRUPT" feature is activated and AT+WIND=2048 is entered, if the pin interrupt is set, an unsolicited response "+WIND: 12" is received and the Open AT® customer application is resumed if it was previously suspended (see AT+WOPEN=5).
- When the "SWITCHATT" feature is activated, the switch attenuation algorithm is available to the +ECHO command.
- "AMR" feature can only be activated for AMR product. If the AMR function is not available, its activation or deactivation has no effect and there is no error response.

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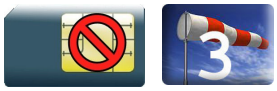
6.5 Commercial Feature Management +WCFM



6.5.1 Description

This Wavecom proprietary command enables or disables Wavecom specific features. Disabling a feature can be done with no restriction, but a password is required to enable features. This command is used only on request of Wavecom

Once a feature is successfully enabled or disabled, the product needs to be reset to take the modification into account.

6.5.2 Syntax

Action command

AT+WCFM=<mode>[,<FtrMask>[,<Password>]]

[+WCFM: <FtrMask>,<resetFlag>]

OK

Read command

None

Test command

None

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6.5.3 Parameters and Defined Values

<mode>:		requested operation
	0	disable some features of <FtrMask>
	1	enable some features of <FtrMask>
	2	display the features state
	3	disable some extended commercial features of <FtrMask>
	4	enable some extended commercial features of <FtrMask>
	5	display the extended commercial features state
<FtrMask>:		features mask 16 bits hexadecimal string commercial features (<mode>=0, <mode>=1 or <mode>=2) :
	02	GPRS Class 2
	04	Wireless CPU Highest GPRS CLASS allowed
	10	Open AT® Bluetooth Plug In
	20	Echo Cancellation Algorithm
	40	EDGE (EGPRS)
		extended commercial features (<mode>=3, <mode>=4 or <mode>=5) :
	01	Internet Plug In
	02	MQTT: IBM Websphere
	04	ORANGE M2M Connect
	08	Open AT® GTI Plug In
	10	Real Time Operating System
	20	Open Sim Access
	40	Open AT® C-GPS Plug In
<PassWord>:		password for feature unlocking 256 bits hexadecimal string

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<resetFlag>:		reset flag
	0	The feature has not been modified since the last boot of the product.
	1	The feature has been modified since the last boot of the product; a reset must be performed to take the modifications into account.

6.5.4 Parameter Storage

The <FtrMask> parameter is stored in EEPROM without using AT&W.

6.5.5 Examples

Command	Responses
AT+WCFM=2 *Note: Display the feature status*	+WCFM: "AAAA",0 OK
AT+WCFM=0,"0A00" *Note: Disable some features*	OK
AT+WCFM=2 *Note: Display the feature status*	+WCFM: "0A00",1 OK *Note: <resetFlag> parameter indicates if a reset is necessary* *A reset must be performed to take the modifications into account.*
AT+WCFM=1,"0003","1234567890ABCDEF1234567890ABCDEF1234567890ABCDEF" *Note : Enable features*	OK *Note: The features are enabled (the password is correct)*

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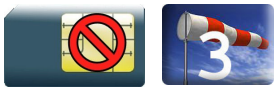
6.6 Wavecom Slow Idle Mode +W32K



6.6.1 Description

This Wavecom proprietary command allows the slow idle mode to be enabled or disabled.

With this command, a specific procedure on RS232 serial link is requested to activate or deactivate slow idle mode.

6.6.2 Syntax

Action command

AT+W32K=<mode>

OK

Read command

None

Test command

None

6.6.3 Parameters and Defined Values

<mode>:		slow idle mode
	0	disable
	1	enable

6.6.4 Parameter Storage

None.

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6.6.5 Examples

Command	Responses
AT+W32K=1 *Note: Enable slow idle mode*	OK
AT+W32K=0 *Note: Disable slow idle mode*	OK

6.6.6 Notes:

- When power down mode is entered, the product uses a 32kHz internal clock during inactivity stages (despite of its nominal internal clock).
- When enabled, power down mode is active after 1 to 15 seconds.
- For additional information
  - about power down mode, see Application Note on Power Down Control via RS232,
  - about Wireless CPU's working modes, please refor to the Appendixes of the AT Commands Interface Guide,
  - about RS232 serial link procedure to activate or deactivate the slow idle mode, please refer to the Appendixes of the AT Commands Interface Guide.

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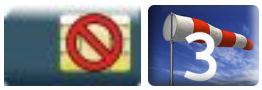
6.7 Power Off +CPOF



6.7.1 Description

This Wavecom proprietary command stops the GSM software stack and the hardware layer or the Wireless CPU activity. The AT+CFUN=0 command is equivalent to +CPOF.

Note:

In autobaud mode, after a +CPOF unsolicited information waking up the Wireless CPU is sent at 9600 bps until an AT command is sent. When an AT command is sent, the Wireless CPU will synchronize to the sender speed. (see CAUTION in § 8.2 Fixed DTE rate +IPR in Serial Ports Commands section).

6.7.2 Syntax

Action command
AT+CPOF[=<mode>]
OK

Read command
None

Test command
None

6.7.3 Parameters and Defined Values

<mode>: power off mode

	1	power off

6.7.4 Parameter Storage

None.

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6.7.5 Examples

Command	Responses
AT+CPOF *Note: Stop GSM stack*	OK
AT+CPOF=1 *Note: Stop the wireless CPU*	OK

6.7.6 Note

After AT+CPOF=1, the Wireless CPU will not respond to AT commands. To reset, use the hard reset.

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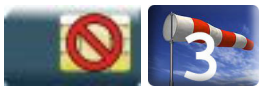
6.8 Set Phone Functionality +CFUN



6.8.1 Description

This command selects the functionality level for the mobile station.

When the application wants to stop the product with a power off, or if the application wants to force the product to execute an IMSI DETACH procedure, then it must send:

AT+CFUN=0 (equivalent to +CPOF).

This command executes an IMSI DETACH and makes a backup copy of some internal parameters in SIM and in EEPROM. The SIM card cannot be accessed.

If the mobile equipment is not powered off by the application after this command has been sent, a re-start command (AT+CFUN=1) will have to be issued to restart the GSM registration process.

If the mobile equipment is turned off after this command, then a power on will restart the GSM registration process.

The AT+CFUN=1 command restarts the entire GSM stack and GSM functionality: a complete software reset is performed. All parameters are reset to their previous values if AT&W was not used.

If entries are written in the phonebook (+CPBW) and if the product is reset directly before +CPBW response (AT+CFUN=1, with no previous AT+CFUN=0 command), some entries may be lost (the SIM task does not have enough time to write entries in the SIM card).

In addition, the OK response will be sent at the last saved (AT&W) baud rate defined by the +IPR command. With the autobauding mode, the response can be sent at a different baud rate, it is therefore preferable to save the defined baud rate with AT&W before sending the AT+CFUN=1 command.

Normally, when using UART1 or UART2 to manage the Wireless CPU, the OK response is sent to the application after the Wireless CPU reset.

Caution:

When using the emulated serial port, the OK response is not provided. In addition, the Wireless CPU reset will cause the USB stack to stop. From the host's point of view, it is similar to a USB cable disconnection. As a consequence, the host will uninstall the Wavecom USB driver and the application will reference a non valid driver.

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6.8.2 Syntax

Action command
AT+CFUN=<fun>[,<rst>]
OK

Read command
AT+CFUN?
+CFUN: <fun>
OK

Test command
AT+CFUN=?
+CFUN: (list of supported <fun>s),(list of supported <rst>s)
OK

6.8.3 Parameters and Defined Values

<fun>:		functionality level
	0	set minimum functionality, IMSI detach procedure
	1	set the full functionality mode with a complete software reset
<rst>:		no impact if not omitted, only compliance

6.8.4 Parameter Storage

None.

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6.8.5 Examples

Command	Responses
AT+CFUN=?	+CFUN: (0,1),(0,1) OK
AT+CFUN? *Note: Ask for current functionality level*	+CFUN: 1 OK *Note: Full functionality*
AT+CFUN=0 *Note: Set minimum functionality, IMSI detach procedure*	OK
AT+CFUN=1 *Note: Set the full functionality mode with a complete software reset*	OK

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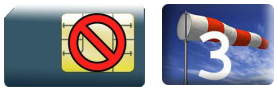
6.9 Wavecom Reset +WRST



6.9.1 Description

This Wavecom proprietary command resets the Wireless CPU after a programmed delay. The Wireless CPU will reset cyclically until this mode is disabled.

6.9.2 Syntax

Action command

AT+WRST=<Mode>,<Delay>

OK

Read command

AT+WRST?

+WRST: <Mode>[,<Delay>,<RemainTime>]

OK

Test command

AT+WRST=?

OK

6.9.3 Parameters and Defined Values

<Mode>:		timer reset mode
	0	disabled
	1	enabled
<Delay>:		time set to reset the Wireless CPU range: "000:01"- "168:59" (format hhh:mm)
<RemainTime>:		time before next reset range: "000:01"- "168:59" (format hhh:mm)

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6.9.4 Parameter Storage

The <Mode> and <Delay> parameters are stored in EEPROM without using AT&W.

6.9.5 Examples

Command	Responses
AT+WRST=0 *Note: Disable timer*	OK
AT+WRST=1,"001:03" *Note: Enable timer and set delay at 1 hour 3 minutes*	OK
AT+WRST?	+WRST: 1,"001:03","001:01" OK *Note: Timer activated to reset after 1hour and 3 minutes., next reset is set for 1 hour and 1 minute.*

6.9.6 Notes

Caution:

The +WRST command is strictly forbidden when the user application communicates with the Wavecom Wireless CPU by using the USB serial port.

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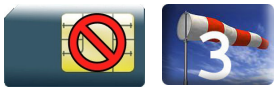
6.10 Save Configuration &W



6.10.1 Description

This command writes the active configuration into a non-volatile memory (EEPROM).

6.10.2 Syntax

Action command
AT&W
OK

Read command
None

Test command
None

6.10.3 Parameters and Defined Values

None.

6.10.4 Parameter Storage

None.

6.10.5 Examples

Command	Responses
AT+IPR=9600 *Note: Change data rate in memory only*	OK
AT&W	OK
AT+CFUN=1	OK
AT+IPR?	+IPR: 9600 OK

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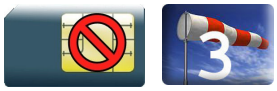
6.11 Restore Factory Settings &F



6.11.1 Description.

This command is used to restore factory settings from EEPROM.

6.11.2 Syntax

Action command
AT&F[<n>]
OK

Read command
None

Test command
None

6.11.3 Parameters and Defined Values

<n>:		setting restore parameter If <n> is not omitted and with a value different from 0, the response is OK without any treatment.
	0	restore factory settings

6.11.4 Parameter Storage

None.

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6.11.5 Examples

Command	Responses
AT&F *Note: Asks for restoring the factory settings*	OK *Note: Done*
AT&F0 *Note: Idem*	OK *Note: Done*

6.11.6 Notes

For each parameter, the section "Parameter Storage" specifies which default values can be restored using AT&F. The parameters are restored in RAM and in E2P, overwriting the profile set with AT&W.

This command does not update the +IPR command.

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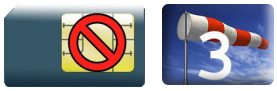
6.12 Default Configuration Z



6.12.1 Description

This command restores the configuration profile from non-volatile memory (EEPROM).

6.12.2 Syntax

Action command

ATZ

OK

Read command

None

Test command

None

6.12.3 Parameters and Defined Values

None.

6.12.4 Parameter Storage

None

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6.12.5 Examples

Command	Responses
AT+IPR?	+IPR: 115200 OK *Note: Default value is in EEPROM*
AT+IPR=9600 *Note: Change data rate in memory only*	OK
AT+IPR?	+IPR: 9600 OK
ATZ	OK
AT+IPR?	+IPR: 115200 OK *Note: Default value set back from EEPROM*

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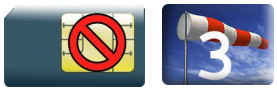
6.13 Display configuration &V



6.13.1 Description.

This command is used to display the modem configuration.

6.13.2 Syntax

Action command

AT&V[<n>]

```
Q:<val1> V:<val2> S0:<val3> S2:<val4> S3:<val5> S4:<val6> S5:<val7>
+CR:<val8> +CRC:<val9> +CMEE:<val10> +CBST:<val11>
+SPEAKER:<val12> +ECHO:<val13> &C:<val14> &D:<val15> %C:<val16>
[+IPR:<val17>] +ICF:<val18> +IFC:<val19>
OK
```

Note: For each <valx> parameter, please refer to the corresponding command.

Read command

```
None
```

Test command

```
None
```

6.13.3 Parameters and Defined Values

<n>:		display control parameter
	0	display the modem configuration in RAM (default value if no parameter provided)
	1	display the modem configuration in EEPROM
	2	display the modem factory configuration

6.13.4 Parameter Storage

None.

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6.13.5 Examples

Command	Responses
AT&V *Note: Display active parameters in RAM*	Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008 +CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1 +SPEAKER:0 +ECHO:0,0 &C:1 &D:2 %C:0 +IPR:9600 +ICF:3,4 +IFC:2,2 OK *Note: Done* *For Echo, the first value corresponds to Echo cancellation 1.*

6.13.6 Notes

The parameters displayed are the following:

- For <n> = 0 or 1
  Q:val1, V:val2, S0:val3, S2:val4, S3:val5, S4:val6, S5:val7,
  +CR:val8, +CRC:val9, +CMEE:val10, +CBST:val11,
  +SPEAKER:val12, +ECHO:val13, &C:val14, &D:val15, %C:val16
  +IPR:val17, +ICF:val18, +IFC:val19
- For <n> = 2
  Q:val1, V:val2, S0:val3, S2:val4, S3:val5, S4:val6, S5:val7,
  +CR:val8, +CRC:val9, +CMEE:val10, +CBST:val11,
  +SPEAKER:val12, +ECHO:val13, &C:val14, &D:val15, %C:val16
  +ICF:val18, +IFC:val19
  The +IPR value is not returned for <n>=2.

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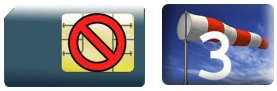
6.14 Wavecom Custom Character Set +WCCS



6.14.1 Description

This Wavecom proprietary command allows to edit and display the custom character set tables. These tables are used by the "CUSTOM" mode of the +CSCS and the +WPCS commands. In this "CUSTOM" mode, when the user enters a string, it is converted into GSM alphabet using the custom to GSM table. In a similar way, when the user requests a string display, the string is converted from GSM alphabet using the custom alphabet and the custom alphabet extension tables.

6.14.2 Syntax

- If <mode>=0

Action command

AT+WCCS=<mode>,<table>,<character_range>[,<character_range>]

+WCCS: <character_number>,<characters>

OK

- If <mode>=1

Action command

AT+WCCS=<mode>,<table>,<character_range>[,<character_range>]

><characters><ctrl-Z>

OK

Read command

None

Test command

None

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6.14.3 Parameters and Defined Values

<mode>:		requested operation
	0	display the table
	1	edit the table
<table>:		character table selection
	0	custom to GSM conversion table (default table is PCCP437 to GSM table)
	1	custom alphabet table (default table is GSM 7 bit default alphabet)
	2	custom alphabet extension table (default table is GSM 7 bit default alphabet extended)
<character_range>:		range of character codes in <table>
	0-127	for table index 1 and index 2
	0-255	for table index 0
<character_number>:		number of displayed characters
	0-127	for table index 1 and index 2
	0-255	for table index 0
<characters>:		sequence of ASCII characters hexastring type

6.14.4 Parameter Storage

The <characters> parameter is stored in EEPROM without using AT&W.

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6.14.5 Examples

Command	Responses
AT+WCCS=?	+WCCS: (0-1),(0-2),(0-255),(0-255) OK
AT+WCCS=0,0,120,130 *Note: Display from character 120 to character 130 of the custom to GSM conversion table*	+WCCS: 11, 78797A2020202020097E05 OK *Note: 11 characters displayed*
AT+WCCS=1,0,115 **20<ctrl-Z>** *Note: Edit character 115 of the custom to GSM conversion table*	OK *Note: Edition successful*
AT+WCCS=1,1,0,4 **40A324A5E8<ctrl-Z>** *Note: Edit the 5 first characters of the custom alphabet table*	OK *Note: Edition successful*
AT+WCCS=0,1,1 *Note: Display character 1 of the custom alphabet table*	+WCCS: 1,A3 OK

6.14.6 Notes

In edition mode, the session is terminated by <ctrl-Z>, or aborted by <ESC>. Only hexadecimal characters ("0"..."9", "A"..."F") can be used. The number of characters entered must be equal to the edition range requested, otherwise the command will return "+CME ERROR: 24".

The default custom alphabet extension table contains the following extended characters:

| ^ € { } [ ] ~ \

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6.15 Select TE Character Set +CSCS

6.15.1 Description

This command informs the ME which character set is used by the TE. The ME can convert each character of entered or displayed strings. This is used to send, read or write short messages.

6.15.2 Syntax

Action command
AT+CSCS=<Character Set>
OK

Read command
AT+CSCS?
+CSCS: <Character Set>
OK

Test command
AT+CSCS=?
+CSCS: (list of supported <Character Set>s)
OK

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6.15.3 Parameters and Defined Values

<Character Set>:		character table set (ASCII string)
	"GSM"	GSM default alphabet.
	"PCCP437"	PC character set code page 437 (default value)
	"CUSTOM"	user defined character set
	"HEX"	hexadecimal mode. No character set used; the user can read or write hexadecimal values

6.15.4 Parameter Storage

The <Character Set> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

6.15.5 Examples

Command	Responses
AT+CSCS=? *Note: Get possible values*	+CSCS: ("GSM","PCCP437","CUSTOM","HEX") OK
AT+CSCS="GSM" *Note: GSM default alphabet*	OK
AT+CSCS? *Note: Get current value*	+CSCS: "GSM" OK *Note: GSM default alphabet*

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6.16 Wavecom Phonebook Character Set +WPCS

6.16.1 Description

This Wavecom proprietary command informs the ME which character set is used by the TE for the phonebooks. The ME can convert each character of entered or displayed strings. This is used to read or write phonebook entries (parameters <text>, <address> and <mail>).

6.16.2 Syntax

Action command

AT+WPCS=<Character Set>

OK

Read command

AT+WPCS?

+WPCS: <Character Set>

OK

Test command

AT+WPCS=?

+WPCS: (list of supported <Character Set>s)

OK

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6.16.3 Parameters and Defined Values

<Character Set>:		character table set (ASCII string)
	"TRANSPARENT"	transparent mode The strings are displayed and entered as they are stored in SIM or in ME. (default value)
	"CUSTOM"	user defined character set
	"HEX"	hexadecimal mode No character set used; the user can read or write hexadecimal values.

6.16.4 Parameter Storage

The <Character Set> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

6.16.5 Examples

Command	Responses
AT+WPCS=? *Note: Get possible values*	+WPCS: ("TRANSPARENT","HEX","CUSTOM") OK *Note: Possible values*
AT+WPCS="CUSTOM" *Note: Custom character set*	OK
AT+WPCS? *Note: Get current value*	+WPCS: "CUSTOM" OK

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6.17 Set Language +CLAN

6.17.1 Description

This command sets the language in the MT.

6.17.2 Syntax

Action command

AT+CLAN=<code>

OK

Read command

AT+CLAN?

+CLAN: <code>

OK

Test command

AT+CLAN=?

+CLAN: (list of supported <code>s)

OK

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6.17.3 Parameters and Defined Values

<code>:		2 character code for the language The number indicated after the name refers to numeric value for the language in ISO 639 [16].
	"AUTO"	Selects the first language from EF-LP in the SIM card. "AUTO" is not returned by the read command. default value
	"de"	German (0)
	"en"	English (1)
	"it"	Italian (2)
	"fr"	French (3)
	"es"	Spanish (4)
	"nl"	Dutch (5)
	"sv"	Swedish (6)
	"da"	Danish (7)
	"pt"	Portuguese (8)
	"fi"	Finnish (9)
	"no"	Norwegian (10)
	"el"	Greek (11)
	"tr"	Turkish (12)
	"hu"	Hungarian (13)
	"pl"	Polish (14)
	"cs"	Czech (32)
	"he"	Hebrew (33)
	"ar"	Arabic (34)
	"ru"	Russian (35)
	"is"	Icelandic (36)

6.17.4 Parameter Storage

None.

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6.17.5 Examples

Command	Responses
AT+CLAN="fr"	OK
AT+CLAN=?	+CLAN: ("AUTO","de","en","it","fr","es","nl","sv","da","pt","fi","no","el","tr","hu","pl","cs","he","ar","ru","is") OK
AT+CLAN?	+CLAN: "fr" OK

6.17.6 Notes

After reset, the Wireless CPU starts in "AUTO" mode.

The read command returns a NULL string when in "AUTO" mode and the first entry in EF-LP is undefined.

The read command returns an error message when in "AUTO" mode and the first entry in EF-LP SIM file is invalid.

The read command returns an error message when EF-LP SIM file is invalidated.

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6.18 Language Event +CLAE

6.18.1 Description

This command is used to enable/disable +CLAV unsolicited result code, returned when the language in the MT is changed.

6.18.2 Syntax

Action command

AT+CLAE=<mode>

OK

Read command

AT+CLAE?

+CLAE: <mode>

OK

Test command

AT+CLAE=?

+CLAE: (list of supported <mode>s)

OK

Unsolicited response

+CLAV: <code>

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6.18.3 Parameters and Defined Values

<mode>:		language event mode
	0	disable unsolicited result code +CLAV (default value)
	1	enable unsolicited result code +CLAV
<code>:		2 character code for the language The number indicated after the name refers to numeric value for the language in ISO 639 [16].
	"de"	German (0)
	"en"	English (1)
	"it"	Italian (2)
	"fr"	French (3)
	"es"	Spanish (4)
	"nl"	Dutch (5)
	"sv"	Swedish (6)
	"da"	Danish (7)
	"pt"	Portuguese (8)
	"fi"	Finnish (9)
	"no"	Norwegian (10)
	"el"	Greek (11)
	"tr"	Turkish (12)
	"hu"	Hungarian (13)
	"pl"	Polish (14)
	"cs"	Czech (32)
	"he"	Hebrew (33)
	"ar"	Arabic (34)
	"ru"	Russian (35)
	"is"	Icelandic (36)

6.18.4 Parameter Storage

The <mode> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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6.18.5 Examples

Command	Responses
AT+CLAE=?	+CLAE: (0-1) OK
AT+CLAE=1	OK +CLAV: "fr" *Note: Current language is French.*
AT+CLAE?	+CLAE: 1 OK

6.18.6 Notes

Unsolicited response +CLAV is returned when "AT+CLAE=1" is sent to the Wireless CPU and previous setting of <mode> was 0.

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6.19 Select Type of Address +CSTA

6.19.1 Description

This command selects the type of number for further dialing commands (D) according to GSM specifications.

6.19.2 Syntax

Action command

AT+CSTA=<type>

OK

Read command

AT+CSTA?

+CSTA: <type>

OK

Test command

AT+CSTA=?

+CSTA: (list of supported <type>s)

OK

6.19.3 Parameters and Defined Values

< type>:		type of address octet in integer format (refer to GSM 04.08 subclause 10.5.4.7)
	145	international number
	129	national number (default value)

6.19.4 Parameter Storage

The <type> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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6.19.5 Examples

Command	Responses
AT+CSTA=?	+CSTA: (129,145) OK
AT+CSTA=145	OK
ATD33146290800; *Note: International access code character "+"will be automatically added to each outgoing call*	OK
AT+CSTA=129	OK
ATD+33146290800; *Note: International access code character "+" has to be added for international calls, national calls otherwise.*	OK
AT+CSTA?	+CSTA: 129 OK

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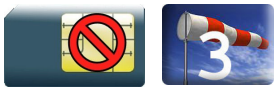
6.20 Cellular Text Telephone Modem +WCTM



6.20.1 Description

This Wavecom proprietary command allows the user to activate and deactivate the Cellular Text telephone Modem capability for outgoing voice call as specified in 3GPP 24.008 [8].

CTM mode is used to send audio signals from an external text terminal (ex: a TTY typewriter) within a voice call made by the ME. The text terminal must have a special mobile phone input/output to work correctly.

When the ME indicates that CTM text telephony for an outgoing voice call is supported, the network selects a speech CODEC and additionally CTM text telephony detection and conversion functions.

To guarantee optimal audio management of CTM signals, it is mandatory to deactivate Acoustic Echo Cancellation (see +ECHO command) and Side Tone (see +SIDET command).

Voice gain of transmitter and receiver (see +VGR, +VGT commands) have to be calibrated according to the external text terminal audio characteristics.

6.20.2 Syntax

Action command

AT+WCTM=<mode>

OK

Read command

AT+WCTM?

+WCTM: <mode>

OK

Test command

AT+WCTM=?

+WCTM: (list of supported <mode>s)

OK

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6.20.3 Parameters and Defined Values

<mode>:		CTM mode
	0	disable (default value) All incoming CTM calls will be rejected. Caller will receive a "no carrier" indication.
	1	enable

6.20.4 Parameter Storage

The <mode> parameter is stored using AT&W command.

6.20.5 Examples

Command	Responses
AT+WCTM=?	+WCTM: (0-1) OK
AT+WCTM=1	OK
AT+WCTM?	+WCTM: 1 OK

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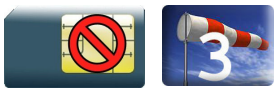
7 Wireless CPU Status Commands

7.1 General Indications +WIND



7.1.1 Description

This Wavecom proprietary command allows controlling a general mechanism to send unsolicited indications to the application.

7.1.2 Syntax

Action command
AT+WIND=<IndLevel>
OK

Read command
AT+WIND?
+WIND: <IndLevel>
OK

Test command
AT+WIND=?
+WIND: (list of supported <IndLevel>s)
OK

- For <event>=0,1,2,3,4,7,8,9,13,14,16:

Unsolicited response
+WIND: <event>

- For <event>=5 and <event>=6:

Unsolicited response
+WIND: <event>,<idx>

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- For <event>=10:

Unsolicited response

```
+WIND:
<event>,<phonebook>,<status>[,<phonebook>,<status>[,<phonebook>,<st
atus>[,<phonebook>,<status>[,<phonebook>,<status>]]]]
```

- For <event>=11:

Unsolicited response

```
+WIND: <event>,[<checksum>],[<checksum>],[<checksum>],[<checksum>]
,[<checksum>],[<checksum>]
```

- For <event>=12:

Unsolicited response

```
+WIND: <event>,<ext_it_id>[,<EdgeState>]
```

- For <event>=15:

Unsolicited response

```
+WIND: <event>[,1,"<Full name>"][,2,"<Short name>"][,3,"<Local
time zone>"][,4,"<Universal time and local time zone>"][,5,"<LSA
Identity>"][,6,"<Daylight Saving time>"]
```


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7.1.3 Parameters and Defined Values

<IndLevel>:		indication levels bit field (default value: 0) bit set to 0: indication deactivated bit set to 1: indication activated
	0	no unsolicited "+WIND: <event>" will occur
	1 (bit 0)	activate hardware SIM insert / remove indications or SIM presence after software reset
	2 (bit 1)	activate calling party alert indication
	4 (bit 2)	activate idle state indication
	8 (bit 3)	activate end of Wireless CPU initialization (after PIN 1/CHV 1 code entered) indication
	16 (bit 4)	activate new call identifier indication
	32 (bit 5)	activate call release indication
	64 (bit 6)	activate network service available indication
	128 (bit 7)	activate network lost indication
	256 (bit 8)	activate audio ON indication
	512 (bit 9)	activate SIM phonebooks reload status
	1024 (bit 10)	activate SIM phonebooks checksum indication
	2048 (bit 11)	activate interruption indication
	4096 (bit12)	activate hardware Rack Open/Closed Indication
	8192 (bit13)	activate NITZ indication
	16384 (bit 14)	activate SMS service ready indication

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<event>:	event identifier
0	the SIM presence pin has detected a "SIM removed"
1	the SIM presence pin has detected a "SIM inserted"
2	the calling party is alerting
3	the product is ready to process AT commands (except phonebooks, AOC, SMS), at init or after AT+CFUN=1
4	the product is ready to process all AT commands, end of phonebook init or swap (FDN to ADN)
5	a call <idx> has been created (after ATD or +CCWA...)
6	a call <idx> has been released, after a NO CARRIER, a +CSSU: 5 indication, or after the release of a call waiting
7	the network service is available for an emergency call
8	the network is lost
9	the audio channel is opened
10	reload status of each SIM phonebook after init phase (after power on or SIM insertion)
11	checksum of SIM phonebooks after initialization
12	an interruption has occurred (only if INTERRUPT feature is activated)
13	the rack has been detected as closed
14	the rack has been detected as opened
15	the Wireless CPU has received a NITZ information message from the network
16	SMS and SMS CB services are initialized

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<idx>:		call identifier integer value
<phonebook>:		phonebook memory storage
	"SM"	ADN
	"FD"	FDN
	"ON"	MSISDN
	"SN"	Service Number
	"EN"	Emergency Number
<status>:		phonebook status after initialization
	0	not reloaded from SIM (no change since last init or SIM removal)
	1	reloaded from SIM to internal memory (at least one entry has changed)
<checksum>:		128-bit "fingerprint" of the phonebook The checksums are presented in the following order : SM, FD, ON, SN, EN, LD. If the phonebook is not present in the SIM, the checksum is empty.
< ext_it_id>:		interruption identifier
	0	INT0
	1	INT1
< EdgeState>:		state of the edge in case of both edge (the interruption happens with a high to low and low to high edge) (please refer to +WIPC command description)
	0	interruption happens with high to low edge
	1	interruption happens with low to high edge
<Full name>:		long alphanumerical format name received from the NITZ message string type
<Short name>:		short alphanumerical format name received from the NITZ message string type
<Local time zone>:		difference, expressed in quarters of an hour, between the local time and GMT. signed integer

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<Universal time and local time zone>:	indicates date, time and time zone expressed in quarters of an hour, in format Year/Month/Day,Hour:Min:Seconds±TimeZone string ("yy/MM/dd,hh:mm:ss±zz")
<LSA Identity>:	localized Service Area identity of the current cell in hexa format (3 bytes) hexa string
<Daylight Saving Time>:	when the local time zone is compensated for DST (Day Saving time, or summertime), the serving PLMN shall provide a DST parameter to indicate it. The adjustment for DST can be +1h or +2h. range: 0-2

7.1.4 Parameter Storage

The <IndLevel> parameter is stored in EEPROM without using AT&W command. The default value can be restored using AT&F.

7.1.5 Examples

Command	Responses
AT+WIND?	+WIND: 0 OK
AT+WIND=255 *Note: The SIM has been removed*	+WIND: 0 *Note: The SIM presence pin has been detected as "SIM removed"*
Note: The SIM has been inserted	+WIND: 1 *Note: The SIM presence pin has been detected as "SIM inserted"*
Note: The network service is available for an emergency call	+WIND: 7
Note: The initialization has been completed	+WIND: 4
Note: The Wireless CPU received a NITZ information message	+WIND: 15,1,"Cingular Extend",2,"Cingular",3,"+08",4,"03/14/27,16:59:48+08",5,"123456",6,"2"
AT+WIND=2048	OK *Note: Activate the +WIND indications for interruption*
	+WIND: 12,0 *Note: An interruption occurred on INT0*

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7.1.6 Note

The following table indicates the correspondancies between <IndLevel> values and "+WIND: <event>[...]" indications that are activated.

<IndLevel> value	corresponding <event>
1	0 and 1
2	2
4	3
8	4
16	5
32	6
64	7
128	8
256	9
512	10
1024	11
2048	12
4096	13 and 14
8192	15
16384	16

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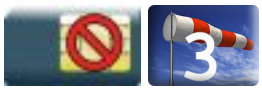
7.2 Phone Activity Status +CPAS



7.2.1 Description

This command returns the activity status of the mobile station.

7.2.2 Syntax

Action command
AT+CPAS
+CPAS: <pas>
OK

Read command
None

Test command
AT+CPAS=?
+CPAS: (list of supported <pas>s)
OK

7.2.3 Parameters and Defined Values

<pas>:		phone activity status
	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)

7.2.4 Parameter Storage

None.

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7.2.5 Examples

Command	Responses
AT+CPAS *Note: Current activity status*	+CPAS: 0 OK
AT+CPAS=?	+CPAS: (0-5) OK

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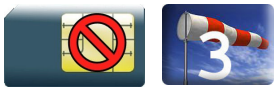
7.3 SIM Holder Status +WSHS



7.3.1 Description

This Wavecom proprietary command allows to check at any time the status of the SIM card holder.

7.3.2 Syntax

Action command
AT+WSHS
+WSHS: <status>
OK

Read command
None

Test command
AT+WSHS=?
+WSHS: (list of supported <status>s)
OK

7.3.3 Parameters and Defined Values

<status>:		SIM holder status
	0	open
	1	closed

7.3.4 Parameter Storage

None.

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7.3.5 Examples

Command	Responses
AT+WSHS=?	+WSHS: (0,1) OK
AT+WSHS *Note: Request the current SIM holder state*	+WSHS: 0 OK *Note: The SIM holder is open*

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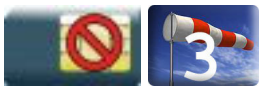
7.4 Indicator Control +CIND



7.4.1 Description

This command is used to read or set the values of ME indicators. If ME does not allow setting of indicators or ME is not currently reachable, "+CME ERROR: <err>" is returned.

7.4.2 Syntax

Action command

None

Read command

AT+CIND?

+CIND: <ind>,<ind>,<ind>,<ind>,<ind>,<ind>,<ind>

OK

Test command

AT+CIND=?

+CIND: (<descr>,(list of supported <ind>s))[,(<descr>,(list of supported <ind>s))[,…]]

OK

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7.4.3 Parameters and Defined Values

<ind>:		ME indicator state for one <descr> parameter integer type value, which shall be in range of corresponding <descr> parameter
	0	indicator is OFF or in a state which can be identified as "OFF" state
	1	indicator is ON or in a state that is more substantial than "OFF" state
	2-5	2 is more substantial than 1, and so on.
<descr>:		ME indicator description
	"battchg"	battery charge level (0-5)
	"signal"	signal quality (0-5)
	"service"	service availability (0-1)
	"message"	message received (0-1)
	"call"	call in progress (0-1)
	"roam"	roaming indicator (0-1)
	"smsfull"	SMS memory storage status in the MT (0-2) 0: memory locations are available 1: memory full 2: One SMS has been received in the SC but the SMS storage where this SMS is to be stored is full.

7.4.4 Parameter Storage

None.

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7.4.5 Examples

Command	Responses
AT+CIND?	+CIND: 1,2,1,1,0,0,0 OK *Note: battchg: 1, signal: 2, service: 1 - ME registered on the network, message: 1 - a SMS has been received, call: 0 – no call in progress, roam: 0 - not roaming, smsfull: 0 -SIM card is not full of SMS.*
AT+CIND=? *Note: Read possible value for ME indicators*	+CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("message",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-2)) OK

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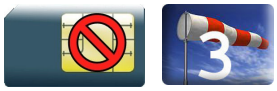
7.5 Mobile Equipment Event Reporting +CMER



7.5.1 Description

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

7.5.2 Syntax

Action command

AT+CMER=[<mode>][,[<keyp>][,[<disp>][,[<ind>][,[<bfr>]]]]]

OK

Read command

AT+CMER?

+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>

OK

Test command

None

Unsolicited response

+CKEV: <key>,<press> (key press event report)

+CIEV: <indresp>,<value> (indicator event report)

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7.5.3 Parameters and Defined Values

<mode>: TBD

3	(default value)

<keyp>: keypad event reporting mode

0	disabled (default value)
1	Keypad event reporting is routed using unsolicited code. Only the key pressings not caused by +CKPD are indicated
2	Keypad event reporting is routed using unsolicited code. All key pressings are indicated

<ind>: indicator event reporting mode

0	disabled (default value)
1	Indicator event reporting using unsolicited result code. Only the indicator events not caused by +CIND shall be indicated by the TA to TE
2	Indicator event reporting using unsolicited result code. All indicator events shall be directed from TA to TE

<key>: keyboard map is (5,5)

0	1	2	3	4
5	6	7	8	9
10	11	12	13	14
15	16	17	18	19
20	21	22	23	24

<press>: key operation

1	key pressed
0	key released

<indresp>: indicator order number (as specified for +CIND)

<value>: new value of the indicator

<bfr>: TA buffer of unsolicited result codes mode

0	TA buffer defined within this command is flushed to the TE default value

<disp> display event reporting mode

0	disabled (default value)

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7.5.4 Parameter Storage

The <keyp> and <ind> parameters are stored in EEPROM using AT&W command. The default values can be restored using AT&F.

7.5.5 Examples

Command	Responses
AT+CMER=,1 *Note: Asks for key press event report*	OK
	+CKEV: 12,1 +CKEV: 12,0 *Note: Key 12 has been pressed and released*
AT+CMER=,,,1 *Note: Asks for indicator event report*	OK
	+CMTI: "SM",10 +CIEV: 7,1 *Note: SMS memory storage is full*
AT+CMER?	+CMER: 3,1,0,1,0 OK

7.5.6 Notes

As Wavecom OS does not manage the emulation of key press, the values 1 and 2 of <keyp> lead to the same results.

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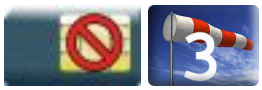
7.6 Mobile Equipment Control Mode +CMEC



7.6.1 Description

This command selects the equipment which operates ME keypad, writes to ME display and sets ME indicators. If operation mode is not allowed by the ME, "+CME ERROR: <err>" is returned.

7.6.2 Syntax

Action command

AT+CMEC=<keyp>[,<disp>[,<ind>]]

OK

Read command

AT+CMEC?

+CMEC: <keyp>,<disp>,<ind>

OK

Test command

AT+CMEC=?

+CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s)

OK

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7.6.3 Parameters and Defined Values

<keyp>:		ME keypad control mode
	2	ME can be operated from both ME keypad and TE
<disp>:		ME display control mode
	0	only ME can write to its display (+CDIS command can only be used to read the display)
<ind>:		ME indicators control mode
	0	only ME can set the status of its indicators (+CIND command can only be used to read the indicators)

7.6.4 Parameter Storage

None.

7.6.5 Examples

Command	Responses
AT+CMEC=?	+CMEC: (2),(0),(0) OK
AT+CMEC=2,0,0	OK
AT+CMEC?	+CMEC: 2,0,0 OK

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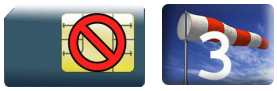
7.7 Wavecom Status Request +WSTR



7.7.1 Description

This Wavecom proprietary command returns some operation status. It can be used to check the state of the initialization sequence and the network status.

7.7.2 Syntax

Action command

AT+WSTR=<req status>

+WSTR: <req status>,<value>

OK

Read command

None

Test command

AT+WSTR=?

+WSTR: (list of supported <req status>s)

OK

7.7.3 Parameters and Defined Values

<req status>:		requested status	
	1	initialization sequence status	
	2	network status	
<value>:		current status	
		For <req status>=1	**For<req status>=2**
	0	not started	no network
	1	ongoing	network available
	2	finished	

7.7.4 Parameter Storage

None.

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7.7.5 Examples

Command	Responses
AT+WSTR=? *Note: Asks for the list of possible values*	+WSTR: (1-2) *Note: possible values are 1 and 2*
AT+WSTR=1 *Note: Selects the status 1 (INIT SEQUENCE)*	+WSTR: 1,2 OK *Note: Initialization finished*
AT+WSTR=2 *Note: Selects the status 2 (NETWORK STATUS)*	+WSTR: 2,1 OK *Note: The network is available*

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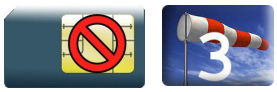
8 Serial Port Commands

8.1 Echo E



8.1.1 Description.

This command is used to determine whether the modem echoes characters received by an external application (DTE) or not.

8.1.2 Syntax

Action command
ATE[<n>]
OK

Read command
None

Test command
None

8.1.3 Parameters and Defined Values

<n>:		echo activation parameter
	0	Characters are not echoed (default value if <n> omitted)
	1	Characters are echoed.

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8.1.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command.

8.1.5 Examples

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

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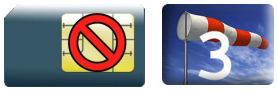
8.2 Fixed DTE Rate +IPR



8.2.1 Description

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

8.2.2 Syntax

Action command

AT+IPR=<rate>

OK

Read command

AT+IPR?

+IPR: <rate>

OK

Test command

AT+IPR=?

+IPR: (list of auto-detectable <rate>s),(list of supported <rate>s)

OK

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8.2.3 Parameters and Defined Values

<rate>:		baud rates that can be used by the DCE
	0	enables autobauding
	300	
	600	
	1200	
	2400	
	4800	
	9600	
	19200	
	38400	
	57600	
	115200	default value
	230400	
	460800	
	921600	

8.2.4 Parameter Storage

The <rate> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

8.2.5 Examples

Command	Responses
AT+IPR?	+IPR: 9600 OK *Note: Current rate is 9600 bps*
AT+IPR=?	+IPR: (1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600),(0,300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600) OK *Note: Possible values, according to V25 ter recommendation: the first set of values indicates the range of auto-detectable baud rates .The second set of values indicates the baud rates supported by the DCE.*

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Command	Responses
AT+IPR=38400	OK *Note: Disables autobauding and sets rate to 38400 bps*
AT+IPR=0	OK *Note: Enables autobauding*

8.2.6 Notes

- The serial autobauding feature is supported, and covers the following serial speeds (only): 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600 bps. Beyond those serial speeds, correct operation of the Wireless CPU is not guaranteed.
- Any AT command issued by the DTE must start with both capital 'A' and 'T' (or '/') or both lower case 'a' and 't' (or '/'), otherwise the DCE may return some garbage characters and become desynchronized. Should this happen, the DTE simply issues 'AT\r' (at 2400 or 4800 bauds) once or twice or just 'AT' (at 9600 bauds) to resynchronize the modem.
- The DTE waits for 1ms after receiving the last character of the AT response (which is always '\n' or 0x0A) to send a new AT command at either the same rate or a new rate. Should this delay be ignored, the DCE can become desynchronized. Once again, sending 'AT\r' once or twice or just 'AT' causes the DCE to recover.

Caution:

When starting up, if autobauding is enabled and no AT command has yet been received, the product sends all unsolicited responses (like RING) at 9600 bauds.

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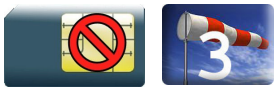
8.3 DTE-DCE Character Framing +ICF



8.3.1 Description

This command is used to determine the local serial port start-stop (asynchronous) character framing used by the DCE.

8.3.2 Syntax

Action command

AT+ICF=<format>[,<parity>]

OK

Read command

AT+ICF?

+ICF: <format>,<parity>

OK

Test command

AT+ICF=?

+ICF: (list of supported <format>s),(list of supported <parity>s)

OK

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8.3.3 Parameters and Defined Values

<format>:		character framing format
	1	8 data 2 stop **<parity>** parameter is ignored.
	2	8 data 1 parity 1 stop if no **<parity>** provided, 3 is used by default as **<parity>** value.
	3	8 data 1 stop **<parity>** parameter is ignored. default value
	4	7 data 2 stop **<parity>** parameter is ignored.
	5	7 data 1 parity 1 stop if no **<parity>** provided, 3 is used by default as **<parity>** value.
	6	7 data 1 stop **<parity>** parameter is ignored.
<parity>:		character framing parity
	0	odd
	1	even
	2	mark
	3	space
	4	none (default value)

8.3.4 Parameter Storage

The <format> and <parity> parameters are stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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8.3.5 Examples

Command	Responses
AT+ICF=?	+ICF: (1-6),(0-4) OK *Note: Possible values*
AT+ICF=2,0	OK *Note: New values*
AT+ICF?	+ICF: 2,0 OK *Note: Current values*

8.3.6 Notes

All framing settings of the serial interface (i.e 8O1, 8E1, 8S1, 8N1, 7N1, 7O1, 7E1, 7S1 and 7N2) are supported for autobaud mode.

If USB port is used:

- the action command is supported for compatibility reasons (but without effect),
- the response to the action command and the read command behaviour is the same as if sent on UART1 or UART2. See the section Managing the USB feature of the "Appendixes to AT Commands Interface Guide" for the supported USB emulated serial port settings.

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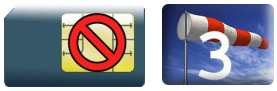
8.4 DTE-DCE Local Flow Control +IFC



8.4.1 Description

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

8.4.2 Syntax

Action command

AT+IFC=<DCE_by_DTE>,<DTE_by_DCE>

OK

Read command

AT+IFC?

+IFC: <DCE_by_DTE>,<DTE_by_DCE>

OK

Test command

AT+IFC=?

+IFC: (list of supported <DCE_by_DTE>s),(list of supported <DTE_by_DCE>s)

OK

8.4.3 Parameters and Defined Values

<DCE_by_DTE>:		local flow control parameter
	0	none
	2	RTS (default value)
<DTE_by_DCE>:		local flow control parameter
	0	none
	2	CTS (default value)

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8.4.4 Parameter Storage

The <DCE_by_DTE> and <DTE_by_DCE> parameters are stored in EEPROM using AT&W command. The default value can be restored using AT&F.

8.4.5 Examples

Command	Responses
AT+IFC=?	+IFC: (0,2),(0,2) OK *Note: Possible values*
AT+IFC=0,0	OK *Note: New values*
AT+IFC?	+IFC: 0,0 OK

8.4.6 Notes

If USB port is used:

- the action command is supported for compatibility reasons (but without effect),
- the response to the action command is the same as if sent on UART1 or UART2 and the value of the both parameters is always 2.

When <DCE_by_DTE> parameter is set to 2 (DTE prompts flow control through RTS), DCE behavior is as follows:

- If the DCE has never detected RTS in the high (or ON) condition since startup, then it ignores RTS (assuming this signal is not connected).
- As soon as the DCE detects RTS high, the signal acts on it. Therefore, subsequent RTS transition to OFF will prevent the DCE from sending any further data in both online and offline modes.

This behavior allows the user to use the default settings (hardware flow control) and leaves RTS disconnected. In the case the RTS is connected and is high at least once, it acts on the DCE.

When the <DTE_by_DCE> parameter is set to 0 (none), the CTS is kept high all the time.

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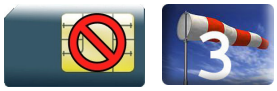
8.5 Result Code Suppression Q



8.5.1 Description

This command determines whether the mobile equipment sends result codes or not.

8.5.2 Syntax

Action command
ATQ[<n>]
[OK]

Read command
None

Test command
None

8.5.3 Parameters and Defined Values

<n>:		result code transmission parameter
	0	DCE transmits result codes.
	1	Result codes are suppressed and not transmitted (default value).

8.5.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

8.5.5 Examples

Command	Responses
ATQ0 *Note: DCE transmits result codes*	OK *Note: Command valid*
ATQ1 *Note: Result codes are suppressed and not transmitted*	*Note: No response*

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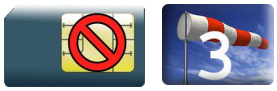
8.6 DCE Response Format V



8.6.1 Description

This command determines whether the DCE response format uses or not the header characters <CR><LF>, and whether the result codes are provided as numeric or verbose.

8.6.2 Syntax

Action command
ATV<n>
OK

Read command
None

Test command
None

8.6.3 Parameters and Defined Values

<n>: format control parameter

	information responses	result code
0	<text><CR><LF>	<numeric code><CR>
1 (default value)	<CR><LF> <text><CR><LF>	<CR><LF> <verbose code><CR><LF>.

8.6.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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8.6.5 Examples

Command	Responses
ATV0 *Note: DCE transmits limited headers and trailers and numeric result codes*	0 *Note: Command is valid (0 means OK)*
ATV1 *Note: DCE transmits full headers and trailers and verbose response text*	OK *Note: Command valid*

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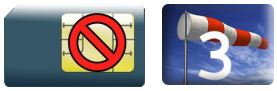
8.7 Set DCD Signal &C



8.7.1 Description

This command controls the Data Carrier Detect (DCD) signal.

8.7.2 Syntax

Action command
AT&C[<n>]
OK

Read command
None

Test command
None

8.7.3 Parameters and Defined Values

<n>:		DCD signal control parameter
	0	DCD always on
	1	DCD matches the state of the remote modem's data carrier (default value).

8.7.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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8.7.5 Examples

Command	Responses
AT&C0 *Note: DCD always on*	OK *Note: Command valid*
AT&C1 *Note: DCD matches state of the remote modem's data carrier*	OK *Note: Command valid*

8.7.6 Notes

Wavecom products slightly differ from V25ter Recommendation. DCD signal ("Circuit 109") is turned ON at the same time the CONNECT message is sent, whereas the specification states that the DCD should be turned ON after the CONNECT message was received.

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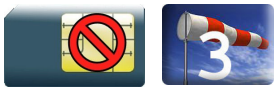
8.8 Set DTR Signal &D



8.8.1 Description

This command controls the Data Terminal Ready (DTR) signal.

8.8.2 Syntax

Action command
AT&D[<n>]
OK

Read command
None

Test command
None

8.8.3 Parameters and Defined Values

<n>:		DTR signal control parameter
	0	DTR signal is ignored.
	1	Modem switches from data to command mode when DTR switches from ON to OFF.
	2	Upon DTR switch from ON to OFF, the call is released (default value).

8.8.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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8.8.5 Examples

Command	Responses
AT&D0 *Note: The DTR signal is ignored*	OK *Note: Command valid*
AT&D1 *Note: Modem switches from data to command mode when DTR switches from ON to OFF*	OK *Note: Command valid*
AT&D2 *Note: Upon DTR switch from ON to OFF, the call is released*	OK *Note: Command valid*

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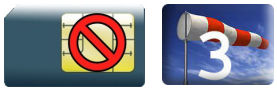
8.9 Set DSR Signal &S



8.9.1 Description

This command controls the Data Set Ready (DSR) signal.

8.9.2 Syntax

Action command
AT&S[<n>]
OK

Read command
None

Test command
None

8.9.3 Parameters and Defined Values

<n>:		DSR signal control parameter
	0	DSR always ON
	1	DSR OFF in command mode, DSR ON in data mode (default value)

8.9.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

8.9.5 Examples

Command	Responses
AT&S0 *Note: DSR always valid*	OK
AT&S1 *Note: DSR off in command mode, DSR on in data mode*	OK

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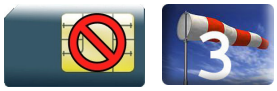
8.10 Wavecom Ring Indicator Mode +WRIM



8.10.1 Description

This Wavecom proprietary command sets the state of the Ring Indicator Mode.

8.10.2 Syntax

Action command

AT+WRIM=<mode>[,<events_bit_field>[,<pulse_width>]]

OK

Read command

None

Test command

AT+WRIM=?

+WRIM: <mode>[,<events_bit_field>[,<pulse_width>]]

[+WRIM: <mode>[,<events_bit_field>[,<pulse_width>]][…]]

OK

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8.10.3 Parameters and Defined Values

<mode>:		RI mode
	0	up-down RI mode: no pulses are sent before unsolicited AT response. Up-down signals are sent when receiving an incoming call (default value).
	1	pulse RI mode: an electrical pulse is sent on the Ring Indicator signal ONLY for selected event and/or unsolicited AT responses as specified in <events_bit_field>, in order to lose no AT responses when client tasks are in sleep state. When receiving incoming calls, electrical pulses are sent on the RI signal. For incoming IP packet event, the electrical pulse is sent just before sending a downloaded data packet (GPRS or CSD) if the remote client tasks has dropped down his RTS signal. For unsolicited AT response, the electrical pulse is sent just before sending an unsolicited AT response.
<events_bit_field>:		events for ring indication mandatory in pulse RI mode (<mode> = 1) bit set to 0: message disabled bit set to 1: message enabled
	bit 0	incoming IP packet
	bit 1	RING, +CRING, +CCWA, +CLIP
	bit 2	+CMT, +CMTI, +CDS, +CDSI
	bit 3	+CBM, +CBMI
	bit 4	+CME ERROR: 13, +CCELL, +CCED The unsolicited response "+CME ERROR: 13" is sent out only when there is a SIM card problem.
	bit 5	+CREG, +CIEV
	bit 6	+WBCI, +WDCI
	bit 7	+CCCM
	bit 8	+CKEV
	bit 9	+CSQ
	bit 10	NO CARRIER
	bit 11	+STCR, +STRIL, +STIN
	bit 12	+WIND
	bit 13	+CALA

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	bit 14	+WDIAGI
	bit 15	+WLOC
	bit 16	for Open AT® applications If this bit is set, RI pulse will be sent when the unsolicited response initiated by an Open AT® application is sent.
	bit 17	+CGREG
	bit 18	+CGEV
	bit 19	+CSSU
	bit 20	+CUSD
	bit 21	+WBTUM, +WBTSM
	bit 22	+CLAV
<pulse_width>:		RI pulse width used only in pulse RI mode (<mode>=1). If <pulse_width> parameter is omitted, the last entered value will be used.
	0	duration of pulse is 5 µs (default value)
	1-33	duration of pulse in units of 30 µs. Caution: **Pulse duration may be increased by up to 3 ms, due to overhead interrupt processes.**

8.10.4 Parameter Storage

The parameters are stored in EEPROM without using AT&W command. The default value can be restored using AT&F.

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8.10.5 Examples

Command	Responses
AT+WRIM=? *Note : Ask for the list of possible values*	+WRIM: 0 +WRIM: 1,(0-8388607),(0-33) OK *Note : Possible mode values 0, 1*
AT+WRIM=0 *Note : Select up-down RI mode*	OK *Note : Up-down RI mode selected*
AT+WRIM=1,71 *Note: bit field (0...0)1000111 (0x47 or decimal 71) to enable IP packets, RING, +CRING, +CCWA, +CLIP, +CMT, +CMTI, +CDS, +CDSI, +WBCI, +WDCI*	OK
AT+WRIM? *Note : Ask for the current value*	+WRIM: 1,71,0 OK *Note : Current mode is pulse RI*

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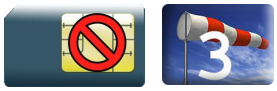
8.11 Back to online mode O



8.11.1 Description

This command allows to return to online data mode if a connection has been established and the ME is in command mode.

8.11.2 Syntax

Action command
ATO
OK

Read command
None

Test command
None

8.11.3 Parameters and Defined Values

None.

8.11.4 Parameter Storage

None.

8.11.5 Examples

None.

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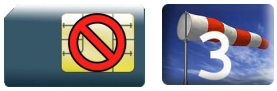
8.12 Multi-flow Management +WMFM



8.12.1 Description

This Wavecom proprietary command manages Multi-Flows:

- opening or closing ports
- associating (or attaching, redirecting) incoming data to ports.

By default, only UART1 is opened, and GSM and GPRS (if applicable) data direction is dynamic.

8.12.2 Syntax

- for <type_of_action>=0

Action command

AT+WMFM=<type_of_action>,<mode>[,<port_id>]

[+WMFM: <type_of_action>,<mode>,<port_id>,<state>[…]]

OK

- for <type_of_action>=1

Action command

AT+WMFM=<type_of_action>,<mode>[,<port_id>[,<data>]]

[+WMFM: <type_of_action>,<mode>,<port_id>,<data>[…]]

OK

Read command

AT+WMFM?

+WMFM: <type_of_action>,<mode>,<port_id>,<state>

[+WMFM: <type_of_action>,<mode>,<port_id>,<state>[…]]

+WMFM: <type_of_action>,<mode>,<port_id>,<data>

[+WMFM: <type_of_action>,<mode>,<port_id>,<data>[…]]

OK

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Test command

AT+WMFM=?

```
+WMFM: <type_of_action>,(list of supported <mode>s),(list of
supported <port_id>s)[,(list of supported <data>s)]

[+WMFM: <type_of_action>,(list of supported <mode>s),(list of
supported <port_id>s)[,(list of supported <data>s)][…]]

OK
```

8.12.3 Parameters and Defined Values

<type_of_action>:		managing mode
	0	manage active physical ports
	1	manage incoming data
<mode>:		requested operation according to <type_of_action>:
	0	close physical port or set dynamic mode for incoming data (data direction is set on ATD / ATA commands for GSM, or ATD / +CGDATA commands for GPRS)
	1	open physical port or attach incoming data to <port_id>
	2	read state
	3	Internal use
<port_id>:		port identifier
	1	UART1
	1x	DLC x on UART 1 (x : from 1 to 4)
	2	UART2
	2x	DLC x on UART 2 (x : from 1 to 4)
	3	USB
	3x	DLC x on USB (x: from 1 to 4)
	4	dynamic port (only in read mode, default value with <type_of_action>=1)
	80	Open AT® application

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<data>:		data type
	0	GSM data
	1	GPRS data
<state>:		physical port state
	0	deactivated
	1	activated

8.12.4 Parameter Storage

The <state> and <port_id> parameters are stored in EEPROM without using AT&W.

8.12.5 Examples

Command	Responses
AT+WMFM=?	+WMFM: 0,(0-2),(1-3) +WMFM: 1,(0-2),(1),(0,1) OK *Note: To manage incoming data, only UART 1 is available*
AT+WMFM=0,2 *Note: Read state of all ports*	+WMFM: 0,2,1,1 +WMFM: 0,2,2,0 +WMFM: 0,2,3,0 OK *Note: UART1 is opened*
AT+WMFM=0,1,2 *Note: Open UART2*	OK
AT+WMFM=0,2,2 *Note: Read UART2 state*	+WMFM: 0,2,2,1 OK
AT+WMFM=1,2 *Note: Read attachments of ports to which data are redirected*	+WMFM: 1,2,4,0 +WMFM: 1,2,4,1 OK *Note: GSM and GPRS data are dynamic*

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Command	Responses
AT+WMFM=1,1,1,0 *Note: Attach GSM data to UART1*	OK *Note: GSM data are redirected to UART1*
AT+WMFM=1,1,1,1 *Note: Attach GPRS data to UART1*	OK *Note: GPRS data are redirected to UART1*
AT+WMFM=1,2,1 *Note: Read attachments of UART1*	+WMFM: 1,2,1,0 +WMFM: 1,2,1,1 OK *Note: GSM and GPRS data are redirected to UART1*
AT+WMFM=1,0,,0 *Note: Set GSM data dynamic mode*	OK *Note: GSM data are directed dynamically on call setup*
AT+WMFM=1,0,,1 *Note: Set GPRS data dynamic mode*	OK *Note: GPRS data are directed dynamically on session setup*
AT+WMFM?	+WMFM: 0,2,1,1 +WMFM: 0,2,2,1 +WMFM: 0,2,3,0 +WMFM: 1,2,4,0 +WMFM: 1,2,4,1 OK
AT+CMUX=0 *Note: Launch 27.010 protocol on UART 2 and open 4 DLCs*	OK
AT+WMFM=?	+WMFM: 0,(0-2),(1-3) +WMFM: 1,(0-2),(1,21,22,23,24),(0,1) OK *Note: To manage incoming data, UART1, and DLC 1, 2, 3, 4 on UART2 are available.*
AT+WMFM=1,1,21,0 *Note: Attach GSM data to DLC 1 on UART2*	OK

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8.12.6 Notes:

- Since the UART2 port does not provide all the serial signals (only RX/TX/RTS/CTS), it is not recommended to use this port for GSM or GPRS data mode.
- The response to AT+WMFM=? is dynamic according to the different UART states for <type_of_action>=1 (depending on which port number is opened when the command is sent to the Wireless CPU).
- Only the remote UART can be opened or closed (it is impossible to close UART1 sending WMFM command trough UART1)
- When <port Id> attached to a data flow allocated for incoming data is closed, the management returns to dynamic mode.
- In the "mode" parameter, 3 value is not allowed because used internally.
- The reading "Port: 80" state with +WMFM command always returns +CME ERROR: 3

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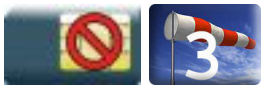
8.13 Multiplexing Mode +CMUX



8.13.1 Description

This command is used to manage (enable or disable) the 3GPP TS 27.010 [14] multiplexing protocol control channel.

This command allows the multiplexing of 4 logical channels on a single UART. Two UARTs are available on the Wavecom Wireless CPUs, but multiplexing can only apply to one. The client application may handle, by this means, up to 5 channels (4 logical multiplexed channels on an UART and 1 physical channel on the other UART).

When a CMUX session is enabled, the Wavecom Wireless CPU allows to open 4 DLCs. These DLCs can be in the range of 1 to 4. This excludes DLC0 which is for the control channel.

8.13.2 Syntax

Action command

AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>]]]]]]]

OK

Read command

AT+CMUX?

+CMUX: <mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>

OK

Test command

AT+CMUX=?

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

OK

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8.13.3 Parameters and Defined Values

<mode>:		multiplexer transparency mechanism
	0	basic option
<subset>:		multiplexer control channel set up A virtual channel may subsequently be set up differently but if there is no settings negotiation, the virtual channel will be set up according to the control channel <subset> setting.
	0	UIH frames used only
<port_speed>:		transmission rate
	1	9600 bit/s
	2	19200 bit/s
	3	38400 bit/s
	4	57600 bit/s
	5	115200 bit/s
	6	230400 bit/s
	7	460800 bit/s
	8	921600 bit/s
<N1>:		maximum frame size
	1-255	default value: 31
<T1>:		acknowledgement timer in units of 20 ms.
	1-128	default value: 5 (100 ms)
<N2>:		maximum number of retransmission
	0-255	default value: 3
<T2>:		response timer for the multiplexer control channel in units of 20 ms. <T2> must be longer than <T1>
	1-128	default value: 15 (300 ms)
<T3>:		wake up response timer in units of 2 seconds
	1-128	default value: 5 (10 s)

8.13.4 Parameter Storage

None.

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8.13.5 Examples

Command	Responses
AT+CMUX=? *Note: Get supported values*	+CMUX: (0),(0),(1-5),(1-255), (1-128),(0-255),(1-128),(1-128) OK
AT+CMUX=0,0,5,31,5,3,15,5 *Note: Enter multiplex mode*	OK
AT+CMUX? *Note: Get current values*	+CMUX: 0,0,5,31,5,3,15,5 OK

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9 Security Commands

9.1 Enter PIN +CPIN

9.1.1 Description

This command is used to enter the ME passwords (PIN 1/CHV 1, PIN 2/CHV 2, PUK1, PUK2, etc.), that are required before any ME functionality can be used.

PIN 1/CHV 1 and PIN 2/CHV 2 are between 4 and 8 digits long, PUK1 and PUK2 are only 8 digits long.

After three unsuccessful attempts to enter the PIN, the PUK 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. PIN 1/CHV 1 is then enabled if PUK1 is correct.

The application is responsible for checking the PIN after each reset or power on if the PIN was enabled.

9.1.2 Syntax

Action command

AT+CPIN=<pin>[,<NewPin>]

OK

Read command

AT+CPIN?

+CPIN: <code>

Note: No OK

Test command

None

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9.1.3 Parameters and Defined Values

<NewPin>:		Personal Identification Number This parameter is required if the PIN state is SIM PUK. four to eight digits number
<pin>:		Personal Identification Number normally PIN 1/CHV 1 According to AT+CPIN?, the <pin> parameter can be PUK 1, PH-SIM PIN, PH-NET PIN, PH-NETSUB PIN, PH-SERVPROV PIN, PH-CORPORATE PIN four to eight digits number
<code>:		SIM code status
	READY	ME is not writing for any password
	SIM PIN	PIN 1/CHV 1 is required
	SIM PUK	PUK1 is required
	SIM PIN2	PIN 2/CHV 2 is required
	SIM PUK2	PUK2 is required
	PH-SIM PIN	SIM lock (phone-to-SIM) is required
	PH-NET PIN	network personalization is required
	PH-NETSUB PIN	network subset is required
	PH- SERVPROV PIN	service provider is required
	PH- CORPORATE PIN	corporate is required

9.1.4 Parameter Storage

None.

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9.1.5 Examples

Command	Responses
AT+CPIN=1234 *Note: Enter PIN*	OK *Note: PIN code is correct*
AT+CPIN=5678 *Note: Enter PIN*	+CME ERROR: 3 *Note: Operation not allowed, PIN previously entered*
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*

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.

If the user tries to do something which requires PIN 2/CHV 2, the product will refuse the action with a "+CME ERROR: 17" (SIM PIN2 required). The product then waits for SIM PIN 2/CHV 2 to be given.

If PIN 2/CHV 2 is blocked, SIM PUK2 is required instead of SIM PIN 2/CHV 2.

For example, the product needs PIN 2/CHV 2 to write in the fixed dialing phonebook (FDN) , so if SIM PIN 2/CHV 2 authentication has not been performed during the current session, SIM PIN 2/CHV 2 is required

Command	Responses
AT+CPBS="FD" *Note: Choose FDN*	OK
AT+CPBW=5,"01290917",129,"Jacky" *Note: Write in FDN at location 5*	+CME ERROR: 17 *Note: SIM PIN2 is required*
AT+CPIN?	+CPIN: SIM PIN2 *Note: SIM PIN2 is required*
AT+CPIN=5678 *Note: Enter SIM PIN2*	OK
AT+CPBW=2,"01290917",129,"Jacky" *Note: Write in FDN at location 5*	OK *Note: Writing in FDN is allowed*

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9.1.6 Notes:

+CME ERROR: 553 is returned when the PIN 1/CHV 1 code is tried to be changed using burned PUK 1 code.

+CME ERROR: 554 is returned when the PIN 1/CHV 1 and PUK1 codes try to be entered when theses codes are burned.

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9.2 Enter PIN2 +CPIN2

9.2.1 Description

This Wavecom proprietary command is used to validate the PIN 2/CHV 2 code or to validate the PUK2 code (UNBLOCK CHV2) and to define a new PIN 2/CHV 2 code.

This command is only used when the last command executed resulted in PIN 2/CHV 2 authentication failure.

PIN 2/CHV 2 length is between 4 and 8 digits, PUK2 length is 8 digits only.

After three unsuccessful attempts, PUK2 will be required. PUK2 validation forces the user to enter a new PIN 2/CHV 2 code as a second parameter and this will be the new PIN 2/CHV 2 code if PUK1 validation succeeds.

9.2.2 Syntax

Action command

AT+CPIN2=<pin2>[,<NewPin2>]

OK

Read command

AT+CPIN2?

+CPIN2: <code>

Note: No OK

Test command

None

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9.2.3 Parameters and Defined Values

<pin2>:		Personal Identification Number 2 four to eight digits number
<oper>:		Personal Unblocking Key 2 needed to change the PIN2.
<Newpin2>		New Personal Identification Number 2 four to eight digits number
<code>:		SIM code status
	READY	no PIN2 is needed
	SIM PIN2	PIN2 is required
	SIM PUK2	PUK2 is required

9.2.4 Parameter Storage

None.

9.2.5 Examples

Command	Responses
AT+CPIN2=1234 *Note: Enter PIN2*	OK *Note: PIN2 code is correct*
AT+CPIN2=5678 *Note: Enter PIN2*	+CME ERROR: 3 *Note: Operation not allowed, PIN2 previously entered*
AT+CPIN2=00000000,1234 *Note: Enter PUK2 and new PIN2*	+CME ERROR: 16 *Note: Incorrect Password (PUK2)*
AT+CPIN2=12345678,1234 *Note: Enter PUK2 and new PIN2, 2nd attempt*	OK *Note: PUK2 correct, new PIN2 stored*
AT+CPIN2=1234	OK

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9.3 PIN Remaining Attempt Number +CPINC

9.3.1 Description

This Wavecom proprietary command is used to get the number of valid attempts for PIN 1/CHV 1, PIN 2/CHV 2, PUK1 and PUK2 identifiers.

9.3.2 Syntax

Action command

AT+CPINC

```
+CPINC: <n1>,<n2>,<k1>,<k2>

OK
```

Read command

AT+CPINC?

```
+CPINC: <n1>,<n2>,<k1>,<k2>

OK
```

Test command

AT+CPINC=?

```
OK
```


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9.3.3 Parameters and Defined Values

<n1>:	attempts left for PIN 1/CHV 1 range: 0-3 (0 = blocked, 3 = max)
<n2>:	attempts left for PIN 2/CHV 2 range: 0-3 (0 = blocked, 3 = max)
<k1>:	attempts left for PUK1 range: 0-10 (0 = blocked, 10 = max)
<k2>:	attempts left for PUK2 range: 0-10 (0 = blocked, 10 = max)

9.3.4 Parameter Storage

None.

9.3.5 Examples

Command	Responses
AT+CPINC *Note: Get the number of attempts left*	+CPINC: 2,3,10,10 OK *Note: First PIN 1/CHV 1 attempt was a failure*
AT+CPINC? *Note: Get current values*	+CPINC: 2,3,10,10 OK *Note: First PIN 1/CHV 1 attempt was a failure*

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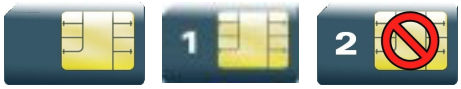
9.4 Change Password +CPWD



9.4.1 Description

This command is used by the application to change a password (PIN, call barring, NCK, etc.). The facility values are the same as for the +CLCK command with a "P2" facility to manage "SIM PIN 2/CHV 2".

For the network lock ("PN"), unlocking is forbidden after 10 failed attempts to disable (unlock) the network lock with an incorrect password.

9.4.2 Syntax

Action command

AT+CPWD=<fac>,<oldpwd>,<newpwd>

OK

Read command

None

Test command

AT+CPWD=?

+CPWD: list of supported (<fac>,<pwdlength>)s

OK

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9.4.3 Parameters and Defined Values

<fac>:		facility P2 SIM P2
	"PS"	SIM lock facility with a 8 digits password
	"SC"	PIN enabled (<mode>=1) / disabled (<mode>=0)
	"AO"	BAOC (Barr All Outgoing Calls)
	"OI"	BOIC (Barr Outgoing International Calls)
	"OX"	BOIC-exHC (Barr Outgoing International Calls except to Home Country)
	"AI"	BAIC (Barr All Incoming Calls)
	"IR"	BIC-Roam (Barr Inc. When Roaming outside Home Country)
	"AB"	All Barring services
	"AG"	All out Going barring services
	"AC"	All inComing barring services
	"P2"	PIN code 2/CHV2
	"FD"	SIM Fixed Dialing Numbers (FDN) memory feature (PIN2 is required as <password>)
	"PN"	Network lock with a 8 digits password (NCK)
	"PU"	Network Subset lock with a 8 digits password (NSCK)
	"PP"	Service Provider lock with a 8 digits password (SPCK).
	"PC"	Corporate lock with a 8 digits password (CCK)
<oldpwd>:		on 4 or up to 8 or 16 digits according to the facility
<newpwd>:		new password specified for the facility string type [....]
<pwdlength>:		maximum length of the password for the facility range: 4-16

9.4.4 Parameter Storage

None.

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9.4.5 Examples

Command	Responses
AT+CPWD=? *Note: Possible values*	+CPWD: ("PS",8),("SC",8),("AO",4), ("OI",4),("OX",4),("AI",4), ("IR",4),("AB",4),("AG",4), ("AC",4),("P2",8),("FD",8), ("PN",8),("PU",8),("PP",8), ("PC",8) OK *Note: PIN 1/ CHV 1, PIN 2/CHV 2 must be on 8 digits maximum (4 minimum). For call barring, on 4 digits maximum.*
AT+CPWD="SC",1234,5555 *Note: Change PIN*	OK *Note: PIN was correct*
AT+CPWD="SC",1234,5555 *Note: Change PIN*	+CME ERROR: 16 *Note: PIN was wrong*
AT+CPIN=5555 *Note: Enter PIN*	OK *Note: PIN was correct*
AT+CPWD="PN",12345678,00000000 *Note: Change NCK*	OK *Note: NCK changed for network lock*

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9.5 Facility Lock +CLCK

9.5.1 Description

This command is used by the application to lock, unlock or ask for an ME or network facility.

9.5.2 Syntax

Action command

AT+CLCK=<fac>,<mode>[,<password>[,<class>]]

[+CLCK: <status>,<class>[…]]

OK

Read command

AT+CLCK?

+CLCK: (<fac>,<status>),[…]

OK

Test command

AT+CLCK=?

+CLCK: (list of supported <fac>s)

OK

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9.5.3 Parameters and Defined Values

<fac>:		facility
	"PS"	SIM lock facility with a 8 digits password
	"SC"	PIN enabled (<mode>=1) / disabled (<mode>=0)
	"AO"	BAOC (Barr All Outgoing Calls)
	"OI"	BOIC (Barr Outgoing International Calls)
	"OX"	BOIC-exHC (Barr Outgoing International Calls except to Home Country)
	"AI"	BAIC (Barr All Incoming Calls)
	"IR"	BIC-Roam (Barr Incoming When Roaming outside Home Country)
	"AB"	All Barring services
	"AG"	All out Going barring services
	"AC"	All inComing barring services
	"FD"	SIM Fixed Dialing Numbers (FDN) memory feature (PIN 2/CHV 2 is required as <password>)
	"PN"	Network lock with a 8 digits password (NCK)
	"PU"	Network Subset lock with a 8 digits password (NSCK)
	"PP"	Service Provider lock with a 8 digits password (SPCK).
	"PC"	Corporate lock with a 8 digits password (CCK)
<mode>:		requested operation
	0	unlocks the facility
	1	locks the facility
	2	query status
<password>:		password code string type, 4 to 8 digits depending on <fac>

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<class>:		call class The combination of different classes is not supported, it will only result in the activation/deactivation/status request of all classes (7).
	1	voice
	2	data
	4	fax
	7	voice, data and fax (default value if omitted)
	8	short messages
<status>:		facility lock status
	0	not active
	1	active

9.5.4 Parameter Storage

The <mode> and <password> parameters are stored in EEPROM and SIM (depending on <fac>) without using the AT&W command.

9.5.5 Examples

Command	Responses
AT+CLCK=?	+CLCK: ("PS","SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PN","PU","PP","PC") OK
AT+CLCK="SC",1,1234 *Note: activate PIN locking, 1234 is PIN 1/CHV 1*	OK
AT+CLCK="SC",2	+CLCK: 1 OK
AT+CLCK?	+CLCK: ("PS",0),("SC",1),("FD",0),("PN",0),("PU",0),("PP",0),("PC",0) OK

9.5.6 Notes

FDN locking is only available after receiving the +WIND: 4 indication.

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9.6 Wavecom LoCK +WLCK

All cases except auto CNL

For auto CNL

9.6.1 Description

This Wavecom proprietary command allows the ME to be locked on a specific network operator.

9.6.2 Syntax

Action command

AT+WLCK=<fac>,<passwd>,<NetId>[,<GID1>[,GID2]][,<CnlType>[,<CnlData>]]

OK

Read command

None

Test command

None

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9.6.3 Parameters and Defined Values

<fac>:		facility to be locked
	"PS"	SIM lock facility with a 8 digits password (PCK)
	"PN"	network lock with a 8 digits password (NCK)
	"PU"	network subset lock with a 8 digits password (NSCK)
	"PP"	service provider lock with a 8 digits password (SPCK)
	"PC"	corporate lock with a 8 digits password (CCK)
<CnlType>:		type of lock for cooperative network list (CNL)
	0	automatic (cooperative network list retrieved from EF-CNL SIM file) EF-CNL file must be present in SIM to use automatic mode.
	1	manual (cooperative network list is given in the <CnlData> parameter)
<CnlData>:		cooperative network list same format as in EF-CNL SIM file (please refer to [8] or [9]) used only if <CnlType> = 1 hexastring type
<passwd>:		password code string type, 8 digits
<NetId>:		operator in numeric format: MCC and MNC
<GID1>:		Group IDentifier level 1
<GID2>:		Group IDentifier level 2

9.6.4 Parameter Storage

The lock action is stored in EEPROM without using AT&W.

9.6.5 Example

Command	Responses
AT+WLCK="PN",12345678,20810 *Note: Activate network lock on SFR (208,10)*	OK *Note: Network lock activated*
AT+WLCK="PS",12345678,208105923568974 *Note: Activate SIM lock*	OK *Note: SIM lock activated*

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Command	Responses
AT+WLCK="PU",12345678,2081035 *Note: Activate Network Subset lock on SFR (208, 10, 35)*	OK *Note: Network Subset lock activated*
AT+WLCK="PP",12345678,20810,"E5" *Note: Activate Service Provider lock on SFR (208, 10) and GID1 (0xE5).*	OK *Note: Service Provider lock activated*
AT+WLCK="PC",12345678,20810,"E5","10" *Note: Activate Corporate lock on SFR (208, 10), GID1 (0xE5) and GID2 (0x10)*	OK *Note: Corporate lock activated*
AT+WLCK="PN",12345678,20810,0 *Note: Activate Network lock on SFR (208, 10) using cooperative network list from SIM file EF-CNL (must be present in SIM)*	OK *Note: Network lock activated on SFR and co-operative network list present in SIM*
AT+WLCK="PN",12345678,20801,1,"02F802FFFFFF02F801FFFFFF" *Note: Activate Network lock on F ORANGE (208, 01) with manual co-operative network list including SFR (208, 10) and Bouygtel (208, 20)*	OK *Note: Network lock activated on F ORANGE (primary network), SFR and Bouygtel (cooperative networks)*

9.6.6 Notes

Test SIM cards (with MCC=001 & MNC=01) do not check these locks.

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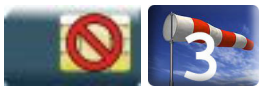
10 Time Management Commands

10.1 Clock Management +CCLK



10.1.1 Description

This command is used to set or get the current date and time of the ME real time clock.

10.1.2 Syntax

Action command
AT+CCLK=<date and time string>
OK

Read command
AT+CCLK?
+CCLK: <date and time string>
OK

Test command
None

10.1.3 Parameters and Defined Values

<date and time string>:	string format for date/time is: "yy/MM/dd,hh:mm:ss" Valid years are 00 (for 2000) to 99 (for 2099). The seconds field is not mandatory. Default date/time is "00/01/01,00:00:00" (January 1st, 2000 /midnight).

10.1.4 Parameter Storage

None.

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10.1.5 Examples

Command	Responses
AT+CCLK="00/06/09,17:33:00" *Note: Set date to June 9th, 2000, and time to 5:33 pm*	OK *Note: Date/Time stored*
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" OK *Note: Current date is June 9th, 2000 current time is 5:34:23 pm*

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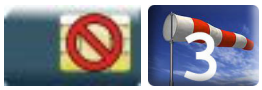
10.2 Alarm Management +CALA



10.2.1 Description

This command is used to set date/time alarms in the ME. The maximum number of alarms is 16.

Note:

The current date/time should be already set with +CCLK command before using +CALA.

10.2.2 Syntax

Action command

AT+CALA=[<date and time string>][,<index>]

OK

Read command

AT+CALA?

+CALA: <date and time string>,<index>

[+CALA: <date and time string>,<index>[…]]

OK

Test command

None

Unsolicited response

+CALA: <date and time string>,<index>

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10.2.3 Parameters and Defined Values

<date and time string>:	string format for date/time is: "yy/MM/dd,hh:mm:ss" Valid years are 00 (for 2000) to 99 (for 2099). The seconds field is not mandatory. Default date/time is "00/01/01,00:00:00" (January 1st, 2000 /midnight).
<index>:	offset in the alarm list, range: 1-16.

10.2.4 Parameter Storage

None.

10.2.5 Examples

Command	Responses
AT+CALA="00/06/08,15:25" *Note: set an alarm for June 8th, 2000 at 3:25 pm*	OK
AT+CALA="00/06/09,07:30" *Note: set an alarm for June 9th, 2000 at 7:30 am*	OK
AT+CALA? *Note: List all alarms*	+CALA: "00/06/08,15:25:00",1 +CALA: "00/06/09,07:30:00",2 OK *Note: Two alarms are set (index 1, 2)*
	+CALA: "00/06/08,15:25:00",1 *Note: An alarm occurs (index 1)*
AT+CALA="",2 *Note: Delete alarm index 2*	OK *Note: Alarm index 2 deleted*
AT+CALA? *Note: List all alarms*	OK *Note: No alarm*

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AT COMMANDS INTERFACE GUIDE FOR OS 6.61

VOLUME 2

Reference: WM_DEV_OAT_UGD_014
Revision: 004
Date: September 21, 2006

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Related Documents

This interface specification is based on the following recommendations:

[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] 3GPP 05.02: 3rd Generation Partnership Project; Technical Specification Group GSM/EDGE- Radio Access Network; Multiplexing and multiple access on the radio path – 3GPP TS 05.02 V6.9.2 (2001-04)

[8] 3GPP 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3

[9] 3GPP TS 11.11 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface

[10] 3GPP TS 05.08 Radio subsystem link control

[11] 3GPP TS 23.040 Technical realization of the Short Message Service (SMS);

[12] 3GPP TS 22.042 Network Identity and Time Zone (NITZ) service description; Stage 1

[13] 3GPP TS 51.011 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface

[14] 3GPP TS 27-010 Terminal Equipment to User Equipment (TE-UE) multiplexer protocol

[15] 3GPP 23.014 Support of Dual Tone Multi Frequency (DTMF) signaling

[16] ISO 639 Langages Codes

[17] 3GPP 27 060 Packet domain; Mobile Station (MS) supporting Packet Switched services

[18] 3GPP TS 23.038 Alphabets and language-specific information

[19] 3GPP TS 27.005 Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)

[20] ETSI GSM 11.14 Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface

[21] 3GPP TS 23.003 Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification

[22] ETSI GSM 02.24 Digital cellular telecommunications system (Phase 2+) (GSM);Description of Charge Advice Information (CAI)

[23] ETSI GSM 02.86 Digital cellular telecommunications system (Phase 2+) (GSM);Advice of Charge (AoC) Supplementary Services - Stage 1

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[24] ETSI GSM 02.90 Digital cellular telecommunications system (Phase 2+) (GSM);Unstructured Supplementary Service Data (USSD) - Stage 1

[25] ETSI GSM 02.85 Digital cellular telecommunications system (Phase 2+) (GSM);Closed User Group (CUG) Supplementary Services - Stage 1

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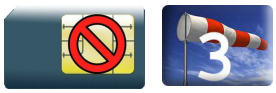
11 GSM Network Commands

11.1 Signal Quality +CSQ



11.1.1 Description

This command is used to read the received signal strength indication and the channel bit error rate with or without a SIM card inserted.

11.1.2 Syntax

Action command
AT+CSQ
+CSQ: <rssi>,<ber>
OK

Read command
None

Test command
None

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11.1.3 Parameters and Defined Values

<rssi>:		received signal strength
	0	-113 dBm or less
	1	-111 dBm
	2 to 30	-109 to –53 dBm
	31	-51dBm or greater
	99	not known or not detectable
<ber>:		channel bit error rate
	0...7	as RXQUAL values in the table GSM 05.08 [10]
	99	not known or not detectable

11.1.4 Parameter Storage

None.

11.1.5 Examples

Command	Responses
AT+CSQ	+CSQ: 17,1 OK

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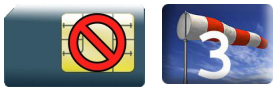
11.2 Network Registration +CREG



11.2.1 Description

This command is used by the application to check the registration status of the product.

11.2.2 Syntax

Action command

AT+CREG=<mode>

OK

Read command

AT+CREG?

+CREG: <mode>,<stat>

OK

Test command

AT+CREG=?

+CREG: (list of supported <mode>s)

OK

Unsolicited response

+CREG: <mode>,<stat>[,<lac>,<cid>]

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11.2.3 Parameters and Defined Values

<mode>:		request operation
	0	disable network registration unsolicited result code (default value)
	1	enable network registration code result code +CREG: <stat>
	2	enable network registration and location information unsolicited result code +CREG: <stat>,<lac>,<ci> if there is a change of network cell
<stat>:		network registration state
	0	not registered, ME is not currently searching for a new operator
	1	registered, home network
	2	not registered, ME currently searching for a new operator
	3	registration denied
	4	unknown
	5	registered, roaming
<lac>:		location area code string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>:		cell ID string type ; two byte cell ID in hexadecimal format

11.2.4 Parameter Storage

The <mode> parameter is stored in EPROM using AT&W command. The default value can be restored using AT&F.

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11.2.5 Examples

Command	Responses
AT+CREG?	+CREG: <mode>,<stat> OK
AT+CREG=0 *Note: Disable network registration unsolicited result code*	OK *Note: Command valid*
AT+CREG=1 *Note: Enable network registration*	OK *Note: Command valid*
AT+CREG=2 *Note: Enable network registration unsolicited result code registration*	OK *Note: Command valid*
AT+CREG=?	+CREG: (0-2) OK *Note: 0,1,2 <mode> values are supported*

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11.3 Operator Selection +COPS

11.3.1 Description

There are three possible ways of selecting an operator (PLMN):

- The product is in manual mode. It then tries to find the operator specified by the application and if found, tries to register.
- The product is in automatic mode. It then tries to find the home operator and if found, tries to register. If not found, the product automatically searches for another network.
- The product enters into manual/automatic mode. It tries to find an operator specified by the application (as in manual mode). If this attempt fails it enters automatic mode. If this is successful, the operator specified by the application is selected. The mobile equipment then enters into automatic mode.

Note:

The read command returns the current mode and the current selected operator. In manual mode, this PLMN may not be the one set by the application (as it is in the search phase).

These commands are not allowed during communication.

11.3.2 Syntax

Action command
AT+COPS=<mode>[,<format>[,<oper>]]
OK

Read command
AT+COPS?
+COPS: <mode>[,<format>,<oper>]
OK

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Test command **AT+COPS=?** +COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>)s] OK

11.3.3 Parameters and Defined Values

<mode>:		network registration mode
	0	automatic (default value)
	1	manual
	2	deregistration; ME will be unregistered until <mode>=0 or 1 is selected
	3	set only <format> (for read command AT+COPS?)
	4	manual/automatic (<oper> shall be present), if manual selection fails, automatic mode is entered.
<format>:		format of <oper> field
	0	long alphanumeric format <oper>
	1	short alphanumeric format <oper>
	2	numeric <oper> (default value)
<stat>:		status of <oper> field
	0	unknown
	1	available
	2	current
	3	forbidden
<oper>:		operator identifier (MCC/MNC in numeric format only for operator selection) The long alphanumeric format can be up to 16 characters long (for operator names description see "Operator names" section in the present document "Appendixes"; field is "Name"). The short alphanumeric format can be up to 10 characters long.

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11.3.4 Parameter Storage

The <format> and <mode> parameters are stored in EEPROM using AT&W command. The default values can be restored using AT&F.

11.3.5 Examples

Command	Responses
AT+COPS? *Note: Ask for current PLMN*	+COPS: 0,2,20801 OK *Note: Home PLMN is Orange*
AT+COPS=? *Note: Ask for PLMN list*	+COPS: (2,"F SFR","SFR","20810"),(3,"F-BOUYGUES TELECOM","BYTEL","20820"),(3,"Orange F","Orange","20801") OK *Note: Home PLMN is SFR, BYTEL and Orange networks have been detected*
AT+COPS=1,2,20810 *Note: Ask for registration on SFR network*	+CME ERROR: 32 *Note: Network not allowed – emergency calls only*
AT+COPS=1,2,23433 *Note: Ask for registration on UK Orange network*	+CME ERROR: 529 *Note: Selection failed – emergency calls only*
AT+COPS=0 *Note: Ask for registration in automatic mode*	OK *Note: Successful*
AT+COPS=3,0 *Note: Set <format> to long alphanumeric*	OK *Note: Successful*
AT+COPS? *Note: Ask for current PLMN*	+COPS: 0,0,"Orange F" OK *Note: Home PLMN is Orange*
AT+COPS=2 *Note: Ask for deregistration from network*	OK *Note: Successful*
AT+COPS? *Note: Ask for current PLMN*	+COPS: 2 OK *Note: ME is unregistered until <mode>=0 or 1 is selected*

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11.3.6 Notes

- If an incoming call occurs during a PLMN list request, the operation is aborted (+CME ERROR: 520) and the unsolicited RING appears.
- If SPN (Service Provider Name) is present in the SIM, it will be returned in both long and short alphanumeric <oper> fields. The string in the "short" field will be the SPN truncated to the appropriate number of characters (10).
- The fact that the network supports emergency call (+CME ERROR: 547) does not imply that emergency call without SIM is working. The only way to verify this state, is to do ATD112; .

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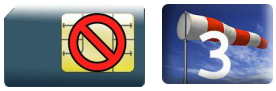
11.4 Cell environment description +CCED



11.4.1 Description

This Wavecom proprietary command retrieves the parameters of the main cell and of up to six neighbouring cells.

There are two possible methods to provide these cell parameters:

- On request by the application or
- Automatically by the product every 5 seconds.

Automatic mode is not supported during registration.

11.4.2 Syntax

Action command

AT+CCED=<mode>[,<requested dump>[,<CsqStep>]]

[+CSQ: <rssi>,<ber>]

[+CCED: [<Main Cell dump>][[,]<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]]][[,]<Main Cell TA>][[,]<Neighbor 1 TA>][[,]<Neighbor 2 TA>][[,]<Neighbor 3 TA>][[,]<Neighbor 4 TA>][[,]<Neighbor 5 TA>][[,]<Neighbor 6 TA>]]

OK

Read command

None

Test command

None

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Unsolicited response
`[+CSQ: <rssi>,<ber>]`
`[+CCED: [<Main Cell dump>][[,]<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]]][[,]<Main Cell TA>]]`

11.4.3 Parameters and Defined Values

<mode>:		requested operation
	0	one shot requested the requested dump is returned as intermediate response
	1	automatic shots requested the requested dump is returned by the wireless CPU as unsolicited response
	2	stop automatic shots
<requested dump>:		requested cell parameter If omitted, the last value used for a CCED request is used, or 15 (if the command has not been previously used)
	1	Main Cell only +CCED: <Main Cell dump>
	2	Neighbours 1 to 6 +CCED: <Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]]
	3	Main Cell then Neighbours 1 to 6 `+CCED: <Main Cell dump>,<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]]`
	4	Main Cell Timing Advance +CCED: <Main Cell TA>
	5	Main Cell, then Timing Advance `+CCED: <Main Cell dump>[,<Main Cell TA>]`

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6	Neighbours 1 to 6, then Timing Advance `+CCED: <Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]][,<Main Cell TA>]`
7	+CCED response: Main Cell, then Neighbours 1 to 6, then Timing Advance `+CCED: [<Main Cell dump>][[,]<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]][,<Main Cell TA>]`
8	Main Cell RSSI indications `+CSQ: <rssi>,<ber>`

9	Main Cell only
	`+CSQ: <rssi>,<ber>`
	`+CCED: <Main Cell dump>`

10	Neighbors 1 to 6
	`+CSQ: <rssi>,<ber>`
	`+CCED: <Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]]`

11	Main Cell, then Neighbours 1 to 6
	`+CSQ: <rssi>,<ber>`
	`+CCED: [<Main Cell dump>][[,]<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]]`

12	Timing Advance only
	`+CSQ: <rssi>,<ber>`
	`+CCED: <Main Cell TA>`

13	Main Cell, then Timing Advance
	`+CSQ: <rssi>,<ber>`
	`+CCED: <Main Cell dump>[,<Main Cell TA>]`

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	14	Neighbours 1 to 6, then Timing Advance
		`+CSQ: <rssi>,<ber>`
		`+CCED: <Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>],<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]][,<Main Cell TA>]`

	15	Main Cell, then Neighbours 1 to 6, then Timing Advance
		`+CSQ: <rssi>,<ber>`
		`+CCED: [<Main Cell dump>][[,]<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]][,<Main Cell TA>]`

	16	<requested dump> 1 + <requested dump> 2 + <requested dump> 4 + Neighbour1 to Neighbour6 Timing Advance (only available for mode= 0) Neighbour1 to Neighbour6 Timing Advance are only available in IDLE mode. `+CCED: [<Main Cell dump>][[,]<Neighbor 1 dump>[,<Neighbor 2 dump>[,<Neighbor 3 dump>[,<Neighbor 4 dump>[,<Neighbor 5 dump>[,<Neighbor 6 dump>]]]]][[,]<Main Cell TA>][[,]<Neighbor 1 TA>][[,]<Neighbor 2TA>][[,]<Neighbor 3 TA>][[,]<Neighbor 4 TA>][[,]<Neighbor 5 TA>][[,]<Neighbor 6 TA>]`
<CsqStep>:		step required for the RSSI indications between two +CSQ unsolicited responses range: 1-5 (default value: 1) If not indicated, the previous value is taken into account
<Main Cell dump>:		This parameter gathers the following parameters for the Main Cell parameters : `[<MCC>],[<MNC>],[<LAC>][,<CI>],[<BSIC>],[<BCCH Freq>],[<RxLev>],[<RxLev Full>],[<RxLev Sub>],[<RxQual>],[<RxQual Full>],[<RxQual Sub>],[<Idle TS>]`

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<Neighbor x dump>:	This parameter gathers the following parameters for the Neighbour Cells parameters: `[<MCC>],[<MNC>],[<LAC>][,<CI>],[<BSIC>],[<BCCH Freq>],[<RxLev>]` x is between 1 and 6
<Neighbor x TA>:	Neighbour cell Timing Advance neighbours timing Advance are not available in dedicated mode. x is between 1 and 6
<MCC>:	Mobile Country Code 3 digits
<MNC>:	Mobile Network Code 2 or 3 digits
<LAC>:	Location Area Code string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<CI> :	Cell Id string type; two bytes in hexadecimal format If the Cell Id is not available, this parameter is omitted.
<BSIC>:	Base Station Identity Code
<BCCH Freq>:	Broadcast Control CHannel Freq absolute The range depends of the selected band: • P900 range: 1-124 • E900 range: 1-124, 975-1023 and 0 for 1024 • 850 range: 128-251 • DCS1800 range: 512-885 • PCS1900 range: 512-810

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<RxLev>:		RSSI level on BCCH channel, in idle mode. This parameter is empty in dedicated mode.
	0	-110 dBm or less
	1	-110 dBm to -109 dBm
	2	-109 dBm to -108 dBm
	3-63	-108 dBm to -49 dBm
	62	-49 dBm to -48 dBm
	63	-48 dBm and greater
<RxLev Full>:		RSSI level on all TCH channel, in dedicated mode
<RxLev Sub>:		RSSI level on a subset of TCH channel, in dedicated mode
<RxQual>:		signal quality on BCCH channel, in idle mode
<RxQual Full>:		signal quality on all TCH channel, in dedicated mode
<RxQual Sub>:		signal quality on a subset of TCH channel, in dedicated mode
<Idle TS>:		Time Slot
<Main Cell TA>:		Main Cell Timing Advance
<rssi>:		received signal strength
	0	-113 dBm or less
	1	-111 dBm
	2 to 30	-109 to –53 dBm
	31	-51dBm or greater
	99	not known or not detectable
<ber>:		channel bit error rate This parameter is not evaluated using +CCED command.
	99	not known or not detectable

Note:

For more details about parameters, please refer to 3GPP 05.02 Radio Transmission and Reception [7].

11.4.4 Parameter Storage

None

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11.4.5 Examples

Command	Responses
AT+CCED=0,3 *Note: request main cell and neighbours 1 to 6*	+CCED: 208,20,0002,0418,37,706,24,,,0,,,0,20820,0006,989b,37,835,20,208,20,0002,02a9,37,831,12,208,20101,7966,34,818,13,208,200006,9899,39,713,9,208,20,0002,0a72,33,711,12,208,20,0101,03fb,36,824,10,1 OK
AT+CCED=0 *Note: Repeat last request*	+CCED: 208,20,0002,0418,37,706,24,,,0,,,0,20820,0006,989b,37,835,20,208,20,0002,02a9,37,831,12,208,20101,7966,34,818,13,208,200006,9899,39,713,9,208,20,0002,0a72,33,711,12,208,20,0101,03fb,36,824,10,1 OK
AT+CCED=0,1 *Note: Only main cell request*	+CCED: 208,20,0002,0418,37,706,25,,,0,,,0 OK
AT+CCED=0,1 *Note: Call in progress:RXLev and RXQual are empty, RxLevwFull, RxLevSub, RxQualFull and RxQualSub have data.*	+CCED: 208,10,189C,,19,85,,31,32,,0,0,OK
AT+CCED=1,8,1 *Note: Request +CSQ response when the <rssi> is changed (step = 1)*	OK +CSQ: 12,99 +CSQ: 13,99

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Command	Responses
AT+CCED=0,16 *Note: idle mode*	+CCED: 208,20,0006,0418,54,789,,,,255,,,0,208,20,0006,,57,1018,20,208,01,7500,6497,17,55,17,208,10,54c4,f0ed,31,700,9,208,20,0006,7d9a,50,1023,8,208,20,0002,9a29,48,1015,7,1,1,1,2,1,2 OK *Note: 1,1,1,2,1,2 correspond to the Main Cell timing Advance and 5 Neighbours timing Advance*
AT+CCED=0,16 *Note: dedicated mode*	+CCED: 208,20,0006,0418,54,789,,19,19,,0,0,,,,,,41,801,6,,,,,57,1018,20,,,,,48,1015,10,,,,,57,1006,4,,,,,50,1023,7,,,,,57,814,3,1,,,,,, OK *Note: Neighbours timing Advance are not available in dedicated mode*

11.4.6 Notes

When automatic shots are selected, +CSQ responses are sent whenever the <rssi> difference measured by the product is equal to or greater than the <CsqStep> value. So, the <rssi> level between successive +CSQ responses is equal to or greater than <CsqStep>.

Automatic shots are supported in idle mode and during communication.

Values of MCC/MNC are set to 0 in the case of "No service".

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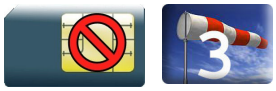
11.5 Wavecom Multi-band Selection Command +WMBS



11.5.1 Description

This Wavecom proprietary command selects the GSM bands on which the Wireless CPU has to operate. This command is allowed only if the selected bands are supported (please refer to +WFM command). The user can choose if the change is immediate or not:

- either the Wireless CPU has to be reset to take this change into account (this is the default case)
- or the GSM stack restarts immediately on the specified band(s). In this mode, the command +WMBS is forbidden during the initialization phase of the Wireless CPU and during calls.

11.5.2 Syntax

Action command

AT+WMBS=<Band>[,<param>]

OK

Read command

AT+WMBS?

+WMBS: <Band>,<ResetFlag>

OK

Test command

AT+WMBS=?

+WMBS: (list of supported <Band>s),(list of supported <param>s)

OK

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11.5.3 Parameters and Defined Values

<Band>:		band frequency configuration
	0	mono-band mode 850 MHz
	1	mono-band mode 900 extended MHz (900E)
	2	mono-band mode 1800 MHz
	3	mono-band mode 1900 MHz
	4	dual-band mode 850/1900 MHz
	5	dual-band mode 900E (extended) / 1800 MHz
	6	dual-band mode 900E (extended) / 1900 MHz
<Param>:		type of change
	0	The Wireless CPU will have to be reset to start on specified band(s). <ResetFlag> is set to 1. default value if omitted
	1	The change is effective immediately: the GSM stack is restarted with specified band(s). <ResetFlag> is set to 0. This mode is forbidden while in communication and during Wireless CPU initialization.
<ResetFlag>:		reset flag
	0	The feature was not modified since the last boot of the product.
	1	The feature has been modified since the last boot of the product: it has to be reset in order to take the modification into account.

11.5.4 Parameter Storage

The <Band> parameter is stored without using AT&W command.

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11.5.5 Examples

Command	Responses
AT+WMBS=?	+WMBS: (0,1,2,3,4,5,6),(0-1) OK *Note: All bands are available*
AT+WMBS=0	OK
AT+WMBS?	+WMBS: 0,1 OK *Note: Wireless CPU has to be reset for change to be effective.*
AT+WMBS=1,1	OK
AT+WMBS?	+WMBS: 1,0 OK *Note: Wireless CPU does not have to be reset for change to be effective.*

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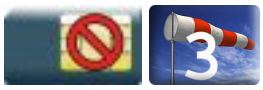
11.6 Registration control +WREGC



11.6.1 Description

This Wavecom proprietary command can be used by the application to control GSM registration on the network (enable/disable).

11.6.2 Syntax

Action command

AT+WREGC=<mode>

OK

Read command

AT+WREGC?

+WREGC: <mode>

OK

Test command

AT+WREGC=?

+WREGC: (list of supported <mode>s)

OK

11.6.3 Parameters and Defined Values

<mode>:		registration control mode
	0	all registrations enabled (default value)
	1	power up registration disabled
	2	power down deregistration disabled
	3	power up registration and power down deregistration disabled

11.6.4 Parameter Storage

The <mode> parameter is stored in EEPROM without using the AT&W command. The default value can be restored using AT&F.

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11.6.5 Examples

Command	Responses
AT+WREGC=?	+WREGC: (0-3) OK
AT+WREGC=0 *Note: All registrations enabled*	OK
AT+WREGC?	+WREGC: 0 OK *Note: All registrations enabled*

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11.7 Wavecom Location +WLOC

11.7.1 Description

This Wavecom proprietary command can be used by the application to retrieve the following local information: MCC-MNC, LAC, CI, Network measurement, BCCH channel list, Timing Advance, date and time.

Two methods exist for the external application to get these information:

- on request of the application,
- periodically by the Wireless CPU.

The location feature has to be activated to get information (see +WFM command).

11.7.2 Syntax

- <mode>=0

Action command
AT+WLOC=<mode>
OK

- <mode>=1

Action command
AT+WLOC=<mode>
+WLOC: [<MCC-MNC>,][<LAC>,][<CI>,][<NetMeas>,][<BCCHlist>,][<TA>,][<Date and Time>]
OK

- <mode>=2

Action command
AT+WLOC=<mode>[,<time period>]
OK

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- <mode>=3

Action command

AT+WLOC=<mode>[,<requested dump>]

OK

Read command

AT+WLOC?

+WLOC: <status>,<time period>,<requested dump>

OK

Test command

AT+WLOC=?

OK

Unsollicited response

+WLOC: [<MCC-MNC>,][<LAC>,][<CI>,][<NetMeas>,][<BCCHlist>,][<TA>,][<Date and Time>]

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11.7.3 Parameters and Defined Values

<mode>:		requested operation
	0	stop automatic shots
	1	one shot requested
	2	automatic shots requested (every x seconds)
	3	configuration of the <dump> value
<time period>:		time period for automatic shots range: 5-255 (multiple of 5, default value 5) If omitted, the value will be set to 5.
<requested dump>:		requested measurements bitfield: 1-255 (default value:255) If omitted, the value will be set to 255.
	1	date and time will be returned in the response
	2	TA will be returned in the response
	4	BCCH will be returned in the response
	8	network measurements will be returned in the response
	16	CI will be returned in the response
	32	LAC will be returned in the response
	64	MNC-MCC will be returned in the response
<MCC-MNC>:		MCC and MNC codes 3 bytes in hexadecimal format (network coding)
<LAC>:		Location Area Code string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<CI>:		Cell Id string type; two bytes in hexadecimal format If the Cell Id is not available, this parameter is omitted.
<NetMeas>:		network measurements 16 bytes in hexadecimal format

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<BCCHlist>:		BCCH channel list maximum 48 bytes (if version V0 of GSM Rec 11.14 [20]) 129 bytes (if version V1 of GSM Rec 11.14 [20]) The version number is indicated in TERMINAL PROFILE information in EEPROM. It is not usercustomizable. It is configured at production-time.
<TA>:		timing advance 1 byte in hexadecimal format
<Date and Time>:		date and time 7 bytes: date, time and time zone in SIM ToolKit format
<status>:		automatic shot status
	0	disabled
	1	enabled

11.7.4 Parameter Storage

The <mode>, <time period> and <requested dump> parameters are stored without using AT&W command. The default value of <mode> only can be restored using AT&F.

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11.7.5 Examples

Command	Responses
AT+WLOC=3,255 *Note: Set the information to display (255 -> complete information)*	OK
AT+WLOC=1 *Note: Displays the local information once*	+WLOC: 02f802,0006,7772,f13101b04cf51278 91138e95a846d160,8b49d08d0797c419e 272e10889a000009302170399020403c1 020a03c5020a03,00,010121111349ff OK
AT+WLOC=2,10 *Note: Displays OK then the current local information immediately for the first time and then every 10 seconds.*	OK +WLOC: 02f802,0006,7772,ed3001af4cf492780 b040889c74acc23,8b49d08d0797c419e2 72e1 0889a000009302160399020503c1020a0 3c5020a03,00,010121111354ff +WLOC: 02f802,0006,7772,f02d01ae4cf41278 4b03c889c846dba5,8b49d08d0797c 419e272e10889a0000093021703990 20403c1020a03c5020903,00,010121 111404ff
AT+WLOC?	+WLOC: 1,10,255 OK *Note: The location is in automatic mode, the period value is set to 10 seconds, the configuration value is set to 255.*
AT+WLOC=0 *Note: Stops the display of local information*	OK

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11.7.6 Notes

If the data are not valid at the requested time, the network measurement, BCCH list and Timing Advance cannot be displayed (",," is displayed instead).

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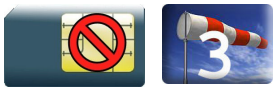
11.8 Wavecom Scan +WSCAN



11.8.1 Description

This Wavecom proprietary command displays the received signal strength indication for a specified frequency (in absolute format).

This command is not allowed during communication.

11.8.2 Syntax

Action command
AT+WSCAN=<freq>
+WSCAN: <rssi>
OK

Read command
None

Test command
None

11.8.3 Parameters and Defined Values

<freq>:	absolute frequency The range depends of the selected band: • P900 range: 1-124 • E900 range: 1-124, 975-1023 and 0 for 1024 • 850 range: 128-251 • DCS1800 range: 512-885 • PCS1900 range: 512-810

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<rssi>:		received signal strength indication
	0	-113 dBm or less
	1	-111 dBm
	2-30	-109 to -53 dBm
	31	-51dBm or more
	99	not known or not detectable

11.8.4 Parameter Storage

None.

11.8.5 Examples

Command	Responses
AT+WSCAN=50 *Note: Request <rssi> of absolute frequency 50*	+WSCAN: 23 OK *Note: <rssi> is 23*

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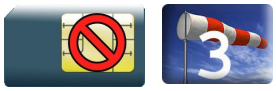
11.9 Abort command +WAC



11.9.1 Description

This Wavecom prorietary command allows SMS, SS and PLMN selection related commands to be aborted.

11.9.2 Syntax

Action command
AT+WAC
OK

Read command
AT+WAC?
OK

Test command
AT+WAC=?
OK

11.9.3 Parameters and Defined Values

None

11.9.4 Parameter Storage

None.

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11.9.5 Examples

Command	Responses
AT+COPS=? *Note: Available PLMN*	
AT+WAC *Note: Aborts the request of PLMN list*	OK *Note: PLMN list request aborted*
AT+CCFC=0,2 *Note: Interrogation of status of Call Forwarding service.*	
AT+WAC *Note: Aborts the request of Interrogation of Call Forwarding service*	+CME ERROR: 551 *Note: Interrogation of Call Forwarding service request abortion failure*

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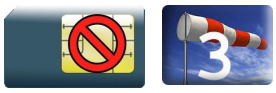
12 Call Control Commands

12.1 Dial Command to a specific number D

Emergency call



Normal call

12.1.1 Description

The ATD command is used to set a voice, data or fax call. As per GSM 02.30, the dial command also controls supplementary services.

The following Emergency Numbers are available without a SIM card:

000, 08, 110, 112, 118, 119, 911 and 999.

The following Emergency Numbers are available with a SIM card:

- when EF_ECC file is missing from SIM: 112 and 911
- when SIM includes an EF_ECC file: 112, 911 and any Emergency Numbers available in the EF_ECC file.

12.1.2 Syntax

Action command
ATD<nb>[<I>][<G>][;]
[Depending of GSM sequence]
OK / CONNECT <speed> / NO CARRIER / BUSY / NO ANSWER

Read command
None

Test command
None

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12.1.3 Parameters and Defined Values

<nb>:		destination phone number (ASCII string) or GSM sequence 0-9,*,#,+,A,B,C,D,P
<I>:		CLIR supplementary service subscription If present, the CLIR supplementary service subscription is overridden temporary for this call only.
	I	activate (disable presentation of own phone number to remote)
	i	deactivate (enable presentation of own phone number to remote)
<G>:		CUG supplementary service information If present, the CUG supplementary service information is overridden temporary for this call only.
	G	activate
	g	deactivate
;		for voice call If omitted, the call will be a data or a fax one.
<speed>:		data call connection speed in bps
	300	
	1200	
	2400	
	4800	
	9600	
	14400	

12.1.4 Parameter storage

None

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12.1.5 Examples

Command	Responses
ATD0123456789; *Note: Call the 0123456789 number, voice call*	OK *Note: Call succeeds*
ATD0123456789P123; *Note: Call the 0123456789 number, voice call with a pause and DTMF sequence 123*	OK
ATD0123456789 *Note: Call the 0123456789 number, data call*	CONNECT 9600 *Note: Call succeeds*
ATD*#21# *Note: Check any call forwarding status*	+CCFC: 0,7 OK *Note: No call forwarding*

12.1.6 Notes

- If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.
- For an international number, the local international prefix does not need to be set (usually 00) but must be replaced by the '+' character.
  Example: to set up a voice call to Wavecom offices from another country, the AT command is: "ATD+33146290800;"
- Note that some countries may have specific numbering rules for their GSM handset numbering.
- When the FDN phonebook has been activated (see +CLCK command), only numbers beginning with the digits of FDN phonebook entries can be called. For example, if "014629" is entered in the FDN phonebook all the phone numbers beginning with these 6 digits can be called.
- An outgoing call attempt can be refused if the AOC service is active and credit has expired (NO CARRIER).
- As per GSM 02.30, GSM sequences may be controlled using dial commands. These sequences can contain "*", "#", but ";" is forbidden in the sequence. For example, to invoke or suppress CLIR service temporally, ATD*31#<nb>[;] and ATD#31#<nb>[;] can be used (with ';' at the end, a voice call will be launched).
- If the FDN phonebook is activated, the call forwarding sequences are allowed only if they are present in the FDN.
- See GSM Sequence List pragraph in the Appendixes to have the list of supported sequences.

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12.2 Direct Dial Command using phonebook index D

12.2.1 Description

This command allows initiating an outgoing voice, data or fax call directly by indicating the index of a specific or current phonebook entry.

12.2.2 Syntax

Action command
ATD>[<mem>]<index>[<I>][<G>][;]
OK / CONNECT <speed> / NO CARRIER / BUSY / NO ANSWER

Read command
None

Test command
None

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12.2.3 Parameters and Defined Values

<mem>:		phonebook memory storage If omitted, the currently selected phonebook is used.
	SM	ADN Abbreviated Dialing Numbers (SIM phonebook)
	FD	FDN Fixed Dialing Numbers (SIM restricted phonebook)
	ON	MSISDN (SIM own numbers)
	EN	ECC Emergency Call Codes (SIM or ME)
	LD	LND Last Number Dialed
	MC	Missed (unanswered received) Calls list
	ME	ME (flash) phonebook
	MT	combined ME and SIM phonebook (ME+SM)
	RC	Received Calls list
	SN	SDN Service Dialing Numbers (SIM special service numbers)
<index>:		phonebook entry index integer type The range depends of the SIM capability (for ADN phonebook) and is (1-500) for flash phonebook
<I>:		CLIR supplementary service subscription If present, the CLIR supplementary service subscription is overridden temporary for this call only
	I	activate (disable presentation of own phone number to remote)
	i	deactivate (enable presentation of own phone number to remote)
<G>:		CUG supplementary service information If present, the CUG supplementary service information is overridden temporary for this call only.
	G	activate
	g	deactivate
;		for voice call If omitted, the call will be a data or a fax one

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<speed>:	data call connection speed in bps
	300
	1200
	2400
	4800
	9600
	14400

12.2.4 Parameter Storage

None.

12.2.5 Examples

Command	Responses
ATD>1; *Note: Call the 1st entry of current phonebook*	OK *Note: Call succeeds*
ATD>ME1; *Note: Call the 1st entry of flash phonebook*	OK *Note: Call succeeds*

12.2.6 Note

When the FDN phonebook has been activated (see +CLCK command), only direct dialing from FDN phonebook entries is available.

An outgoing call attempt can be refused if the AOC service is active and credit has expired (NO CARRIER).

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12.3 Direct Dial Command using a phonebook entry name D

12.3.1 Description

This command allows initiating an outgoing voice, data or fax call directly by indicating the entry name of a specific phonebook.

12.3.2 Syntax

Action command

ATD>[<mem>]<name>[<I>][<G>][;]

OK / CONNECT <speed> / NO CARRIER / BUSY / NO ANSWER

Read command

None

Test command

None

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12.3.3 Parameters and Defined Values

<mem>:		phonebook memory storage If omitted, the currently selected phonebook is used.
	SM	ADN Abbreviated Dialing Numbers (SIM phonebook)
	FD	FDN Fixed Dialing Numbers (SIM restricted phonebook)
	ON	MSISDN (SIM own numbers)
	EN	ECC Emergency Call Codes (SIM or ME)
	LD	LND Last Number Dialed
	MC	Missed (unanswered received) Calls list
	ME	ME phonebook
	MT	combined ME and SIM phonebook (ME+SM)
	RC	Received Calls list
	SN	SDN Service Dialing Numbers (SIM special service numbers)
<name>:		phonebook entry name ASCII string (between "") The maximum number of characters depends on SIM capability for all phonebooks except ME (up to 30 characters).
<I>:		CLIR supplementary service subscription If present, the CLIR supplementary service subscription is overridden temporary for this call only.
	I	activate (disable presentation of own phone number to remote)
	i	deactivate (enable presentation of own phone number to remote)
<G>:		CUG supplementary service information If present, the CUG supplementary service information is overridden temporary for this call only.
	G	activate
	g	deactivate
;		for voice call If omitted, the call will be a data or a fax one.

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<speed>:	data call connection speed in bps
	300
	1200
	2400
	4800
	9600
	14400

12.3.4 Parameter storage

None

12.3.5 Examples

Command	Responses
ATD>"John"; *Note: Call the number of the current phonebook entry which name is John*	OK *Note: Call succeeds*
ATD>ME"John"; *Note: Call the number of the flash phonebook entry which name is John*	OK *Note: Call succeeds*

12.3.6 Note

When the FDN phonebook has been activated, only direct dialing from FDN phonebook entries is available.

An outgoing call attempt can be refused if the AOC service is active and credit has expired (NO CARRIER).

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12.4 Redial Last Telephone Number DL

12.4.1 Description

This command is used by the application to redial the last number used in the D command.

12.4.2 Syntax

Action command
ATDL
<last number>
OK

Read command
None

Test command
None

12.4.3 Parameters and Defined Values

<last number>:	last number dialed followed by ";" for voice calls only string type

12.4.4 Parameter Storage

None.

12.4.5 Examples

Command	Responses
ATDL *Note: Redial last number*	0146290800; OK *Note: Last call was a voice call.*

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12.5 Answer a Call A

12.5.1 Description

When the product receives a call, it sets the Ring Indicator 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.

12.5.2 Syntax

Action command
ATA
OK

Read command
None

Test command
None

12.5.3 Parameters and Defined Values

None.

12.5.4 Parameter Storage

None.

12.5.5 Examples

Command	Responses
	RING *Note: Incoming call*
ATA *Note: Answer to this incoming call*	OK *Note: Call accepted*
ATH *Note: Disconnect call*	OK *Note: Call disconnected*

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12.6 Hang-Up Command H

12.6.1 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 Wavecom proprietary ATH1 command has been added 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.

12.6.2 Syntax

Action command
ATH[<n>]
OK

Read command
None

Test command
None

12.6.3 Parameters and Defined Values

<n>:		disconnection type
	0	ask for disconnection
	1	ask for outgoing call disconnection

12.6.4 Parameter Storage

None.

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12.6.5 Examples

Command	Responses
ATH *Note: Ask for call disconnection*	OK *Note: Every call, if any, are released*
ATH1 *Note: Ask for outgoing call disconnection*	OK *Note: Outgoing call, if any, is released*

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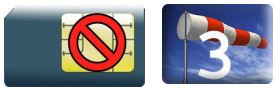
12.7 Wavecom Hang-up +WATH



12.7.1 Description

This Wavecom proprietary command is used by the application to disconnect the remote user, specifying a release cause and the location. In the case of multiple calls, all calls are released (active, on-hold and waiting calls).

12.7.2 Syntax

Action command

AT+WATH=<RelCause>[,<location>]

OK

Read command

None

Test command

AT+WATH=?

+WATH= (list of supported <RelCause>s),(list of supported <location>s)

OK

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12.7.3 Parameters and Defined Values

<RelCause>:		release cause range: 1-127 integerl value Please refer to section "Failure Cause from GSM 04.08 recommendation" in the Appendixes chapter of this guide.
<location>:		release location Please refer to ETSI GSM 24.008 [8] for values.
	0	user
	1	private network serving the local user
	2	transit network
	3	transit network
	4	public network serving the remote user
	5	private network serving the remote user
	7	international network
	10	network beyond inter-working point

12.7.4 Parameter Storage

None.

12.7.5 Examples

Command	Responses
AT+WATH=?	+WATH: (1-127),(0-5,7,10) OK
AT+WATH=31 *Note: Ask for disconnection with release cause=normal and location=USER*	OK *Note: All calls, if any, are released*
AT+WATH=17,2 *Note: Ask for disconnection with release cause=user busy and location= public network serving the local user*	OK *Note: All calls, if any, are released*

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12.8 Remote disconnection

This message is used by the product to inform the application that an active call has been released by the remote user.

The product sends "NO CARRIER" to the application and sets the DCD signal.

In addition, for AOC, the product can release the call if credit has expired (release cause 68 with +CEER command).

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12.9 Extended Error Report +CEER

12.9.1 Description

This command gives the cause of call release when the last call set up (originating or answering) failed.

12.9.2 Syntax

Action command
AT+CEER
+CEER: <report>
OK

Read command
None

Test command
None

12.9.3 Parameters and Defined Values

<report>:	call release cause (please refer to section "failure cause from GSM 24.08 recommendation" in Appendix)

12.9.4 Parameter Storage

None.

12.9.5 Examples

Command	Responses
ATD123456789; *Note: Outgoing voice call*	NO CARRIER *Note: Call setup failure*
AT+CEER *Note: Ask for release cause*	+CEER: Error 41 OK *Note: "Temporary failure"*

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12.10 Automatic Dialing with DTR %Dn

12.10.1 Description

This command enables and disables:

- automatic dialing of the phone number stored in the first location of the ADN phonebook (or FDN phonebook, if it is activated using +CLCK command),
- automatic sending of the short message (SMS) stored in the first location of the SIM.

The number is dialed when DTR OFF switches to ON.

The short message is sent when DTR OFF switches to ON.

12.10.2 Syntax

Action command
AT%D<n>[;]
OK

Read command
None

Test command
None

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12.10.3 Parameters and Defined Values

<n>:		automatic dialing mode
	0	disables automatic DTR number dialing/message transmission
	1	enables automatic DTR dialing if DTR switches from OFF to ON Dials the phone number in the first location of the ADN phonebook (or FDN phonebook, if it is activated using +CLCK command). voice call (with semi-colon) data or Fax call (without semi-colon)
	2	activates automatic DTR short message transmission if DTR switches from OFF to ON Sends the short message in the first location of the SIM (even if the current selected SMS memory is not SM in +CPMS command).
;		for voice call If omitted, the call will be a data or a fax one.

12.10.4 Parameter Storage

None.

12.10.5 Examples

Command	Responses
AT%D1; *Note: Activates DTR voice number dialing*	OK *Note: Command has been executed*
DTR is OFF *DTR switches ON* *Note: The number in the first location of the ADN is dialed automatically* *DTR switches OFF* *Note: The product goes on-hook*	OK
AT%D2 *Note: Activates DTR short message sending*	OK *Note: Command has been executed*
DTR is OFF *DTR switches ON* *Note: The first short message is sent*	+CMSS: 1

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12.10.6 Notes

If the first location is empty:

- AT%D1 and AT%D2 commands will receive an OK response,
- the DTR ON event will trigger a "+CME ERROR: 21" or a "+CMS ERROR: 321".

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12.11 Automatic Answer S0

12.11.1 Description

This command determines and controls the product automatic answering mode.

12.11.2 Syntax

Action command
ATS0=<value>
OK

Read command
ATS0?
<value>
OK

Test command
None

12.11.3 Parameters and Defined Values

<value>:	number of rings before automatic answer (3 characters padded with zeros) Values range is 0 to 255 (default value: 000).

12.11.4 Parameter Storage

The <value> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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12.11.5 Examples

Command	Responses
ATS0=2 *Note: Automatic answer after 2 rings*	OK
ATS0? *Note: Current value*	002 OK *Note: 3 characters padded with zeros*

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12.12 Incoming Call Bearer +CICB

12.12.1 Description

This Wavecom proprietary command is used to set the type of incoming calls when no incoming bearer is specified (see +CSNS).

Note:

Setting the +CICB command affects the current value of +CSNS.

12.12.2 Syntax

Action command

AT+CICB=<mode>

OK

Read command

AT+CICB?

+CICB: <mode>

OK

Test command

AT+CICB=?

+CICB: (list of supported <mode>s)

OK

12.12.3 Parameters and Defined Values

<mode>:		default incoming call bearer
	0	data
	1	fax
	2	speech (default value)

12.12.4 Parameter Storage

The <mode> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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12.12.5 Examples

Command	Responses
AT+CICB=2 *Note: If no incoming bearer, force a voice call*	OK
AT+CICB? *Note: Get current value*	+CICB: 2 OK *Note: Default incoming bearer: voice call*
AT+CICB=? *Note: Test command*	+CICB: (0-2) OK

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12.13 Single Numbering Scheme +CSNS

12.13.1 Description

This command selects the bearer to be used when an MT single numbering scheme call is set up (see +CICB).

Note:

Setting the +CSNS command affects the current value of +CICB.

12.13.2 Syntax

Action command
AT+CSNS=<mode>
OK

Read command
AT+CSNS?
+CSNS: <mode>
OK

Test command
AT+CSNS=?
+CSNS: (list of supported <mode>s)
OK

12.13.3 Parameters and Defined Values

<mode>:		bearer to be used
	0	voice (default value)
	2	fax
	4	data

12.13.4 Parameter Storage

The <mode> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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12.13.5 Examples

Command	Responses
AT+CSNS=0 *Note: Force a voice call*	OK
AT+CSNS? *Note: Get current value*	+CSNS: 0 OK *Note: Default incoming bearer: voice call*
AT+CSNS=? *Note: Test command*	+CSNS: (0,2,4) OK

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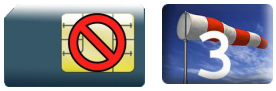
12.14 Service Reporting Control +CR



12.14.1 Description

This command enables a detailed type of service reporting in case of incoming or outgoing data calls. Before sending the CONNECT response to the application, the product will specify the type of data connection which has been set up.

12.14.2 Syntax

Action command

AT+CR=<mode>

OK

Read command

AT+CR?

+CR: <mode>

OK

Test command

AT+CR=?

+CR: (list of supported <mode>s)

OK

Unsolicited response

+CR: <type>

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12.14.3 Parameters and Defined Values

<mode>:		extended reports activation
	0	disable (default value)
	1	enable
<type>:		type of call
	ASYNC	asynchronous transparent
	REL ASYNC	asynchronous non transparent
	GPRS	GPRS

12.14.4 Parameter Storage

The <mode> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

12.14.5 Examples

Command	Responses
AT+CR=?	+CR: (0,1) OK
AT+CR=1 *Note: Extended reports enabled*	OK *Note: Command valid*
AT+CR?	+CR: 1 OK
ATD0612345678 *Note: CSD data call*	+CR: ASYNC CONNECT 9600

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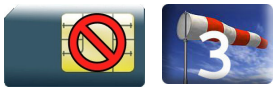
12.15 Cellular Result Codes +CRC



12.15.1 Description

This command allows more detailed ring information for an incoming call (voice or data). Instead of the string "RING", an extended string is used to indicate which type of call is ringing.

12.15.2 Syntax

Action command

AT+CRC=<mode>

OK

Read command

AT+CRC?

+CRC: <mode>

OK

Test command

AT+CRC=?

+CRC: (list of supported <mode>s)

OK

Unsolicited response

+CRING: <type>[,<PDP_type>[,<PDP_addr>]]

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12.15.3 Parameters and Defined Values

<mode>:		extended ring information mode
	0	disable (default value)
	1	enable
<type>:		detailed ring information
	ASYNC	asynchronous transparent
	REL ASYNC	asynchronous non transparent
	VOICE	voice
	FAX	fax
	GPRS	GPRS network request for PDP context activation
<PDP_type>:		type of packet data protocol
	"IP"	Internet Protocol (IETF STD 5)
	"PPP"	Point to Point Protocol (IETF STD 51)
<PDP_addr>:		PDP address: identifies the MT in the address space applicable to the PDP string type

12.15.4 Parameter Storage

The <mode> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

12.15.5 Examples

Command	Responses
AT+CRC=?	+CRC: (0,1) OK
AT+CRC=1 *Note: Extended reports enabled*	OK *Note: Command valid*
AT+CRC?	+CRC: 1 OK
	+CRING: VOICE *Note: Incoming voice call*

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13 Data Commands

13.1 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 to switch to offline mode.

- Switch from online to offline mode

  To switch from online mode to offline mode, the "+++" sequence must be sent. Following this, the product gets back to offline mode with an "OK" response, and a AT command can be sent. This "+++" sequence must be sent with a guard time of 1s before and after the sequence.

  Note: The "+++" sequence will only work with the +ICF command using one of the following settings:

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

- Switch from offline to online mode

  Please refer to the "O" command description.

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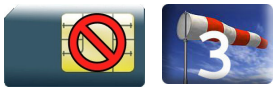
13.2 Bearer Type Selection +CBST



13.2.1 Description

This command allows to select a bearer type for outgoing and incoming data calls.

13.2.2 Syntax

Action command

AT+CBST=[<speed>][,[<name>][,<ce>]]

OK

Read command

AT+CBST?

+CBST: <speed>,<name>,<ce>

OK

Test command

AT+CBST=?

+CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s)

OK

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13.2.3 Parameters and Defined Values

<speed>:		data call connection speed used only for outgoing calls
	0	autobauding, modem type: none (default value)
	1	300 bps, modem type: V.21
	2	1200 bps, modem type: V.22
	3	1200/75 bps, modem type: V.23
	4	2400 bps, modem type: V.22bis
	5	2400 bps, modem type: V.26ter
	6	4800 bps, modem type: V.32
	7	9600 bps, modem type: V.32
	8	specific
	12	9600 bps, modem type: V.34
	14	1400 bps, modem type: V.34
	65	300 bps, modem type: V.110
	66	1200 bps, modem type: V.110
	68	2400 bps, modem type: V.110
	70	4800 bps, modem type: V.110
	71	9600 bps, modem type: V.110
	75	14400 bps, modem type: V.110
<name>:		operating mode
	0	no data compression is provided and only asynchronous mode is supported (default value)
<ce>:		connection element
	0	transparent only
	1	non transparent only (default value)
	2	transparent preferred
	3	non transparent preferred

13.2.4 Parameter Storage

All parameters are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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13.2.5 Examples

Command	Responses
AT+CBST=?	+CBST: (0-8,12,14,65,66,68,70,71,75),(0),(0-3) OK
AT+CBST=7,0,1 *Note: Select a bearer*	OK
AT+CBST? *Note: Current values*	+CBST: 7,0,1 OK

13.2.6 Notes

For incoming calls, if <ce> is set to "Transparent only" and the network offers only "Non Transparent" or vice versa, then the call is released.

<ce> parameter values 2 and 3 are equivalent to former values 100 and 101. These values are managed for compatibility purposes, but they may not be used in new code (2 as former 100, and 3 as former 101).

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13.3 DTE-DCE Local Rate Reporting +ILRR

13.3.1 Description

This command controls whether a +ILRR unsolicited response is sent to the application with the current (negotiated or renegotiated) DTE-DCE speed rate.

If enabled, the unsolicited result code is transmitted in an incoming or outgoing data call, after any data compression report, and before any connection indication (CONNECT).

13.3.2 Syntax

Action command

AT+ILRR=<value>

OK

Read command

AT+ILRR?

+ILRR: <value>

OK

Test command

AT+ILRR=?

+ILRR: (list of supported <value>s)

OK

Unsolicited response

+ILRR: <rate>

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13.3.3 Parameters and Defined Values

<value>:		local port rate report
	0	disable (default value)
	1	enable
<rate>:		current (negotiated or renegotiated) DTE-DCE speed rate values in bps
	300	
	600	
	1200	
	2400	
	4800	
	9600	
	19200	
	38400	
	57600	
	115200	
	230400	
	460800	
	921600	

13.3.4 Parameter Storage

The <value> parameter are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

13.3.5 Examples

Command	Responses
AT+ILRR=?	+ILRR: (0,1) OK
AT+ILRR=0 *Note: Local port rate report disabled*	OK *Note: Command valid*
AT+ILRR=1 *Note: Local port rate report enabled*	OK *Note: Command valid*

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Command	Responses
AT+ILRR?	+ILRR: 1 OK
ATD0123456789 *Note: CSD call*	+ILRR: 9600 CONNECT 9600 *Note: Data rate is 9600*

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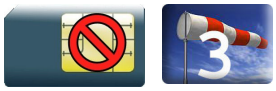
13.4 Radio Link Protocol Parameters +CRLP



13.4.1 Description

This command modifies the radio link protocol parameters used for non transparent data transmission.

13.4.2 Syntax

Action command

AT+CRLP=[<iws>][,[<mws>][,[<T1>][,[<N2>][,[<ver>]]]]]

OK

Read command

AT+CRLP?

+CRLP: <iws>,<mws>,<T1>,<N2>,<ver>

OK

Test command

AT+CRLP=?

+CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <ver>s)

OK

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13.4.3 Parameters and Defined Values

<iws>:		down window size range: 0-61 (default value: 61)
<mws>:		up window size range: 0-61 (default value: 61)
<T1>:		acknowledgement timer in units of 10 ms range: 40-255 (default value: 48)
<N2>:		retransmission attempts range: 1-255 (default value 6)
<ver>:		RLP version number
	0	V42bis not supported
	1	V42bis supported (default value)

13.4.4 Parameter Storage

Parameters are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

13.4.5 Examples

Command	Responses
AT+CRLP=?	+CRLP: (0-61),(0-61),(40-255),(1-255),(0,1) OK
AT+CRLP=61,61,48,6,0 *Note: Set new parameters*	OK
AT+CRLP?	+CRLP: 61,61,48,6,0 OK

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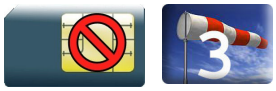
13.5 Other Radio Link Parameters +DOPT



13.5.1 Description

This Wavecom proprietary command modifies additional radio link protocol parameters.

13.5.2 Syntax

Action command

AT+DOPT=[<reset_allowed>][,<dtx_allowed>]

OK

Read command

AT+DOPT?

<reset_allowed>,<dtx_allowed>

OK

Test command

AT+DOPT=?

(list of supported <reset_allowed>s),(list of supported <dtx_allowed>s)

OK

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13.5.3 Parameters and Defined Values

<reset_allowed>:		behaviour in case of bad radio link
	0	data communication is hung up in case of bad radio link
	1	data communication is held, even if the radio link is bad; there is a possibility of losing data (default value)
<dtx_allowed>:		power mode
	0	normal mode
	1	economic battery mode, not supported by all networks (default value)

13.5.4 Parameter Storage

Parameters are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

13.5.5 Examples

Command	Responses
AT+DOPT=?	(0,1),(0,1) OK
AT+DOPT=1 *Note: Second parameter is omitted*	OK
AT+DOPT=1,1 *Note: Set new parameters*	OK
AT+DOPT?	1,1 OK
AT+DOPT=,0 *Note: First parameter is omitted*	OK

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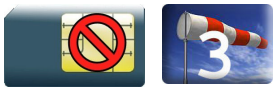
13.6 Select Mode +FCLASS



13.6.1 Description

This command sets the product to a particular operating mode (data or fax).

13.6.2 Syntax

Action command
AT+FCLASS=<n>
OK

Read command
AT+FCLASS?
+FCLASS: <n>
OK

Test command
AT+FCLASS=?
+FCLASS: (list of supported <n>s)
OK

13.6.3 Parameters and Defined Values

<n>:		operating mode
	0	data (default value)
	1	fax class 1
	2	fax class 2

13.6.4 Parameter Storage

None.

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13.6.5 Examples

Command	Responses
AT+FCLASS=? *Note: Test command*	+FCLASS: (0,1,2) OK *Note: All operating modes supported*
AT+FCLASS=1 *Note: Fax class 1 mode requested*	OK *Note: Command valid*
AT+FCLASS? *Note: Current value*	+FCLASS: 1 OK *Note: Command valid*

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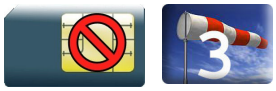
13.7 Select Data Compression %C



13.7.1 Description

This command enables or disables data compression negotiation.

13.7.2 Syntax

Action command
AT%C[<n>]
OK

Read command
AT%C?
<n>
OK

Test command
None

13.7.3 Parameters and Defined Values

<n>:		compression mode
	0	no compression (default value)
	2	V42 compression if supported

13.7.4 Parameter Storage

<n> is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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13.7.5 Examples

Command	Responses
AT%C2	OK
AT%C?	2 OK

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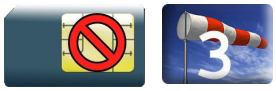
13.8 V42 Bis Data Compression +DS



13.8.1 Description

This command enables or disables V42bis data compression. Note that the product only allows the MNP2 protocol.

13.8.2 Syntax

Action command

AT+DS=[<dir>][,[<neg>][,[<P1>][,[<P2>]]]]

OK

Read command

AT+DS?

+DS: <dir>,<neg>,<P1>,<P2>

OK

Test command

AT+DS=?

+DS: (list of supported <dir>s),(list of supported <neg>s),(list of supported <P1>s),(list of supported <P2>s)

OK

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13.8.3 Parameters and Defined Values

<dir>:		desired direction(s) of operation for the data compression feature, from the DTE point of view
	0	negotiated
	1	transmit only
	2	receive only
	3	both directions, accept any direction (default value)
<neg>:		specifies whether the DCE may continue to operate or not if the desired result is not obtained
	0	do not disconnect if V42bis is not negotiated by the remote DCE as specified in <dir> (default value)
	1	disconnect if V42bis is not negotiated by the remote DCE as specified in <dir>
<P1>:		maximum number of dictionary entries that may be negotiated range: 512-2048 (default value: 2048)
<P2>:		maximum string length to be negotiated range: 6-250 (default value: 20)

13.8.4 Parameter Storage

All parameters are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

13.8.5 Examples

Command	Responses
AT+DS=?	+DS: (0-3),(0,1),(512-2048),(6-250) OK
AT+DS=3,0,2048,250 *Note: Set new parameters*	OK
AT+DS?	+DS: 3,0,2048,250 OK

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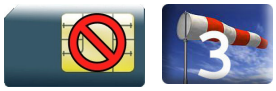
13.9 V42 Bis Data Compression Report +DR



13.9.1 Description

This command enables/disables the +DR intermediate result code that represents the current DCE-DCE data compression type. This intermediate result code, if enabled, is issued before the final result code, after the service report control +CR and before the +ILRR intermediate report.

13.9.2 Syntax

Action command

AT+DR=<status>

OK

Read command

AT+DR?

+DR: <status>

OK

Test command

AT+DR=?

+DR: (list of supported <status>s)

OK

Intermediate response

+DR: <direction>

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13.9.3 Parameters and Defined Values

<status>:		status fo the V42bis use
	0	disabled (default value)
	1	enabled
<direction>:		DCE-DCE data compression type
	NONE	data compression is not in use
	V42B	V42bis is in use in both directions
	V42B RD	V42bis is in use in receive direction only
	V42B TD	V42bis is in use in transmit direction only

13.9.4 Parameter Storage

<status> is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

13.9.5 Examples

Command	Responses
AT+DR=?	+DR: (0,1) OK
AT+DR=1 *Note: Reporting enabled*	OK
AT+DR?	+DR: 1 OK
ATD0123456789 *Note: outgoing data call*	+DR: V42B CONNECT 9600

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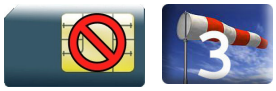
13.10 Select Data Error Correcting Mode \N



13.10.1 Description

This command controls the preferred error correcting mode for a data connection. It can only be used for transparent data transmission.

13.10.2 Syntax

Action command
AT\N[<n>]
OK

Read command
AT\N?
<n>
OK

Test command
None

13.10.3 Parameters and Defined Values

<n>:		error correction mode
	0	disables error correcting mode (default value)
	5	selects MNP error correcting mode

13.10.4 Parameter Storage

<n> is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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13.10.5 Examples

Command	Responses
AT\N0 *Note: No error correction*	OK
AT\N?	0 OK

13.10.6 Notes

+E prefixed V25ter commands are not used.

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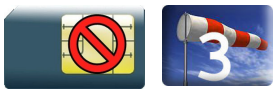
14 GPRS Commands

14.1 GPRS Mobile Station Class +CGCLASS



14.1.1 Description

This command is used to set the MT to operate according to the specified GPRS mobile class.

14.1.2 Syntax

Action command

AT+CGCLASS=<class>

OK

Read command

AT+CGCLASS?

+CGCLASS: <class>

OK

Test command

AT+CGCLASS=?

+CGCLASS: (list of supported <class>s)

OK

14.1.3 Parameters and Defined Values

<class>:		GPRS mobile class (in descending order of functionality)
	"B"	class B
	"CG"	class C in GPRS only mode
	"CC"	class C in circuit switched only mode (lowest)

14.1.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command.

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14.1.5 Examples

Command	Responses
AT+CGCLASS=?	+CGCLASS: ("CG","CC","B") OK
AT+CGCLASS="CC" *Note: Enter GSM mode*	OK
AT+CGCLASS?	+CGCLASS: "CC" OK

14.1.6 Notes

If the MT is GPRS attached, when the action command is issued with a <class>="CC" specified, a GPRS detach request is sent to the network.

If the MT is GSM attached, when the action command is issued with a <class>="CG" specified, a GSM detach request is sent to the network.

During switch-On in CG class, the MS always performs an automatic GPRS attach (the ATTACH-STATUS parameter of +WGPRS is ignored).

If the MS is not already GPRS attached, when switching from B/CC class to CG class then no automatic GPRS attach is performed.

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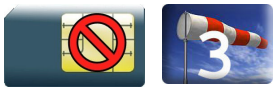
14.2 GPRS parameters customization: +WGPRS



14.2.1 Description

This Wavecom proprietary command modifies some Wavecom GPRS parameters:

- the ATTACH-STATUS (the ME does or not perform automatically a GPRS attachment after initialization),
- the PDP-INIT-STATUS (activates automatically or not some defined PDP contexts after initialization),
- the user-defined multislot class. This parameter represents the GPRS or EGPRS class chosen by the user to perform power saving (by reducing TX /uplink time slots).

In addition, this command allows to:

- set automatically "ACTIVABLE" some defined PDP contexts after initialization,
- set some parameters for PALM® OS software: PPP Silent Mode.

(PPP waits for PPP Client to start the dialog) and Slow CONNECT (due to the delay of the processing of PALM® OS, the CONNECT is sent one second after the dialing command request)

The Wavecom Wireless CPU must be rebooted to activate the new setup except for <mode> 3, 5, 6 and 7 (please refer to "Defined Values" paragraph).

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14.2.2 Syntax

Action command

AT+WGPRS=<mode>[,[<parameter>][,[<cid>],[<class>]]]

OK

Read command

AT+WGPRS?

+WGPRS: <mode>[,<response>[,<cid>]]

[+WGPRS: <mode>[,<response>[,<cid>]] […]]

OK

Test command

AT+WGPRS=?

+WGPRS: (list of supported <mode>s),(list of supported <parameter>s),(list of supported <cid>s),(list of supported <class>s)

OK

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14.2.3 Parameters and Defined Values

<mode>:		Wavecom GPRS parameter
	0	ATTACH-STATUS (the ME performs automatically a GPRS attachment after initialization) only <parameter> is used
	1	PDP-INIT-STATUS (declares some PDP contexts liable to be activated automatically after initialization by <mode>=2) only <parameter> is used
	2	sets ACTIVABLE automatically after init a define PDP context only <parameter> and <cid> are used
	3	PPP silent mode (PPP waits for PPP Client to start the dialog) only <parameter> is used
	4	definition of the GPRS multislot class. This parameter represents the GPRS or EGPRS class chosen by the user to perform power saving (by reducing TX /uplink time slots). only <class> is used
	5	Slow CONNECT for PALM® OS (due to the delay of the processing of PALM® OS, the CONNECT is sent one second after the dialing command request) only <parameter> is used
	6	PPP Filtering only <parameter> is used
	7	Automatic GPRS roaming inter-operator (ME automatically reattaches itself to the network and reactivates its PDP context by changing of operator when reaching border areas) only <parameter> is used
	8	Definition of the EGPRS multislot class (available for EGPRS compatible Wavecom Wireless CPUs) only <class> is used
<parameter>:		requested operation for <mode> (except for <mode>=4 and 8)
	0	disabled
	1	enabled
<cid>:		PDP context identifier range: 1-4 integer type

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<class>:		GPRS or EGPRS multislot class number. Please refer to [6] and table in "Notes" section for more information
	0	deactivate EGPRS mode (in order to establish GPRS TBF) only available for EGPRS enabled Wireless CPUs and <mode>=8
	2	multislot class 2
	8	multislot class 8
	10	multislot class 10
<response>:		This parameter is returned in "AT+WGPRS?" response. • for <mode>=0,1,2,3,5,6 and 7: <response>=<parameter> • for <mode>=4 and 8: <response>=<class>

14.2.4 Parameter Storage

The <cid> and <class> parameters are stored in EEPROM without using the AT&W command.

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14.2.5 Examples

Command	Responses
AT+WGPRS=? *Note: Request ranges of values for a GPRS compatible Wavecom Wireless CPU*	+WGPRS: (0-7),(0-1),(1-4),(2,8,10) OK
AT+WGPRS=? *Note: Request ranges of values for an EGPRS compatible Wavecom Wireless CPU*	+WGPRS: (0-8),(0-1),(1-4),(0,2,8,10) OK
AT+WGPRS=2,1,3 *Note: Set <cid>=3 to be automatically activated after initialization*	OK
AT+WGPRS=7,1 *Note: set automatic re-attachment to the network and reactivation of PDP context in case of change of operator for MCC/MNC*	OK
AT+WGPRS=4,,,8 *Note: choose GPRS multislot class 8*	OK
AT+WGPRS=8,,,10 *Note: choose EGPRS multislot class 10 for an EGPRS compatible Wavecom Wireless CPU*	OK
AT+WGPRS? *Note: read values for non EGPRS compatible Wireless CPU*	+WGPRS: 0,1 +WGPRS: 1,0 +WGPRS: 2,0,1 +WGPRS: 2,1,3 +WGPRS: 3,0 +WGPRS: 4,8 +WGPRS: 5,0 +WGPRS: 6,0 +WGPRS: 7,1 OK

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Command	Responses
AT+WGPRS? *Note: read values for EGPRS compatible Wireless CPU. EGPRS class is 10.*	+WGPRS: 0,1 +WGPRS: 1,0 +WGPRS: 2,0,1 +WGPRS: 2,1,3 +WGPRS: 3,0 +WGPRS: 4,8 +WGPRS: 5,0 +WGPRS: 6,0 +WGPRS: 7,1 +WGPRS: 8,10 OK

14.2.6 Notes

Additional information for <class>:

Multislot class	Maximum number of slots			Minimum number of slots				Type of MS
	Rx	Tx	Sum	T_{ta}	T_{tb}	T_{ra}	T_{rb}	
2	2	1	3	3	2	3	1	1
8	4	1	5	3	1	2	1	1
10	4	2	5	3	1	2	1	1
12	4	4	5	2	1	2	1	1

Type 1 MS are not required to transmit and receive at the same time.

When the Wireless CPU is set in the "CG" class, the ME always automatically performs a GPRS attachment after init, so AT+WGPRS? always gives +WGPRS: 0,0 for the parameter 0.

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14.3 Define PDP Context +CGDCONT

14.3.1 Description

This command specifies PDP context parameter values for a PDP context identified by the local context identification parameter.

Four PDP contexts can be defined through Wavecom OS.

14.3.2 Syntax

Action command

AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]]

OK

Read command

AT+CGDCONT?

+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>
[+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>
[…]]

OK

Test command

AT+CGDCONT=?

+CGDCONT: (list of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)

[+CGDCONT: (list of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[…]]

OK

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14.3.3 Parameters and Defined Values

<cid>:		PDP context identifier range: 1-4 integer type
<PDP_type>:		type of packet data protocol
	"IP"	Internet Protocol (IETF STD 5)
	"PPP"	Point to Point Protocol (IETF STD 51)
<APN>:		access point name: logical name that is used to select the GGSN or the external packet data network. string type If the value is null or omitted, then the subscription value will be requested.
<PDP_addr>:		PDP address: identifies the MT in the address space applicable to the PDP If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or a dynamic address will be requested. The read form of the command will return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command. string type
<d_comp>:		PDP data compression mode
	0	OFF (default value)
	1	ON
<h_comp>:		PDP header compression mode
	0	OFF (default value)
	1	ON

14.3.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command.

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14.3.5 Examples

Command	Responses
AT+CGDCONT=?	+CGDCONT: (1-4),"IP",,,(0-1),(0-1) +CGDCONT: (1-4),"PPP",,,0,0 OK
AT+CGDCONT=1,"IP","internet"	OK
AT+CGDCONT?	+CGDCONT: 1, "IP", "internet",,0,0 OK
AT+CGDCONT=1 *Note: Delete <cid>=1*	OK
AT+CGDCONT?	OK

14.3.6 Notes

The data compression algorithm provided in SNDCP is V.42bis.

Due to Wavecom choice, 4 PDP contexts can be specified with only one activated at the same time.

A special form of the set command, AT+CGDCONT=<cid> causes the values for context number <cid> to become undefined.

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14.4 GPRS Attach or Detach +CGATT

14.4.1 Description

This command is used to attach the MT to, or detach the MT from the GPRS service. After the command has completed, the MT remains in V.25 ter command state [3]. If the MT is already in the requested state, the command is ignored and the OK response is returned.

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

14.4.2 Syntax

Action command

AT+CGATT=<state>

OK

Read command

AT+CGATT?

+CGATT: <state>

OK

Test command

AT+CGATT=?

+CGATT: (list of supported <state>s)

OK

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14.4.3 Parameters and Defined Values

<state>:		state of GPRS attachment
	0	detached
	1	attached
	2	combined detach (GPRS and GSM detach in the same network request)

14.4.4 Parameter Storage

None.

14.4.5 Examples

Command	Responses
AT+CGATT=1	OK
AT+CGATT?	+CGATT: 1 OK
AT+CGATT=?	+CGATT: (0-2) OK

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14.5 PDP Context Activate or Deactivate +CGACT

14.5.1 Description

This command is used to activate or deactivate the specified PDP context(s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged.

14.5.2 Syntax

Action command

AT+CGACT=<state>[,<cid>[,<cid>[,…]]]

OK

Read command

AT+CGACT?

+CGACT: <cid>,<state>

[+CGACT: <cid>,<state>[…]]

OK

Test command

AT+CGACT=?

+CGACT: (list of supported <state>s)

OK

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14.5.3 Parameters and Defined Values

<state>:		state of PDP context activation
	0	deactivated
	1	activated
<cid>:		PDP context identifier range: 1-4 integer type

14.5.4 Parameter Storage

None.

14.5.5 Examples

Command	Responses
AT+CGDCONT=1,"IP","APN"	OK
AT+CGACT=1,1	OK
AT+CGACT?	+CGACT: 1,1 OK
AT+CGACT=?	+CGACT: (0-1) OK
AT+CGACT=0 *Note: deactivate all contexts*	OK
AT+CGACT=1 *Note: activate first possible context*	OK

14.5.6 Notes

Before the activation of the context, the MT has to attach itself to the GPRS network, if necessary.

If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.

If the MT is not GPRS attached when the activation form of the command is executed, the MT first performs a GPRS attach and then attempts to activate the specified contexts. If the attach fails, then the MT responds with ERROR. Or if extended error responses are enabled, with the appropriate failure-to-attach error message.

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If no <cid>s are specified, the activation form of the command activates the first possible within the defined contexts. If no <cid>s are specified, the deactivation form of the command deactivates all active contexts.

One PDP context can be activated through Wavecom OS at the same time.

When "AT+CGACT?" is sent, only the status of defined and valid PDP contexts are listed. The line "+CGACT: 0,0", which appears in the previous software version, is not returned from OS 6.61.

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14.6 Request GPRS IP Service D

14.6.1 Description

This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN.

The V.25ter "D" (Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocol. The MT returns CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behavior after the online data state has been entered is described briefly in clause 9, for IP, of GSM 07.60.[17] GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

14.6.2 Syntax

Action command

ATD*<GPRS_SC_IP>[*<cid>]#**

CONNECT

Read command

None

Test command

None

14.6.3 Parameters and Defined Values

<GPRS_SC_IP>:	GPRS Service Code for IP digit string (value 99), which identifies a request to use the GPRS with IP (PDP types IP and PPP)
<cid>:	PDP context identifier range: 1-4 integer type

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14.6.4 Parameter Storage

None.

14.6.5 Examples

Command	Responses
ATD*99*1#**	CONNECT

14.6.6 Notes

If <cid> is supported, its usage is the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may then be used in the modem initialization AT command string to set values for PDP type, APN, QoS etc...

If <cid> is not supported or is supported but omitted, the MT attempts to activate the context using the 'Empty PDP type' (GSM 04.08, refer to [8]). No PDP address or APN is sent in this case and only one PDP context subscription record is present in the HLR for this subscriber.

If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.

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14.7 Enter Data State +CGDATA

14.7.1 Description

This command causes the MT to perform the necessary actions to set up communication between the TE and the network. This may include performing a GPRS attach and one PDP context activation.

GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

If the activation is successful, data transfer may proceed.

After data transfer and layer 2 protocol termination procedure completion, the V.25ter command state is re-entered and the MT returns the final result code OK.

14.7.2 Syntax

Action command
AT+CGDATA[=<cid>]
CONNECT

Read command
None

Test command
AT+CGDATA=?
+CGDATA:
OK

14.7.3 Parameters and Defined Values

<cid>:	PDP context identifier
	range: 1-4
	integer type

14.7.4 Parameter Storage

None.

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14.7.5 Examples

Command	Responses
AT+CGDATA=?	+CGDATA: "PPP" OK
AT+CGDATA=1	*CONNECT*

14.7.6 Notes

If no <cid> is given, the MT attempts to activate the context with available information. The other context parameters are set to their default values (no APN, default QoS parameters, dynamic IP address requested).

In case of abnormal termination or start up, the V.25ter command state is reentered and the MT returns the final result code NO CARRIER or, if enabled, "+CME ERROR". Attach, activate and other errors may be reported.

This command has the same effects as ATD*99***.

If a GPRS PPP session is already running, the setting of a CSD (GSM data call) is not supported.

This command may be used in both normal and modem compatibility modes.

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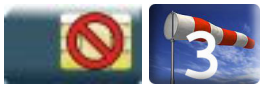
14.8 GPRS Hang-Up Command GH



14.8.1 Description

This Wavecom proprietary command is used by the application to release current GPRS resources (Uplink and/or Downlink Temporary Block Flow).

The command does not affect an active voice call but interrupts any GPRS uplink or downlink transfer without deactivating the used PDP context.

14.8.2 Syntax

Action command
ATGH
OK

Read command
None

Test command
None

14.8.3 Parameters and Defined Values

None.

14.8.4 Parameter Storage

None.

14.8.5 Examples

None.

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14.9 Network requested PDP context activation

In this mode of operation, the MT behaves like an answering modem and accepts the normal V.25ter commands associated with answering a call. If GPRS-specific configuration commands are required, they may be sent to the MT as part of the modem initialization commands.

The +CGAUTO command is used to select modem compatibility mode.

14.9.1 Automatic response to a network request for PDP context activation 'S0'

The V.25ter "S0" (Automatic answer) command may be used to turn off and on the automatic response to a network request for a PDP context activation.

When the "ATS0=n" (n>0) command is received, the MT attempts to perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code RING to the TE, followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a "AT+CGANS=1" with no <cid> value specified.

Note: The "ATS0=n" (n=0) command does not perform an automatic GPRS detach.

14.9.2 Manual acceptance of a network request for PDP context activation 'A'

The V.25ter "A" (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING. The MT responds with CONNECT, enters V.25ter online data state and follows the same procedure as it would after having received a "AT+CGANS=1" with no <cid> value specified. It is an error to issue the "A" command when there is no outstanding network request.

14.9.3 Manual rejection of a network request for PDP context activation "H"

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

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

14.10.1 Description

This command requests the MT to respond to a network request for GPRS PDP context activation which has been signaled to the TE by the RING or +CRING unsolicited result code.

PDP context activation procedures take place prior to or during the PDP startup.

14.10.2 Syntax

Action command

AT+CGANS[=<response>[,<cid>]]

OK

Read command

None

Test command

AT+CGANS=?

+CGANS: (list of supported <response>s)

OK

14.10.3 Parameters and Defined Values

<response>:		response to the request integer type
	0	reject the request If <response> is omitted it is assumed to be 0.
	1	accept and request that the PDP context be activated
<cid>:		PDP context identifier range: 1-4 integer type

14.10.4 Parameter Storage

None.

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14.10.5 Examples

Command	Responses
	RING
AT+CGANS=1,1	OK
AT+CGANS=?	+CGANS: (0,1) OK

14.10.6 Notes

One <cid> may be specified in order to provide the values needed for the context activation request.

During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message.
If a <cid> is given, its information must match with the PDP type and PDP address in the network request as follows:

- The PDP type must match exactly.
- The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

If any of this information is in conflict, the command will fail.
The context is activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the MT returns the final result code OK.

In the event of an erroneous termination or a failure to startup, the V.25ter command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported. It is also an error to issue the +CGANS command when there is no outstanding network request.

This command may be used in both normal and modem compatibility modes.

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14.11 Automatic Response to a Network Request for PDP Context Activation +CGAUTO

14.11.1 Description

This command disables or enables an automatic positive response (auto answer) to the receipt of a "Request PDP Context Activation" message from the network. It also provides control over the use of the V.25ter basic commands "S0", "A" and "H" for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.

14.11.2 Syntax

Action command

AT+CGAUTO=<n>

OK

Read command

AT+CGAUTO?

+CGAUTO: <n>

OK

Test command

AT+CGAUTO=?

+CGAUTO: (list of supported <n>s)

OK

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14.11.3 Parameters and Defined Values

<n>:		automatic response mode
	0	turn off automatic response for GPRS only GPRS network requests are manually accepted or rejected by the +CGANS command.
	1	turn on automatic response for GPRS only GPRS network requests are automatically accepted.
	2	modem compatibility mode, GPRS only Automatic acceptance of GPRS network requests is controlled by the "S0" command. Manual control uses the "A" and "H" commands, respectively, to accept and reject GPRS requests (+CGANS may also be used). Incoming circuit switched calls can be neither manually nor automatically answered.
	3	modem compatibility mode, GPRS and circuit switched calls (default value) Automatic acceptance of both GPRS network requests and incoming circuit switched calls is controlled by the "S0" command. Manual control uses the "A" and "H" commands, respectively, to accept and reject GPRS requests (+CGANS may also be used).

14.11.4 Parameter Storage

The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

14.11.5 Examples

Command	Responses
AT+CGAUTO=?	+CGAUTO: (0-3) OK
AT+CGAUTO=2	OK
AT+CGAUTO?	+CGAUTO: 2 OK

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14.11.6 Notes

In class C GPRS the modem cannot simultaneously receive GPRS and GSM incoming calls.

When the AT+CGAUTO=0 command is received, the MT will not perform a GPRS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request.

When the AT+CGAUTO=1 command is received, the MT will attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR or, if enabled, "+CME ERROR: <err>" being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received an AT+CGANS=1 with <cid> values specified.

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14.12 Quality of Service Profile (Minimum acceptable) +CGQMIN

14.12.1 Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the "Activate PDP Context Accept" message.

14.12.2 Syntax

Action command

AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]

OK

Read command

AT+CGQMIN?

+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>
[+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>
[…]]

OK

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Test command

AT+CGQMIN=?

```
+CGQMIN: <PDP_type>,(list of supported <precedence>s),(list of
supported <delay>s),(list of supported <reliability>s),(list of
supported <peak>s),(list of supported <mean>s)

[+CGQMIN: <PDP_type>,(list of supported <precedence>s),(list of
supported <delay>s),(list of supported <reliability>s),(list of
supported <peak>s),(list of supported <mean>s)[…]]

OK
```

14.12.3 Parameters and Defined Values

<cid>:		PDP context identifier range: 1-4 integer type
<precedence>:		precedence class integer type
	0	subscribed precedence (subscribed by the Network by default if value is omitted)
	1	high priority (service commitments shall be maintained ahead of precedence classes 2 and 3)
	2	normal priority (service commitments shall be maintained ahead of precedence class 3.)
	3	low priority (service commitments shall be maintained after precedence classes 1 and 2)
<delay>:		delay class (see table below)
	0	subscribed
	1	delay class 1
	2	delay class 2
	3	delay class 3
	4	delay class 4

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<reliability>:		reliability class (octet 3) (see table below)
	0	subscribed reliability class
	1	unused. If received, it shall be interpreted as '010'
	2	unacknowledged GTP; acknowledged LLC and RLC, protected data
	3	unacknowledged GTP and LLC; acknowledged RLC, protected data
	4	unacknowledged GTP, LLC, and RLC, protected data
	5	unacknowledged GTP, LLC, and RLC, unprotected data
<peak>:		peak throughput class integer type
	0	subscribed
	1	up to 1 000 (8 kbits/s)
	2	up to 2 000 (16 kbits/s)
	3	up to 4 000 (32 kbits/s)
	4	up to 8 000 (64 kbits/s)
	5	up to 16 000 (128 kbits/s)
	6	up to 32 000 (256 kbits/s)
	7	up to 64 000 (512 kbits/s)
	8	up to 128 000 (1 024 kbits/s)
	9	up to 256 000 (2 048 kbits/s)
<mean>:		mean throughput class range: 0-31 integer type

14.12.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command.

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14.12.5 Examples

Command	Responses
AT+CGQMIN=?	+CGQMIN:"IP",(0-3),(0-4),(0-5),(0-9),(0-31) +CGQMIN:"PPP",(0-3),(0-4),(0-5),(0-9),(0-31) OK
AT+CGDCONT=1,"IP","APN"	OK
AT+CGQMIN=1,1,4,5,2,31	OK
AT+CGQMIN?	+CGQMIN: 1,1,4,5,2,31 OK

14.12.6 Notes

A special form of the set command, AT+CGQMIN=<cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

Detailed information regarding the parameters:

<delay>

Delay Class	delay (maximum values)			
	SDU size: 128 bytes		SDU size: 1024 bytes	
	mean transfert delay (sec)	95 percentile delay	mean transfert delay (sec)	95 percentile delay
0	subscribes	subscribed by the Nwk / default if value is omitted		
1 (Predictive)	< 0.5	< 1.5	< 2	< 7
2 (Predictive)	< 5	< 25	< 15	< 75
3 (Predictive)	< 50	< 250	< 75	< 375
4 (Best effort)	unspecified			

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<reliability>

Reliability Class	GTP Mode	LLC Frame Mode	LLC Data Protection	RLC Block Mode	Traffic Type
0	subscribed	subscribed by the Nwk / default if value is omitted			
1	unacknowledged	acknowledged	protected	acknowledged	non real-time traffic, error-sensitive application that can cope with infrequent data loss.
2	unacknowledged	acknowledged	protected	acknowledged	non real-time traffic, error-sensitive application that can cope with infrequent data loss.
3	unacknowledged	unacknowledged	protected	acknowledged	non real-time traffic, error-sensitive application that can cope with data loss,GMM/SM ,and SMS.
4	unacknowledged	unacknowledged	protected	unacknowledged	real-time traffic, error sensitive application that can cope with data loss.
5	unacknowledged	unacknowledged	unprotected	unacknowledged	real-time traffic, error non sensitive application that can cope with data loss.
For real-time traffic, the QoS profile also requires appropriate settings for delay and throughput.					

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14.13 Quality of Service Profile (Requested) +CGQREQ

14.13.1 Description

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

14.13.2 Syntax

Action command

AT+CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]

OK

Read command

AT+CGQREQ?

+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>

[+CGQREQ:
<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[…]]

OK

Test command

AT+CGQREQ=?

+CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s)

[+CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s)[…]]

OK

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14.13.3 Parameters and Defined Values

<cid>:		PDP context identifier range: 1-4 integer type
<precedence>:		precedence class integer type
	0	subscribed precedence (subscribed by the Network by default if value is omitted)
	1	high priority (service commitments shall be maintained ahead of precedence classes 2 and 3)
	2	normal priority (service commitments shall be maintained ahead of precedence class 3.)
	3	low priority (service commitments shall be maintained after precedence classes 1 and 2)
<delay>:		delay class (see table below)
	0	subscribed
	1	delay class 1
	2	delay class 2
	3	delay class 3
	4	delay class 4
<reliability>:		reliability class (octet 3) (see table below)
	0	subscribed reliability class
	1	unused. If received, it shall be interpreted as '010'
	2	unacknowledged GTP; acknowledged LLC and RLC, protected data
	3	unacknowledged GTP and LLC; acknowledged RLC, protected data
	4	unacknowledged GTP, LLC, and RLC, protected data
	5	unacknowledged GTP, LLC, and RLC, unprotected data

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<peak>:		peak throughput class integer type
	0	subscribed
	1	up to 1 000 (8 kbits/s)
	2	up to 2 000 (16 kbits/s)
	3	up to 4 000 (32 kbits/s)
	4	up to 8 000 (64 kbits/s)
	5	up to 16 000 (128 kbits/s)
	6	up to 32 000 (256 kbits/s)
	7	up to 64 000 (512 kbits/s)
	8	up to 128 000 (1 024 kbits/s)
	9	up to 256 000 (2 048 kbits/s)

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<mean>:	mean throughput class
	integer type
0	subscribed by the Nwk / default if value is omitted
1	100 (~0.22 bit/s)
2	200 (~0.44 bit/s)
3	500 (~1.11 bit/s)
4	1 000 (~2.2 bit/s)
5	2 000 (~4.4 bit/s)
6	5 000 (~11.1 bit/s)
7	10 000 (~22 bit/s)
8	20 000 (~44 bit/s)
9	50 000 (~111 bit/s)
10	100 000 (~0.22 kbits/s)
11	200 000 (~0.44 kbits/s)
12	500 000 (~1.11 kbits/s)
13	1 000 000 (~2.2 kbits/s)
14	2 000 000 (~4.4 kbits/s)
15	5 000 000 (~11.1 kbits/s)
16	10 000 000 (~22 kbits/s)
17	20 000 000 (~44 kbits/s)
18	50 000 000 (~111 kbits/s)
31	Best effort

14.13.4 Parameter Storage

None.

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14.13.5 Examples

Command	Responses
AT+CGQREQ=?	+CGQREQ:"IP",(0-3),(0-4),(0-5),(0-9),(0-31) +CGQREQ:"PPP",(0-3),(0-4),(0-5),(0-9),(0-31) OK
AT+CGDCONT=1,"IP","APN"	OK
AT+CGQREQ=1,1,4,5,2,31	OK
AT+CGQREQ?	+CGQREQ: 1,1,4,5,2,31 OK

14.13.6 Notes

A special form of the set command, AT+CGQREQ=<cid> causes the requested profile for context number <cid> to become undefined.

Detailed information regarding the parameters:

<delay>

Delay Class	delay (maximum values)			
	SDU size: 128 bytes		SDU size: 1024 bytes	
	mean transfert delay (sec)	95 percentile delay	mean transfert delay (sec)	95 percentile delay
0	subscribes	subscribed by the Nwk / default if value is omitted		
1 (Predictive)	< 0.5	< 1.5	< 2	< 7
2 (Predictive)	< 5	< 25	< 15	< 75
3 (Predictive)	< 50	< 250	< 75	< 375
4 (Best effort)	unspecified			

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<reliability>

Reliability Class	GTP Mode	LLC Frame Mode	LLC Data Protection	RLC Block Mode	Traffic Type
0	subscribed	subscribed by the Nwk / default if value is omitted			
1	unacknowledged	acknowledged	protected	acknowledged	non real-time traffic, error-sensitive application that can cope with infrequent data loss.
2	unacknowledged	acknowledged	protected	acknowledged	non real-time traffic, error-sensitive application that can cope with infrequent data loss.
3	unacknowledged	unacknowledged	protected	acknowledged	non real-time traffic, error-sensitive application that can cope with data loss,GMM/SM ,and SMS.
4	unacknowledged	unacknowledged	protected	unacknowledged	real-time traffic, error sensitive application that can cope with data loss.
5	unacknowledged	unacknowledged	unprotected	unacknowledged	real-time traffic, error non sensitive application that can cope with data loss.
For real-time traffic, the QoS profile also requires appropriate settings for delay and throughput.					

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14.14 PDP Context Modify +CGCMOD

14.14.1 Description

This command is used to modify the specified PDP context with respects to QoS profiles. After the command has completed, the MT returns to V.25ter online data state.

14.14.2 Syntax

Action command

AT+CGCMOD[=<cid>[,<cid>[,…]]]

OK

Read command

None

Test command

AT+CGCMOD=?

+CGCMOD: (list of <cid>s associated with active contexts)

OK

14.14.3 Parameters and Defined Values

<cid>:	PDP context identifier range: 1-4 integer type

14.14.4 Parameter Storage

None.

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14.14.5 Examples

Command	Responses
AT+CGDCONT=1,"IP","APN"	OK
AT+CGACT=1,1	OK
AT+CGCMOD=1	OK
AT+CGCMOD=?	+CGCMOD: (1) OK
AT+CGCMOD *Notes: Modify all the active contexts*	OK

14.14.6 Notes

Once the PDP context is activated, this command can only be used to modify the QoS which is set by the command +CGQREQ. It cannot be used to modify the minimum acceptable QoS (set by +CGQMIN).

If no <cid>s are specified the activation form of the command modifies all active contexts.

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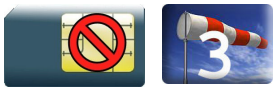
14.15 GPRS network registration status +CGREG



14.15.1 Description

This command controls the presentation of an unsolicited result code +CGREG when there is a change in the MT's GPRS network registration status or when there is a change of the network cell.

14.15.2 Syntax

Action command

AT+CGREG=<n>

OK

Read command

AT+CGREG?

+CGREG: <n>,<stat>[,<lac>,<ci>]

OK

Test command

AT+CGREG=?

+CGREG: (list of supported <n>s)

OK

Unsolicited response

+CGREG: <stat>[,<lac>,<ci>]

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14.15.3 Parameters and Defined Values

<n>:		unsolicited result code activation mode
	0	disable network registration unsolicited result code (default value)
	1	enable network registration unsolicited result code +CGREG: <stat>
	2	enable network registration and location information unsolicited result code +CGREG: <stat>,<lac>,<ci>
<stat>:		network registration state
	0	not registered, ME is not currently searching for a new operator to register to
	1	registered, home network
	2	not registered, but ME is currently searching for a new operator to register to
	3	registration denied
	4	unknown
	5	registered, roaming
<lac>:		location area code two byte in hexadecimal format string type
<ci>:		cell ID two byte in hexadecimal format string type

14.15.4 Parameter Storage

The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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14.15.5 Examples

Command	Responses
AT+CGREG=?	+CGREG: (0-2) OK
AT+CGREG=2	OK +CGREG: 1,"7500","877F"
AT+CGREG?	+CGREG: 2,1,"7500","877F" OK

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14.16 GPRS Event reporting +CGEREP

14.16.1 Description

This command enables or disables sending of +CGEV unsolicited result codes from MT to TE in the case of certain events occurring in the GPRS MT or the network.

14.16.2 Syntax

Action command

AT+CGEREP=<mode>[,<bfr>]

OK

Read command

AT+CGEREP?

+CGEREP: <mode>,<bfr>

OK

Test command

AT+CGEREP=?

+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)

OK

- If <event>=ME REJECT

Unsolicited response

+CGEV: <event> <PDP_type>, <PDP_addr>

- If <event>= NW REACT or NW DEACT or ME DEACT

Unsolicited response

+CGEV: <event> <PDP_type>, <PDP_addr>[,<cid>]

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- If <event>=NW DETACH or ME DETACH

Unsolicited response
`+CGEV: <event>`

- If <event>= NW CLASS or ME CLASS

Unsolicited response
`+CGEV: <event> <class>`

14.16.3 Parameters and Defined Values

<mode>:		buffer unsolicited result mode
	0	disable buffer unsolicited result codes (default value)
	2	enable buffer unsolicited result codes
<bfr>:		handling method for buffered result codes
	0	MT buffer of unsolicited result codes defined within this command is cleared when <mode>=2 is entered.
<event>:		GPRS event
	ME REJECT	A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.
	NW REACT	The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT.
	NW DEACT	The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.
	ME DEACT	The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.
	NW DETACH	The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.
	ME DETACH	The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.
	NW CLASS	The network has forced a change of MS class. The highest available class is reported.
	ME CLASS	The mobile equipment has forced a change of MS class. The highest available class is reported.

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<PDP_type>:		type of packet data protocol
	"IP"	Internet Protocol (IETF STD 5)
	"PPP"	Point to Point Protocol (IETF STD 51)
<PDP_addr>:		PDP address identifies the MT in the address space applicable to the PDP string type
<cid>:		PDP context identifier range: 1-4 integer type

14.16.4 Parameter Storage

The <mode> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

14.16.5 Examples

Command	Responses
AT+CGEREP=?	+CGEREP: (0,2),(0) OK
AT+CGEREP=2	OK
AT+CGEREP?	+CGEREP: 2,0 OK
	+CGEV: ME DEACT "IP", "10.15.139.22",1 *Note: PDP context deactivation*

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14.17 Select Service for MO SMS Messages +CGSMS

14.17.1 Description

This command is used to specify the service or service preference that the MT will use to send MO SMS messages.

14.17.2 Syntax

Action command

AT+CGSMS=<service>

OK

Read command

AT+CGSMS?

+CGSMS: <service>

OK

Test command

AT+CGSMS=?

+CGSMS: (list of supported <service>s)

OK

14.17.3 Parameters and Defined Values

<service>:		service or service preference to be used
	0	GPRS
	1	circuit switched (default value)
	2	GPRS preferred (use circuit switched if GPRS is not available)
	3	circuit switched preferred (use GPRS if circuit switched not available)

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14.17.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command.

14.17.5 Examples

Command	Responses
AT+CGSMS=?	+CGSMS: (0-3) OK
AT+CGSMS=0	OK
AT+CGSMS?	+CGSMS: 0 OK

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14.18 Show PDP Address +CGPADDR

14.18.1 Description

This command returns a list of PDP addresses for the specified context identifiers.

14.18.2 Syntax

Action command

AT+CGPADDR[=<cid>[,<cid>[,…]]]

+CGPADDR: <cid>,<PDP_addr>

[+CGPADDR: <cid>,<PDP_addr>[…]]

OK

Read command

None

Test command

AT+CGPADDR=?

+CGPADDR: (list of defined <cid>s)

OK

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14.18.3 Parameters and Defined Values

<PDP_addr>:	PDP address: identifies the MT in the address space applicable to the PDP string type The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address, it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_addr> is omitted if none is available.
<cid>:	PDP context identifier range: 1-4 integer type If no <cid> is specified, the addresses for all defined contexts are returned.

14.18.4 Parameter Storage

None.

14.18.5 Examples

Command	Responses
AT+CGPADDR=?	+CGAPDDR: (1,2,4) OK
AT+CGPADDR=2	+CGPADDR=2,"10.3.73.151" OK
AT+CGPADDR	+CGPADDR: 1, +CGPADDR: 2,"10.3.73.151" +CGPADDR: 4, OK *Note: Context 2 is active*

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15 PLMN Commands

15.1 Selection of Preferred PLMN list +CPLS

15.1.1 Description

This command is used to select one PLMN selector with access technology listed in the SIM card that is used by +CPOL command.

15.1.2 Syntax

Action command

AT+CPLS=<list>

OK

Read command

AT+CPLS?

+CPLS: <list>

OK

Test command

AT+CPLS=?

+CPLS: (list of supported <list>s)

OK

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15.1.3 Parameters and Defined Values

<list>:		preferred PLMN list
	0	user controlled PLMN selector with access technology EF_PLMNwAct If this file is not found EF_PLMNSel will be selected.
	1	operator controlled PLMN selector with access technology EF_OPLMNwAct
	2	home PLMN selector with access technology EF_HPLMNwAct

15.1.4 Parameter Storage

None.

15.1.5 Examples

Command	Responses
AT+CPLS? *Note: Ask for selection of the SIM file*	+CPLS: 1 OK *Note: EF_OPLMNwAct is selected*
AT+CPLS=0 *Note: Selection of EF_PLMNwAct*	OK *Note: If EF_PLMNwAct is not present, EF_PLMNsel will be selected*
AT+CPLS=1 *Note: Selection of EF_OPLMNwAct*	+CME ERROR: 3 *Note: EF_OPLMNwAct is not present*
AT+CPLS=? *Note: Get possible values*	+CPLS: (0,1,2) OK *Note: The 3 files with Access technology are present and can be selected*
AT+CPLS=? *Note: Get possible values*	+CPLS: (0) OK *Note: Only EF_PLMNwAct or EF_PLMNsel can be selected*

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15.2 Preferred Operator List +CPOL

15.2.1 Description

This command is used to edit (or update) the SIM preferred list of networks. This list is read in the SIM file selected by +CPLS command.

15.2.2 Syntax

Action command

AT+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>,<GSMcomp_Act>,
<Utran_Act>]]]

OK

Read command

AT+CPOL?

+CPOL: <index>,<format>,<oper>[,<GSM_AcT>,<GSMcomp_Act>,
<Utran_Act>]
[+CPOL: <index>,<format>,<oper>[,<GSM_AcT>,<GSMcomp_Act>,
<Utran_Act>][…]]
OK

Test command

AT+CPOL=?

+CPOL: (list of supported <index>s),(list of supported <format>s)
OK

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15.2.3 Parameters and Defined Values

<format>:		PLMN list
	0	long alphanumeric format for <oper>
	1	short alphanumeric format for <oper>
	2	numeric format for <oper>
<oper>:		operator identifier character string or integer (see <format>)
<GSM_AcT>:		GSM access technology
<GSMcomp_Act>:		GSM compact access technology
<Utran_Act>:		
	0	access technology not selected
	1	access technology selected

15.2.4 Parameter Storage

None.

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15.2.5 Examples

Command	Responses
AT+CPOL? *Note: Ask for preferred list of networks with only EF_PLMNsel present*	+CPOL: 1,2,26201 +CPOL: 6,2,20810 OK *Note: Preferred list of networks in numeric format (read in EF_PLMNsel)*
AT+CPOL? *Note: Ask for preferred list of networks with EF_PLMNwAct selected and present*	+CPOL: 1,2,26201,1,0,0 +CPOL: 6,2,20810,1,0,0 OK *Note: Preferred list of networks in numeric format (read in EF_PLMNwAct)* *GSM access technology selected* *GSM compact access technology not selected* *Utran access technology not selected*
AT+CPOL=,0 *Note: Select long alphanumeric format*	OK
AT+CPOL? *Note: Ask for preferred list of networks with only EF_PLMNsel present*	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" OK *Note: Preferred list of networks in long alphanumeric format*
AT+CPOL=7,2,20801 *Note: Add a network to the list*	OK
AT+CPOL? *Note: Ask for preferred list of networks with only EF_PLMNsel present*	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 7,0,"Orange F" OK *Note: Preferred list of networks in long alphanumeric format*
AT+CPOL=7 *Note: Delete 7th location*	OK

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Command	Responses
AT+CPOL? *Note: Ask for preferred list of networks with only EF_PLMNsel present*	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" OK *Note: Preferred list of networks in long alphanumeric format*
AT+CPOL=8,2,77777 *Note: Add a new network to the list i with only EF_PLMNsel present*	OK
AT+CPOL=8,2,77777,0,0,1 *Note: Add a new network to the list with EF_PLMNwact present*	OK *Note: access technology UTRAN is selected*
AT+CPOL=8,2,77777 *Note: Add a new network to the list with EF_PLMNwact present*	OK *Note: Default access technology GSM is selected*
AT+CPOL? *Note: Ask for preferred list of networks with only EF_PLMNsel present*	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 8,2,77777 OK *Note: Preferred list of networks in long alphanumeric format but 8th entry is unknown so the product returns it in the numeric format*
AT+CPOL=9,0,"Orange F" *Note: Add a new network to the list (text format)*	OK
AT+CPOL? *Note: Ask for preferred list of networks with only EF_PLMNsel present*	+CPOL: 1,0,"D1-TELEKOM" +CPOL: 6,0,"F SFR" +CPOL: 8,2,77777 +CPOL: 9,0,"Orange F" OK *Note: Preferred list of networks in long.*
AT+CPOL=?	+CPOL: (1-16),(0-2) OK *Note: The EF can accept 16 records, and supported format are 0,1 or 2.*

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15.2.6 Notes

The different possibilities are:

- AT+CPOL=<index>, to delete an entry.
- AT+CPOL=,<format>, to set the format used by the read command (AT+CPOL?).
- AT+CPOL=,<format>,<oper>, to put <oper> in the next free location.
- AT+CPOL=<index>,<format>,<oper>, to write <oper> in the <format> at the <index>.
- AT+CPOL=<index>,<format>,<oper>,<GSM_AcT>,<GSMcp_Act>,<Utran_Act>, to write <oper> in the <format> at the <index> giving the access technology (in the case of EF_PLMNwact, EF_HPLMNwact or EF_OPLMNwact is present).

Note:

If access technology parameters are not given, the GSM access technology will be chosen.

The supported formats are those of the +COPS command. The length of this list is limited to 85 entries for EF_PLMNsel, and 51 for EF_PLMNwAct, EF_OPLMNwAct, EF_HPLMNwAct.

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15.3 Operator List Management +WOLM

15.3.1 Description

This Wavecom proprietary command allows a new or modified operator to be added to the PLMN list. At most 10 PLMNs can be created and stored in the flash memory.

Note that if two entries with the same network (MCC+MNC), but having different names, are entered, the first one will be taken into account to have the name.

15.3.2 Syntax

Action command

AT+WOLM=<mode>,<loc>[,<NumOper>,<short name>,<long name>]

OK

Read command

AT+WOLM?

+WOLM: <loc>,<NumOper>,<short name>,<long name>

[+WOLM: <loc>,<NumOper>,<short name>,<long name>[…]]

OK

Test command

AT+WOLM=?

OK

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15.3.3 Parameters and Defined Values

<mode>:		request operation
	0	delete
	1	write
	2	read
<loc>:		location If this parameter is not filled with <mode>=1, the location will be the first empty.
<NumOper>:		operator in numeric format: MCC and MNC
<short name>:		the short name of the PLMN
<long name>:		the long name of the PLMN

15.3.4 Parameter Storage

None.

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15.3.5 Examples

Command	Responses
AT+WOLM=1,1,20812,"WM","WM PLMN" *Note: Add a new PLMN at location 1*	OK
AT+WOLM=2,1 *Note: Read the PLMN at location 1*	+WOLM: 1,20812,"WM","WM PLMN" OK
AT+WOLM=2,11 *Note: Read the PLMN at location 11*	+CME ERROR: 21 *Note: Invalid index*
AT+WOLM=1,1,20812,"WM1","WM1 PLMN" *Note: Modify an existing PLMN*	OK *Note: Done*
AT+WOLM=? *Note: Test command*	OK
AT+WOLM? *Note: Interrogate current list*	+WOLM: 1,20812,"WM1","WM1 PLMN" OK *Note: List of the created PLMNs in flash*
AT+WOLM=1,,20813,"PLMN2","PLMN2 LONG" *Note: Add a new PLMN at available location*	OK or +CME ERROR: 20 *Note: <Err> returns if no more PLMNs can be added*
AT+WOLM=0,1 *Note: Delete an entry at location 1*	OK
AT+WOLM=0,11 *Note: Delete an entry at location 11*	+CME ERROR: 21 *Note: Invalid index*

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15.4 Read Operator Name +WOPN

15.4.1 Description

This Wavecom proprietary command allows to:

- read the operator name in long alphanumeric format from the numeric format,
- read the operator name in short alphanumeric format from the numeric format,
- erase NITZ PLMN names stored in flash memory,
- configure the method used for getting PLMN names.

15.4.2 Syntax

- For <mode>=0 or 1:

Action command
AT+WOPN=<mode>,<NumOper>[,<lac>]
+WOPN=<mode>,<AlphaOper>
OK

- For <mode>=3:

Action command
AT+WOPN=<mode>,0
OK

- For <mode>=4:

Action command
AT+WOPN=<mode>[,<PlmnMethod>]
[+WOPN: <PlmnMethod>]
OK

Read command
None

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Test command
AT+WOPN=?
OK

15.4.3 Parameters and Defined Values

<mode>:		requested operation
	0	print operator name using long alphanumeric format
	1	print operator name using short alphanumeric format
	2	reserved for later use
	3	erase NITZ PLMN list if <NumOper>=0
	4	read or write the method used for getting PLMN names read access if <PlmnMethod> omitted. write access if <PlmnMethod> provided.
<NumOper>:		operator identifier in numeric format (MCC/MNC) integer type
<AlphaOper>:		operator identifier in long or short alphanumeric format (refer to section "Operator names" of the Appendixes of the present document for operator names description) string type
<lac>:		location Area Code string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) if it is not entered, current LAC will be used (0 if limited service)
<PlmnOns>:		method for getting PLMN name bit field (default value: 31) bit set to 0: method deactivated bit set to 1: method activated
	Bit 0	E-ONS
	Bit 1	CPHS
	Bit 2	SPN
	Bit 3	NITZ
	Bit 4	Flash

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15.4.4 Parameter Storage

The <PlmnMethod> parameter is stored in EEPROM without using AT&W command.

15.4.5 Examples

Command	Responses
AT+WOPN=0,20801 *Note: Give an operator in numeric format*	+WOPN: 0,"Orange F" OK *Note: Alphanumeric answer*
AT+WOPN=3,0 *Note: Erase NITZ PLMN names stored in flash memory*	OK
AT+WOPN=4 *Note: Read from EEPROM which method will be used for PLMN names.*	+WOPN: 31 OK
AT+WOPN=4,0 *Note: Write to EEPROM which method will be used for PLMN names.*	OK

15.4.6 Note

With E-ONS (Enhanced Operator Name Service) feature, <lac> is an optional parameter to read names from OPL/PNN SIM files.

When the Wireless CPU receives a NITZ (Network Information and Time Zone) message with Long Name and/or Short Name information, an entry with registered PLMN and names in message is created in the flash memory. These names will then be used with +COPS, +COPN, +WOPN, +CPOL commands with the priority order defined in 3GPP TS 22.101. The Wireless CPU supports only network names with the default GSM alphabet coding scheme.

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The priority order is:

1 - E-ONS	First entry if on Home PLMN, or existing matching entry in OPL/PNN SIM files
2 - CPHS	if on Home PLMN, use SIM file CPHS ONS (0x6F14) for Long Name if present and SIM file CPHS SONS (0x6F18) for short name if present (if not, reuse SIM file CPHS ONS)
3 - SPN	If on Home PLMN, use SIM file SPN (0x6F46) if present
4 - NITZ	If there is a matching entry in the list of names received so far, use it.
5 - FLASH	If there is a matching entry in flash PLMN list (created by +WOLM), use it.
6 - ROM	PLMN names in ROM defined according to MoU SE.13 and NAPRD Operator Names documents

For details, please refer to the following diagram:

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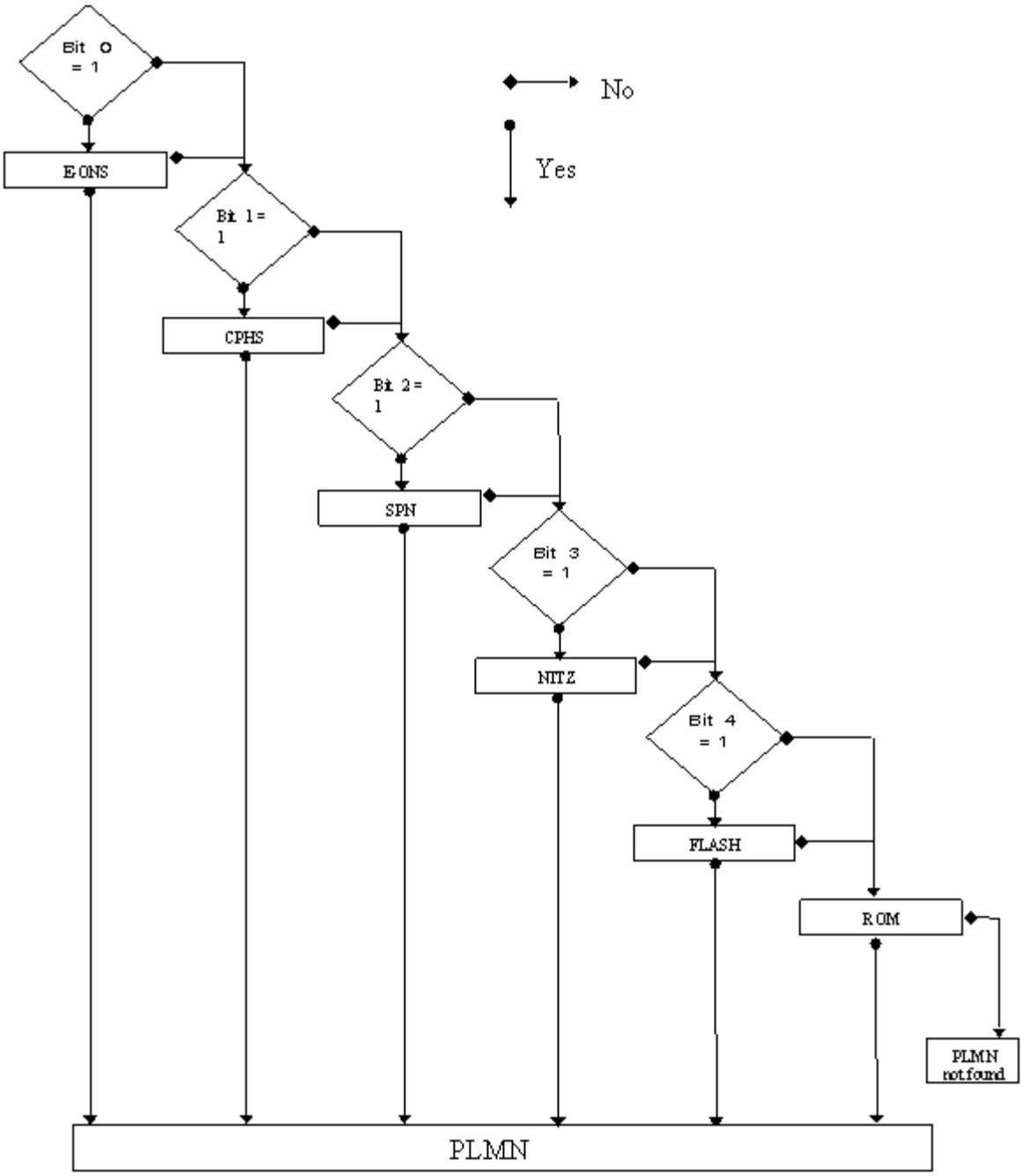

Operation flow for **PlmnMethod**

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Once a long name is found following this priority order, it is given as response to AT command.

Refer to 3GPP TS 24.008 [8] , 3GPP TS 23.040 [11] , 3GPP TS 22.042 [12] and COMMON PCN HANDSET SPECIFICATION CPHS Phase 2 v4.2 for more information.

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15.5 Read Operator Name +COPN

15.5.1 Description

This command returns the list of all operator names (in numeric and alphanumeric format) stored in the Wireless CPU.

15.5.2 Syntax

Action command

AT+COPN

```
+COPN: <NumOper>,<AlphaOper>
[+COPN: <NumOper>,<AlphaOper>[…]]
OK
```

Read command

```
None
```

Test command

AT+COPN=?

```
OK
```

15.5.3 Parameters and Defined Values

<NumOper>:	operator in numeric format
<AlphaOper>:	operator in long alphanumeric format (see section "Operator names" of the Appendixes for operator names description)

15.5.4 Parameter Storage

None.

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15.5.5 Examples

Command	Responses
AT+COPN *Note: Ask for list of all networks*	+COPN: 20201"GR COSMOTE" +COPN: 20205"vodafone GR" +COPN: 20209"GR Q-TELECOM" +COPN: 20210"TIM GR" ... OK
AT+COPN=?	OK

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AT COMMANDS INTERFACE GUIDE FOR OS 6.61

VOLUME 3

Reference: WM_DEV_OAT_UGD_014
Revision: 004
Date: September 21, 2006

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Related Documents

This interface specification is based on the following recommendations:

[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] 3GPP 05.02: 3rd Generation Partnership Project; Technical Specification Group GSM/EDGE- Radio Access Network; Multiplexing and multiple access on the radio path – 3GPP TS 05.02 V6.9.2 (2001-04)

[8] 3GPP 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3

[9] 3GPP TS 11.11 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface

[10] 3GPP TS 05.08 Radio subsystem link control

[11] 3GPP TS 23.040 Technical realization of the Short Message Service (SMS);

[12] 3GPP TS 22.042 Network Identity and Time Zone (NITZ) service description; Stage 1

[13] 3GPP TS 51.011 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface

[14] 3GPP TS 27-010 Terminal Equipment to User Equipment (TE-UE) multiplexer protocol

[15] 3GPP 23.014 Support of Dual Tone Multi Frequency (DTMF) signaling

[16] ISO 639 Langages Codes

[17] 3GPP 27 060 Packet domain; Mobile Station (MS) supporting Packet Switched services

[18] 3GPP TS 23.038 Alphabets and language-specific information

[19] 3GPP TS 27.005 Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)

[20] ETSI GSM 11.14 Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface

[21] 3GPP TS 23.003 Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification

[22] ETSI GSM 02.24 Digital cellular telecommunications system (Phase 2+) (GSM);Description of Charge Advice Information (CAI)

[23] ETSI GSM 02.86 Digital cellular telecommunications system (Phase 2+) (GSM);Advice of Charge (AoC) Supplementary Services - Stage 1

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[24] ETSI GSM 02.90 Digital cellular telecommunications system (Phase 2+) (GSM);Unstructured Supplementary Service Data (USSD) - Stage 1

[25] ETSI GSM 02.85 Digital cellular telecommunications system (Phase 2+) (GSM);Closed User Group (CUG) Supplementary Services - Stage 1

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16 Phonebooks Commands

16.1 Select Phonebook Memory Storage +CPBS

16.1.1 Description

This command selects phonebook memory storage.

Please refer to Recommendation 3GPP 11.11 [9] for more details.

16.1.2 Syntax

Action command

AT+CPBS=<storage>[,<pin2>]

OK

Read command

AT+CPBS?

+CPBS: <storage>,<used>,<total>

OK

Test command

AT+CPBS=?

+CPBS: (list of supported <storage>s)

OK

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16.1.3 Parameters and Defined Values

<storage>:		phonebook memory storage
	"SM"	ADN Abbreviated Dialing Numbers (SIM phonebook)
	"FD"	FDN Fixed Dialing Numbers (SIM restricted phonebook)
	"ON"	MSISDN (SIM own numbers)
	"EN"	ECC Emergency Call Codes (SIM or ME)
	"LD"	LND Last Number Dialed
	"MC"	ME missed (unanswered received) calls list
	"ME"	ME phonebook
	"MT"	combined ME and SIM phonebook (ME+SM)
	"RC"	ME received calls list
	"SN"	SDN Service Dialing Numbers (SIM special service numbers)
<pin2>:		Personal Identification Number 2.
<used>:		used locations in selected memory integer type
<total> :		total number of locations in selected memory integer type

16.1.4 Parameter Storage

None.

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16.1.5 Examples

Command	Responses
AT+CPBS="SM" *Note: Select ADN phonebook*	OK *Note: ADN phonebook is selected*
AT+CPBS=? *Note: Possible values*	+CPBS: ("SM","LD","MC","ON","ME","RC","MT","SN","EN") OK
AT+CPBS? *Note: Get current phonebook memory storage*	+CPBS: "SM",10,20 OK *Note: ADN phonebook selected, 10 locations used, 20 locations available*

16.1.6 Notes

On ADN and FDN activation: when FDN has been activated with the +CLCK command, the selection of ADN phonebook is possible only if AND status bit3 is set to 1 (EF file "readable and updatable when invalidated").

Selection of ADN phonebook when FDN is active is SIM dependent.

Selection of "FD" phonebook with <pin2>, when <pin2> is already verified, will give "+CME ERROR: 3".

The previously selected phonebook remains the same when the Wireless CPU is switched on or reset, even if a new SIM card is inserted. However, in the case when the replacement SIM card does not contain any selected phonebook, the ADN phonebook is selected.

The maximum number of entries for ME phonebook is set to 500.

When the SIM is not present, the following emergency numbers are available: 000, 08, 112, 110, 118, 119, 911, 999.

When a SIM is present, the following emergency numbers are available: 112, 911, emergency numbers from ECC SIM files (if existing).

The following emergency numbers are stored in EEPROM:

- 112
- 911
- 999
- 08

So, "EN" will be available even if ECC SIM file is not present.

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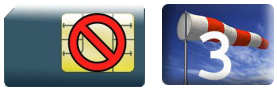
16.2 Contact Selector +WCOS



16.2.1 Description

This Wavecom proprietary command allows extended contact display to be enabled\disabled.

16.2.2 Syntax

Action command

AT+WCOS=<mode>

OK

Read command

AT+WCOS?

+WCOS: <mode>

OK

Test command

AT+WCOS=?

+WCOS: (list of supported <mode>s)

OK

16.2.3 Parameters and Defined Values

<mode>:		extended contact mode
	0	select the SIM contacts (default mode)
	1	select the extended contacts for phonebook entries
	2	reserved Customer application should not use this value.

16.2.4 Parameter Storage

The <mode> parameter is stored in EEPROM.

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16.2.5 Examples

Command	Responses
AT+WCOS=? *Note: Possible values ?*	+WCOS: (0-2) OK *Note: Possible responses*
AT+WCOS=1 *Note: Extended contact selected*	OK
AT+WCOS? *Note: Test command*	+WCOS: 1 OK *Note: Extended contact selected*

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16.3 Write Phonebook Entry +CPBW

16.3.1 Description

This command writes a phonebook entry in an index location number of the current phonebook memory storage.

16.3.2 Syntax

Depending on the context several possibilities:

- The entry is stored in the ADN phonebook and AT+WCOS=0:

Action command
AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]
OK

- The entry is stored in the ADN phonebook and AT+WCOS=1:

Action command
AT+CPBW=<index>[,<number>[,<type>[,<text>[,<phb_group>]]]]
OK

- The entry is stored in the ME phonebook and AT+WCOS=0:

Action command
AT+CPBW=<index>[,<number>[,<type>[,<text>]]]
OK

- The entry is stored in the ME phonebook and AT+WCOS=1:

Action command
AT+CPBW=<index>[,<number>[,<type>[,<text>[,<contact>[,<phb_group>]]]]]
OK

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Read command

None

Test command

AT+CPBW=?

+CPBW: (list of supported <index>s),[<nlength>],(list of supported <type>s),[<tlength>]

OK

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16.3.3 Parameters and Defined Values

<index>:		location in memory storage range of possible values depending on the capacity of the phonebook memory integer type
<number>:		phone number in ASCII format string type
<type>:		TON/NPI (type of address octet in integer format).
	145	international number
	129	national number
<text>:		associated contact name string type (see note below) SIM dependant for the ADN phonebook (use AT+CPBW=?)
<phb_group>:		phonebook group number in which the entry should be saved range value (1-10)
<nlength>:		max length of field <number> integer type
<tlength>:		max length of field <text> integer type
<contact>:		This parameter gathers the following parameters: <num_Mobile>, <num_Work>, <num_Fax>, <num_Data>, <Email>, <Address>
<num_Mobile>:		phone number (dedicated for mobile phone number for example) up to 20 digits
<num_Work>:		phone number (dedicated for work phone number for example) up to 20 digits
<num_Fax>:		phone number (dedicated for fax phone number for example) up to 20 digits
<num_Data>:		phone number (dedicated for data phone number for example) up to 20 digits
<Email>:		e-mail address string type up to 56 characters

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<Address>:	mail address string type up to 56 characters

Note:

- For the <text> parameter all strings starting with "80" , "81" or "81" are considered in UCS2 format.
- The +CSCS (Select Character Set) command does not affect the format for phonebook entries.

16.3.4 Parameter Storage

None.

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16.3.5 Examples

Command	Responses
AT+CPBS="SM" *Note: ADN phonebook*	OK
AT+CPBS? *Note: Get current memory storage*	+CPBS:"SM",1,10 OK *Note: ADN phonebook is selected, 1 location is used and 10 locations are available*
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBW=? *Note: Test command*	+CPBW: (1-50),20,(129,145),10 OK *Note: 50 locations, phone number = 20 digits max, TON/NPI = 129 or 145, text length = 10 character max*
AT+CPBW=5,"112",129,"SOS" *Note: Write at location 5*	OK *Note: Location 5 written*
AT+CPBR=5 *Note: Read the entry at location 5*	+CPBR: 5,"112",129,"SOS" OK
AT+CPBS? *Note: Get current memory storage*	+CPBS: "SM",2,10 OK *Note: ADN phonebook is selected, 2 locations are used and 10 locations are available*
AT+CPBW=5,"01290917",129,"Jacky" *Note: Overwrite location 5*	OK *Note: Location 5 overwritten*
AT+CPBW=6,"01292349",129,"8000410042" *Note: Write location 6 (UCS2 format for the<text> field)*	OK *Note: Location 6 is written*
AT+CPBW=8,"01292349",129,"80xyz" *Note: Write location*	OK *Note: Location 8 is written. The string has a wrong UCS2 format, it is therefore considered as an ASCII string.*
AT+CPBW=5,"01290917",129,"Jacky",1 *Note: Write an extended entry*	+CME ERROR: 3 *Note: Error because +WCOS: 0*

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Command	Responses
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+CPBW=5,""01290917"",129,"Jacky",1 *Note: Write an extended entry*	OK
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBS="ME" *Note: ME phonebook*	OK
AT+CPBS? *Note: How many entries are used ?*	+CPBS: "ME",2,500 *Note: in ME phonebook, 2 locations are used out of 500 available locations*
AT+CPBW=1,"0123456798",129,"first entry" *Note: Write an not extended entry*	OK
AT+CPBR=1 *Note: Read the first entry*	+CPBR: 1,"0123456798",129,"first entry" OK
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+CPBW=1,"0123456798",129,"first entry" *Note: Write an entry not extended*	OK
AT+CPBW=2,"9876543210",129,"second entry","6543210987",129 *Note: Write an entry extended*	OK
AT+CPBR=1,2 *Note: Read entry 1 and 2*	+CPBR: 1,"0123456798",129,"first entry","",,"",,"",,"",,"","",0 +CPBR: 2,"9876543210",129,"second entry","6543210987",129,"",,"",,"",,"","",0 OK

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Command	Responses
AT+CPBW=13,"+331290909",145,"Fred","0141284549",129,"0600003210",129,"0141280000",129,"019876543210",129,"fred@mail_address.com","Becker Street London",1 *Note: Write location with Contact and Phonebook Group n°1*	OK *Note: Location 13 is written*
AT+CPBW=,"+33145221100",145,"SOS" *Note: Write at the first location available*	OK *Note: First location available is written*
AT+CPBS="SM" *Note: ADN phonebook*	OK
AT+WCOS?	+WCOS: 1 OK *Note: Extended phonebook*
AT+CPBW=1 *Note: Delete entry at first location*	OK
AT+CPBW=1,"0123456",,"test",1 *Note: Add an extended entry in SIM with group number (1)*	OK
AT+CPBR=1	+CPBR:1,"0123456",129,"test",1 OK
AT+CPBW=1,"",,"No number" *Note : write an empty number. The TON/NPI is omitted*	OK

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16.3.6 Notes

- This command is not allowed when the fixed dialing phonebook (FDN) is locked. Moreover, when the FDN is unlocked, PIN2 is required to write in the FDN phonebook. If PIN2 authentication has been performed during the current session, the +CPBW command with FDN is allowed.
- "RC" and "MC" phonebooks can only be erased by using +CPBW. Adding field and/or modifying field is not allowed for these phonebooks.
- This command is not allowed for "EN", "LD", "MC", "RC", "MT", "SN" phonebooks, which can not be written.
- If the AT+WCOS=1 command was used, the request would include the 'Contact' structure.
- When an empty number is written, the <type> parameter should be omitted. When this entry is read, the <type> in the response is equal to 128 (unknown) (see+CPBR command (§16.4)).

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16.4 Read Phonebook Entries +CPBR

16.4.1 Description

This command returns phonebook entries for a range of locations from the current phonebook memory storage selected with +CPBS.

16.4.2 Syntax

Depending on the context several possibilities:

- The entry is stored in the ADN phonebook and AT+WCOS=0:

Action command
AT+CPBR=<first_entry>[,<last_entry>]
+CPBR: <loc>,<num>,<type>,<name>
[+CPBR: <loc>,<num>,<type>,<name>[…]]
OK

- The entry is stored in the ADN phonebook and AT+WCOS=1:

Action command
AT+CPBR=<first_entry>[,<last_entry>]
+CPBR: <loc>,<num>,<type>,<name>,<phb_group>
[+CPBR: <loc>,<num>,<type>,<name>,<phb_group>[…]]
OK

- The entry is stored in the ME phonebook and AT+WCOS=0:

Action command
AT+CPBR=<first_entry>[,<last_entry>]
+CPBR: <loc>,<num>,<type>,<name>
[+CPBR: <loc>,<num>,<type>,<name>[…]]
OK

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- The entry is stored in the ME phonebook and AT+WCOS=1:

Action command

AT+CPBR=<first_entry>[,<last_entry>]

+CPBR:<loc>,<num>,<type>,<name>,<contact>,<phb_group>

[+CPBR:<loc>,<num>,<type>,<name>,<contact>,<phb_group>[…]]

OK

Read command

None

Test command

AT+CPBR=?

+CPBR: (list of supported <loc>s),<nlength>,<tlength>

OK

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16.4.3 Parameters and Defined Values

<first_entry>:		first location (or range of locations) where to read phonebook entry
<last_entry>:		last location (or range of locations) where to read phonebook entry
<type>:		TON/NPI
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".
	128	value returned by the Wireless CPU when the <num> parameter is empty. <num> format is unknown.
<nlength>:		value indicating the maximum length of field <num> integer type
<tlength>:		value indicating the maximum length of field <name> integer type
<loc>:		phonebook index integer type
<phb_group>:		phonebook group range value (1-10)
<num>:		phone number string type
<name>:		name associated with the phone number string type
<contact>:		this parameter gathers the following parameters: <num_Mobile>, <num_Work>, <num_Fax>, <num_Data>, <Email>,<Address>
<num_Mobile>:		phone number (dedicated for mobile phone number for example) up to 20 digits

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<num_Work>:	phone number (dedicated for work phone number for example) up to 20 digits
<num_Fax>:	phone number (dedicated for fax phone number for example) up to 20 digits
<num_Data>:	phone number (dedicated for data phone number for example) up to 20 digits
<Email>:	e-mail address string type up to 56 characters
<Address>:	mail address string type up to 56 characters

16.4.4 Parameter Storage

None.

16.4.5 Examples

Command	Responses
AT+CPBR=? *Note: Test command*	+CPBR: (1-50),20,10 OK *Note: 50 locations (from 1 to 50), max length for phone number is 20 digits, 10 characters max for name*
AT+WCOS? *Note: Test command*	+WCOS: 0 OK *Note: Contact not selected*
AT+CPBR=12,14 *Note: Read entries from 12 to 14*	+CPBR: 12,"112",129,"Emergency" +CPBR: 13,"+331290909",145,"Fred" +CPBR: 14,"0146290808",129,"Zazi" OK *Note: Display locations 12,13,14 with location, number, type (TON/NPI), name*

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Command	Responses
AT+CPBR=10 *Note: Read entry 10*	+CPBR: 10,"0146290921",129,"Rob" OK *Note: Display location 10*
AT+CPBR=11 *Note: Read entry 11 (UCS2 format)*	+CPBR: 11,"0146290921",129,"8000010002FFFF" OK *Note: Display location 11*
AT+CPBS="ME" *Note: Flash memory*	OK
AT+WCOS=1	OK *Note: Contact selected*
AT+CPBR=13 *Note: Read entry*	+CPBR: 13,"+331290909",145,"Fred","0141284549",129,"0600003210",129,"0141280000",129,"019876543210",129,"fred@mail_address.com","Becker Street London",1 OK *Note: Display location 13 with location, number, type (TON/NPI), name and contact and phonebook group n°1*

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Command	Responses
AT+CPBS="SM" *Note: ADN phonebook*	OK
AT+CPBR=1	+CPBR=1,"0123456",129,"test" OK
AT+WCOS=0	OK
AT+CPBW=1,"",,"No number"	OK
AT+CPBR=1	+CPBR: 1,"",128,"No number" OK

16.4.6 Notes

- For all phonebook read commands (+CPBR, +CPBF, +CPBN, +CPBP, +CNUM), the TON/NPI MSB of each number is set to 1 (ex: a TON/NPI stored as 17 is displayed as 145).
- If the AT+WCOS=1 command was used, the response will include <Contact> structure.

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16.5 Find Phonebook Entries +CPBF

16.5.1 Description

This command returns phonebook entries with alphanumeric fields starting with a given pattern. The AT+CPBF="" command can be used to display all phonebook entries sorted in alphabetical order.

This command is not allowed for "LD", "RC", "MC" phonebooks and for the "EN" phonebook, which does not contain alphanumeric fields.

It is possible to use this command with UCS2 strings. If a wrong UCS2 format is entered, the string is considered as an ASCII string.

16.5.2 Syntax

Depending on the context several responses to the command are possible:

- The entry is stored in the ADN phonebook and AT+WCOS=0:

Action command

AT+CPBF=<string>

```
+CPBF: <loc>,<num>,<type>,<name>
OK
```

- The entry is stored in the ADN phonebook and AT+WCOS=1

Action command

AT+CPBF=<string>

```
+CPBF: <loc>,<num>,<type>,<name>,<phb_group>
OK
```

- The entry is stored in the ME phonebook and AT+WCOS=0

Action command

AT+CPBF=<string>

```
+CPBF: <loc>,<num>,<type>,<name>
OK
```


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- The entry is stored in the ME phonebook and AT+WCOS=1

Action command
AT+CPBF=<string>
+CPBF: <loc>,<num>,<type>,<name>,<contact>,<phb_group>
OK

Read command
None

Test command
AT+CPBF=?
+CPBF: [<nlength>],[<tlength>],[<glength>],[<slength>],[<elength>]
OK

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16.5.3 Parameters and Defined Values

<string>:		searched pattern string (depends on the format of data stored in the phonebooks)
<loc>:		location number (20 digits max)
<num>:		phone number (20 digits max)
<type>:		TON/NPI (Type of address byte in integer format)
	129	national number
	145	international number
	128	unknown number (empty)
<phb_group>:		phonebook group range value (1-10)
<name>:		name associated with the phone number string type
<contact>:		this parameter gathers the following parameters: <num_Mobile>, <num_Work>, <num_Fax>, <num_Data>, <Email>,<Address>
<num_Mobile>:		phone number (dedicated for mobile phone number for example) up to 20 digits
<num_Work>:		phone number (dedicated for work phone number for example) up to 20 digits
<num_Fax>:		phone number (dedicated for fax phone number for example) up to 20 digits
<num_Data>:		phone number (dedicated for data phone number for example) up to 20 digits
<Email>:		e-mail address string type up to 56 characters
<Address>:		mail address string type up to 56 characters

16.5.4 Parameter Storage

None.

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16.5.5 Examples

Command	Responses
AT+CPBF=? *Note: Test command*	+CPBF: 20,14 OK *Note: Max length for phone number is 20 digits, 14 characters for the text*
AT+CPBF="E" *Note: Read entries with "E"*	+CPBF: 12,"112",129,"Emergency" +CPBF: 15,"+331290101",145,"Eric" OK *Note: Display locations with text field starting with "E"*
AT+CPBF="H" *Note: Read entries with "H"*	+CME ERROR: 22 *Note: No entry found*
AT+CPBF="800001" *Note: Read entries starting with 0001 UCS2 character*	+CPBF: 11,"0146290921",129,"8000010002FFFF" OK *Note: Display locations with text field starting with 0001 UCS2 character*
AT+CPBF="8045C" *Note: Read entries with "8045C" (ASCII format)*	+CME ERROR: 22 *Note: No entry found. The string has a wrong UCS2 format, it is therefore considered as an ASCII string*
AT+CPBS="SM" *Note: ADN phonebook*	OK
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBF="Test" *Note: Read entries with "Test"*	+CPBF: 1,"0123456789",129,"Test ADN" *Note: Display locations with text field starting with "Test"*
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+CPBF="Test" *Note: Read entries with "Test"*	+CPBF: 1,"0123456789",129,"Test ADN",0 *Note: Display locations with text field starting with "Test" extended entry*
AT+CPBS="ME" *Note: Flash phonebook*	OK

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Command	Responses
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBF="Test" *Note: Read entries with "Test"*	+CPBF: 1,"0123456789",129,"Test ME" *Note: Display locations with text field starting with "Test"*
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+CPBF="Test" *Note: Read entries with "Test"*	+CPBF: 1,"0123456789",129,"Test ME","9876543210",129,"",,"","",,"e_mail@mail_address.com","post address",0 *Note: Display locations with text field starting with "Test", extended entry*
AT+WCOS=0	OK
AT+CPBW=1,"",,"No number"	OK
AT+CPBF="No number"	+CPBF: 1,"",128,"No number" OK

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16.6 Phonebook Phone Search +CPBP

16.6.1 Description

This Wavecom proprietary command orders the product to search in the phonebook for an item with the same phone number as provided in the parameter.

If two different entries of the selected phonebook have the same number, the entry returned by +CPBP command is the first one written using +CPBW command..

16.6.2 Syntax

Depending on the context several responses to the command are possible:

- The entry is stored in the ADN phonebook and AT+WCOS=0:

Action command
AT+CPBP=<number>
+CPBP: <index>,<number>,<type>,<text>
OK

- The entry is stored in the ADN phonebook and AT+WCOS=1

Action command
AT+CPBP=<number>
+CPBP: <index>,<number>,<type>,<text>,<phb_group>
OK

- The entry is stored in the ME phonebook and AT+WCOS=0

Action command
AT+CPBP=<number>
+CPBP: <index>,<number>,<type>,<text>
OK

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- The entry is stored in the ME phonebook and AT+WCOS=1

Action command
AT+CPBP=<number>
+CPBP: <index>,<number>,<type>,<text>,<contact>,<phb_group>
OK

Read command
None

Test command
AT+CPBP=?
+CPBP: (list of supported <index>s),<nlenght>,<tlength>
OK

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16.6.3 Parameters and Defined Values

<index>:		location in memory storage range of possible values depending on the capacity of the phonebook memory integer type
<number>:		phone number in ASCII format string type
<type>:		TON/NPI (type of address octet in integer format).
	145	international number
	129	national number
<text>:		associated contact name string type (see note below) SIM dependant for the ADN phonebook (use AT+CPBW=?)
<phb_group>:		phonebook group number range value (1-10)
<nlength>:		max length of field <number> integer type
<tlength>:		max length of field <text> integer type
<contact>:		this parameter gathers the following parameters: <num_Mobile>, <num_Work>, <num_Fax>, <num_Data>, <Email>,<Address>
<num_Mobile>:		phone number (dedicated for mobile phone number for example) up to 20 digits
<num_Work>:		phone number (dedicated for work phone number for example) up to 20 digits
<num_Fax>:		phone number (dedicated for fax phone number for example) up to 20 digits
<num_Data>:		phone number (dedicated for data phone number for example) up to 20 digits
<Email>:		e-mail address string type up to 56 characters

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<Address>:	mail address string type up to 56 characters

16.6.4 Parameter Storage

None.

16.6.5 Examples

Command	Responses
AT+CPBP=? *Note: Test command*	+CPBP: (1-50),20,10 OK *Note: 50 locations (from 1 to 50), max length for phone number is 20 digits, max length for text is 10 characters*
AT+CPBP="+331290101" *Note: Search entries corresponding to this phone number*	+CPBP: 15,"+331290101",145,"Eric" OK *Note: Display the entry corresponding to the specified phone number*
AT+CPBP="01290202" *Note: Search entries corresponding to this phone number*	+CPBP: 15,"+331290202",145,"David" OK *Note: Display the entry corresponding to the specified phone number*
AT+CPBP="+331288575" *Note: Search entries corresponding to this phone number*	+CPBP: 15,"+331290101",145,"8045682344FFFF" OK *Note: Display the entry corresponding to the specified phone number (UCS2 format)*
AT+CPBS="SM" *Note: ADN phonebook*	OK
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBP="0123456789" *Note: Search entries corresponding to this phone number*	+CPBP: 1,"0123456789",129,"Test ADN" OK *Note: Display the entry corresponding to the specified phone number*
AT+WCOS=1 *Note: Phonebook extended*	OK

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Command	Responses
AT+CPBP="0123456789" *Note: Search entries corresponding to this phone number*	+CPBP: 1,"0123456789",129,"Test ADN",0 OK
AT+CPBS="ME" *Note: ME phonebook*	OK
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBP="0123456789" *Note: Search entries corresponding to this phone number*	+CPBP: 1,"0123456789",129,"Test ME" OK
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+CPBP="0123456789" *Note: Search entries corresponding to this phone number*	+CPBP: 1,"0123456789",129,"Test ME","9876543210",129,"",,"",,"",,"e_mail@somewhere.com","postal address",0 OK

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16.7 Move Action in Phonebook +CPBN

16.7.1 Description

This Wavecom proprietary command performs a forward or backward move in the phonebook (in alphabetical order). It is not allowed for the "EN" phonebook which does not contain alphanumeric fields.

16.7.2 Syntax

Depending on the context, several responses to the command are possible:

- The entry is stored in the ADN phonebook and AT+WCOS=0:

Action command
AT+CPBN=<mode>
+CPBN: <index>,<number>,<type>,<name>
OK

- The entry is stored in the ADN phonebook and AT+WCOS=1

Action command
AT+CPBN=<mode>
+CPBN: <index>,<number>,<type>,<name>,<phb_group>
OK

- The entry is stored in the ME phonebook and AT+WCOS=0

Action command
AT+CPBN=<mode>
+CPBN: <index>,<number>,<type>,<name>
OK

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- The entry is stored in the ME phonebook and AT+WCOS=1

Action command
AT+CPBN=<mode>
+CPBN: <index>,<number>,<type>,<name>,<contact>,<phb_group>
OK

Read command
None

Test command
AT+CPBN=?
+CPBN: (list of supported <mode>s)
OK

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16.7.3 Parameters and Defined Values

<mode>:		requested entry to be displayed
	0	first item
	1	last item
	2	next valid item in alphabetical order
	3	previous valid item in alphabetical order
	4	last item read (usable only if a read operation has been performed on the current phonebook)
	5	last item written (usable only if a write operation has been performed on the current phonebook)
<index>:		location in memory storage range of possible values depending on the capacity of the phonebook memory integer type
<number>:		phone number in ASCII format string type
<type>:		TON/NPI (type of address octet in integer format).
	145	international number
	129	national number
	128	unknown number (empty)
<phb_group>:		phonebook group number range :1-10
<name>:		name of the group. up to 30 ASCII characters or 13 UCS2
<contact>:		this parameter gathers the following parameters: <num_Mobile>, <num_Work>, <num_Fax>, <num_Data>, <Email>,<Address>
<num_Mobile>:		phone number (dedicated for mobile phone number for example) up to 20 digits
<num_Work>:		phone number (dedicated for work phone number for example) up to 20 digits
<num_Fax>:		phone number (dedicated for fax phone number for example) up to 20 digits

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<num_Data>:	phone number (dedicated for data phone number for example) up to 20 digits
<Email>:	e-mail address string type up to 56 characters
<Address>:	mail address string type up to 56 characters

16.7.4 Parameter Storage

None.

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16.7.5 Example

Command	Responses
AT+CPBN=?	+CPBN: (0-5) OK *Note: Possible modes*
AT+CPBS="SM" *Note: ADN phonebook*	OK
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBN=0 *Note: Read the first location*	+CPBN: 15,"+331290101",145,"Eric" OK *Note: Display the first location*
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+CPBN=2 *Note: Read the next location*	+CPBN: 5,"+33147658987",145,"Frank",0 OK *Note: Display the second location, extended entry*
AT+CPBN=2 *Note: Read the next location*	+CPBN: 6,"+331290302",145,"Marc",0 OK *Note: Display the third location, extended entry*
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+CPBN=3 *Note: Read the previous location*	+CPBN: 5,"+33147658987",145,"Frank" OK *Note: Display the second location*

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Command	Responses
AT+CPBN=1 *Note: Read the last location*	+CPBN: 6,"+331290302",145,"Marc" OK *Note: Display the last location*
AT+CPBN=2 *Note: Read the next location*	+CPBN: 15,"+331290101",145,"Eric" OK *Note: Display the first location*
AT+CPBF="Er" *Note: Find "Er" in phonebook*	+CPBF: 15,"+331290101",145,"Eric" OK *Note: Display the location*
AT+CPBN=2 *Note: Read the next location*	+CPBN: 5,"+33147658987",145,"Frank" OK *Note: Display the following location*
AT+CPBF="Er" *Note: Find "Er" in phonebook*	+CPBF: 15,"+331290101",145,"Eric" OK *Note: Display the location*
AT+CPBN=4 *Note: Get the last location read*	+CPBN: 15,"+331290101",145,"Eric" OK *Note: Display the last location read*
AT+CPBW=,"0146290800",129,"WM" *Note: Write an item at the first location available*	OK *Note: No information about this location*
AT+CPBN=4 *Note: Get the last location read*	+CPBN: 15,"+331290101",145,"Eric" OK *Note: Display the last location read*
AT+CPBN=5 *Note: Display the last item written with its location*	+CPBN: 38,"0146290800",129,"WM" OK *Note: Display the last item written with its location*
AT+CPBN=4 *Note: Get the last item read*	+CPBN: 38,"0146290800,129,"WM" OK *Note: Now the last item read is the last written item too*

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Command	Responses
AT+CPBF="800041FFFF" *Note: Find"800041" in phonebook*	+CPBF: 15,"+3312345",145,"8000414339FFFF" OK *Note: Display this location*
AT+CPBN=4 *Note: Get the last location read*	+CPBN: 15,"+3312345",145,"8000414339FFFF" OK *Note: Display the last location read Please note that the AT+CPBN=5 command is useful after an AT+CPBW command used without a location.*

16.7.6 Notes

The AT+CPBN=5 command is useful after an AT+CPBW command used without a location.

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16.8 Create and Delete a Phonebook Group +WPGW

16.8.1 Description

This Wavecom proprietary command creates or deletes a phonebook group.

16.8.2 Syntax

Action command

AT+WPGW=<phb_group>[,<name>]

OK

Read command

None

Test command

AT+WPGW=?

+WPGW: (list of supported <index>s),<tlength>

OK

16.8.3 Parameters and Defined Values

<phb_group>:	phonebook group number range value (1-10)
<name>:	name of the group. up to 30 ASCII characters or 13 UCS2
<tlength>:	value indicating the maximum length of field <name> integer type

16.8.4 Parameter Storage

None.

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16.8.5 Examples

Command	Responses
AT+WPGW=? *Note: Test command*	+WPGW: (1-10),30 OK *Note: 10 possible groups, group name can be 30 characters max*
AT+WPGW=1,"group 1" *Note: Create group #1*	OK *Note: Group 1 created*
AT+WPGW=1,"phb group1" *Note: Rename group #1*	OK *Note: Group 1 renamed*
AT+WPGW=1	OK *Note: Erase group #1*

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16.9 Read a Phonebook Group +WPGR

16.9.1 Description

This Wavecom proprietary command reads the phonebook group entries, the phonebook group name or the number of entries used in a group.

16.9.2 Syntax

Depending on the mode, several syntaxes are available for the action command:

- <mode>= 1, 2

Action command
AT+WPGR=<mode>[,<group index>]
+WPGR: <group index>,<group name>
[+WPGR: <group index>,<group name>[…]]
OK

- <mode>= 3

Action command
AT+WPGR=<mode>,<group index>
+WPGR: <loc>,<num>,<type>,<name>[,<contact>][,<phb_group>]
[+WPGR: <loc>,<num>,<type>,<name>[,<contact>][,<phb_group>][…]]
OK

Note :

The response syntax is the same as +CPBR (refer to CPBR command for more details. (§ 16.4).

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- <mode> = 4

Action command
AT+WPGR=<mode>
+WPGR: <used>/<total>
OK

Read command
None

Test command
AT+WPGR=?
+WPGR: (list of supported <mode>s),(list of supported <group index>s)
OK

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16.9.3 Parameters and Defined Values

<mode>:		phonebook group read mode
	1	read the name of one phonebook group
	2	read the names of all phonebook groups
	3	list all entries of one phonebook group
	4	read the number of used entries in a phonebook group
<used>:		number of used entries in a phonebook group integer type
<total>:		number of available entries in a phonebook group integer type
<group name>:		phonebook group name string type
<group index>:		phonebook group index integer type
<loc>:		phonebook index integer type
<phb_group>:		phonebook group number range value (1-10)
<num>:		phone number string type
<name>:		name associated with the phone number string type
<type>:		TON/NPI
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".
	128	value returned by the Wireless CPU when the <num> parameter is empty. <num> format is unknown.

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<contact>:	this parameter gathers the following parameters: <num_Mobile>, <num_Work>, <num_Fax>, <num_Data>, <Email>,<Address>
<num_Mobile>:	phone number (dedicated for mobile phone number for example) up to 20 digits
<num_Work>:	phone number (dedicated for work phone number for example) up to 20 digits
<num_Fax>:	phone number (dedicated for fax phone number for example) up to 20 digits
<num_Data>:	phone number (dedicated for data phone number for example) up to 20 digits
<Email>:	e-mail address string type up to 56 characters
<Address>:	mail address string type up to 56 characters

16.9.4 Parameter Storage

None.

16.9.5 Examples

Command	Responses
AT+WPGR=? *Note: Test command*	+WPGR: (1-4),(1-10) OK *Note: 10 possible groups*
AT+WPGR=1,1 *Note: Read the name of phonebook group 1*	+WPGR: 1,"group 1" OK
AT+WPGR=2 *Note: Read the names of all phonebook groups*	+WPGR: 1,"group 1" +WPGR: 2,"group 2" OK

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Command	Responses
AT+WCOS=0 *Note: Phonebook not extended*	OK
AT+WPGR=3,1 *Note: Lists all entries of phonebook group 1*	+WPGR: 1,"+33123456789",145,"John" +WPGR: 2,"+33567891234",145,"Elvis" +WPGR: 31,"+331290909",145,"Fred" +WPGR: 32,"0123456789",129,"Test" +WPGR: 33,"",128,"No number" OK *Note: SIM entries: index 1 and 2; Flash entries: index 31 and 32 (The SIM supports 30 entries in this example)*
AT+WCOS=1 *Note: Phonebook extended*	OK
AT+WPGR=3,1 *Note: Lists all entries of phonebook group 1* *The entries list displayed with AT+WPGR=3,1 contains records from both ME and SIM phonebook (MT phonebook).*	+WPGR: 1,"+33123456789",145,"John",1 +WPGR: 2,"+33567891234",145,"Elvis",1 +WPGR: 31,"+331290909",145,"Fred","0141284549",129,"0600003210",129,"0141280000",129,"019876543210",129,"fred@mail_address.com","Becker Street London",1 +WPGR: 32,"0123456789",129,"Test","0141284549",129,"0600003210",129,"0141280000",129,"6549873210",129,"test@mail_address.com","",1 +WPGR: 33,"",128,"No number",,,,,,,,,1 OK *Note: SIM entries: index 1 and 2; Flash entries: index 31 and 32 (The SIM supports 30 entries in this example)*
AT+WPGR=4,1 *Note: Read the number of used entries in the phonebook group 1*	+WPGR: 5/100 OK *Note: 4 entries are used from the 100 possible entries*

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16.10 Settings of a Group +WPGS

16.10.1 Description

This Wavecom proprietary command sets the parameters for a group.

16.10.2 Syntax

Depending on the mode, several syntaxes are available for the action command:

- <mode>= 0

Action command
AT+WPGS=<mode>,<group index>
+WPGS: <restrict call>
OK

- <mode>= 1

Action command
AT+WPGS=<mode>,<group index>,<restrict call>
OK

Read command
None

Test command
AT+WPGS=?
+WPGS: (list of supported <mode>s),(list of supported <group index>s),(list of supported <restrict call>s)
OK

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16.10.3 Parameters and Defined Values

<mode>:		requested operation
	0	read group settings
	1	write group settings
<group index>:		index of a group
<restrict call>:		call restriction mode
	0	all refused - incoming call is forwarded to the voice mailbox or rejected like busy line (depends on network operator)
	1	all accepted - incoming call is received (RING message is displayed)

16.10.4 Parameter Storage

None.

16.10.5 Examples

Command	Responses
AT+WPGS=1,1,1 *Note: Set restrict call to "All Accepted"*	OK
AT+WPGS=0,1 *Note: Command reads group 1 settings*	+WPGS: 1 OK *Note: Group 1 all accepted*
AT+WPGS=? *Note: Test command*	+WPGS: (0-1),(1-10),(0-1) OK

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16.11 Delete Calls Phonebook +WDCP

16.11.1 Description

This Wavecom proprietary command allows to delete the calls listed in some phonebooks.

16.11.2 Syntax

Action command

AT+WDCP=<mem>

OK

Read command

None

Test command

AT+WDCP=?

+WDCP: (list of supported <mem>s)

OK

16.11.3 Parameters and Defined Values

<mem>:		type of phonebook
	"LD"	SIM (ME extended) last dialing phonebook
	"MC"	ME missed calls list phonebook
	"RC"	ME received calls list phonebook

16.11.4 Parameter Storage

None.

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16.11.5 Examples

Command	Responses
AT+WDCP=? *Note: Possible values ?*	+WDCP: ("LD","MC","RC") OK *Note: Identifiers of the phonebooks supporting a list of calls*
AT+WDCP="LD" *Note: Delete all the content of Last Dialing phonebook.*	OK *Note: Last Dialing phonebook is now empty.*

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16.12 Subscriber Number +CNUM

16.12.1 Description

This command returns the subscriber MSISDN(s). If the subscriber has several MSISDNs for various services, each MSISDN is returned in a separate line.

16.12.2 Syntax

Action command

AT+CNUM

+CNUM: <alpha$_1$>,<number$_1$>,<type$_1$>

[+CNUM: <alpha$_2$>,<number$_2$>,<type$_2$>[…]]

OK

Read command

None

Test command

AT+CNUM=?

OK

16.12.3 Parameters and Defined Values

<alpha$_i$>:		optional alphanumeric string associated with <number$_i$>
<number$_i$>:		phone number in ASCII format string type
<type$_i$>:		TON/NPI (type of address octet in integer format)
	145	international number
	129	national number

16.12.4 Parameter Storage

None.

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16.12.5 Examples

Command	Responses
AT+CNUM *Note: Get MSISDN(s)*	+CNUM: "Phone","0612345678",129 +CNUM: "Fax","0687654321",129 +CNUM: "80001002FFFF","+0183773",145 OK *Note: Last number is in UCS2 format*
AT+CNUM=?	OK

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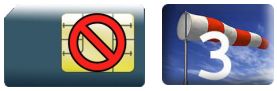
16.13 Set Voice Mail Number +CSVM



16.13.1 Description

This commands allows to set/get and enable/disable the voice mail number in memory.

16.13.2 Syntax

Action command

AT+CSVM=<mode>[,<number>[,<type>]]

OK

Read command

AT+CSVM?

+CSVM: <mode>,<number>,<type>

OK

Test command

AT+CSVM=?

+CSVM: (list of supported <mode>s),(list of supported <type>s)

OK

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16.13.3 Parameters and Defined Values

<mode>:		voice mail number mode
	0	disable the voice mail number (default value)
	1	enable the voice mail number
<number>:		phone number in ASCII format string type
<type>:		TON/NPI for <number>
	145	international number <number> includes the international access code character "+".
	129	national number <number> does not include the international access code character "+".

16.13.4 Parameter Storage

All parameters are stored in EEPROM. The default value can be restored using AT&F.

16.13.5 Examples

Command	Responses
AT+CSVM=? *Note: Possible values ?*	+CSVM: (0-1),(129,145) OK *Note: Activation/deactivation and format 129 & 145 are supported*
AT+CSVM=0,"888",129 *Note: Disable Voice Mail number and change value to "888".*	OK
AT+CSVM? *Note: Get mail number*	+CSVM: 1,"888",129 OK *Note: Voice mail number "888" is activated*

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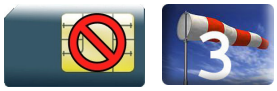
16.14 Avoid Phonebook Init +WAIP



16.14.1 Description

This Wavecom proprietary command allows the initialization of all phonebooks to be inhibited during subsequent boots.

16.14.2 Syntax

Action command

AT+WAIP=<mode>

OK

Read command

AT+WAIP?

+WAIP: <mode>

OK

Test command

AT+WAIP=?

+WAIP: (list of supported <mode>s)

OK

16.14.3 Parameters and Defined Values

<mode>:		phonebook initialization mode
	0	normal initialization (default value)
	1	no phonebook initialization

16.14.4 Parameter Storage

The <mode> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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16.14.5 Examples

Command	Responses
AT+WAIP=? *Note: Query possible values*	+WAIP: (0,1) *OK* *Note: Disable / enable*
AT+WAIP=1 *Note: Inhibit initialization of phonebooks (next boot)*	OK *Note: no answer*
AT+WAIP? *Note: Get current value*	+WAIP: 1 OK

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17 Short message Commands

17.1 Select Message Service +CSMS

17.1.1 Description

This command defines the availability of the SMS services and the SMS AT commands version.

The supported services are originated (SMS-MO), terminated short message (SMS-MT) or Cell Broadcast Message (SMS-CB) services.

17.1.2 Syntax

Action command

AT+CSMS=<service>

+CSMS: <mt>,<mo>,<bm>

OK

Read command

AT+CSMS?

+CSMS: <service>,<mt>,<mo>,<bm>

OK

Test command

AT+CSMS=?

+CSMS: (list of supported <service>s)

OK

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17.1.3 Parameters and Defined Values

<service>:		selected service
	0	SMS AT commands are compatible with GSM 07.05 [1] phase 2 version 4.7.0. (default value)
	1	SMS AT commands are compatible with GSM 07.05 [1] phase 2+ version.
<mt>:		SMS-MT support
	0	SMS-MT not supported
	1	SMS-MT supported
<mo>:		SMS-MO support
	0	SMS-MO not supported
	1	SMS-MO supported
<bm>:		SMS-CB support
	0	SMS-CB not supported
	1	SMS-CB supported

17.1.4 Parameter Storage

The <service> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

17.1.5 Examples

Command	Responses
AT+CSMS=0 *Note: SMS AT command phase 2 version 4.7.0*	+CSMS: 1,1,1 OK *Note: SMS-MO, SMS-MT and SMS-CB supported*
AT+CSMS? *Note: Get current values*	+CSMS: 0,1,1,1 OK
AT+CSMS=? *Note: Possible services*	+CSMS: (0,1) OK

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17.2 New Message Indication +CNMI

17.2.1 Description

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

17.2.2 Syntax

Action command

AT+CNMI=<mode>,<mt>,<bm>,<ds>,<bfr>

OK

Read command

AT+CNMI?

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

OK

Test command

AT+CNMI=?

+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)

OK

- For <mt>=1

Unsolicited response

+CMTI: <mem>,<index>

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- For <mt>=2 and PDU mode

Unsolicited response

```
+CMT: [<alpha>],<length>
<pdu>
```

- For <mt>=2 and text mode

Unsolicited response

```
+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,
<tosca>,<length>]
<data>
```

- For <bm>=1

Unsolicited response

```
+CBMI: <mem>,<index>
```

- For <bm>=2 and PDU mode

Unsolicited response

```
+CBM: <length>
<pdu>
```

- For <bm>=2 and text mode

Unsolicited response

```
+CBM: <sn>,<mid>,<dcs>,<page>,<pages>
<data>
```

- For <ds>=1 and PDU mode

Unsolicited response

```
+CDS: <length>
<pdu>
```


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- For <ds>=1 and text mode

Unsolicited response
`+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>`

- For <ds>=2

Unsolicited response
`+CDSI: <mem>,<index>`

17.2.3 Parameters and Defined Values

<mode>:		processing of unsolicited result codes (see note below)
	0	same processing as <mode>=2
	1	same processing as <mode>=2
	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	same processing as <mode>=2
<mt>:		result code indication routing for SMS-DELIVER indications
	0	no SMS-DELIVER indications are routed
	1	SMS-DELIVERs are routed using unsolicited code +CMTI (default value)
	2	SMS-DELIVERs (except class 2 messages) are routed using unsolicited code +CMT
	3	Class 3 SMS-DELIVERS are routed directly using code in <mt>=2 . Other classes messages result in indication <mt>=1.

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<bm>:		rules for storing the received CBMs (Cell Broadcast Message) types. They also depend on the coding scheme (text or PDU) and the setting of Select CBM Types (see +CSCB command).
	0	no CBM indications are routed to the TE (default value). 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.
	2	New CBMs are routed directly to the TE using unsolicited result code +CBM.
	3	Class 3 CBMs: as <bm>=2. Other classes CBMs: as <bm>=1.
<ds>:		SMS-STATUS-REPORTs routing
	0	no SMS-STATUS-REPORTs are routed (default value)
	1	SMS-STATUS-REPORTs are routed using unsolicited code +CDS.
	2	SMS-STATUS-REPORTs are stored and routed using the unsolicited result code +CDSI.
<bfr>:		TA buffer of unsolicited result codes mode
	0	TA buffer defined within this command is flushed to the TE when <mode> = 1 to 3 is entered (OK response shall be given before flushing the codes). Default value
	1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.
<mem>:		memory storage
	"SM"	SMS message storage in SIM (default value)
	"ME"	SMS message storage in Flash
	"SR"	status report message storage (in SIM if the EF-SMR file exists, otherwise in the ME non volatile memory)
	"BM"	CBM message storage (in volatile memory)
<**length**>:		text mode (AT+CMGF=1): number of characters PDU mode (AT+CMGF=0): length of the TP data unit in bytes integer type

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<alpha>:		associated phonebook name string type
<scts>:		service center timestamp string format: "yy/MM/dd,hh:mm:ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<oa>:		originator address string type
<**tooa**>:		type of address of <oa>.
	145	international number
	129	national number
<**fo**>:		first byte of SMS-DELIVER or SMS-STATUS-REPORT, for further information refer to document [1] integer type
<**pid**>:		protocol identifier integer type
<**dcs**>:		data coding scheme, coded like in document[5] integer type
<**sca**>:		service center address string type
<**tosca**>:		type of address of <sca>.
	145	international number
	129	national number
<**data**>:		SMS user data in text mode string type
<**pdu**>:		SMS user data in PDU mode string type (hexadecimal format)
<**index**>:		place of storage in memory integer type
<**sn**>:		CBM serial number integer type

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<**mid**>:		CBM message identifier integer type
<**page**>:		CBM page parameter bits 4-7 integer type
<**pages**>:		CBM page parameter bits 0-3 integer type
<**mr**>:		message reference integer type
<**ra**>:		recipient address string type
<**tora**>:		type of address of <ra>.
	145	international number
	129	national number
<dt>:		discharge time 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 integer type

Note:

Only <mode>=2 is supported.

Any other value for <mode> (0,1 or 3) is accepted (return code will be OK), but the processing of unsolicited result codes will be the same as with <mode>=2.

17.2.4 Parameter Storage

The parameters <mode>,<mt>,<bm>,<ds> and <bfr> are stored in EEPROM using the AT+CSAS command. The default values can be restored using AT&F.

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17.2.5 Examples

Command	Responses
AT+CNMI=2,1,0,0,0 *Note: <mt>=1*	OK
	+CMTI: "SM",1 *Note: Message received*
AT+CNMI=2,2,0,0,0 *Note: <mt>=2*	OK
	+CMT: "123456","98/10/01,12:3000+00",129, 4,32,240,"15379",129,5 *Note: Message received*
AT+CNMI=2,0,0,1,0 *Note: <ds>=1*	OK
AT+CMGS="+33146290800"<CR> **Happy Birthday !<ctrl-Z>** *Note: Send a message in text mode*	+CMGS: 7 OK *Note: Successful transmission*
	+CDS: 2, 116,"+33146290800",145,"98/10/01,12 :30:07+04","98/10/0112:30:08+04",0 *Note: Message was correctly delivered*

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17.3 Set Text Mode Parameters +CSMP

17.3.1 Description

This command is used to select a value for <vp>, <pid>, and <dcs> and configure the text mode.

17.3.2 Syntax

Action command

AT+CSMP=<fo>,<vp>,<pid>,<dcs>

OK

Read command

AT+CSMP?

+CSMP: <fo>,<vp>,<pid>,<dcs>

OK

Test command

None

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17.3.3 Parameters and Defined Values

<fo>:		see note below
<vp>:		validity period In text mode is only coded in "relative" format. default value 167 (24 hours) This means that one byte can describe different values.
	0 to 143	(VP + 1) x 5 minutes (up to 12 hours)
	144 to 167	12 hours + ((VP – 143) x 30 minutes)
	168 to 196	(VP – 166) x 1 day
	197 to 255	(VP – 192) x 1 week
<pid>:		protocol Id (please refer to [1]) string type
<dcs>:		data encoding scheme (please refer to [1]) integer type

Note:

The <fo> byte comprises 6 fields:

b7	b6	b5	b4	b3	b2	b1	b0
RP	UDHI	SRR	VPF		RD	Mit	

RP:	Reply Path, not used in text mode
UDHI:	User Data Header Information b6=1 if the beginning of the User Data field contains a Header in addition to the short message. This option is not supported in +CSMP command, but can be used in PDU mode (+CMGS).
SRR:	Status Report Request. B5=1 if a status report is requested. This mode is supported.
VPF:	Validity Period Format b4=0 & b3=0 -> <vp> field is not present b4=1 & b3=0 -> <vp> field is present in relative format Others formats (absolute & enhanced) are not supported.

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RD:	Reject Duplicates b2=1 to instruct the SC to reject an SMS-SUBMIT for an SM still held in the SC which has the same <mr> and the same <da> as the previously submitted SM from the same <oa>.
MTI:	Message Type Indicator b1=0 & b0=0 -> SMS-DELIVER (in the direction SC to MS) b1=0 & b0=1 -> SMS-SUBMIT (in the direction MS to SC)

17.3.4 Parameter Storage

The <vp>parameter is stored in E2P using the AT+CSAS command. The default value can be restored using AT&F.

17.3.5 Examples

Command	Responses
AT+CSMP? *Note: Current values*	+CSMP: 0,0,0,0 OK *Note: No validity period <dcs>= PCCP437 alphabet (8 bits 7 bits)*
AT+CSMP=17,23,64,244 *Note:<vp> = 23 (2 hours, relative format)* *<dcs> = GSM 8 bits alphabet. Remind to enter <fo> value in decimal notation.*	OK

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17.4 Preferred Message Format +CMGF

17.4.1 Description

This commands allows to select the preferred message format. The message formats supported are text mode and PDU mode.

17.4.2 Syntax

Action command
AT+CMGF=<mode>
OK

Read command
AT+CMGF?
+CMGF=<mode>
OK

Test command
AT+CMGF=?
+CMGF: (list of supported <mode >s)
OK

17.4.3 Parameters and Defined Values

<mode> :		PDU or text mode
	0	PDU mode
	1	text mode (default value)

17.4.4 Parameter Storage

The <mode> parameter is stored in EEPROM using +CSAS command. The default value can be restored using AT&F.

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17.4.5 Examples

Command	Responses
AT+CMGF? *Note : Current message format*	+CMGF:1 OK *Note: Text mode*
AT+CMGF=? *Note: Possible message format*	+CMGF: (0,1) OK *Note: Text or PDU modes are available*
AT+CMGF=0 *Note: Set PDU mode*	OK *Note: PDU mode valid*

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17.5 Preferred Message Storage +CPMS

17.5.1 Description

This command allows the message storage area to be selected (for reading, writing).

17.5.2 Syntax

Action command

AT+CPMS=<mem1>,[<mem2>,[<mem3>]]

```
+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

OK
```

Read command

AT+CPMS?

```
+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

OK
```

Test command

AT+CPMS=?

```
+CPMS: (list of supported <mem1>s,list of supported <mem2>s,list
of supported <mem3>s)

OK
```


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17.5.3 Parameters and Defined Values

<mem1>:		memory used to list, read and delete messages.
	"SM"	SMS message storage in SIM (default value)
	"ME"	SMS message storage in Flash
	"SR"	status report message storage (in SIM if the EF-SMR file exists, otherwise in the ME non volatile memory)
	"BM"	CBM message storage (in volatile memory)
<mem2>:		memory used to write and send messages
	"SM"	SMS message storage in SIM (default value)
	"ME"	SMS message storage in Flash
<mem3>:		memory to which received SMS are preferred to be stored
	"SM"	SMS message storage in SIM (default value)
	"ME"	SMS message storage in Flash
<used1>:		used capacity of <mem1>
<used2>:		used capacity of <mem2>
<used3>:		used capacity of <mem3>
<total1>:		total capacity of <mem1>
<total2>:		total capacity of <mem2>
<total3>:		total capacity of <mem3>

17.5.4 Parameter Storage

None.

17.5.5 Examples

Command	Responses
AT+CPMS=?	+CPMS: (("SM","ME","BM","SR"),("SM","ME"),("SM","ME")) OK
Note: Possible message storages	*Note: Read, list, delete: SMS or SMS Status Report* *Write, send: SMS*

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Command	Responses
AT+CPMS? *Note: Read*	+CPMS: "SM",3,10,"SM",3,10,"SM",3,10 OK *Note: Read, write...SMS from/to SIM. 3 SMS are stored in SIM. 10 is the total memory available in SIM*
AT+CPMS="SM","ME","SM" *Note: Select SM for reading, ME for writing and SM for storing*	+CPMS: 3,10,3,99,3,10 OK
AT+CPMS? *Note: Read*	+CPMS: "SM",3,10,"ME",3,99,"SM",3,10 OK *Note: Read, store...SMS from/to flash, write SMS to flash. 3 SMS are stored in flash. 99 is the total memory available in flash*
	+CMTI: "SM",4 *Note: Receive a SMS stored in SIM at location 4*
AT+CPMS="ME","ME","ME" *Note: Select ME for reading, ME for writing and ME for storing*	+CPMS: 3,99,3,99,3,99 OK
AT+CPMS? *Note: Read*	+CPMS: "ME",3,99,"ME",3,99,"ME",3,99 OK *Note: Read, write, store SMS from/to flash. 3 SMS are stored in flash. 99 is the total memory available in flash*
	+CMTI: "ME",4 *Note: Receive a SMS stored in flash at location 4*

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Command	Responses
AT+CPMS="AM" *Note: Select wrong message storage*	+CMS ERROR: 302
AT+CPMS="SM" *Note: Select SM for reading, writing and storing memory are not changed*	+CPMS: 4,10,4,99,4,99 OK
AT+CPMS? *Note: Read*	+CPMS: "SM",4,10,"ME",4,99,"ME",4,99 OK *Note: Read SMS from SIM; write, store SMS from/to flash*

17.5.6 Notes

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

The maximum number of SMS in flash is 99.

When the wireless CPU is switched on, <mem1>, <mem2> and <mem3> are initialized to SM.

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17.6 Service Center Address +CSCA

17.6.1 Description

This command is used to indicate to which service center the message must be sent.

The product has no default value for this address. If the application tries to send a message without having indicated the service center address, an error will be generated.

Therefore, the application must indicate the SC address when initializing the SMS. This address is then permanently valid. The application may change it if necessary.

17.6.2 Syntax

Action command

AT+CSCA=<sca>,[,<tosca>]

OK

Read command

AT+CSCA?

+CSCA= <sca>,[,<tosca>]

OK

Test command

None

17.6.3 Parameters and Defined Values

<sca>:		service center address
<**tosca**>:		type of address of <sca>.
	145	international number
	129	national number

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17.6.4 Parameter Storage

The parameter <sca> is stored in EEPROM using the CSAS command.

17.6.5 Examples

Command	Responses
AT+CSCA="0696741234" *Note: Service center initialization*	OK
AT+CSCA?	+CSCA: "0696741234",129 OK

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17.7 Show Text Mode Parameters +CSDH

17.7.1 Description

This command gives additional information on text mode result codes. This information can be found in the description of the +CMT, +CMGR, +CMGL commands and responses.

17.7.2 Syntax

Action command

AT+CSDH=<n>

OK

Read command

AT+CSDH?

+CSDH: <n>

OK

Test command

AT+CSDH=?

+CSDH: (list of supported <n>s)

OK

17.7.3 Parameters and Defined Values

<n>:		show text mode
	0	do not show header values (default value)
	1	show the values in result codes

17.7.4 Parameter Storage

The parameter <n> is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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17.7.5 Examples

Command	Responses
AT+CSDH=0 *Note: Set value to "do not show"*	OK
AT+CSDH? *Note: Current value*	+CSDH: 0 OK *Note: Do not show header values*
AT+CSDH=?	+CSDH: (0,1) OK

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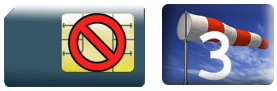
17.8 More Messages to Send +CMMS



17.8.1 Description

This command allows to keep the link opened while sending several short messages within a short delay.

17.8.2 Syntax

Action command

AT+CMMS=<mode>

OK

Read command

AT+CMMS

+CMMS: <mode>

OK

Test command

AT+CMMS=?

+CMMS: (list of supported <mode>s)

OK

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17.8.3 Parameters and Defined Values

<mode>:		operating mode
	0	disable feature
	1	keeps link opened while messages are sent If the delay between two messages exceeds 5 seconds, the link is closed and the mode is reset to 0: the feature is disabled.
	2	keeps link opened while messages are sent If the delay between two messages exceeds 5 seconds, the link is closed but the mode remains set to 2: the feature is still enabled.

17.8.4 Parameter Storage

None.

17.8.5 Examples

Command	Responses
AT+CMMS=?	+CMMS: (0-2) OK
AT+CMMS=2	OK *Note: Feature is enabled, link is open*
AT+CMMS?	+CMMS: 2 OK

17.8.6 Notes

- The delay of 5 seconds complies with Recommandation 3GPP TS 27.005 [19].
- Before sending the last SMS in the link, use AT+CMMS=0 command. This command will indicate that the next SMS will be the last one.

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17.9 Send Message +CMGS

17.9.1 Description

This command allows the user application to send short messages to the network. The text can contain all existing characters except <ctrl-Z> and <ESC> (ASCII 27).This command can be aborted using the <ESC> character when entering text.

In PDU mode, only hexadecimal characters are used ("0"...."9","A"...."F").

17.9.2 Syntax

- In text mode:

Action command

AT+CMGS=<da>[,<toda>]<CR>

> "text to be sent <Ctrl-Z>"

+CMGS: <mr>

OK

- In PDU mode :

Action command

AT+CMGS=<length><CR>

> "PDU to be sent <Ctrl-Z>"

+CMGS: <mr>

OK

Read command

None

Test command1

None

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17.9.3 Parameters and Defined Values

<da>:	destination address string type
<toda>:	type of address of da
<length>:	text mode (AT+CMGF=1): number of characters PDU mode (AT+CMGF=0): length of the TP data unit in bytes integer type
<mr>:	message reference integer type

17.9.4 Parameter Storage

None.

17.9.5 Examples

Command	Responses
AT+CMGS="+33146290800"<CR>	>
Please call me soon, Fred.<ctrl-Z> *Note: Send a message in text mode*	
	+CMGS: <250> OK *Note: Successful transmission*
AT+CMGS=<length><CR> *Note: Send a message in PDU mode (1/3)*	>
<pdu> *Note: Enter message in PDU mode (2/3)*	
<ctrl-Z> *Note: End the message (3/3)*	+CMGS: <251> OK *Note: Successful transmission*

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17.9.6 Notes

The message reference, <mr>, which is returned to the application is allocated by the product. This number begins with 0 and is incremented by one for each outgoing message (successful and failure cases); it is cyclic on one byte (0 follows 255).

This number is not a storage number – outgoing messages are not stored.

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17.10 Write Message to Memory +CMGW

17.10.1 Description

This command stores a message in memory (either SMS-SUBMIT or SMS-DELIVERS). The memory location <index> is returned (no choice possible as with phonebooks +CPBW).

Text or PDU is entered as described for the Send Message +CMGS command.

17.10.2 Syntax

Depending on the mode, two syntax commands are available.

- In text mode:

Action command
AT+CMGW=<oa/da>[,<tooa/toda>[,<stat>]] <CR>
> enter text <ctrl-Z / ESC>
OK

- In PDU mode:

Action command
AT+CMGW=<length>[,<stat>]<CR>
> give PDU <ctrl-Z / ESC>
OK

Read command
None

Test command
None

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17.10.3 Parameters and Defined Values

<oa/da>:		originating or destination Address Value string format.
<**toda**>:		type of address of <da>
	145	international number
	129	national number
<**tooa**>:		type of address of <oa>
	145	international number
	129	national number
<stat>:		status of message in memory (PDU mode)
	0	received unread messages
	1	received read messages
	2	stored unsent messages
	3	stored sent messages
<stat>:		status of message in memory (text mode)
	"REC UNREAD"	received unread messages
	"REC READ"	received read messages
	"STO UNSENT"	stored unsent messages (default if omited)
	"STO SENT"	stored sent messages
<length>:		length of the actual data unit in bytes integer type

17.10.4 Parameter Storage

None.

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17.10.5 Examples

Command	Responses
AT+CMGW="+33146290800"<CR>	>
Hello how are you ?<ctrl-Z> *Note: Write a message in text mode*	
	+CMGW: 4 OK *Note: Message stored in index 4*
AT+CMGW=<length><CR> *Note: Write a message in PDU mode (1/3)*	>
<pdu> *Note: Enter message in PDU mode (2/3)*	
<ctrl-Z> *Note: End the message (3/3)*	+CMGW: <index> OK *Note: Message stored in <index>*

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17.11 Send Message From Storage +CMSS

17.11.1 Description

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

17.11.2 Syntax

Action command
AT+CMSS=<index>[,<da>[,<toda>]]
+CMSS: <mr>
OK

Read command
None

Test command
None

17.11.3 Parameters and Defined Values

<da>:		destination address, coded like GSM 03.40 [4]TP-DA
<**index**>:		place of storage in memory
<**toda**>:		type of address of <da>.
	145	international number
	129	national number
<**tooa**>:		type of address of <oa>.
	145	international number
	129	national number
<mr>:		message reference integer type

17.11.4 Parameter Storage

None.

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17.11.5 Examples

Command	Responses
AT+CMGW=0660123456 **Today is my birthday** **<ctrl-Z>**	+CMGW: 5 OK *Note: Message stored with index 5*
AT+CMSS=5,0680654321 *Note: Send the message 5 to a different destination number*	+CMSS: <157> OK *Note: Successful transmission*

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17.12 Read Message +CMGR

17.12.1 Description

This command allows the application to read stored messages. The messages are read from the memory selected by the +CPMS command.

17.12.2 Syntax

Depending on the mode, several responses are possible.

- For SMS-DELIVER and text mode:

Action command
AT+CMGR=<index>
+CMGR: <stat>,<oa>,[<alpha>,]<scts>[,<tooa>,<fo>,<pid>,<dcs>,
<sca>,<tosca>,<length>]
<data>
OK

- For SMS-SUBMIT and text mode:

Action command
AT+CMGR=<index>
+CMGR: <stat>,<da>,[<alpha>,][,<toda>,<fo>,<pid>,<dcs>,
[<vp>],<sca>,<tosca>,<length>]
<data>
OK

- For SMS-STATUS-REPORT and text mode:

Action command
AT+CMGR=<index>
+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>
OK

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- For PDU mode:

Action command
AT+CMGR=<index>
+CMGR: <stat>,[<alpha>],<length>
<pdu>
OK

Read command
None

Test command
None

17.12.3 Parameters and Defined Values

<da>:		destination address string type
<**toda**>:		type of address of <da>.
	145	international number
	129	national number
<**dcs**>:		data coding scheme, coded like in document[5] integer type
<dt>:		discharge time 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])
<oa>:		originator address string type
<**tooa**>:		type of address of <oa>.
	145	international number
	129	national number

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<scts>:	service center timestamp string format: "yy/MM/dd,hh:mm:ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<**fo**>:	first byte of SMS-DELIVER, SMS-SUBMIT or SMS-STATUS-REPORT, for further information refer to document [1] integer type
<**pid**>:	protocol identifier integer type
<**index**>:	place of storage in memory integer type
<**length**>:	text mode (AT+CMGF=1): number of characters PDU mode (AT+CMGF=0): length of the TP data unit in bytes integer type
<**mr**>:	message reference integer type
<**pdu**>:	SMS user data in PDU mode string type (hexadecimal format)
<**ra**>:	recipient address string type
<**sca**>:	service center address string type
<**st**>:	status of a SMS-STATUS-REPORT integer type
<stat>:	status of message in memory (PDU mode)
0	received unread messages
1	received read messages
2	stored unsent messages
3	stored sent messages

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<stat>:		status of message in memory (text mode)
	"REC UNREAD"	received unread messages
	"REC READ"	received read messages
	"STO UNSENT"	stored unsent messages
	"STO SENT"	stored sent messages
<**tora**>:		type of address of <ra>
	145	international number
	129	national number
<**tosca**>:		type of address of <sca>
	145	international number
	129	national number
<alpha>:		associated phonebook name string type
<**data**>:		SMS user data in text mode string type
<vp>:		validity period In text mode is only coded in "relative" format. This means that one byte can describe different values.
	0 to 143	(VP + 1) x 5 minutes (up to 12 hours)
	144 to 167	12 hours + ((VP – 143) x 30 minutes)
	168 to 196	(VP – 166) x 1 day
	197 to 255	(VP – 192) x 1 week

17.12.4 Parameter Storage

None.

17.12.5 Examples

Command	Responses
	`+CMTI: "SM",1` *Note: New message received*

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Command	Responses
AT+CMGR=1 *Note: Read the message*	+CMGR: "REC UNREAD","0146290800","98/10/01,18:22:11+00" ABCdefGHI OK
AT+CMGR=1 *Note: Read the message again*	+CMGR: "REC READ","0146290800","98/10/01,18:22:11+00" ABCdefGHI OK *Note: Message is read now*
AT+CMGR=2	OK *Note: Location empty*
AT+CMGF=0;+CMGR=1 *Note: In PDU mode*	+CMGR: 2,,26 07913366003000F3040B913366920547F40013001190412530400741AA8E5A9C5201 OK *Note: Message is stored but unsent, no <alpha>field*
AT+CMGF=1;+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*	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: "REC UNREAD",6,160,"+33612345678",129,"01/05/31,15:15:09+00","01/05/31,15:15:09+00",0 OK

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17.13 List Message +CMGL

17.13.1 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.

17.13.2 Syntax

Depending on the mode, several responses are possible.

- For SMS-DELIVER or SMS-SUBMIT and text mode

Action command

AT+CMGL=<stat>

```
+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>,<tooa/toda>,
<length>]
<data>
[+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>,<tooa/toda>,
<length>]
<data>[…]]
OK
```

- For SMS-STATUS-REPORT and text mode

Action command

AT+CMGL=<stat>

```
+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>
[+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,
<st>[…]]
OK
```


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- For PDU mode

Action command **AT+CMGL=<stat>** +CMGL: <index>,<stat>,[<alpha>],<length> <pdu> [+CMGL: <index>,<stat>,[<alpha>],<length> <pdu>[…]] OK

17.13.3 Parameters and Defined Values

<da>:		destination address string type
<**toda**>:		type of address of <da>
	145	international number
	129	national number
<dt>:		discharge time 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])
<oa>:		originator address string type
<**tooa**>:		type of address of <oa>
	145	international number
	129	national number
<scts>:		service center timestamp string format: "yy/MM/dd,hh:mm:ss±zz" (Year/Month/Day,Hour:Min:Seconds±TimeZone)
<**fo**>:		first byte of SMS-DELIVER, SMS-SUBMIT or SMS-STATUS-REPORT, for further information refer to document [1] integer type
<**pid**>:		protocol identifier integer type
<**index**>:		place of storage in memory integer type

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<length>:		text mode (AT+CMGF=1): number of characters PDU mode (AT+CMGF=0): length of the TP data unit in bytes integer type
<mr>:		message reference integer type
<ra>:		recipient address string type
<sca>:		service center address string type
<st>:		status of a SMS-STATUS-REPORT integer type
<stat>:		status of message in memory (PDU mode)
	0	received unread messages
	1	received read messages
	2	stored unsent messages
	3	stored sent messages
<stat>:		status of message in memory (text mode)
	"REC UNREAD"	received unread messages
	"REC READ"	received read messages
	"STO UNSENT"	stored unsent messages
	"STO SENT"	stored sent messages
<tora>:		type of address of <ra>
	145	international number
	129	national number
<alpha>:		associated phonebook name string type

17.13.4 Parameter Storage

None.

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17.13.5 Examples

Command	Responses
AT+CMGL="REC UNREAD" *Note: List unread messages in text mode*	+CMGL: 1,"REC UNREAD","0146290800",, I will be late +CMGL: 3,"REC UNREAD","46290800",, See you tonight ! OK *Note: 2 messages are unread, these messages will then have their status changed to "REC READ"*
AT+CMGL="REC READ" *Note: List read messages in text mode*	+CMGL: 1,"REC READ","0146290800",, I will be late +CMGL: 2,"REC READ","0146290800",, Keep cool +CMGL: 3,"REC READ","46290800",, See you tonight ! OK
AT+CMGL="STO SENT" *Note: List stored and sent messages in text mode*	OK *Note: No message found*
AT+CMGL=1 *Note: List read messages in PDU mode*	+CMGL: 1,1,,26 07913366003000F3040B913366920547F4001300 1190412530400741AA8E5A9C5201 OK

17.13.6 Notes

For SMS status reports, only "ALL" / 4 and "READ" / 1 values of the <stat> parameter will list messages; other values will only return OK.

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17.14 Delete Message +CMGD

17.14.1 Description

This command is used to delete one or several messages from preferred message storage ("BM" SMS-CB "RAM storage", "SM" SMSPP storage "SIM storage" or "SR" SMS Status-Report storage).

Refer also to +CPMS command.

17.14.2 Syntax

Action command

AT+CMGD=<index>[,<DelFlag>]

OK

Read command

None

Test command

None

17.14.3 Parameters and Defined Values

<index>:		Index of the message to be deleted (If <DelFlag> = 0)
	1-20	if the preferred message storage is "BM" If <DelFlag> is > 0, <index> is ignored.
	SIM values	If the preferred message storage is "SM" or "SR".

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<DelFlag>:		message deletion mode
	0	delete message at location <index> (default value) If <DelFlag> is omitted, the default value is used.
	1	delete all READ messages
	2	delete all READ and SENT messages
	3	delete all READ, SENT and UNSENT messages
	4	delete all messages

17.14.4 Parameter Storage

None.

17.14.5 Examples

Command	Responses
	+CMTI:"SM",3 *Note: New message received*
AT+CMGR=3 *Note: Read it*	+CMGR: "REC UNREAD","0146290800","98/10/01,18:19:20+00"<CR><LF> Message received! *Note: Unread message received from 0146290800 on the 10/01/1998 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	OK *Note: All READ messages and SENT mobile originated messages are deleted*

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Command	Responses
AT+CMGD=1,3	OK *Note: All READ, SENT and UNSENT messages are deleted*
AT+CMGD=1,4	OK *Note: All messages are deleted*

17.14.6 Notes

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.

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17.15 New Message Acknowledgement +CNMA

17.15.1 Description

This command enables the acknowledgement of the reception of a new message routed directly to the TE.

- In TEXT mode, only positive acknowledgement to the network (RP-ACK) is possible.
- In PDU mode, either positive (RP-ACK) or negative (RP-ERR) acknowledgement to the network is possible.

Acknowledge with +CNMA is possible only if the +CSMS parameter is set to 1 (AT+CSMS=1) when a +CMT or +CDS indication is shown (see +CNMI command).

If no acknowledgement is given within the network timeout, an RP-ERR is sent to the network, the <mt> and <ds> parameters of the +CNMI command are then reset to zero (do not show new message indication).

17.15.2 Syntax

Depending on the mode, two syntaxes are available:

- text mode

Action command
AT+CNMA
OK

- PDU mode

Action command
AT+CNMA[=<n>[,<length>[<CR> PDU is entered <ctrl-Z/ESC>]]]
OK

Read command
AT+CNMA?
OK

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Test command **AT+CNMA=?** OK

17.15.3 Parameters and Defined Values

<n>:		type of acknowledgement in PDU mode
	0	send RP-ACK without PDU (same as TEXT mode)
	1	send RP-ACK with optional PDU message
	2	send RP-ERR with optional PDU message
<length>:		length of the PDU message Please refer to GSM 03.40 Recommendation [4] for other PDU negative acknowledgement codes.

17.15.4 Parameter Storage

None.

17.15.5 Examples

Example of acknowledgement of a new message in TEXT mode:

Command	Responses
AT+CSMS=1 *Note: SMS AT commands compatible with GSM 07.05 Phase 2 + version [1]*	OK
AT+CMGF=1 *Note: Set TEXT mode*	OK *Note: TEXT mode valid*
AT+CNMI=2,2,0,0,0 *Note: <mt>=2*	OK
	+CMT: "123456","98/10/01,12:30 00+00",129,4,32,240,"15379",129,5 Received message *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*

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Example of acknowledgement of a new message in PDU mode:

Command	Responses
AT+CSMS=1 *Note: SMS AT commands compatible with GSM 07.05 Phase 2 + version*	OK
AT+CMGF=0 *Note: Set PDU mode*	OK *Note: PDU mode valid*
AT+CNMI=2,2,0,0,0 *Note: <mt>=2*	OK
	+CMT: ,2907913366003000F1240B913366920547F30000003003419404800B506215D42ECFE7E17319 *Note: Message received*
AT+CNMA=2,2<CR>>00D3 <Ctrl-Z> *Note: Negative ACK to the SMS. Reason is: memory capacity exceeded*	OK

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17.16 Message Status Modification +WMSC

17.16.1 Description

This Wavecom proprietary command allows the manipulation of a message status. The accepted status changes are from READ to NOT READ and vice versa, and from SENT to NOT SENT and vice versa.

17.16.2 Syntax

Action command

AT+WMSC=<loc>,<status>

OK

Read command

None

Test command

None

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17.16.3 Parameters and Defined Values

<loc>:		location number of the stored message integer type
<stat>:		status of message in memory (PDU mode)
	0	received unread messages
	1	received read messages
	2	stored unsent messages
	3	stored sent messages
<stat>:		status of message in memory (text mode)
	"REC UNREAD"	received unread messages
	"REC READ"	received read messages
	"STO UNSENT"	stored unsent messages (default if ommited)
	"STO SENT"	stored sent messages

17.16.4 Parameter Storage

None.

17.16.5 Examples

Command	Responses
AT+CMGR=2	+CMGR: "REC READ","+336290918",,"99/05/0114:19:44+04" Hello All of you ! OK
AT+WMSC=2,"REC UNREAD"	OK
AT+CMGR=2	+CMGR: "REC UNREAD","+336290918",,"99/05/01 14:19:44+04" Hello All of you ! OK

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17.17 Un-change SMS Status +WUSS

17.17.1 Description

This Wavecom proprietary command is used to keep the SMS Status to UNREAD after +CMGR or +CMGL.

17.17.2 Syntax

Action command

AT+WUSS=<mode>

OK

Read command

AT+WUSS?

+WUSS: <mode>

OK

Test command

AT+WUSS=?

+WUSS: (list of supported <mode>s)

OK

17.17.3 Parameters and Defined Values

<mode>:		SMS status change mode
	1	the SMS status will not change
	0	the SMS status will change (default value)

17.17.4 Parameter Storage

The parameter <mode> is stored in EEPROM. The default value can be restored using AT&F.

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17.17.5 Examples

Command	Responses
AT+WUSS=?	+WUSS: (0-1) OK
AT+WUSS=1	OK
	+CMTI: "SM",10 *Note: SMS has been received in index 10*
AT+CMGR=10	+CMGR: "REC UNREAD","+33660669023",,"03/02/13,18:36:35+00" Do you want to change state ? OK
AT+CMGR=10	+CMGR: "REC UNREAD","+33660669023",,"03/02/13,18:36:35+00"<CR><LF> Do you want to change state ? OK *Note: The state hasn't be updated*
AT+WUSS=0	OK
	+CMTI: "SM",11 *Note: SMS has been received in index 11*
AT+CMGR=11	+CMGR: "REC UNREAD","+33660669023",,"03/02/13,18:56:55+00" It is me again. OK

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Command	Responses
AT+CMGR=11	+CMGR: "REC UNREAD","+33660669023",,"03/02/13,18:56:55+00"<CR><LF> It is me again. OK *Note: The state has been updated*
AT+WUSS?	+WUSS: 0 OK
AT+CMGR=10	+CMGR: "REC READ", "+33660669023",, "03/02/13,18:56:55+00"
AT+WUSS?	+WUSS: 0 OK

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17.18 Message Overwriting +WMGO

17.18.1 Description

The Wavecom proprietary +WMGO command is used to specify a location in the SIM or Flash memory, for the next SMS storing with +CMGW command. The defined location is used only once: +WMGO has to be used again to perform another overwrite.

17.18.2 Syntax

Action command

AT+WMGO=<loc>

OK

Read command

AT+WMGO?

+WMGO: <loc>

OK

Test command

AT+WMGO=?

(list of supported <loc>s)

OK

17.18.3 Parameters and Defined Values

<loc>:	location number of the SMS to write or overwrite Number depends of the SIM or Flash memory capacity.

17.18.4 Parameter Storage

None.

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17.18.5 Examples

Command	Responses
AT+CPMS? *Note: Check the storage area*	+CPMS: "SM",3,10,"SM",3,10,"SM",3,10 OK
AT+CMGW="+33146290800"<CR> **Hello how are you ?<ctrl-Z>** *Note: Write a message in text mode*	+CMGW: 4 OK *Note: Message stored in index 4 in the SIM*
AT+WMGO=?	+WMGO: (1-10) OK *Note: Possible values for the SIM*
AT+CMGW=4	OK
AT+CMGW="+33146290000"<CR> **You are overwritten** **<ctrl-Z>**	+CMGW: 4 OK *Note: New Message stored in index 4*

17.18.6 Notes

- If the external application specifies a free location, and an incoming message is received before the +CMGW command occurs, the product may store the incoming message at the specified available location. If the user then issues an +CMGW command without changing the location with another +WMGO, the received message will be overwritten.
- The location number is not kept over a software reset.
- if the storage area is changed with the +CPMS command, the value of WMGO will be reset to 0.

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17.19 Copy Messages +WMCP

17.19.1 Description

This Wavecom proprietary command copies the SMS from the SIM to the Flash or from the Flash to the SIM.

17.19.2 Syntax

Action command

AT+WMCP=<mode>[,<loc>]

OK

Read command

AT+WMCP?

OK

Test command

AT+WMCP=?

+WMCP: (list of supported <mode>s),(list of supported <loc>s)

OK

17.19.3 Parameters and Defined Values

<mode>:		copy mode
	0	from the SIM to the Flash
	1	from the Flash to the SIM
<loc>:		location of the SMS to copy (mandatory for <mode>=1) If this location is not defined, all the SMS will be copied. The SMS copied will have the first free location.

17.19.4 Parameter Storage

None.

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17.19.5 Examples

Command	Responses
AT+WMCP=?	+WMCP: 0,(1-12) +WMCP: 1,(1-99) OK *Note: The location of the SMS which can be copied from the SIM to the flash is 1 to 12 (maximum available in the SIM). The location of the SMS which can be copied from the flash to the SIM is 1 to 99 (the maximum available in the flash).*
AT+CPMS? *Note: Read the SMS storage*	+CPMS: "SM",3,10,"ME",0,99,"SM",3,10 OK *Note: Read, write...SMS from/to SIM. 3 SMS are stored in SIM. 10 is the total memory available in SIM. No SMS in Flash.*
AT+CMGR=1 *Note: Read the first SMS from the SIM*	+CMGR: "REC UNREAD","0146290800", "98/10/01,18:22:11+00",<CR><LF> *My test message: SMS in the SIM at location 1* OK
AT+WMCP=0,1 *Note: Copy the SMS at location 1 in the SIM to the Flash*	OK
AT+CPMS? *Note: Read the SMS storage*	+CPMS: "SM",3,10,"ME",1,99,"SM",3,10 OK *Note: Read, write...SMS from/to SIM. 3 SMS are stored in SIM. 10 is the total memory available in SIM. 1 SMS in Flash.*
AT+CPMS="ME","ME","ME" *Note: Select ME for reading, ME for writing and ME for storing*	+CPMS: 1,99,1,99,1,99 OK
AT+CMGR=1 *Note: Read the first SMS from the Flash*	+CMGR: "REC READ","0146290800", "98/10/01,18:22:11+00",<CR><LF> *My test message: SMS in the SIM at location 1* OK

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Command	Responses
AT+CMGW="+33146290800"<CR> Other test message: SMS in the Flash at location 2<ctrl-Z> *Note: Write a message in text mode*	+CMGW: 2 OK *Note: Message stored in index 2 in the flash*
AT+CPMS? *Note: Read the SMS storage*	+CPMS: "ME",2,99,"ME",2,99,"ME",2,99 OK *Note: Read, write...SMS from/to the flash. 2 SMS are stored in the flash*
AT+WMCP=1,2 *Note: Copy the SMS at location 2 in the flash to the SIM*	OK
AT+CPMS="SM","ME","SM" *Note: Select SM for reading, ME for writing and SM for storing*	+CPMS: 4,10,2,99,4,10 OK
AT+CMGR=4 *Note: Read the first SMS from the SIM*	+CMGR: "REC UNREAD","+33146290800", "98/10/01,18:22:11+00",<CR><LF> Other test message: SMS in the Flash at location 2 OK

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Command	Responses
AT+CPMS="ME" *Note: Select ME for reading*	+CPMS: 2,99,2,99,4,10 OK
AT+CMGD=0,4 *Note: Erase all the SMS stored in the Flash*	OK
AT+CPMS? *Note: Read the SMS storage*	+CPMS: "ME",0,99,"ME",0,99,"SM",4,10 OK *Note: No SMS is stored in the flash.*
AT+WMCP=0 *Note: Copy all the SMS from the SIM to the Flash*	OK
AT+CPMS? *Note: Read the SMS storage*	+CPMS: "ME",4,99,"ME",4,99,"SM",4,10 OK *Note: 4 SMS are stored in the flash.*

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17.20 Save Settings +CSAS

17.20.1 Description

All settings specified by the +CSCA and +CSMP commands are stored in EEPROM if the SIM card is a Phase 1 card or in the SIM card if it is a Phase 2 SIM card.

17.20.2 Syntax

Action command
AT+CSAS
OK

Read command
None

Test command
None

17.20.3 Parameters and Defined Values

None.

17.20.4 Parameter Storage

None.

17.20.5 Examples

Command	Responses
AT+CSAS *Note: Store +CSCA and +CSMP parameters*	OK *Note: Parameters saved*

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17.21 Restore Settings +CRES

17.21.1 Description

All settings specified in the +CSCA and +CSMP commands are restored from EEPROM if the SIM card is Phase 1 or from the SIM card if it is a Phase 2 one.

17.21.2 Syntax

Action command
AT+CRES
OK

Read command
None

Test command
None

17.21.3 Parameters and Defined Values

None.

17.21.4 Parameter Storage

None.

17.21.5 Examples

Command	Responses
AT+CRES *Note: Restore +CSCA and +CSMP parameters*	OK *Note: Parameters restored*

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17.22 Select Cell Broadcast Message Types +CSCB

17.22.1 Description

This command selects which types of CBMs are to be received by the ME. It is allowed in both PDU and text modes.

17.22.2 Syntax

Action command

AT+CSCB=<mode>[,[<mids>,[,<dcs>]]]

OK

Read command

None

Test command

None

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17.22.3 Parameters and Defined Values

<mode>:		please refer to [1]
	0	activation of CBM reception
<mids>:		message Identifiers Indicates to which type of message identifiers the ME should listen.
<dcs>:		data coding schemes, please refer to [1] string type
	0	German
	1	English Italian
	2	French
	3	Spanish Dutch
	4	Swedish
	5	Danish
	6	Portuguese Finnish
	7	Norwegian Greek
	8	Turkish
	9	Hungarian Polish
	10	Czech
	11	German
	12	English Italian
	13	French
	14	Spanish Dutch
	32	Swedish

Note:

The <bm> parameter of +CNMI command controls the message indication. The activation of CBM reception (<mode>=0) can select only specific Message Identifiers (list in <mids>) for specific Languages (list in <dcss>), but the deactivation stops any reception of CBMs (only AT+CSCB=1 is allowed).

17.22.4 Parameter Storage

None.

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17.22.5 Examples

Command	Responses
AT+CSCB=0,"15-17,50,86","" *Note: Accept SMS-CB types, 15,16,17,50 and 86 in any language*	OK *Note: CBMs can be received*
	+CBM: 1000112233445566778899 *Note: CBM length of a received Cell Broadcast message (SMS-CB), CBM bytes in PDU mode)*
AT+CSCB=1 *Note: Deactivate the reception of CBMs*	OK *Note: CBM reception is completely stopped*

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17.23 Cell Broadcast Message Identifiers +WCBM

17.23.1 Description

This Wavecom proprietary command is used to read the EF-CBMI SIM file. The EF-CBMI file is not used with the +CSCB command.

The application should read this file (using AT+WCBM?) and combine the Message Identifiers with those required by the application.

17.23.2 Syntax

Action command

AT+WCBM=<mids>

OK

Read command

AT+WCBM?

+WCBM=<mids>

OK

Test command

None

17.23.3 Parameters and Defined Values

<mids>:	message Identifiers Indicates to which type of message identifiers the ME should listen.

17.23.4 Parameter Storage

None.

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17.23.5 Examples

Command	Responses
AT+WCBM="10,100,1000,10000" *Note: Write 4 messages identifiers in EF-CBMI*	OK *Note: CBMIs are stored in EF-CBMI*
AT+WCBM? *Note: Read the CBMIs in EF-CBMI*	+WCBM="10,100,1000,100000" OK *Note: 4 CBMIs are stored in EF-CBMI*

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18 SIM Commands

18.1 Card Identification +CCID

18.1.1 Description

This command orders the product to read the EF-CCID file on the SIM card.

18.1.2 Syntax

Action command

AT+CCID

+CCID: <CCID>

OK

Read command

AT+CCID?

+CCID: <CCID>

OK

Test command

AT+CCID=?

OK

18.1.3 Parameters and Defined Values

<CCID>:	identification number for the SIM (20 digit)

18.1.4 Parameter Storage

None.

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18.1.5 Examples

Command	Responses
AT+CCID *Note: Get card ID*	+CCID: "123456789AB111213141" OK *Note: EF-CCID is present, hexadecimal format*
AT+CCID? *Note: Get current value*	+CCID: "123456789AB111213141" OK *Note: Same result as +CCID*

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18.2 Request IMSI +CIMI

18.2.1 Description

This command is used to read and identify the IMSI of the SIM card.

18.2.2 Syntax

Action command
AT+CIMI
<IMSI>
OK

Read command
None

Test command
None

18.2.3 Parameters and Defined Values

<IMSI>:	IMSI of the SIM card 15 digits number

18.2.4 Parameter Storage

None.

18.2.5 Examples

Command	Responses
AT+CIMI *Note: Read the IMSI*	208200120320598 OK *Note: IMSI value (15 digits), starting with MCC (3 digits) / MNC (2 digits, 3 for PCS 1900)*

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18.3 Generic SIM Access +CSIM

18.3.1 Description

This command allows direct control of the SIM by a distant application on the TE. The <command> is sent without any modification to the SIM. In the same manner the SIM <response> is sent back by the ME unchanged.

The user must then pay attention to processing SIM information within the frame specified by GSM as specified in recommendation 3GPP 11.11 [9] (or 3GPP 51.011 [13]).

If operation mode is not allowed by the ME, a "+CME ERROR: <err>" is returned.

Between two successive +CSIM commands, there is no locking of the interface between the SIM and the GSM application. Since in this situation some command types and parameters can modify wrong SIM files, some operations, described below, are not allowed for the CSIM command. However, it is possible to process them with the CRSM command.

18.3.2 Syntax

Action command

AT+CSIM=<length>,<command>

```
+CSIM: <length>,<response>
OK
```

Read command

AT+CSIM?

```
OK
```

Test command

AT+CSIM=?

```
OK
```


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18.3.3 Parameters and Defined Values

<length>:	Length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response). For command sent to TE, this value must be in the range [10 – 522], else a "+CME ERROR: 3" is returned. integer type
<command>:	Command passed on by the MT to the SIM in the format as described in 3GPP 11.11 [9] (or 3GPP 51.011 [13]) (hexadecimal character format; see the +CSCS command). The supported commands are : READ BINARY READ RECORD FETCH STATUS SELECT SEEK TERMINAL RESPONSE ENVELOPE TERMINAL RESPONSE hexadecimal type Second Byte Value not supported: Due to the absence of locking, a "CME_ERROR=3" is returned for the following instructions (See CRSM commands): • D6 : UPDATE BINARY • DC : UPDATE RECORD • 32 : INCREASE • 44 : REHABILITATE • 04 : INVALIDATE • 88 : RUN GSM ALGORITHM • 20 : VERIFY CHV • 24 : CHANGE CHV • 26 : DISABLE CHV • 28 : ENABLE CHV • 2C : UNBLOCK CHV • FA : SLEEP • C0 : GET RESPONSE Second Byte Value warning: Due to the absence of locking, the right response may not be

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	returned for the following instructions (See CRSM commands). · C2 : ENVELOPE · A2 : SEEK · A4 : SELECT Fifth Byte Value Restriction: For the following instructions (Second Byte): · A4 : SELECT · 10 : TERMINAL PROFILE · C2 : ENVELOPE · 14 : TERMINAL RESPONSE · A2 : SEEK the user must make sure that the value of the fifth Byte of the instruction corresponds of the length of bytes (data starting from 6th byte) which follow it. The value of the Fifth Byte must be equal of the value: <length>/2 – 5, else the command is not send to the SIM and "CME ERROR=3" is returned.
<response>:	Response to the command passed on by the SIM to the MT in the format as described in 3GPP 11.11 [9] (or 3GPP 51.011 [13]) (hexadecimal character format; refer to CSCS). hexadecimal type

18.3.4 Parameter Storage

None.

18.3.5 Examples

Command	Responses
AT+CSIM=14,"A0A40000027F20" *Note: Select DF Telecom (7F20)*	+CSIM: 4,"9F16" OK *Note : Command correctly treated with length 16 for response data*
AT+CSIM?	OK
AT+CSIM=?	OK

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18.4 Restricted SIM Access +CRSM

18.4.1 Description

By using this command instead of Generic SIM Access +CSIM, the application has easier but more limited access to the SIM database. This command transmits the SIM <command> and its required parameters to the MT.

As response to the command, the MT sends the actual SIM information parameters and response data. The MT error result code "+CME ERROR: <err>" may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in the response parameters.

As with the +CSIM command, there is no locking between two successive commands. The user should be aware of the precedence of the GSM application commands over the TE commands.

18.4.2 Syntax

Action command

AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]

```
+CRSM: <sw1>,<sw2>[,<response>]

OK
```

Read command

AT+CRSM?

```
OK
```

Test command

AT+CRSM=?

```
OK
```


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18.4.3 Parameters and Defined Values

<command>:		command passed on by the MT to the SIM (all other values are reserved); refer to 3GPP 11.11 [9] (or 3GPP 51.011 [13]). integer type (see note 1 below)
	176	READ BINARY
	178	READ RECORD
	192	GET RESPONSE
	242	STATUS
<fileid>:		identifier of an elementary data file on SIM mandatory for every command except STATUS integer type (see note 2 below)
<P1>, <P2>, <P3>:		parameters passed on by the MT to the SIM These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP 11.11 [9] (or 3GPP 51.011 [13]). integer type
<data>:		information which is to be written to the SIM (hexadecimal character format; refer to +CSCS) hexadecimal type
<sw1>, <sw2>:		information from the SIM about the execution of the actual command These parameters are delivered to the TE in both cases, on successful or failed execution of the command. integer type
<response>:		response to successful completion of the command previously issued (hexadecimal character format; refer to +CSCS) STATUS and GET RESPONSE return data, which gives information about the current elementary data field. This information includes the file type and size (refer to 3GPP [9] 11.11 (or 3GPP 51.011[13]). After the READ BINARY or READ RECORD command, the requested data will be returned. hexadecimal type

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Note 1:

The MT internally executes all commands necessary for selecting the desired file, before performing the actual command.

Note 2:

The range of valid file identifiers depends on the actual SIM and is defined in 3GPP 11.11 [9] (or 3GPP 51.011 [13]). Optional files may not be present at all. This value must be in the range [0 – 65535] else a "+CME ERROR: 3" is returned.

18.4.4 Parameter Storage

None.

18.4.5 Examples

Command	Responses
AT+CRSM=178,28474,1,4,28 *Note : READ RECORD on EF-ADN (1st entry) with length 28*	+CRSM: 144,0,"74657374FFFFFFFFFFFFFFFFFFF07811032466587F9FFFFFFFFFFFF" OK *Note : SIM response : 9000 with the data stored in SIM*
AT+CRSM?	OK
AT+CRSM=?	OK

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18.5 Write Language Preference +WLPW

18.5.1 Description

This Wavecom proprietary command writes a Language Preference value in EF-LP.

18.5.2 Syntax

Action command

AT+WLPW=<index>,<value>

OK

Read command

None

Test command

None

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18.5.3 Parameters and Defined Values

<index>:		offset in the available languages range (SIM dependent) integer value
<value>:		example of values for languages (Please refer to [18] 3GPP TS 23.038 Alphabets and language-specific information [19] 3GPP TS 27.005 Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
	0	German
	1	English
	2	Italian
	3	French
	4	Spanish
	5	Dutch
	6	Swedish
	7	Danish
	8	Portuguese
	9	Finnish
	10	Norwegian
	11	Greek
	12	Turkish
	13	Hungarian
	14	Polish
	32	Czech
	33	Hebrew
	34	Arabic
	35	Russian

18.5.4 Parameter Storage

None

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18.5.5 Examples

Command	Responses
AT+WLPW=1,5 *Note: Writes Language Preference equal to 5 with index 1*	OK *Note: EF-LP correctly updated*

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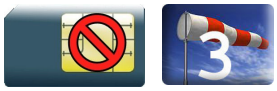
18.6 Read Language Preference +WLPR



18.6.1 Description

This Wavecom proprietary command reads a Language Preference value of EF-LP. The first indices should have the highest priority.

18.6.2 Syntax

Action command
AT+WLPR=<index>
+WLPR: <value>
OK

Read command
AT+WLPR?
+WLPR: <nb>
OK

Test command
None

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18.6.3 Parameters and Defined Values

<index>:		offset in the available languages range (SIM dependent) integer value
<nb>:		number of non empty Language Preferences in EF-LP (SIM dependent) integer value
<value>:		*example of values for languages, please refer to [18] 3GPP TS 23.038 Alphabets and language-specific information* *[19] 3GPP TS 27.005 Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)* for more information.
	0	German
	1	English
	2	Italian
	3	French
	4	Spanish
	5	Dutch
	6	Swedish
	7	Danish
	8	Portuguese
	9	Finnish
	10	Norwegian
	11	Greek
	12	Turkish
	13	Hungarian
	14	Polish
	32	Czech
	33	Hebrew
	34	Arabic
	35	Russian

18.6.4 Parameter Storage

None

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18.6.5 Examples

Command	Responses
AT+WLPR?	+WLPR: 4 OK *Note: Four language preferences are available in EF-LP*
AT+WLPR=1 *Note: Read first EF-LP index value*	+WLPR: 5 OK *Note: Language preference is 5*

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19 SIM ToolKit Commands

19.1 Overview of SIM Application ToolKit

19.1.1 Summary

SIM ToolKit, also known as "SIM Application ToolKit" introduces functionalities, which open the way to a broad range of value added services.

The principle is to allow service providers to develop new applications *(e.g. for 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 Wireless CPU.

19.1.2 Functionality

SIM ToolKit refers to the functionalities described in the GSM Technical specification 11.14 [20] .

It introduces twenty five commands for the SIM. Three classes of increasing ToolKit functionalities have been defined, with class 1 offering a subset of commands and class 3 offering the full range of commands (Please refer to section "Support of SIM ToolKit by the M.E." in the Appendixes).

The SIM Application ToolKit supports:

- profile download,
- proactive SIM,
- data download into SIM,
- menu selection,
- call control by SIM.

19.1.3 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 is supported by the customer application.

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

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19.1.4 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).

19.1.5 Data Download to SIM

Data downloading to the SIM *(SMS, phonebook...)* allows data 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.

19.1.6 Menu Selection

A set of menu items is supplied by the SIM Application ToolKit. The menu selection command can then be used to signal to the SIM Application which menu item is selected.

The commands used for this operation are **+STIN, +STGI and +STGR**.

19.1.7 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.

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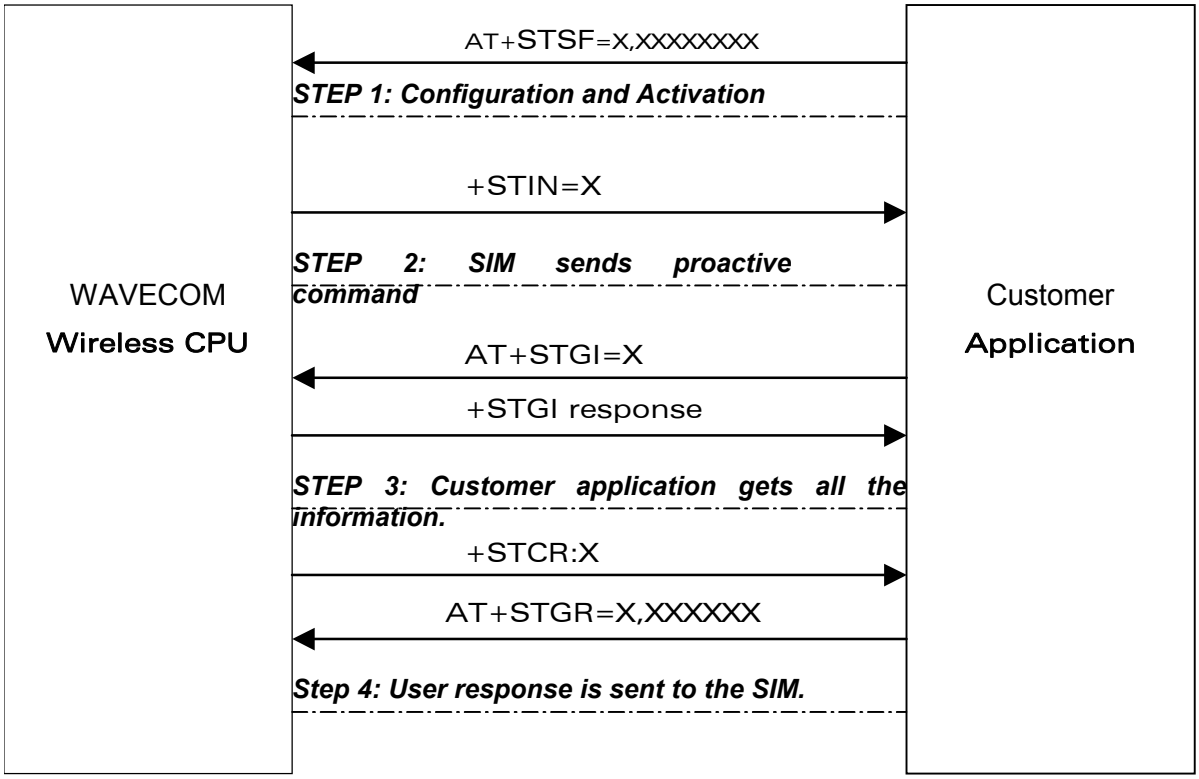
The commands used for this operation are:

- +STCR (SIM ToolKit Control Response),
- +STGR (SIM ToolKit Give Response).

19.1.8 Messages exchanged during a SIM ToolKit operation

The following figure shows the SIM ToolKit commands and unsolicited results that are exchanged.



On the first step, the customer application informs the Wavecom product which facilities are supported. This operation is performed with the +STSF (SIM ToolKit Set Facilities) command, which also allows to activate or deactivate the SIM ToolKit functionality.

On the second step, an unsolicited result +STIN (SIM ToolKit indication) is sent by the product, indicating to 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 AT+STIN? command.

On the third step, the customer application uses the +STGI (SIM ToolKit Get Information) command to get all the information about the SIM ToolKit command, returned by a +STIN message.

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On the fourth step, 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.

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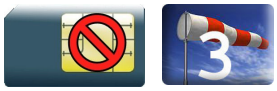
19.2 SIM ToolKit Set Facilities +STSF



19.2.1 Description

This Wavecom proprietary command allows SIM ToolKit facilities to be activated, deactivated or configured.

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

19.2.2 Syntax

Action command

AT+STSF=<mode>[,[<Config>][,[<Timeout>][,<AutoResponse>]]]

OK

Read command

AT+STSF?

+STSF: <mode>,<Config>,<Timeout>,<Autoresponse>

OK

Test command

AT+STSF=?

+STSF: (list of supported <mode>s),(list of supported <Config>s),(list of supported <Timeout>s),(list of supported <AutoResponse>s)

OK

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19.2.3 Parameters and Defined Values

<mode>:		SIM ToolKit functionalities activation mode
	0	deactivates the SIM ToolKit functionalities.
	1	activates the SIM ToolKit functionalities.
	2	configures the SIM ToolKit functionalities.
<Config>:		SIM ToolKit terminal profile This parameter gives the list of the SIM Application ToolKit facilities that are supported by the customer application. Some bits of the first nine bytes 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. Please refer to section "Structure of Terminal Profile" in the Appendixes for more information. range: 320060C01F0100471C-FFFFFFFF7F01005F3E default value: 3F6BFFFF1F0100573E
<Timeout>:		timeout for user responses (in units of 10 seconds). This parameter sets the maximum time for the user action (e.g. to select an item or to input a text). range: 1-255 (default value:1)
<Autoresponse>:		automatic response activation mode When autoresponse is activated, the +STIN indication for "Play Tone", "Refresh", "Send SS", "Send SMS" or "Send USSD" is automatically followed by the corresponding +STGI response.
	0	not activated
	1	activated (default value)

19.2.4 Parameter Storage

All parameters are stored in EEPROM without using AT&W.

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19.2.5 Examples

Command	Responses
AT+STSF=? *Note: Test command SIM ToolKit Set Facilities*	+STSF: (0-2),(320060C01F0100471C-FFFFFFFF7F01005F3E)),(1-255),(0-1) OK
AT+STSF?	+STSF: 0," 1F6BFFFF1F0100573E ",3,0 *Note: No activation of SIM ToolKit functionality*
AT+STSF=2,"FFFFFFFF7F01005F3E" *Note: Set all SIM ToolKit facilities (class 3).*	OK
AT+STSF=1 *Note: Activation of SIM ToolKit functionality*	OK
AT+CFUN=1	OK *Note: Reboot Wireless CPU.*
AT+STSF?	+STSF: 1,"FFFFFFFF7F01005F3E",3,0 OK *Note: SIM ToolKit functionality activated with all facilities*

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19.3 SIM ToolKit Indication +STIN

19.3.1 Description

This Wavecom proprietary command allows the customer application to identify the proactive command sent via a mechanism of unsolicited SIM ToolKit indications.

The last SIM ToolKit indication sent by the SIM can be requested by the AT+STIN? command. This command is only usable between the sending of the STIN indication by the SIM (see §19.1.8 step 2) and the response of the user with the +STGI command.

19.3.2 Syntax

Action command
None

Read command
AT+STIN?
+STIN: <CmdType>
OK

Test command
AT+STIN=?
OK

Unsolicited response
+STIN: <CmdType>

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19.3.3 Parameters and Defined Values

<CmdType>: type of proactive command or error sent by the SIM

0	"Setup Menu"
1	"Display Text"
2	"Get Inkey"
3	"Get Input"
4	"Setup Call"
5	"Play Tone" (*)
6	"Sel Item"
7	"Refresh" (*)
8	"Send SS" (*)
9	"Send SMS" (*)
10	"Send USSD" (*)
11	"SETUP EVENT LIST"
12	a "SET UP IDLE MODE TEXT"
13	a "SEND DTMF"
14	a "LANGUAGE NOTIFICATION"
93	"SMS-PP Data Download" failed due to SIM BUSY
94	"SMS-PP Data Download" failed due to SIM ERROR
98	timeout when no response from user
99	"End Session"

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

19.3.4 Parameter Storage

None.

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19.3.5 Examples

Command	Responses
	+STIN: 0 *Note: "Setup Menu" proactive command has been sent by the SIM.*
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	+STGI: "Toolkit Menu"+STGI: 1,4,"Item 1",0 +STGI: 2,4,"Item 2",0 OK +STGI: 99 *Note: Display the SIM ToolKit application menu*
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*

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19.4 SIM ToolKit Get Information +STGI

19.4.1 Description

This Wavecom proprietary command allows to get the information (e.g. text to display, menu information, priorities...) of a proactive command sent by the SIM.

The information is returned only after receiving a SIM ToolKit indication (+STIN).

19.4.2 Syntax

Depending on the value of the <CmdType> parameter several response syntaxes are available:

- For <CmdType>=0: get information about "Setup Menu" (No action expected from SIM).

Action command
AT+STGI=<CmdType>
+STGI: <Alpha Identifier menu>
+STGI: <Id>,<NbItems>,<AlphaId Label>,<HelpInfo>[,<NextActionId>]
[+STGI: <Id>,<NbItems>,<AlphaId Label>,<HelpInfo>[,<NextActionId>]
[…]]
OK

- For <CmdType>=1: get information about "Display Text" (No action expected from SIM).

Action command
AT+STGI=<CmdType>
+STGI: <Prior>,<Text>,<ClearMode>
OK

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- For <CmdType>=2: get information about "Get Inkey" (SIM expects key pressed sent using +STGR)

Action command
AT+STGI=<CmdType>
+STGI: <InkeyFormat>,<HelpInfo>[,<TextInfo>]
OK

- For <CmdType>=3: get information about '"Get Input" (SIM expects key input sent using +STGR)

Action command
AT+STGI=<CmdType>
+STGI:
<InputFormat>,<EchoMode>,<SizeMin>,<SizeMax>,<HelpInfo>[,<TextInfo>,<DefaultText>]
OK

- For <CmdType>=4: get information about "Setup Call" (If <Class> is omitted, call is processed as a voice call)

Action command
AT+STGI=<CmdType>
+STGI: <Type>,<CalledNb>,<SubAddress>,<Class>,<AlphaId>,<AlphaId2>
OK

- For <CmdType>=5: get information about "Play Tone" (No action)

Action command
AT+STGI=<CmdType>
+STGI: <ToneType>[,<TimeUnit>,<TimeInterval>,<TextInfo>]
OK

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- For <CmdType>=6: get information about "Sel Item" (SIM expects an item choice sent using +STGR)

Action command

AT+STGI=<CmdType>

```
+STGI: <DefaultItem>, <Alpha Identifier menu>
+STGI: <Id>,<NbItems>,<AlphaId Label>,<HelpInfo>[,<NextActionId>]
[+STGI: <Id>,<NbItems>,<AlphaId Label>,<HelpInfo>[,<NextActionId>]
[…]]
OK
```

- For <CmdType>=7: get information about "Refresh" (No action, "Refresh" done automatically by product).

Action command

AT+STGI=<CmdType>

```
+STGI: <RefreshType>
OK
```

- For <CmdType>=8: get information about "Send SS" (No action, "Send SS" done automatically by product).

Action command

AT+STGI=<CmdType>

```
+STGI: <TextInfo>
OK
```

- For <CmdType>=9: get information about "Send SMS" (No action, "Send SMS" done automatically by product).

Action command

AT+STGI=<CmdType>

```
+STGI: <TextInfo>
OK
```


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- For <CmdType>=10: get information about "Send USSD" proactive command. (No action, "Send USSD" done automatically by product)

Action command
AT+STGI=<CmdType>
+STGI: <TextInfo>
OK

- For <CmdType>=11: get information about "Setup Event List".

Action command
AT+STGI=<CmdType>
+STGI: <Evt>
OK

- For <CmdType>=12: get information about "Setup Idle Mode Text".

Action command
AT+STGI=<CmdType>
+STGI: <Text>
OK

- For <CmdType>=13: get information about "Send DTMF".

Action command
AT+STGI=<CmdType>
+STGI: <TextInfo>
OK

- For <CmdType>=14: get information about "Language Notification".

Action command
AT+STGI=<CmdType>
+STGI: <Specific>[,<Code>]
OK

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Read command
None

Test command
AT+STGI=?
+STGI: (list of supported <CmdType>s)
OK

19.4.3 Parameters and Defined Values

<Alpha Identifier menu>:		alpha identifier of the main menu string type
<Id>:		menu item Identifier range: 1-255
<NbItems>:		number of items in the main menu range: 1-255
<AlphaId Label>:		alpha identifier label of items string type (ASCII format)
<HelpInfo>:		help information availability
	0	not available
	1	available
<NextActionId>:		next proactive command identifier integer type
<Prior>:		display priority
	0	normal
	1	high
<Text>:		text to display string type (ASCII format)
<ClearMode>:		message clearing mode
	0	clear message after a delay (3 seconds)
	1	wait for user to clear message

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<InkeyFormat>:		"Get Inkey" format
	0	Digit (0-9, *, #,and +)
	1	SMS alphabet default
	2	UCS2
	3	Yes/No (y and n)
<Textinfo>:		text information string type (ASCII format)
<InputFormat>:		"Get Input" format
	0	digit (0-9, *, #,and +)
	1	SMS alphabet default
	2	UCS2
	3	unpacked format
	4	packed format
<EchoMode>:		echo mode
	0	off
	1	on
<SizeMin>:		minimum length of input range: 1-255
<SizeMax>:		maximum length of input range: 1-255
<DefaultText>:		default input text string type (ASCII format)
<Type>:		call behaviour
	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 string type (ASCII format)
<SubAdress>:		called party sub-address string type (ASCII format)

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<Class>:		call class
	0	voice call
	1	data call
	2	fax call
<Alpha Id>:		text information for user confirmation phase string type (ASCII format)
<Alpha Id2>:		text information for call set-up phase and calling phase string type (ASCII format)
<ToneType>:		tone type
	0	dial
	1	busy
	2	congestion
	3	radio ack
	4	dropped
	5	error
	6	call waiting
	7	ringing
	8	general beep
	9	positive beep.
	10	negative beep.

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<TimeUnit>:		time unit for < TimeInterval>
	0	minutes
	1	seconds
	2	tenths of seconds
<TimeInterval>:		time required for tone playing expressed in <TimeUnit> range: 1-255
<PresentStyle>:		presentation type
	0	unspecified
	1	specified in <PresentChoice>
<PresentChoice>:		presentation choice for <PresentStyle>=1
	0	choice of data values
	1	choice of navigation options
<DefaultItem>:		default item identifier range: 1-255
<RefreshType>:		refresh type
	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
<Evt>:		setup event list
	1	reporting asked for "Idle Screen"
	2	reporting asked for "User Activity"
	3	reporting asked for "Idle Screen" and "User Activity"
	4	cancellation of reporting event
<Specific>:		language notification type
	0	non specific
	1	specific

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<Code>:		2 character code for the language The number indicated after the name refers to numeric value for the language in ISO 639 [16]. If non-specific, no <Code> will be defined. See Notes for UCS2 format texts.
	"de"	German (0)
	"en"	English (1)
	"it"	Italian (2)
	fr"	French (3)
	"es"	Spanish (4)
	"nl "	Dutch (5)
	"sv"	Swedish (6)
	"da"	Danish (7)
	"pt"	Portuguese (8)
	"fi"	Finnish (9)
	"no"	Norwegian (10)
	"el"	Greek (11)
	"tr"	Turkish (12)
	"hu"	Hungarian (13)
	"pl"	Polish (14)
	"cs"	Czech (32)
	"he"	Hebrew (33)
	"ar"	Arabic (34)
	"ru"	Russian (35)
	"is"	Icelandic (36)

19.4.4 Parameter Storage

None.

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19.4.5 Examples

Command	Responses
	+STIN: 0 *Note: "Setup Menu" proactive command has been sent by the SIM.*
AT+STGI=0 *Note:Get information about the main menu*	+STGI: "SIM TOOLKIT MAIN MENU" +STGI: 1,3,"BANK",0 +STGI: 2,3,"QUIZ",0 +STGI: 3,3,"WEATHER",0 OK *Note: Main menu contains 3 items*

19.4.6 Notes

For the UCS2 format, texts are displayed in Hexa ASCII format. Example: when the SIM sends a TextString containing 0x00 0x41, the text displayed is "0041". (For details see section "3.6 Coding of Alpha fields in the SIM for UCS2" of the Appendixes)

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19.5 SIM ToolKit Give Response +STGR

19.5.1 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
- SETUP EVENT LIST — reporting events
- SETUP IDLE MODE TEXT — reporting events

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
- NO RESPONSE — no response from the user
- END SESSION — user abort

19.5.2 Syntax

Action command

AT+STGR=<CmdType>[,<Result>[,<Data>]]

[> <input text> <ctrl-Z/ESC>]

OK

Read command

None

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Test command **AT+STGR=?** OK

19.5.3 Parameters and Defined Values

<CmdType>:		command type
	0	item selection in the main menu
	1	user confirmation to clear a "DISP 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"
	11	response for a "SETUP EVENT LIST"
	12	response for a "SETUP IDLE MODE TEXT"
	95	send "BACKWARD MOVE" to SIM
	96	send "BEYOND CAPABILITIES" to SIM
	97	send "UNABLE TO PROCESS" to SIM
	98	send "NO RESPONSE" to SIM
	99	send "END SESSION" to SIM

- Values when <CmdType>=0 (Select an item from the main menu)

<Result>:		user action
	1	item selected by the user
	2	help information required by user
<Data>:		item identifier of the item selected by the user integer type

- Values when <CmdType>=1 (Select an item from the main menu)

None.

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- Values when <CmdType>=2 (GET INKEY, see Notes)

<Result>:		user action
	0	session ended by user
	1	response given by the user
	2	help information required by user
<Data>:		key pressed by the user string type

- Values when <CmdType>=3 (GET INPUT, see Notes)

<Result>:		user action
	0	session ended by user
	1	response given by the user
	2	help information required by user
<input text>:		text sent by user string type

- Values when <CmdType>=4 (SETUP CALL)

<Result>:		user action
	0	user refuses the call
	1	user accepts call

- Values when <CmdType>=6 (SELECT ITEM)

<Result>:		user action
	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>:		item identifier selected by the user integer type

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- Values when <CmdType>=11 (SETUP EVENT LIST)

<Result>:	user action
1	user selects idle screen
2	user selects user activity

- Values when <CmdType>=12 (SETUP IDLE MODE TEXT)

<Result>:	user action
0	user successfully integrates the idle mode text
1	user is not able to successfully integrate the idle mode text

- For all other cases, no values are needed.

19.5.4 Parameter Storage

None.

19.5.5 Examples

Command	Responses
	+STIN: 0 *Note: The main menu has been sent from the SIM.*
AT+STGI=0 *Note: Get information about the main menu*	+STGI: 1,3,"BANK",0 +STGI: 2,3,"QUIZ",0 +STGI: 3,3,"WEATHER",0 OK *Note:The main menu contains 3 items*
AT+STGR=0,1,1	OK +STIN: 6 *Note: The item 2 of the main menu has been selected.*

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Command	Responses
AT+STGI=6 *Note: Get information about the BANK menu*	+STGI: 1,"BANK" +STGI: 1,2,"PERSONAL ACCOUNT ENQUIRY",1 +STGI: 2,2,"NEWS",0 OK *Note: The BANK menu contains two items.*
AT+STGR=6,1,1	OK *Note: Select Item 1*
	+STIN: 99 *Note: End of session*

19.5.6 Notes

- For a GET INKEY with format set to "Yes/No", the data shall contain:
  - the value "y" when the answer is "positive",
  - the value "n" when the answer is "negative".
- For inputs in UCS2 format, the data are entered in ASCII format. Example: For "8000410042FFFF" entered, the SIM receives 0x00 0x41 0x00 0x42 with UCS2 DCS. (about the different UCS2 syntaxes, please refer to section "Coding of Alpha fields in the SIM for UCS2" of the Appendixes to AT Commands Interface Guide).
- Comments upon Terminal Responses:
  - For the SETUP MENU Proactive Command, it is only possible to send a Terminal Response after the "+STIN: 0" indication, not after a "AT+STGI=0" request. For the other Proactive Commands, it is possible to send a Terminal Response after the "+STIN" indication or after the "+STGI" command.
  - All of the Terminal Responses are not possible with all of the Proactive Commands. Compatibility between available Terminal Responses and Proactive Commands is given in section "Support of SIM ToolKit by the M.E." of the Appendixes to AT Commands Interface Guide. If a Terminal Response is attempted during a incompatible Proactive Command session, a "+CME ERROR: 3" will be returned.

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19.6 SIM ToolKit Control Response +STCR

19.6.1 Description

This Wavecom proprietary unsolicited response allows the customer application to identify "Call Control" and "SMS Control" responses when an outgoing call or an outgoing SMS is made and the call control facility is activated. This is also applicable to SS calls.

19.6.2 Syntax

Action command

None

Read command

None

Test command

None

Unsolicited response

+STCR: <Result>[,<Number>,<MODestAddr>,<TextInfo>]

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19.6.3 Parameters and Defined Values

<Result>:		SIM response to the operation
	0	control response not allowed
	1	control response with modification
<Number>:		called number, Service Center Address or SS String string type (ASCII format)
<MODestAddr>:		MO destination address string type (ASCII format)
<TextInfo>:		text information string type (ASCII format)

19.6.4 Parameter Storage

None.

19.6.5 Examples

Command	Responses
	+STIN: 9 *Note: "Send SMS" proactive command has been sent by the SIM.*
AT+STGI=9 *Note: get information about "Send SMS"*	+STGI: "Send SM" +STCR: 1,"+112233445566779","+012345679" OK *Note: The "Send SMS" was allowed with modifications. The SC address was changed from +012345679 to +112233445566779*
	+STIN: 99 *Note: End of session*

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19.7 SIM ToolKit Indication +STRIL

19.7.1 Description

This Wavecom proprietary command allows the customer application to exchange SIM ToolKit messages directly with the SIM card, using the unsolicited indication +STRIL to get the full command string.

19.7.2 Syntax

Action command
None

Read command
None

Test command
None

Unsolicited response
+STRIL: <CmdTreated>,<Command string>

19.7.3 Parameters and Defined Values

<CmdTreated>:		
	0	the command must be treated by the application
	1	the command is already treated by the Wireless CPU
<Command string>:		SIM command string in hexadecimal format string type

19.7.4 Parameter Storage

None.

19.7.5 Examples

None

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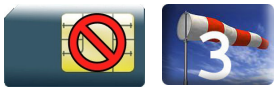
20 Supplementary Services Commands

20.1 List Current Calls +CLCC



20.1.1 Description

This command is used to return a list of current calls.

20.1.2 Syntax

Action command

AT+CLCC

```
[+CLCC:
<id>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]][…]
OK
```

Read command

AT+CLCC?

```
OK
```

Test command

AT+CLCC=?

```
OK
```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20.1.3 Parameters and Defined Values

<id>:		call identification integer type range: 1-7
<dir>:		call direction
	0	mobile originated (MO) call
	1	mobile terminated (MT) call
<stat>:		call state
	0	active
	1	held
	2	dialing (MO call)
	3	alerting (MO call)
	4	incoming call (MT call)
	5	waiting call (MT call)
<mode>:		teleservice
	0	voice
	1	data
	2	fax
	9	unknown
<mpty>:		multiparty
	0	call is not one of multiparty (conference) call parties
	1	call is one of multiparty (conference) call parties
<number>:		phone number in format specified by <type> string type
<type>:		TON/NPI
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".

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<alpha>:	phonebook number entry optional alphanumeric representation of <number>, corresponding to the entry found in phonebook. (for UCS2 format see commands examples +CLIP, +CCWA or +COLP) string type

20.1.4 Parameter Storage

None.

20.1.5 Examples

Command	Responses
	RING *Note: Incoming call*
AT+CLCC	+CLCC: 1,1,4,0,0,"0123456789",129 OK
ATA *Note: Answering the call*	OK
AT+CLCC	+CLCC: 1,1,1,0,0,"0123456789",129 OK
ATH *Note: Releasing the call*	OK
ATD0123456789; *Note: Outgoing call*	
AT+CLCC *Note: Before the called party is ringing*	+CLCC: 1,0,2,0,0,"0123456789",129 OK
AT+CLCC *Note: The called party is ringing*	+CLCC: 1,0,3,0,0,"0123456789",129 OK
	OK *Note: Response to dial command*
AT+CLCC *Note: The call is being answered*	+CLCC: 1,0,0,0,0,"0123456789",129 OK

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20.2 Call Related Supplementary Services +CHLD

20.2.1 Description

This command is used to manage call hold and multiparty conversation (conference call). Calls can be put on hold, recovered, released or added to a conversation.

Call hold and multiparty are only applicable to teleservice 11 (speech telephony).

20.2.2 Syntax

Action command

AT+CHLD=<n>

OK

Read command

AT+CHLD?

OK

Test command

AT+CHLD=?

+CHLD: (list of supported <n>s)

OK

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20.2.3 Parameters and Defined Values

<n>:		call related services
	0	release all held calls or set User Determined User Busy (UDUB) for a waiting call.
	1	release all active calls (if any exist) and accepts the other (held or waiting) call.
	1X	release a specific call X (active, held or waiting).
	2	place all active calls (if any exist) on hold and accepts the other (held or waiting) call.
	2X	place all active calls on hold except call X with which communication is supported.
	3	add a held call to the conversation.
	4	connect the two calls and disconnect the subscriber from both calls (Explicit Call Transfer).

20.2.4 Parameter Storage

None.

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20.2.5 Examples

Command	Responses
AT+CHLD=?	+CHLD: (0-4,11-17,21-27) OK
ATD0123456789;	OK
+WIND: 5,1	
AT+CLCC	+CLCC: 1,0,0,0,0,"0123456789",129 OK
+WIND: 5,2 *Note: incoming call in waiting state*	
AT+CLCC *Note: Com id 1 is active, com id 2 is in waiting state*	+CLCC: 1,0,0,0,0,"0123456789",129 +CLCC: 2,1,5,0,0 OK
AT+CHLD=2	OK
AT+CLCC	+CLCC: 1,0,1,0,0,"0123456789",129 +CLCC: 2,1,0,0,0 OK *Note: Com id 1 is held, com id 2 is active*

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20.3 Calling Line Identification Presentation +CLIP

20.3.1 Description

This command enables the Calling Line Identification Presentation supplementary service. When presentation of the CLI is enabled (and the calling subscriber allows the function), +CLIP unsolicited response is returned after every RING (or +CRING) result code.

20.3.2 Syntax

Action command

AT+CLIP=<n>

OK

Read command

AT+CLIP?

+CLIP: <n>,<m>

OK

Test command

AT+CLIP=?

+CLIP: (list of supported <n>s)

OK

Unsolicited response

+CLIP: <number>,<type>[,<subaddr>,<satype>[,[<alpha>][,<CLI validity>]]]

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20.3.3 Parameters and Defined Values

<n>:		CLIP mode in the TA
	0	disable (default value)
	1	enable
<m>:		subscriber CLIP service status in the network
	0	CLIP not provisioned
	1	CLIP provisioned
	2	unknown (no network...)
<number>:		phone number string type
<type>:		TON/NPI for <number>
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".
<subaddr>		subaddress string type
<satype>:		TON/NPI for <subaddr>
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".
<alpha>:		phonebook name associated with <number> string type
<CLI validity>:		CLI validity
	0	CLI valid
	1	CLI has been withheld by the originator
	2	CLI is not available due to interworking problems or limitation of originating network.

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20.3.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

20.3.5 Examples

Command	Responses
AT+CLIP=1 *Note: Enable CLIP*	OK
AT+CLIP? *Note: Ask for current functionality*	+CLIP:1,1 OK *Note: CLIP is enabled and provisioned*
	RING *Note: Incoming call* +CLIP: "0146290800",129,1,,"FRED" *Note: Incoming call with number and name presentation*
	RING *Note: Incoming call* +CLIP: "0146290800",129,1,,"8000204212FFFF" *Note: Incoming call with number and name presentation (UCS2 format)*
AT+CLIP=?	+CLIP: (0-1) OK

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20.4 Calling Line Identification Restriction +CLIR

20.4.1 Description

This command enables the Calling Line Identification Restriction supplementary service.

20.4.2 Syntax

Action command

AT+CLIR=<n>

OK

Read command

AT+CLIR?

+CLIR: <n>,<m>

OK

Test command

AT+CLIR=?

+CLIR: (list of supported <n>s)

OK

20.4.3 Parameters and Defined Values

<n>:		CLIR mode for outgoing calls
	0	Presentation indicator is used according to the subscription of the CLIR service. (default value)
	1	CLIR invocation
	2	CLIR suppression

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<m>:		subscriber CLIR status in the network
	0	CLIR not provisioned
	1	CLIR provisioned in permanent mode
	2	unknown (no network...)
	3	CLIR temporary mode presentation restricted
	4	CLIR temporary mode presentation allowed

20.4.4 Parameter Storage

The <n> parameter is stored in EEPROM witghout using AT&W command.

20.4.5 Examples

Command	Responses
AT+CLIR=2	OK
AT+CLIR? *Note: Ask for current functionality*	+CLIR: 2,4 OK
AT+CLIR=?	+CLIR: (0-2) OK

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20.5 Connected Line Identification Presentation +COLP

20.5.1 Description

This command enables the COnnected Line identification Presentation supplementary service. This can be useful for call forwarding of the connected line. When presentation of the connected line identification is enabled (and the calling subscriber allows the function), +COLP unsolicited response is returned in response of an ATD command.

20.5.2 Syntax

Action command

AT+COLP=<n>

OK

Read command

AT+COLP?

+COLP: <n>,<m>

OK

Test command

AT+COLP=?

+COLP: (list of supported <n>s)

OK

Unsolicited response

+COLP: <number>,<type>[,<subaddr>,<satype>[,<alpha>]]

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20.5.3 Parameters and Defined Values

<n>:		parameter sets/shows the result code presentation status in the TA
	0	disable (default value)
	1	enable
<m>:		parameter shows the subscriber COLP service status in the network
	0	COLP not provisioned
	1	COLP provisioned
	2	unknown (no network)
<number>:		phone number string type
<type>:		TON/NPI for <number>
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".
<subaddr>		subaddress string type
<satype>:		TON/NPI for <subaddr>
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".
<alpha>:		phonebook name associated with <number> string type

20.5.4 Parameter Storage

The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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20.5.5 Examples

Command	Responses
AT+COLP=1 *Note: Activate COLP*	OK
AT+COLP? *Note: Ask for current functionality*	+COLP:1,1 OK *Note: COLP is enabled and provisioned*
ATD146290800; *Note: Outgoing call*	+COLP: "0146290800",129,,"WAVECOM" *or* +COLP: "0146290800",129,1,,"8000204212FFFF" OK *Note:* *"8000204212FFFF": UCS2 format* *Connected outgoing line number and name presentation*
AT+COLP=?	+COLP: (0-1) *OK*

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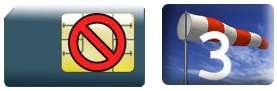
20.6 Supplementary Service Notifications +CSSN



20.6.1 Description

This command allows to configure the supplementary service related network initiated notifications.

20.6.2 Syntax

Action command

AT+CSSN=<n>,<m>

OK

Read command

AT+CSSN?

+CSSN: <n>,<m>

OK

Test command

AT+CSSN=?

+CSSN: (list of supported <n>s),(list of supported <m>s)

OK

Intermediate response

+CSSI: <code1>[,<index>]

Note:

+CSSI becomes a unsolicited response in the case of +WBHV: 2,1.

Unsolicited response

+CSSU: <code2>[,<index>[,<number>,<type>]]

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20.6.3 Parameters and Defined Values

<n>:		MO supplementary service notification
	0	disable (default value)
	1	enable When a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI is sent before any other MO call setup result codes.
<m>:		MT supplementary service notification
	0	disable (default value)
	1	enable When a supplementary service notification is received during a call, unsolicited result code +CSSU is sent.
<code1>:		manufacturer specific service code
	0	unconditional call forwarding is active
	1	some of the conditional call forwarding are active
	2	call has been forwarded
	3	call is waiting
	4	Closed User Group call, with CUG <index>
	5	outgoing calls are barred
	6	incoming calls are barred
	7	CLIR suppression rejected
	8	call has been deflected

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<code2>:		service code
	0	forwarded call (MT call setup)
	1	closed user Group call, with CUG <index>
	2	call has been put on hold (during a voice call, <number> & <type> fields may be present)
	3	call has been retrieved (during a voice call, <number> & <type> fields may be present)
	4	multiparty call entered (during a voice call, <number> & <type> fields may be present)
	5	call on hold has been released (during a voice call)
	7	call is being connected (alerting) with the remote party in alerting state in Explicit Call Transfer operation (during a voice call)
	8	call has been connected with the other remote party in Explicit Call Transfer operation (during a voice call, <number> & <type> fields may be present)
	9	this is a deflected call (MT call setup)
	10	additional incoming call forwarded
<index>:		closed user group string type
<number>:		phone number string type
<type>:		TON/NPI
	145	international number <num> includes the international access code character "+".
	129	national number <num> does not include the international access code character "+".

20.6.4 Parameter Storage

The <n> and <m> parameters are stored in EEPROM using AT&W command. The default value can be restored using AT&F command.

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20.6.5 Examples

Command	Responses
AT+CSSN=?	+CSSN: (0-1),(0-1) OK
AT+CSSN?	+CCSN: 0,0 OK
AT+CSSN=0,1	OK
ATD0123456789;	OK
	+CCWA: "9876543210",128,1 *Note: Call waiting*
AT+CHLD=2 *Note: Accept the waiting call and place the active one on hold*	OK
	+CSSU: 5 *Note: The held call was released (by the remote)*

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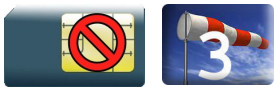
20.7 Unstructured Supplementary Service Data +CUSD



20.7.1 Description

This command is used to:

- enable or disable the CUSD indication sent to the application by the product when an incoming USSD is received
- send and receive USSD strings

Note:

The USSD supplementary service is described in GSM 02.90 [24].

It is based on sequences of digits which may be entered by a mobile user with a handset. A sequence entered is sent to the network which replies with an alphanumerical string, for display only, or for display plus request for the next sequence.

20.7.2 Syntax

- to enable disable

Action command
AT+CUSD=<n>[,<str>[<dcs>]]
OK

Read command
AT+CUSD?
+CUSD: <n>
OK

Test command
AT+CUSD=?
+CUSD: (list of supported<n>s)
OK

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Unsolicited response `+CUSD: <m>[,<str>[,<dcs>]]`

20.7.3 Parameters and Defined Values

<n>:		requested operation
	0	disable the result code presentation (default value)
	1	enable the result code presentation
	2	cancel session (not applicable to read command response)
<m>:		USSD status
	0	no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation)
	1	further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)
	2	USSD terminated by network
	3	other local client has responded
	4	operation not supported
	5	network timeout
<str>:		USSD string converted in the selected character set (please refer to +CSCS) string type
<dcs>:		data coding scheme integer type Refer to [5] for more information.

20.7.4 Parameter Storage

The <n> parameter is stored in EEPROM without using AT&W. The default value can be restored using AT&F command.

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20.7.5 Examples

Command	Responses
AT+CUSD=?	+CUSD: (0-2) OK
AT+CUSD=1,"#123#"	OK
	+CUSD: 1,"02/08 report:0h04mn00S",15 *Note: USSD reponse from network*
AT+CUSD?	+CUSD: 1 OK

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20.8 Call Forwarding +CCFC

20.8.1 Description

This command allows control of the call forwarding supplementary service.

20.8.2 Syntax

Action command

AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]

```
[+CCFC: <status>,<class>[,<number>,<type>[,<subaddr>,<satype>
[,<time>]]][…]]

OK
```

Read command

```
None
```

Test command

AT+CCFC=?

```
+CCFC: (list of supported <reason>s)

OK
```


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20.8.3 Parameters and Defined Values

<reason>:		call forwarding reason
	0	unconditional
	1	mobile busy
	2	no reply
	3	not reachable
	4	all call forwarding
	5	all conditional call forwarding
<mode>:		requested operation
	0	disable
	1	enable
	2	interrogate
	3	registration
	4	erasure unconditional
<number>:		phone number string type
<type>:		TON/NPI (Type of address byte in integer format)
	145	international number <number> includes the international access code character "+"
	129	national number <number> does not include the international access code character "+"
<class>:		call class The combination of different classes is not supported, it will only result in the activation/deactivation/status request of all classes (7).
	1	voice
	2	data
	4	fax
	7	voice, data and fax (default value if omitted)
	8	short messages

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<subaddr>:		not supported
<satype>:		not supported
<time>:		time to wait
	1-30	For <reason> = 2 (No reply), 4 (all calls forwarding) and 5 (all conditional call forwarding), (1 to 30) in seconds before call is forwarded. default value: 20
<status>:		call forwarding status
	0	not active
	1	active

20.8.4 Parameter Storage

None.

20.8.5 Examples

Command	Responses
AT+CCFC=0,3,"0146290800" *Note: Register to an unconditional call forwarding for all classes*	OK
AT+CCFC=0,2 *Note: Interrogate unconditional call forwarding*	+CCFC: 1,1,"0146290800",129 *Note: Call forwarding active for voice* +CCFC: 1,2,"0146290800",129 *Note: Call forwarding active for data* +CCFC: 1,4,"0146290800",129 OK *Note: Call forwarding active for fax*
AT+CCFC=0,4 *Note: Erase unconditional call forwarding*	OK

20.8.6 Notes

If the FDN phonebook is activated, the registration is restricted to the phone numbers written in it.

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20.9 Call Waiting +CCWA

20.9.1 Description

This command allows to control the call waiting supplementary service.

The product will send a +CCWA unsolicited result code when the call waiting service is enabled.

20.9.2 Syntax

Action command

AT+CCWA=<n>,[<mode>[,<class>]]

[+CCWA:<status>,<class>[…]]

OK

Read command

AT+CCWA?

+CCWA: <n>

OK

Test command

AT+CCWA=?

+CCWA: (list of supported <n>s)

OK

Unsolicited response

+CCWA: <number>,<type>[,<class>][,<alpha>]

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20.9.3 Parameters and Defined Values

<n>:		result code presentation status in the TA
	0	disable
	1	enable
<mode>:		
	0	disable
	1	enable
	2	query
<number>:		phone number in ASCII format string type
<type>:		TON/NPI for <number>
	145	international number <number> includes the international access code character "+".
	129	national number <number> does not include the international access code character "+".
<class>:		call class The combination of different classes is not supported, it will only result in the activation/deactivation/status request of all classes (7).
	1	voice
	2	data
	4	fax
	7	voice, data and fax (default value if omitted)
	8	short messages
<status>:		call waiting status
	0	not active
	1	active
<alpha>:		phonebook name associated with <number> string type

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20.9.4 Parameter Storage

The <n> parameter is stored in EEPROM without using AT&W command. The default value can be restored using AT&F

20.9.5 Examples

Command	Responses
AT+CCWA=?	+CCWA: (0,1) OK
AT+CCWA=1,1,1 *Note: Enable call waiting for voice calls*	OK
AT+CCWA=1,2 *Note: Interrogate call waiting*	+CCWA:1,1 OK *Note: Call waiting active for voice calls* +CCWA:"0146290800",145,1, "FREDDY" *Note: Number and name of the waiting voice call* +CCWA:"0146290800",145,1,"8023459678FFFF" *Note: Number and name of the waiting voice call (UCS2 format)*
AT+CCWA=1,0,7 *Note: Erase call waiting*	OK

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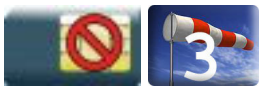
20.10 Keypad Control +CKPD



20.10.1 Description

This command emulates the ME keypad by sending each keystroke as a character in a <keys> string.

The supported GSM sequences are listed in the Appendixes.

If emulation fails, a "+CME ERROR: <err>" is returned.

If emulation succeeds, the result depends on the GSM sequence activated.

20.10.2 Syntax

Action command
AT+CKPD=<keys>
Depending of <keys>
OK

Read command
None

Test command
AT+CKPD=?
+CKPD: (list of supported <keys>)
OK

20.10.3 Parameters and Defined Values

<keys>:	keyboard sequence string of the following characters (0-9,*,#)

20.10.4 Parameter Storage

None.

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20.10.5 Examples

Command	Responses
AT+CKPD="*#21#" *Note: Check every call forwarding status*	OK
AT+CKPD="1234" *Note: Sequence not allowed*	+CME ERROR: 3

20.10.6 Notes

In the case where the FDN phonebook is activated, the sequences concerning "call forwarding" are allowed only if the entire sequence is written in the FDN.

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20.11 Advice Of Charge +CAOC

20.11.1 Description

This commands allows to configure the Advice Of Charge (AOC) supplementary service (GSM 02.24 [22] and GSM 02.86 [23]) which enables the subscriber to obtain information on call cost.

20.11.2 Syntax

Action command

AT+CAOC=<mode>

[+CAOC: <ccm>]

OK

Read command

AT+CAOC?

+CAOC: <mode>

OK

Test command

AT+CAOC=?

+CAOC: (list of supported <mode>s)

OK

Unsolicited response

+CCCM: <ccm>

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20.11.3 Parameters and Defined Values

<mode>:		requested operation
	0	query CCM value
	1	deactivate the unsolicited reporting of CCM value (default value)
	2	activate the unsolicited reporting of CCM value
<ccm>:		current call meter value three bytes of the current call meter value in hexadecimal format (e.g. "00001E" corresponds to the decimal value 30). The value is in home units and bytes are coded in a similar way as the ACMmax value in SIM. string type

20.11.4 Parameter Storage

The <mode> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

20.11.5 Examples

Command	Responses
AT+CAOC=? *Note: Request supported modes*	+CAOC: (0-2) OK *Note: 0, 1, 2 modes supported*
AT+CAOC=0 *Note: Query CCM value*	+CAOC: "000A08" OK *Note: Display CCM value (CCM=2568)*
AT+CAOC=1 *Note: Deactivate unsolicited report of CCM value*	OK *Note: CCM report deactivated*
AT+CAOC=2 *Note: Activate unsolicited report of CCM value*	OK *Note: CCM report activated*
AT+CAOC?	+CAOC: 2 OK
	+CCCM: "000A09" *Note: Unsolicited CCM value*

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20.12 Accumulated Call Meter +CACM

20.12.1 Description

This command resets the Advice Of Charge for Accumulated Call Meter (ACM) value in SIM file EF-ACM. The ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is required to reset the value.

20.12.2 Syntax

Action command

AT+CACM=<pin2passwd>

OK

Read command

AT+CACM?

+CACM: <acm>

OK

Test command

AT+CACM=?

OK

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20.12.3 Parameters and Defined Values

<pin2passwd>:	Personal Identification Number 2. 8 digit number
<acm>:	Accumulated Call Meter three bytes of the current call meter value in hexadecimal format (e.g. "00001E" corresponds to the decimal value 30). The value is in home units and bytes are coded in a similar way as the ACMmax value in SIM. string type

20.12.4 Parameter Storage

None.

20.12.5 Examples

Command	Responses
AT+CACM? *Note: Request ACM value*	+CACM: "000400" OK *Note: Display ACM value (ACM=1024)*
AT+CACM=1234 *Note: Request ACM reset, real PIN2 is "1234"*	OK *Note: ACM value is reset*
AT+CACM ? *Note: Request ACM value*	+CACM: "000000" OK *Note: Display ACM value (ACM = 0)*

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20.13 Accumulated Call Meter Maximum+CAMM

20.13.1 Description

The set command sets the Advice Of Charge related to Accumulated Call Meter maximum value in SIM file EF-ACMmax. ACMmax contains the maximum number of home units the subscriber is allowed to spend. When ACM (see +CACM) reaches ACMmax, calls are prohibited. SIM PIN2 is required to set the value.

20.13.2 Syntax

Action command

AT+CAMM=<ACMmax>,<pin2passwd>

OK

Read command

AT+CAMM?

+CAMM: <ACMmax>

OK

Test command

AT+CAMM=?

OK

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20.13.3 Parameters and Defined Values

<pin2passwd>:	Personal Identification Number 2. 8 digit number
<ACMmax>:	Accumulated Call Meter maximum three bytes of the current call meter value in hexadecimal format (e.g. "00001E" corresponds to the decimal value 30). The value is in home units and bytes are coded in a similar way as the ACMmax value in SIM. string type

20.13.4 Parameter Storage

None.

20.13.5 Examples

Command	Responses
AT+CAMM="000400",1234 *Note: Request ACMmax update, PIN2 is "1234"*	OK *Note: ACMmax updated to 1024*
AT+CACM? *Note: Request ACMmax value*	+CACM:"000400" OK *Note: ACMmax = 1024*

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20.14 Price per UNIT and Currency Table +CPUC

20.14.1 Description

This command sets the parameters for Advice of Charge related to price per unit and the currency table in SIM file EF-PUCT.

PUCT information can be used to convert the home units (as used in +CAOC, +CACM and +CAMM) into currency units.

20.14.2 Syntax

Action command

AT+CPUC=<currency>,<ppu>,<pin2passwd>

OK

Read command

AT+CPUC?

+CPUC: <currency>,<ppu>

OK

Test command

AT+CPUC=?

OK

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20.14.3 Parameters and Defined Values

<currency>:	currency code three character currency code (e.g. "GBP", "DEM") string type
<ppu>:	price per unit dot is used as a decimal separator (e.g. "2.66") string type
<pin2 passwd>:	Personal Identification Number 2. 8 digit number

20.14.4 Parameter Storage

None.

20.14.5 Examples

Command	Responses
AT+CPUC="EUR","0.82",1234 *Note: Set Currency and Price per unit update*	OK *Note: Euros at a rate of 0.82 per unit set*
AT+CPUC?	+CPUC "EUR","0.82" OK

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20.15 Closed User Group +CCUG

20.15.1 Description

This command is used to:

- activate/deactivate the control of CUG information for all following outgoing calls,
- select a CUG index,
- suppress Outgoing Access (OA). OA allows or not a member of a CUG to place calls outside the CUG.
- suppress the preferential CUG. Preferential is the default CUG used by the network when it does not receive an explicit CUG index.

The Closed User Group Supplementary Service enables subscribers to form groups with restricted access (both access to and from).

The CUG supplementary service is described in GSM 02.85 [25]. This service is provided on prior arrangement with the service provider. Subscription options should be selected at implementation.

20.15.2 Syntax

Action command

AT+CCUG=<n>[,<index>[,<info>]]

OK

Read command

AT+CCUG?

+CCUG: <n>,<index>,<info>

OK

Test command

AT+CCUG=?

OK

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20.15.3 Parameters and Defined Values

<n>:		CUG activation mode
	0	disable (default value)
	1	enable
<index>:		CUG index
	0-9	selected default value: 0)
	10	preferred
<info>:		actions
	0	no information (default value)
	1	suppress OA
	2	suppress preferential CUG
	3	suppress OA and preferential CUG

20.15.4 Parameter Storage

All parameters are stored in EEPROM without using AT&W.

20.15.5 Examples

Command	Responses
AT+CCUG=0,0,0	OK
AT+CCUG?	+CCUG: 0,0,0 OK

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AT COMMANDS INTERFACE GUIDE FOR OS 6.61

VOLUME 4

Reference: WM_DEV_OAT_UGD_014
Revision: 004
Date: September 21, 2006

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Related Documents

This interface specification is based on the following recommendations:

[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] 3GPP 05.02: 3rd Generation Partnership Project; Technical Specification Group GSM/EDGE- Radio Access Network; Multiplexing and multiple access on the radio path – 3GPP TS 05.02 V6.9.2 (2001-04)

[8] 3GPP 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3

[9] 3GPP TS 11.11 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface

[10] 3GPP TS 05.08 Radio subsystem link control

[11] 3GPP TS 23.040 Technical realization of the Short Message Service (SMS);

[12] 3GPP TS 22.042 Network Identity and Time Zone (NITZ) service description; Stage 1

[13] 3GPP TS 51.011 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface

[14] 3GPP TS 27-010 Terminal Equipment to User Equipment (TE-UE) multiplexer protocol

[15] 3GPP 23.014 Support of Dual Tone Multi Frequency (DTMF) signaling

[16] ISO 639 Langages Codes

[17] 3GPP 27 060 Packet domain; Mobile Station (MS) supporting Packet Switched services

[18] 3GPP TS 23.038 Alphabets and language-specific information

[19] 3GPP TS 27.005 Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)

[20] ETSI GSM 11.14 Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface

[21] 3GPP TS 23.003 Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification

[22] ETSI GSM 02.24 Digital cellular telecommunications system (Phase 2+) (GSM);Description of Charge Advice Information (CAI)

[23] ETSI GSM 02.86 Digital cellular telecommunications system (Phase 2+) (GSM);Advice of Charge (AoC) Supplementary Services - Stage 1

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[24] ETSI GSM 02.90 Digital cellular telecommunications system (Phase 2+) (GSM);Unstructured Supplementary Service Data (USSD) - Stage 1

[25] ETSI GSM 02.85 Digital cellular telecommunications system (Phase 2+) (GSM);Closed User Group (CUG) Supplementary Services - Stage 1

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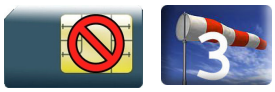
21 Audio Commands

21.1 Speaker & Microphone Selection +SPEAKER



21.1.1 Description

This Wavecom proprietary command is used to select the speaker and the microphone set.

21.1.2 Syntax

Action command

AT+SPEAKER=<ActiveConfig>

OK

Read command

AT+SPEAKER?

+SPEAKER: <ActiveConfig>

OK

Test command

AT+SPEAKER=?

+SPEAKER: (list of supported <ActiveConfig>s)

OK

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21.1.3 Parameters and Defined Values

<ActiveConfig>:		speaker mode (please refer to the "Notes" section below)
	1	config 1 (default value)
	2	config 2
	3	config 3
	4	config 4
	5	config 5 (reserved PCM Bus)
	6	config 6 (reserved PCM Bus)
	7	config 7 (reserved PCM Bus)
	8	config 8 (reserved PCM Bus)
	9	config 9 (only digital)

21.1.4 Parameter Storage

The <ActiveConfig> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

21.1.5 Examples

Command	Responses
AT+SPEAKER=?	+SPEAKER: (1-9) OK
AT+SPEAKER=1 *Note: Activate config1*	OK
AT+SPEAKER? *Note: Request current settings*	+SPEAKER: 1 OK *Note: Config 1 is active*

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21.1.6 Notes

<ActiveConfig>	Analog In (Mic)	Analog Out	Digital IO	Application
1	Mic	Hfr	∅	Analog handset/hands free telephony
2	Mic	Ear	∅	Analog handset/hands free telephony
3	Auxmic	Hfr	∅	Analog handset/hands free telephony
4	Auxmic	Ear	∅	Analog handset/hands free telephony
9	∅	∅	USER PCM bus	Digital handset/hands free telephony

On the Wireless CPU, the speaker and microphone are selected as follows:

- Audio 1 (sub-audio): Auxmic + Ear,
- Audio 2 (main audio): EarMic + Hfr.

The digital audio interface (IOM-2) interface mode allows the connectivity with audio peripherals, and consists of 4 wires (PCM-SYNC, PCM-CLK, PCM-IN, PCM-OUT).

The IOM-2 frame is divided in 6 slots : each slot allows the transmission/reception of a 16 bits word.

When a configuration that includes digital IOs is used, the slot 0 will be allocated for exchanging audio data with the Wireless CPU. Depending on the chosen configuration, the audio samples will be routed in different location in the audio chain.

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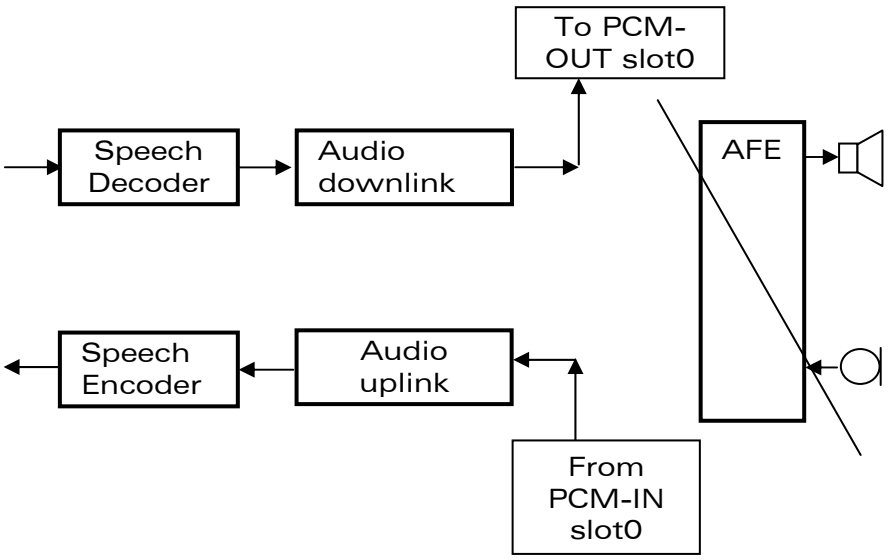
When <ActiveConfig>=9 : the Analogue Audio Front-End (AFE) is disabled, and is replaced by the digital interface, as shown by the following figure :



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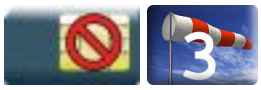
21.2 Ringer Sound Level +CRSL



21.2.1 Description

This command is used to set/get the sound level of the ringer on incoming calls. The action command changes the default <volume> value of the +CRMP command.

21.2.2 Syntax

Action command

AT+CRSL=<sound level>

OK

Read command

AT+CRSL?

+CRSL: <sound level>

OK

Test command

AT+CRSL=?

+CRSL: (list of supported <sound level>s)

OK

21.2.3 Parameters and Defined Values

<sound level>:	ringer sound level range: 0-15 (default value : 6)

21.2.4 Parameter Storage

The <sound level> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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21.2.5 Examples

Command	Responses
AT+CRSL=15 *Note: Set volume to max.*	OK *Note: Current ring playing with max volume.*
AT+CRSL? *Note: Get current ringer sound level.*	+CRSL: 15 OK *Note: Current level is 15 (max.)*
AT+CRSL=? *Note: Supported parameters*	+CRSL: (0-15) OK

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21.3 Microphone Mute Control +CMUT

Test and read command

Action command

21.3.1 Description

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

21.3.2 Syntax

Action command

AT+CMUT=<mode>

OK

Read command

AT+CMUT?

+CMUT: <mode>

OK

Test command

AT+CMUT=?

+CMUT: (list of supported <mode>s)

OK

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21.3.3 Parameters and Defined Values

<mode>:		microphone mute mode
	0	microphone mute off (default value)
	1	microphone mute on

21.3.4 Parameter Storage

None.

21.3.5 Examples

Command	Responses
AT+CMUT=?	+CMUT: (0,1) OK
AT+CMUT=1 *Note: Mute ON (call active)*	OK
AT+CMUT? *Note: Get current value*	+CMUT: 1 OK *Note: Mute is active (call active)*

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21.4 Loudspeaker Volume Level +CLVL

21.4.1 Description

This command is used by the application to tune the loudspeaker volume level.

21.4.2 Syntax

Action command

AT+CLVL=<Volume>

OK

Read command

AT+CLVL?

+CLVL: <Volume>

OK

Test command

AT+CLVL=?

+CLVL: (list of supported <Volume>s)

OK

21.4.3 Parameters and Defined Values

<Volume>:	volume level
	range : 0-12 (default value: 6)

21.4.4 Parameter Storage

The <Volume> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F and AT+VIP=1.

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21.4.5 Examples

Command	Responses
AT+CLVL=?	+CLVL: (0-12) OK
AT+SPEAKER?	+SPEAKER: 1 OK
AT+CLVL?	+CLVL: 6 OK *Note: Default receive gain on speaker 1*
AT+CLVL=12	OK
AT+SPEAKER=2 *Note: Change the current speaker*	OK
AT+CLVL?	+CLVL: 6 OK *Note: Default receive gain*

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21.4.6 Notes

The value returned by the AT+CLVL? command depends on the current speaker (cf. +SPEAKER command description).

The following table gives values corresponding to the Q2686 Wireless CPU.

<Volume>	Receive gain HFR	Receive gain EAR
0	-34 dB	-40 dB
1	-30 dB	-36 dB
2	-26 dB	-32 dB
3	-22 dB	-28 dB
4	-18 dB	-24 dB
5	-14 dB	-20 dB
6	-10 dB	-16 dB
7	-6 dB	-12 dB
8	-2 dB	-8 dB
9	2 dB	-4 dB
10	6 dB	0 dB
11	10 dB	4 dB
12	14 dB	8 dB

The gain values listed here are relative. For absolute (electrical) values, please refer to the specific hardware documentation of the Wireless CPU used in the application.

AT+CLVL=<Volume> returns "+CME ERROR: 3" if the current speaker value is +SPEAKER: 9 (digital speaker).

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21.5 Side Tone Modification +SIDET

21.5.1 Description

This Wavecom proprietary command is used to set the level of audio feedback in the speaker (microphone feedback in the speaker).

21.5.2 Syntax

Action command

AT+SIDET=<val1>[,<val2>]

OK

Read command

AT+SIDET?

+SIDET: <val1>,<val2>

OK

Test command

AT+SIDET=?

+SIDET: (list of supported <val1>s),(list of supported <val2>s)

OK

21.5.3 Parameters and Defined Values

<val1>:		side tone mode
	0	side tone is disabled
	1	side tone is enabled (default value)
<val2>:		side tone level range: 0-63 (default value : 25)

21.5.4 Parameter Storage

The <val1>and <val2> parameters are stored in EEPROM using the AT&W command. The default values can be restored using AT&F and AT+VIP=1.

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21.5.5 Examples

Command	Responses
AT+SIDET=?	+SIDET: (0-1),(0-63) OK
AT+SIDET=1,0	OK
AT+SIDET? *Note: Current value*	+SIDET: 1,0 OK

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21.5.6 Notes

The following table gives the audio feedback values:

<val2>	audio feedback	<val2>	audio feedback	<val2>	audio feedback
0	disable	23	-25,9 dB	46	-7,3 dB
1	-60,2 dB	24	-25,2 dB	47	-6,7 dB
2	-54,2 dB	25	-24,1 dB	48	-6,2 dB
3	-50,7 dB	26	-23,1 dB	49	-5,1 dB
4	-48,2 dB	27	-22,1 dB	50	-4,2 dB
5	-46,2 dB	28	-21,3 dB	51	-3,4 dB
6	-44,6 dB	29	-20,6 dB	52	-2,6 dB
7	-43,3 dB	30	-19,9 dB	53	-1,9 dB
8	-42,1 dB	31	-19,2 dB	54	-1,2 dB
9	-40,2 dB	32	-18,6 dB	55	-0,6 dB
10	-38,6 dB	33	-17,5 dB	56	-0,1 dB
11	-37,3 dB	34	-16,6 dB	57	1,0 dB
12	-36,1 dB	35	-15,7 dB	58	1,9 dB
13	-35,1 dB	36	-14,9 dB	59	2,7 dB
14	-34,2 dB	37	-14,2 dB	60	3,5 dB
15	-25,9 dB	38	-13,5 dB	61	4,2 dB
16	-32,6 dB	39	-12,9 dB	62	4,8 dB
17	-31,3 dB	40	-12,3 dB	63	5,4 dB
18	-30,1 dB	41	-11,3 dB		
19	-29,1 dB	42	-10,3 dB		
20	-28,2 dB	43	-9,5 dB		
21	-27,3 dB	44	-8,7 dB		
22	-26,6 dB	45	-8,0 dB		

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21.6 Gain Control +VGR

21.6.1 Description

This command is used by the application to set the speaker gain

21.6.2 Syntax

Action command

AT+VGR=<Rgain>

OK

Read command

AT+VGR?

+VGR: <Rgain>

OK

Test command

AT+VGR=?

+VGR: (list of supported <Rgain>s)

OK

21.6.3 Parameters and Defined Values

<Rgain>:	reception gain
	range 0-12 (default value: 6)

21.6.4 Parameter Storage

All parameters are stored in EEPROM without using the AT&W command. The default values can be restored using AT&F or AT+VIP=1.

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21.6.5 Examples

Command	Responses
AT+VGR=? *Note: Test command*	+VGR: (0-12) OK *Note: Possible values*
AT+VGR=12	OK
AT+VGR? *Note: Get current reception gain value*	+VGR: 12 OK *Note: Receive gain*

21.6.6 Notes

The value of +VGR depends of the current speaker. AT+VGR=<Rgain> returns "+CME ERROR: 3" if the current speaker value is +SPEAKER: 9 (digital speaker).

The following table gives the gain corresponding to <Rgain> values:

<Rgain>	For the gain HFR	For the receive gain EAR
0	-34 dB	-40 dB
1	-30 dB	-36 dB
2	-26 dB	-32 dB
3	-22 dB	-28 dB
4	-18 dB	-24 dB
5	-14 dB	-20 dB
6	-10 dB	-16 dB
7	-6 dB	-12 dB
8	-2 dB	-8 dB
9	2 dB	-4 dB
10	6 dB	0 dB
11	10 dB	4 dB

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21.7 Gain Control +VGT

21.7.1 Description

This command is used by the application to set the microphone gain.

21.7.2 Syntax

Action command

AT+VGT=<Tgain>

OK

Read command

AT+VGT?

+VGT: <Tgain>

OK

Test command

AT+VGT=?

+VGT: (list of supported <Tgain>s)

OK

21.7.3 Parameters and Defined Values

<Tgain>:	transmission gain
	range 0-2 (default value: 1)

21.7.4 Parameter Storage

The <Tgain> parameter is stored in EEPROM without using the AT&W command. The default value can be restored using AT&F or AT+VIP=1.

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21.7.5 Examples

Command	Responses
AT+VGT? *Note: Get current transmission gain value*	+VGT: 1 OK *Note: Default transmit gain*
AT+VGT=2	OK
AT+VGT=? *Note: Test command*	+VGT: (0-2) OK *Note: Possible values*

21.7.6 Notes

The value of +VGT does not depend on the current speaker.

AT+VGT=<Rgain> return "+CME ERROR: 3" if the current speaker value is +SPEAKER: 9 (digital speaker).

The following table gives the transmit gain values.

<Tgain>	For the transmit gain
0	7 dB
1	20 dB
2	35 dB

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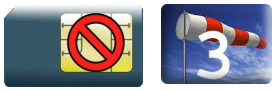
21.8 Digital Gain Control +WDGR



21.8.1 Description

This Wavecom proprietary command is used by the application to tune the receive digital gain of the speaker.

21.8.2 Syntax

Action command

AT+WDGR=<Configuration>,<Rgain>

OK

Read command

AT+WDGR?

+WDGR: <Configuration>,<Rgain>

[+WDGR: <Configuration>,<Rgain>[…]]

OK

Test command

AT+WDGR=?

+WDGR: (list of supported <Configuration>s), (list of supported <Rgain>s)

OK

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21.8.3 Parameters and Defined Values

<Configuration>:		audio configuration
	1	HWL_AUDIO_DSP_RX_PGA_CONF
	2	HWL_AUDIO_DSP_RX_VOL_CONF
<Rgain>:		reception gain range: 0-255 (default value: 64)

21.8.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command The default value can be restored using AT&F and "AT+VIP=1".

21.8.5 Examples

Command	Responses
AT+WDGR=?	+WDGR: (1-2),(0-255) OK *Note: Possible values*
AT+WDGR=1,25	OK *Note: PGA configured with a gain of 25*
AT+WDGR?	+WDGR: 1,25 +WDGR: 2,64 OK

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21.8.6 Notes

<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
0	-∞ dB (minimum)	87	2.67 dB	174	8.69 dB
1	-36.12 dB	88	2.77 dB	175	8.74 dB
2	-30.10 dB	89	2.86 dB	176	8.79 dB
3	-26.58 dB	90	2.96 dB	177	8.84 dB
4	-24.08 dB	91	3.06 dB	178	8.88 dB
5	-22.14 dB	92	3.15 dB	179	8.93 dB
6	-20.56 dB	93	3.25 dB	180	8.98 dB
7	-19.22 dB	94	3.34 dB	181	9.03 dB
8	-18.06 dB	95	3.43 dB	182	9.08 dB
9	-17.04 dB	96	3.52 dB	183	9.13 dB
10	-16.12 dB	97	3.61 dB	184	9.17 dB
11	-15.30 dB	98	3.70 dB	185	9.22 dB
12	-14.54 dB	99	3.79 dB	186	9.27 dB
13	-13.84 dB	100	3.88 dB	187	9.31 dB
14	-13.20 dB	101	3.96 dB	188	9.36 dB
15	-12.60 dB	102	4.05 dB	189	9.41 dB
16	-12.04 dB	103	4.13 dB	190	9.45 dB
17	-11.51 dB	104	4.22 dB	191	9.50 dB
18	-11.02 dB	105	4.30 dB	192	9.54 dB
19	-10.55 dB	106	4.38 dB	193	9.59 dB
20	-10.10 dB	107	4.46 dB	194	9.63 dB
21	-9.68 dB	108	4.54 dB	195	9.68 dB
22	-9.28 dB	109	4.62 dB	196	9.72 dB
23	-8.89 dB	110	4.70 dB	197	9.77 dB
24	-8.52 dB	111	4.78 dB	198	9.81 dB
25	-8.16 dB	112	4.86 dB	199	9.85 dB
26	-7.82 dB	113	4.94 dB	200	9.90 dB
27	-7.50 dB	114	5.01 dB	201	9.94 dB
28	-7.18 dB	115	5.09 dB	202	9.98 dB

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<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
29	-6.88 dB	116	5.17 dB	203	10.03 dB
30	-6.58 dB	117	5.24 dB	204	10.07 dB
31	-6.30 dB	118	5.31 dB	205	10.11 dB
32	-6.02 dB	119	5.39 dB	206	10.15 dB
33	-5.75 dB	120	5.46 dB	207	10.20 dB
34	-5.49 dB	121	5.53 dB	208	10.24 dB
35	-5.24 dB	122	5.60 dB	209	10.28 dB
36	-5.00 dB	123	5.67 dB	210	10.32 dB
37	-4.76 dB	124	5.74 dB	211	10.36 dB
38	-4.53 dB	125	5.81 dB	212	10.40 dB
39	-4.30 dB	126	5.88 dB	213	10.44 dB
40	-4.08 dB	127	5.95 dB	214	10.48 dB
41	-3.87 dB	128	6.02 dB	215	10.53 dB
42	-3.66 dB	129	6.09 dB	216	10.57 dB
43	-3.45 dB	130	6.16 dB	217	10.61 dB
44	-3.25 dB	131	6.22 dB	218	10.65 dB
45	-3.06 dB	132	6.29 dB	219	10.69 dB

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<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
46	-2.87 dB	133	6.35 dB	220	10.72 dB
47	-2.68 dB	134	6.42 dB	221	10.76 dB
48	-2.50 dB	135	6.48 dB	222	10.80 dB
49	-2.32 dB	136	6.55 dB	223	10.84 dB
50	-2.14 dB	137	6.61 dB	224	10.88 dB
51	-1.97 dB	138	6.67 dB	225	10.92 dB
52	-1.80 dB	139	6.74 dB	226	10.96 dB
53	-1.64 dB	140	6.80 dB	227	11.00 dB
54	-1.48 dB	141	6.86 dB	228	11.04 dB
55	-1.32 dB	142	6.92 dB	229	11.07 dB
56	-1.16 dB	143	6.98 dB	230	11.11 dB
57	-1.01 dB	144	7.04 dB	231	11.15 dB
58	-0.86 dB	145	7.10 dB	232	11.19 dB
59	-0.71 dB	146	7.16 dB	233	11.22 dB
60	-0.56 dB	147	7.22 dB	234	11.26 dB
61	-0.42 dB	148	7.28 dB	235	11.30 dB
62	-0.28 dB	149	7.34 dB	236	11.33 dB
63	-0.14 dB	150	7.40 dB	237	11.37 dB
64	0 dB (default)	151	7.46 dB	238	11.41 dB
65	0.13 dB	152	7.51 dB	239	11.44 dB
66	0.27 dB	153	7.57 dB	240	11.48 dB
67	0.40 dB	154	7.63 dB	241	11.52 dB
68	0.53 dB	155	7.68 dB	242	11.55 dB
69	0.65 dB	156	7.74 dB	243	11.59 dB
70	0.78 dB	157	7.79 dB	244	11.62 dB
71	0.90 dB	158	7.85 dB	245	11.66 dB
72	1.02 dB	159	7.90 dB	246	11.70 dB
73	1.14 dB	160	7.96 dB	247	11.73 dB
74	1.26 dB	161	8.01 dB	248	11.77 dB
75	1.38 dB	162	8.07 dB	249	11.80 dB
76	1.49 dB	163	8.12 dB	250	11.84 dB

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<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
77	1.61 dB	164	8.17 dB	251	11.87 dB
78	1.72 dB	165	8.23 dB	252	11.90 dB
79	1.83 dB	166	8.28 dB	253	11.94 dB
80	1.94 dB	167	8.33 dB	254	11.97 dB
81	2.05 dB	168	8.38 dB	255	12.01 dB
82	2.15 dB	169	8.43 dB		
83	2.26 dB	170	8.49 dB		
84	2.36 dB	171	8.54 dB		
85	2.46 dB	172	8.59 dB		
86	2.57 dB	173	8.64 dB		

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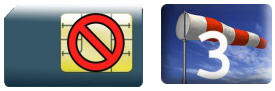
21.9 Digital Gain Control +WDGT



21.9.1 Description

This Wavecom proprietary command is used by the application to tune the transmit digital gain of the microphone.

21.9.2 Syntax

Action command

```
AT+WDGT=<Configuration>,<Tgain>
OK
```

Read command

AT+WDGT?

```
+WDGT: <Configuration>,<Tgain>
[+WDGT: <Configuration>,<Tgain>[…]]
OK
```

Test command

AT+WDGT=?

```
+WDGT: (list of supported <Configuration>s), (list of supported
<Tgain>s)
OK
```

21.9.3 Parameters and Defined Values

<Configuration>:		audio configuration
	1	HWL_AUDIO_DSP_TX_PGA_CONF
<Tgain>:		transmission gain range:default: 0-255 (default value: 64)

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21.9.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command The default value can be restored using AT&F and "AT+VIP=1".

21.9.5 Examples

Command	Responses
AT+WDGT=?	+WDGT: (1),(0-255) OK
AT+WDGT=1,45	OK *Note: Configured with a gain of -3.06dB*
AT+WDGT?	+WDGT: 1,45 OK

21.9.6 Notes

<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
0	-∞ dB (minimum)	87	2.67 dB	174	8.69 dB
1	-36.12 dB	88	2.77 dB	175	8.74 dB
2	-30.10 dB	89	2.86 dB	176	8.79 dB
3	-26.58 dB	90	2.96 dB	177	8.84 dB
4	-24.08 dB	91	3.06 dB	178	8.88 dB
5	-22.14 dB	92	3.15 dB	179	8.93 dB
6	-20.56 dB	93	3.25 dB	180	8.98 dB
7	-19.22 dB	94	3.34 dB	181	9.03 dB
8	-18.06 dB	95	3.43 dB	182	9.08 dB
9	-17.04 dB	96	3.52 dB	183	9.13 dB
10	-16.12 dB	97	3.61 dB	184	9.17 dB
11	-15.30 dB	98	3.70 dB	185	9.22 dB
12	-14.54 dB	99	3.79 dB	186	9.27 dB
13	-13.84 dB	100	3.88 dB	187	9.31 dB
14	-13.20 dB	101	3.96 dB	188	9.36 dB
15	-12.60 dB	102	4.05 dB	189	9.41 dB

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<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
16	-12.04 dB	103	4.13 dB	190	9.45 dB
17	-11.51 dB	104	4.22 dB	191	9.50 dB
18	-11.02 dB	105	4.30 dB	192	9.54 dB
19	-10.55 dB	106	4.38 dB	193	9.59 dB
20	-10.10 dB	107	4.46 dB	194	9.63 dB
21	-9.68 dB	108	4.54 dB	195	9.68 dB
22	-9.28 dB	109	4.62 dB	196	9.72 dB
23	-8.89 dB	110	4.70 dB	197	9.77 dB
24	-8.52 dB	111	4.78 dB	198	9.81 dB
25	-8.16 dB	112	4.86 dB	199	9.85 dB
26	-7.82 dB	113	4.94 dB	200	9.90 dB
27	-7.50 dB	114	5.01 dB	201	9.94 dB
28	-7.18 dB	115	5.09 dB	202	9.98 dB
29	-6.88 dB	116	5.17 dB	203	10.03 dB
30	-6.58 dB	117	5.24 dB	204	10.07 dB
31	-6.30 dB	118	5.31 dB	205	10.11 dB
32	-6.02 dB	119	5.39 dB	206	10.15 dB
33	-5.75 dB	120	5.46 dB	207	10.20 dB
34	-5.49 dB	121	5.53 dB	208	10.24 dB
35	-5.24 dB	122	5.60 dB	209	10.28 dB
36	-5.00 dB	123	5.67 dB	210	10.32 dB
37	-4.76 dB	124	5.74 dB	211	10.36 dB
38	-4.53 dB	125	5.81 dB	212	10.40 dB
39	-4.30 dB	126	5.88 dB	213	10.44 dB
40	-4.08 dB	127	5.95 dB	214	10.48 dB
41	-3.87 dB	128	6.02 dB	215	10.53 dB
42	-3.66 dB	129	6.09 dB	216	10.57 dB
43	-3.45 dB	130	6.16 dB	217	10.61 dB
44	-3.25 dB	131	6.22 dB	218	10.65 dB
45	-3.06 dB	132	6.29 dB	219	10.69 dB

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<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
46	-2.87 dB	133	6.35 dB	220	10.72 dB
47	-2.68 dB	134	6.42 dB	221	10.76 dB
48	-2.50 dB	135	6.48 dB	222	10.80 dB
49	-2.32 dB	136	6.55 dB	223	10.84 dB
50	-2.14 dB	137	6.61 dB	224	10.88 dB
51	-1.97 dB	138	6.67 dB	225	10.92 dB
52	-1.80 dB	139	6.74 dB	226	10.96 dB
53	-1.64 dB	140	6.80 dB	227	11.00 dB
54	-1.48 dB	141	6.86 dB	228	11.04 dB
55	-1.32 dB	142	6.92 dB	229	11.07 dB
56	-1.16 dB	143	6.98 dB	230	11.11 dB
57	-1.01 dB	144	7.04 dB	231	11.15 dB
58	-0.86 dB	145	7.10 dB	232	11.19 dB
59	-0.71 dB	146	7.16 dB	233	11.22 dB
60	-0.56 dB	147	7.22 dB	234	11.26 dB
61	-0.42 dB	148	7.28 dB	235	11.30 dB
62	-0.28 dB	149	7.34 dB	236	11.33 dB
63	-0.14 dB	150	7.40 dB	237	11.37 dB
64	0 dB (default)	151	7.46 dB	238	11.41 dB
65	0.13 dB	152	7.51 dB	239	11.44 dB
66	0.27 dB	153	7.57 dB	240	11.48 dB
67	0.40 dB	154	7.63 dB	241	11.52 dB
68	0.53 dB	155	7.68 dB	242	11.55 dB
69	0.65 dB	156	7.74 dB	243	11.59 dB
70	0.78 dB	157	7.79 dB	244	11.62 dB
71	0.90 dB	158	7.85 dB	245	11.66 dB
72	1.02 dB	159	7.90 dB	246	11.70 dB
73	1.14 dB	160	7.96 dB	247	11.73 dB
74	1.26 dB	161	8.01 dB	248	11.77 dB
75	1.38 dB	162	8.07 dB	249	11.80 dB
76	1.49 dB	163	8.12 dB	250	11.84 dB

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<Tgain>	Gain	<Tgain>	Gain	<Tgain>	Gain
77	1.61 dB	164	8.17 dB	251	11.87 dB
78	1.72 dB	165	8.23 dB	252	11.90 dB
79	1.83 dB	166	8.28 dB	253	11.94 dB
80	1.94 dB	167	8.33 dB	254	11.97 dB
81	2.05 dB	168	8.38 dB	255	12.01 dB
82	2.15 dB	169	8.43 dB		
83	2.26 dB	170	8.49 dB		
84	2.36 dB	171	8.54 dB		
85	2.46 dB	172	8.59 dB		
86	2.57 dB	173	8.64 dB		

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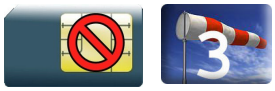
21.10 Audio Filter Command +WADF



21.10.1 Description

This Wavecom proprietary command enables/disables the high and low pass filter in TX and RX mode.

21.10.2 Syntax

Action command

AT+WADF=<mode>,<filter>[,[<param1>][,[<param2>]

[,[<param3>][,[<param4>][,[<param5>][,[<param6>][,[<param7>][,
[<param8>][,[<param9>][,[<param10>]]]]]]]]]]

```
[+WADF:
<mode>,<filter>,<param1>,<param2>,<param3>,<param4>,<param5>,
<param6>,<param7>,<param8>,<param9>,<param10>]

OK
```

Read command

AT+WADF?

```
+WADF: <mode>,<filter>,<param1>,<param2>,<param3>,
<param4>,<param5>,<param6>,<param7>,<param8>,<param9>,<param10>

[+WADF: <mode>,<filter>,<param1>,<param2>,<param3>,
<param4>,<param5>,<param6>,<param7>,<param8>,<param9>,<param10>[…]]

OK
```

Test command

AT+WADF=?

```
+WADF: (list of supported <mode>s),(list of supported <filter>s),
(list of supported <param1>s),(list of supported <param2>s),
(list of supported <param3>s),(list of supported <param4>s),
(list of supported <param5>s),(list of supported <param6>s),
(list of supported <param7>s),(list of supported <param8>s),
(list of supported <param9>s),(list of supported <param10>s)

OK
```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21.10.3 Parameters and Defined Values

<mode>:		requested operation		
	0	stop a specific filter		
	1	enable a specific filter		
	2	ask for the current parameters values of a specific filter		
<filter>:		filter type		
	1	high pass filter in TX mode		
	2	high pass filter in RX mode		
	3	low pass filter in TX mode		
	4	low pass filter in RX mode		
<param$_x$>:		filter parameters		
		range	high pass filter in TX and RX mode (default values)	low pass filter in TX and RX mode (default values)
	<param1>	0-65535	4032	0
	<param2>	0-65535	61562	0
	<param3>	0-65535	57484	0
	<param4>	0-65535	8051	0
	<param5>	0-65535	4032	4096
	<param6>	0-65535	0	0
	<param7>	0-65535	0	0
	<param8>	0-65535	61617	0
	<param9>	0-65535	3742	0
	<param10>	0-65535	3919	4096

21.10.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W.command The default value can be restored using AT&F and "AT+VIP=1".

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21.10.5 Examples

Command	Responses
AT+WADF=? *Note: Possible values*	+WADF: (0-2),(1-4),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535),(0-65535) OK
AT+WADF? *Note : Read the status and parameter values for all filters*	+WADF: 0,1,4032,61562,57484,8051,4032,0,0,61617,3742,3919 +WADF: 0,2,4032,61562,57484,8051,4032,0,0,61617,3742,3919 +WADF: 0,3,0,0,0,0,4096,0,0,0,0,4096 +WADF: 0,4,0,0,0,0,4096,0,0,0,0,4096 OK
AT+WADF=1,1,0,1,2,3,4,5,6,7,8,9 *Note: Activate the high pass filter in TX mode with params (0,1,2,3,4,5,6,7,8,9)*	OK
AT+WADF=2,1 *Note: Ask for the current params values of the high pass filter in TX mode*	+WADF: 1,1,0,1,2,3,4,5,6,7,8,9 OK
AT+WADF? *Note: Ask for the current params values of all filters*	+WADF: 1,1,0,1,2,3,4,5,6,7,8,9 +WADF: 0,2,4032,61562,57484,8051,4032,0,0,61617,3742,3919 +WADF: 0,3,0,0,0,0,4096,0,0,0,0,4096 +WADF: 0,4,0,0,0,0,4096,0,0,0,0,4096 OK
AT+WADF=1,1,9,8,7,6,5,4,3,2,1,0 *Note : Update the params value of the high pass filter in TX mode. The <mode> parameter has the current value, the activation mode will not change.*	OK

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Command	Responses
AT+WADF=2,1 *Note: Ask for the current params values of the high pass filter in TX mode*	+WADF: 1,1,9,8,7,6,5,4,3,2,1,0 OK
AT+WADF=1,1,,,,,,,,,,30 *Note : Update <param10> of the high pass filter in TX mode using the current <mode> value without changing the others parameters*	OK
AT+WADF=2,1 *Note: Ask for the current params values of the high pass filter in TX mode*	+WADF: 1,1,9,8,7,6,5,4,3,2,1,30 OK
AT+WADF=0,1 *Note: Stop the high pass filter in TX mode*	OK

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21.11 Echo Cancellation +ECHO

21.11.1 Description

This Wavecom proprietary command enables/disables the echo cancellation modes.

21.11.2 Syntax

Action command
AT+ECHO=<mode>[,<echo>[,[<param1>][,[<param2>][,[<param3>][,[<param4>][,[<param5>][,[<param6>][,[<param7>][,[<param8>][,[<param9>][,[<param10>][,[<param11>][,[<param12>][,[<param13>][,[<param14>][,[<param15>][,[<param16>][,[<param17>][,[<param18>][,[<param19>][,[<param20>][,[<param21>][,[<param22>][,[<param23>][,[<param24>]]]]]]]]]]]]]]]]]]]]]]]]]
OK

Read command
AT+ECHO?
+ECHO: <mode>,<echo>,<param1>,<param2>,<param3>,<param4>,<param5>,<param6>,<param7>,<param8>,<param9>,<param10>,<param11>,<param12>,<param13>,<param14>,<param15>,<param16>,<param17>,<param18>,<param19>,<param20>,<param21>,<param22>,<param23>,<param24>
OK

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Test command

AT+ECHO=?

```
+ECHO: (list of supported <mode>s),(list of supported <echo>s),(list
of supported <param1>s),(list of supported <param2>s),(list of
supported <param3>s),(list of supported <param4>s),(list of
supported <param5>s),(list of supported <param6>s),(list of
supported <param7>s),(list of supported <param8>s),(list of
supported <param9>s),(list of supported <param10>s),(list of
supported <param11>s),(list of supported <param12>s),(list of
supported <param13>s),(list of supported <param14>s),(list of
supported <param15>s),(list of supported <param16>s),(list of
supported <param17>s),(list of supported <param18>s),(list of
supported <param19>s),(list of supported <param20>s),(list of
supported <param21>s),(list of supported <param22>s),(list of
supported <param23>s),(list of supported <param24>s)

OK
```


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21.11.3 Parameters and Defined Values

<mode>:		echo activation mode
	0	stop
	1	enable
<echo>:		echo mode 8 bit field The range is 1-255.
	1 (bit 0)	echo canceller
	2 (bit 1)	dynamic echo suppressor
	4 (bit 2)	noise suppression
	8 (bit 3)	confort noise injection
	16 (bit 4)	extra suppression of non-linear echoes
	32 (bit 5)	internal use
	64 (bit 6)	internal use
	128 (bit 7)	non-linear preprocessing of the far-end signal.
<param1>:		range 160-270 (default value : 254)
<param2>:		range 12 to 200 (default value : 200)
<param3>:		range 0 to 32767 (default value : 8192)
<param4>:		range 0 to 32767 (default value : 128)
<param5>:		range 0 to 2 (default value : 1)
<param6>:		range 0 to 32767 (default value : 328)
<param7>:		range 0 to 32767 (default value : 16384)
<param8>:		range 0 to 32767 (default value : 29491)
<param9>:		range 0 to 32767 (default value : 7951)
<param10>:		range 0 to 32767 (default value : 26214)
<param11>:		range 0 to 32767 (default value : 984)
<param12>:		range 0 to 32767 (default value : 512)
<param13>:		range 0 to 32767 (default value : 512)
<param14>:		range 0 to 32767 (default value : 256)
<param15>:		range 0 to 32767 (default value : 128)
<param16>:		range 0 to 32767 (default value : 256)
<param17>:		range 0 to 32767 (default value : 400)

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<param18>:	range 0 to 32767 (default value : 10922)
<param19>:	range 0 to 32767 (default value : 2048)
<param20>:	range 0 to 32767 (default value : 8192)
<param21>:	range 0 to 32767 (default value : 256)
<param22>:	range 0 to 32767 (default value : 2048)
<param23>:	range 0 to 32767 (default value : 32767)
<param24>:	range 0 to 255 (default value : 64)

21.11.4 Parameter Storage

All parameters are stored in EEPROM without using the AT&W command. The default values can be restored using AT&F or AT+VIP=1.

21.11.5 Examples

Command	Responses
AT+ECHO=0,1,160,12,3,4,0,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24 *Note : Deactivate the echo canceller echo mode with parameters*	OK
AT+ECHO? *Note: Current values*	+ECHO: 0,1,160,12,3,4,0,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24 OK
AT+ECHO=1,159 *Note: Activate all echo modes without changing the current parameters*	OK
AT+ECHO? *Note: Current values*	+ECHO: 1,159,160,12,3,4,0,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24 OK

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Command	Responses
AT+SPEAKER? *Note: Current speaker*	+SPEAKER: 1 OK
AT+SPEAKER=2 *Note: Change the speaker*	OK
AT+ECHO? *Note: Current values*	+ECHO: 1,159,160,12,3,4,0,6,7,8,9,10, 11,12,13,14,15,16,17,18,19,20, 21,22,23,24 OK *Note: the echo cancellation is taken into account for the new speaker*
AT+ECHO=? *Note: Possible values*	+ECHO: (0-1),(1-255),(160-270),(12-200),(0-32767),(0-32767),(0-2),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-32767),(0-255) OK
AT+VIP=1 *Note : Reinitialize the default values*	OK
AT+ECHO? *Note: Current values*	+ECHO: 0,127,254,200,8192,128,1,328,16384,29491,7951,26214,984,512,512,256,128,256,400,10922,2048,8192,256,2048,32767,64 OK

21.11.6 Notes

The parameters are common to all echo modes.

The echo parameters can be updated without changing the activation mode using the current <mode> value.

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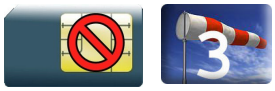
21.12 Wavecom Voice Rate +WVR



21.12.1 Description

This Wavecom proprietary command allows the voice rate for bearer voice to be configured for outgoing and incoming calls.

21.12.2 Syntax

Action command

AT+WVR=[<out_coding_type>][,<in_coding_type>]

OK

Read command

AT+WVR?

+WVR: <out_coding_type>,<in_coding_type>

OK

Test command

AT+WVR=?

+WVR: (list of supported <out_coding_type>s),(list of supported <in_coding_type>s)

OK

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21.12.3 Parameters and Defined Values

<out_coding_type>		voice outgoing call coding type, see following table	
		Preferred type	Other supported types
	0	FR	
	1	EFR	FR
	2	HR	FR
	3	FR	HR
	4	HR	EFR
	5	EFR	HR
	6	AMR-FR	EFR, AMR-HR
	7 (default value)	AMR-FR	EFR, AMR-HR, HR
	8	AMR-HR	HR, AMR-FR, EFR
	9	AMR-HR	AMR-FR, EFR
	10	AMR-HR	AMR-FR, FR
	11	AMR-HR	HR, AMR-FR
	12	AMR-FR	AMR-HR
	13	AMR-FR	FR, AMR-HR
	14	AMR-FR	FR, AMR-HR, HR
<in_coding_type>:		voice incoming call coding type, see <out_coding_type> for possible values	

21.12.4 Parameter Storage

The <out_coding_type> and <in_coding_type> parameters are stored in EEPROM without using the AT&W command..

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21.12.5 Examples

Command	Responses
AT+WVR=?	+WVR: (0-14),(0-14) *Note: HR, EFR and AMR available*
AT+WVR=1 *Note: Configures voice type FR and EFR for outgoing calls only*	OK *Note: Bearer is configured for outgoing calls*
AT+WVR=1,4 *Note: Configures voice type FR and EFR for outgoing calls and HR and EFR for incoming calls*	OK *Note: Bearer is configured for outgoing and incoming calls*
AT+WVR=,4 *Note: Configures voice type HR and EFR for incoming calls*	OK *Note: Bearer is unchanged for outgoing calls and configured for incoming calls*
AT+WVR? *Note: Asks for the current values*	+WVR: 1,4 OK

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21.13 DTMF Signals +VTD

21.13.1 Description

The product enables the user application to send DTMF tones over the GSM network. This command is used to define tone duration.

21.13.2 Syntax

Action command

AT+VTD=<n>

OK

Read command

AT+VTD?

+VTD: <n>

OK

Test command

AT+VTD=?

+VTD: (list of supported <n>s)

OK

21.13.3 Parameters and Defined Values

<n>:	length of tones emitted as a result of the +VTS command, in units of 100 ms integer type Value zero (default value) causes a tone duration of 70 ± 5 ms, according to 3GPP 23.014 [11] . The value used is modulo 256.

21.13.4 Parameter Storage

None.

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21.13.5 Examples

Command	Responses
AT+VTD=6 *Note: Define 600 ms tone duration*	OK
AT+VTD? *Note: Get current tone duration*	+VTD: 6 OK
AT+VTD=?	+VTD: (0-255) OK

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21.14 DTMF Signals +VTS

21.14.1 Description

The product enables the application to send DTMF tones over the GSM network. This command enables tones to be transmitted, only when there is an active call.

21.14.2 Syntax

Action command
AT+VTS=<Tone>
OK

Read command
None

Test command
AT+VTS=?
+VTS: (list of supported <Tone>s)
OK

21.14.3 Parameters and Defined Values

<Tone>:	DTMF tone to transmit values are in {0-9,*,#,A,B,C,D}

21.14.4 Parameter Storage

None.

21.14.5 Examples

Command	Responses
AT+VTS=?	+VTS: (0-9,*,#,A,B,C,D) OK
AT+VTS="A"	OK

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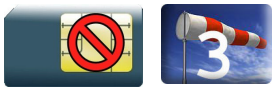
21.15 Play tone +WTONE



21.15.1 Description

This Wavecom proprietary command allows a tone to be played on the current speaker or on the buzzer.

21.15.2 Syntax

Action command
AT+WTONE=<mode>[,<dest>,<freq>[,[<gain>][,[<duration>][,<freq2>[,<gain2>]]]]]
OK

Read command
None

Test command
AT+WTONE=?
OK

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21.15.3 Parameters and Defined Values

<mode>:		tone activation/deactivation	
	0	stop playing	
	1	play a tone	
<dest>:		destination setting	
	1	speaker	
	2	buzzer	
<freq>:		tone frequency (in Hz)	
	1-3999	If <dest>=1 (speaker)	
	1-50000	If <dest>=2 (buzzer)	
<gain>:		tone gain for the <freq> default value if omitted: 9	
		speaker (dB)	**buzzer (dB)**
	1	0	-0.25
	2	-0.5	-0.5
	3	-1	-1
	4	-1.5	-1.5
	5	-2	-2
	6	-3	-3
	7	-6	-6
	8	-9	-9
	9	-15	-15
	10	-18	-18
	11	-24	-24
	12	-30	-30
	13	-36	-40
	14	-42	-∞
	15	-∞	-∞
<freq2>:		2nd tone frequency (in Hz) optional if <mode>=1 only available with the speaker	
	1-3999	speaker	

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<gain2>:		tone gain for the <freq2> same values as <gain>
<duration>:		tone duration (in 100 ms units)
	0-50	default value if omitted: 0 When <duration>=0, the duration is up to 21 minutes, and the tone can be stopped by AT+WTONE=0

21.15.4 Parameter Storage

None

21.15.5 Examples

Command	Responses
AT+WTONE=1,1,300,9,50 *Note: Play a tone*	OK *Note: Done*
AT+WTONE=0 *Note: Stop playing*	OK *Note: Done*
AT+WTONE=1,1,300,9,50,600,9 *Note: Play a tone with 2 frequencies (allowed only with the speaker)*	OK *Note: Done*

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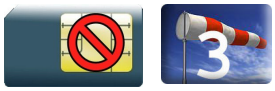
21.16 Play DTMF tone +WDTMF



21.16.1 Description

This Wavecom proprietary command allows a DTMF tone to be played on the current speaker.

21.16.2 Syntax

Action command

AT+WDTMF=<mode>[,<dtmf>[,[<gain>][,<duration>]]]

OK

Read command

None

Test command

AT+WDTMF=?

+WDTMF: (list of supported <mode>s),(list of supported <dtmf>s),(list of supported <gain>s),(list of supported <duration>s)

OK

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21.16.3 Parameters and Defined Values

<mode>:		tone activation/deactivation
	0	stop playing
	1	play a DTMF tone
<dtmf>:		DTMF to be played (mandatory if <mode>=1) range: {0-9,*,#,A,B,C,D}
<gain>:		tone gain for the <dtmf>. integer type default value if omitted: 9. The values are identical to those of the +WTONE (speaker) command. See table in §21.15.3.
<duration>:		tone duration (in 100 ms units)
	0-50	default value if omitted: 0 When <duration>=0, the duration is infinite, and the DTMF tone can be stopped by AT+WDTMF=0

21.16.4 Parameter Storage

None.

21.16.5 Examples

Command	Responses
AT+WDTMF=? *Note: Possible values.*	+WDTMF: (0-1),(0-9,*,#,A,B,C,D),(0-15),(0-50) OK
AT+WDTMF=1,"*",9,50 *Note: Play a DTMF tone*	OK
AT+WDTMF=0 *Note: Stop playing*	OK

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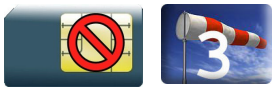
21.17 Set Standard Tone +WSST



21.17.1 Description

This Wavecom proprietary command allows to set/get the sound level of the standard tones.

21.17.2 Syntax

Action command

AT+WSST=<sound level>[,<ring tone level>]

AT+WSST=[<sound level>],<ring tone level>

OK

Read command

AT+WSST?

+WSST: <sound level>,<ring tone level>

OK

Test command

AT+WSST=?

+WSST: (list of supported <sound level>s),(list of supported <ring tone level>s)

OK

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21.17.3 Parameters and Defined Values

<sound level>:	sound level range: 0-15 maximum volume: 0 (default value)
<ring tone level>:	ring tone level range: 0-15 maximum volume: 0 (default value)

21.17.4 Parameter Storage

The parameters are stored in EEPROM without using the AT&W command.

21.17.5 Examples

Command	Responses
AT+WSST=? *Note: Get supported parameters*	+WSST: (0-15),(0-15) OK
AT+WSST=15 *Note: Set volume to minimum*	OK
AT+WSST=,5 *Note: Set ring tone level to 5*	OK
AT+WSST? *Note: Get current standard tones sound level*	+WSST: 15,5 OK *Note: Current standard tones level is 15 (minimum) and ring tone level is 5*

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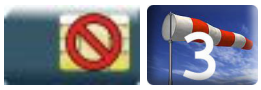
21.18 Ring Melody Playback +CRMP



21.18.1 Description

This command associates a manufacturer defined melody to an incoming voice, data or fax call. For incoming voice, data or fax calls, a choice of 10 melodies can be played back and repeated.

For an incoming short message, 2 manufacturer-defined sounds can be played (once). Melody #1: short beep / Melody #2: long beep.

21.18.2 Syntax

Action command

AT+CRMP=<call type>[,[<volume>][,[<type>][,<index>]]]

OK

Read command

AT+CRMP?

OK

Test command

AT+CRMP=?

+CRMP: (list of supported <call type>s),(list of supported <volume>s),(list of supported <type>s),(list of supported <index>s)

OK

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21.18.3 Parameters and Defined Values

<call type>:		call type
	0	incoming voice call
	1	incoming data call
	2	incoming fax call
	3	incoming short message (SMS)
<volume>:		volume
	0-15	min: 0 max 15 default value: 6
<type>:		melody type
	0	manufacturer defined (default value if omitted)
<index>:		melody index
	0	stop melody playback
	1-10	melody ID (default value if omitted: 1) Range of values is 1 to 10 for voice/data/fax call type, and 1 to 2 for short messages.

21.18.4 Parameter Storage

None.

21.18.5 Examples

Command	Responses
AT+CRMP=0,7,0,2 *Note: Play voice call melody index 2 with volume level 7.*	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),(0-15),0,(0-10) OK

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21.18.6 Notes

Loop melodies (for voice/data/fax call) must be stopped by a +CRMP command with the <index> field set to 0 (example: AT+CRMP=0,,,0).

When the <volume> parameter is given, this overwrites the <sound level> value of the +CRSL command. If the <volume> parameter is not given, the <sound level> value of +CRSL is used as default value.

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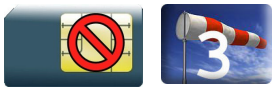
21.19 Wavecom Change Default Melody +WCDM



21.19.1 Description

This Wavecom proprietary command allows the selection of a manufacturer specific melody. This default melody will be played for any new incoming voice call, either on the buzzer or on the speaker.

21.19.2 Syntax

Action command

AT+WCDM=<melody>[,<player>]

AT+WCDM=[<melody>],<player>

OK

Read command

AT+WCDM?

+WCDM: <melody>,<player>

OK

Test command

AT+WCDM=?

+WCDM: (list of supported <melody>s),(list of supported <player>s)

OK

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21.19.3 Parameters and Defined Values

<melody>:		melody number
	0	no melody (default value)
	1-10	melody 1 to 10
<player>:		output used to play the melody
	0	The melody will be played on the buzzer for any new incoming voice call. (default value)
	1	The melody will be played on the speaker for any new incoming voice call.

21.19.4 Parameter Storage

The parameters are stored in EEPROM without using AT&W.command The default values can be restored using AT&F.

21.19.5 Examples

Command	Responses
AT+WCDM=?	+WCDM: (0-10),(0-1) OK
AT+WCDM=5 *Note: Select melody #5*	OK
AT+WCDM? *Note: Indicate the current melody*	+WCDM: 5,0 OK *Note: Melody #5 is currently selected, and the buzzer is selected to play it. An incoming call occurs, and the melody #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: The speaker is selected to play the melody if an incoming call occurs.*

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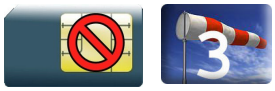
21.20 Wavecom Change Default Player +WCDP



21.20.1 Description

This Wavecom proprietary command allows the default melody player to be selected.

21.20.2 Syntax

Action command

AT+WCDP=<player>

OK

Read command

AT+WCDP?

+WCDP: <player>

OK

Test command

AT+WCDP=?

+WCDP: (list of supported <player>s)

OK

21.20.3 Parameters and Defined Values

<player>:		output selected to play the melody
	0	buzzer (default value)
	1	speaker

21.20.4 Parameter Storage

The <player> parameter is stored in EEPROM without using the AT&W.command The default value can be restored using AT&F.

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21.20.5 Examples

Command	Responses
AT+WCDP=?	+WCDP: (0-1) OK
AT+WCDP=0 *Note: Selects the buzzer*	OK
AT+WCDP?	+WCDP: 0 OK

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21.21 Initialize Voice Parameters +VIP

21.21.1 Description

This command allows factory settings for voice parameters to be restored from EEPROM.

These voice parameters include:

- gain control (+VGR & +VGT commands),
- speaker & microphone selection (+SPEAKER command),
- echo cancellation (+ECHO command),
- side tone modification (+SIDET command),
- digital gain (+WDGT, +WDGR commands),
- audio filter (+WADF command),
- loudspeaker volume level (+CLVL command).

21.21.2 Syntax

Action command
AT+VIP=<n>
OK

Read command
AT+VIP?
+VIP: <n>
OK

Test command
AT+VIP=?
+VIP: (list of supported <n>s)
OK

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21.21.3 Parameters and Defined Values

<n>:		initialization setting
	1	restore all voice parameters

21.21.4 Parameter Storage

None.

21.21.5 Examples

Command	Responses
AT+VIP=?	+VIP: (1) OK
AT+VIP=1 *Note: Restore the factory settings from EEPROM*	OK
AT+VIP?	+VIP: 1 OK

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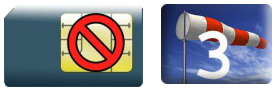
21.22 Auto-tests &T



21.22.1 Description.

This command allows to trigger various auto-tests.

21.22.2 Syntax

Action command
AT&T[<n>]
OK

Read command
None

Test command
None

21.22.3 Parameters and Defined Values

<n>:		auto-test activation parameter
	0	perform software auto-tests
	1	execute the audio loop test (close)
	2	stop the audio loop test (open)

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21.22.4 Parameter Storage

None.

21.22.5 Examples

Command	Responses
AT&T0 *Note: Perform software auto-tests*	OK *Note: No software problem detected, all checksums are correct*

21.22.6 Notes

Caution:

The audio loop activation (enabled with AT&T1 command, disabled with AT&T2 command) involves some restrictions on the use of other AT commands.

- Audio loop mode must not be enabled when a communication is active.
- Audio loop mode must not be enabled when a tone is under generation.
- Audio loop must be disabled (if active) before opening a communication;
- Tone generation and sidetone modification must not be possible when the audio loop is active.

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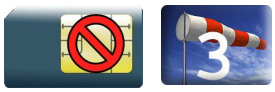
22 I/O Commands

22.1 Input/Output Management +WIOM



22.1.1 Description

This Wavecom proprietary command allows to set the default GPIOs configuration (input or output) after reset, and each GPIO default value (if set as an output) after reset.

22.1.2 Syntax

Action command

AT+WIOM=<Gpiold>,<GpioDir>[,<GpioVal>]

OK

Read command

AT+WIOM?

+WIOM: <Gpiold>,<GpioDir>[,<GpioVal>]

[+WIOM: <Gpiold>,<GpioDir>[,<GpioVal>][...]]

OK

Test command

AT+WIOM=?

+WIOM: (list of supported <Gpiold>s),(list of supported <GpioDir>s),(list of supported <GpioVal>s)

OK

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22.1.3 Parameters and Defined Values

<GpioId>:		GPIO Index range: 1-44
<GpioDir>:		I/O direction or configuration
	0	input (default value)
	1	output
	2	used by a feature (only in read mode)
<GpioVal>:		I/O state
	0	<GpioId> is reset/low
	1	<GpioId> is set/high

22.1.4 Parameter Storage

The <GpioDir> and <GpioVal> parameters are stored in EEPROM without using the AT&W command.

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22.1.5 Examples

Command	Responses
AT+WIOM=?	+WIOM: (1-44),(0-2),(0-1) OK
AT+WIOM?	+WIOM: 1,0 +WIOM: 2,0 +WIOM: 3,2 +WIOM: 4,2 +WIOM: 5,2 +WIOM: 6,2 +WIOM: 7,2 +WIOM: 8,2 +WIOM: 9,2 +WIOM: 10,2 +WIOM: 11,2 +WIOM: 12,2 +WIOM: 13,2 +WIOM: 14,0 +WIOM: 15,0 +WIOM: 16,0 +WIOM: 17,0 +WIOM: 18,2 +WIOM: 19,0 +WIOM: 20,0 +WIOM: 21,0 +WIOM: 22,0 +WIOM: 23,0 +WIOM: 24,0 +WIOM: 25,2 +WIOM: 26,0 +WIOM: 27,0 +WIOM: 28,0 +WIOM: 29,0 +WIOM: 30,0 +WIOM: 31,0 +WIOM: 32,0 +WIOM: 33,0 +WIOM: 34,0 +WIOM: 35,0 +WIOM: 36,2 +WIOM: 37,2

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Command	Responses
	+WIOM: 38,2 +WIOM: 39,2 +WIOM: 40,2 +WIOM: 41,2 +WIOM: 42,2 +WIOM: 43,2 +WIOM: 44,0 OK *Note: GPIO 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 18, 25, 36, 37, 38, 39, 40, 41, 42, 43 are used by a feature. All others are configured as inputs*
AT+WIOM=1,1,1	OK *Note: Configures the GPIO 1 as output with the default value to high*
AT+WIOM?	+WIOM: 1,1,1 +WIOM: 2,0 +WIOM: 3,2 +WIOM: 4,2 +WIOM: 5,2 +WIOM: 6,2 +WIOM: 7,2 +WIOM: 8,2 +WIOM: 9,2 +WIOM: 10,2 +WIOM: 11,2 +WIOM: 12,2 +WIOM: 13,2 +WIOM: 14,0 +WIOM: 15,0 +WIOM: 16,0 +WIOM: 17,0 +WIOM: 18,2 +WIOM: 19,0 +WIOM: 20,0 +WIOM: 21,0 +WIOM: 22,0 +WIOM: 23,0 +WIOM: 24,0 +WIOM: 25,2 +WIOM: 26,0

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Command	Responses
	+WIOM: 27,0 +WIOM: 28,0 +WIOM: 29,0 +WIOM: 30,0 +WIOM: 31,0 +WIOM: 32,0 +WIOM: 33,0 +WIOM: 34,0 +WIOM: 35,0 +WIOM: 36,2 +WIOM: 37,2 +WIOM: 38,2 +WIOM: 39,2 +WIOM: 40,2 +WIOM: 41,2 +WIOM: 42,2 +WIOM: 43,2 +WIOM: 44,0 OK *Note: The GPIO 1 is now as output*
AT+WIOM=3,0	OK *Note: The GPIO 3 is used by a feature but it can be configurable and this state will be updated when the feature associated to this GPIO is deactivated*
AT+WIOM=1,0	OK *Note: The GPIO 1 is configured as input*

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22.1.6 Notes

This Wavecom proprietary command is allowed on a GPIO even if it is allocated by the Open AT® embedded application or by a feature. When the application or the feature associated to this GPIO is deactivated, the new configuration is applied

When a GPIO is used by a feature, it is not available anymore. When writable or readable operations are attempted on these GPIO, +CME_ERROR: 3 will be returned.

<GpioVal> parameter is not displayed, if the GPIO direction is input or if the GPIO is used by a feature.

If a GPIO is set as input (<GpioDir>=0), the parameter <GpioVal> is forbidden.

On Q2686 Wireless CPU, the following GPIOs are available :

<GpioId>	Q2686 Pin Names	Multiplexed with
1	GPIO 1	Not mux
2	GPIO 2	Not mux
3	GPIO 3	INT0
4	GPIO 4	Keyboard COL0
5	GPIO 5	Keyboard COL1
6	GPIO 6	Keyboard COL2
7	GPIO 7	Keyboard COL3
8	GPIO 8	Keyboard COL4
9	GPIO 9	Keyboard ROW0
10	GPIO 10	Keyboard ROW1
11	GPIO 11	Keyboard ROW2
12	GPIO 12	Keyboard ROW3
13	GPIO 13	Keyboard ROW4
14	GPIO 14	UART 2
15	GPIO 15	UART 2
16	GPIO 16	UART 2
17	GPIO 17	UART 2
18	GPIO 18	SIMPRES
19	GPIO 19	Not mux
20	GPIO 20	Not mux
21	GPIO 21	Not mux

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22	GPIO 22	Not mux
23	GPIO 23	Not mux
24	GPIO 24	Not mux
25	GPIO 25	INT1
26	GPIO 26	SCL (I2C Bus)
27	GPIO 27	SDA (I2C Bus)
28	GPIO 28	SPI 1 Bus
29	GPIO 29	SPI 1 Bus
30	GPIO 30	SPI 1 Bus
31	GPIO 31	SPI 1 Bus
32	GPIO 32	SPI 2 Bus
33	GPIO 33	SPI 2 Bus
34	GPIO 34	SPI 2 Bus
35	GPIO 35	SPI 2 Bus
36	GPIO 36	UART 1
37	GPIO 37	UART 1
38	GPIO 38	UART 1
39	GPIO 39	UART 1
40	GPIO 40	UART 1
41	GPIO 41	UART 1
42	GPIO 42	UART 1
43	GPIO 43	UART 1
44	GPIO 44	Not mux

A GPIO can be used as input or output if it is not used by an external feature:

- the keyboard can be activated/deactivated using +WHCNF command,
- the UART1 & UART2 can be activated/deactivated using +WMFM command,
- the SIMPRES can be activated/deactivated using +WFM command (SIMREMOVE feature),
- the interruption pins (INT0 and INT1) are activated/deactivated using +WFM command (NO_INTERRUPT, INTERRUPT, OFFWHENUNPLUG features),
- the I2C, SPI1 & SPI2 buses are only available using an Open AT® application.

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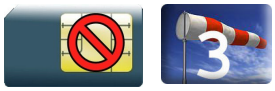
22.2 Read GPIO value +WIOR



22.2.1 Description

This Wavecom proprietary command reads the requested GPIO state.

This Wavecom proprietary command is allowed only on an input GPIO not allocated by an Open AT® embedded application or by a feature.

22.2.2 Syntax

Action command
AT+WIOR=<Gpiold>
+WIOR: <GpioVal>
OK

Read command
None

Test command
AT+WIOR=?
OK

22.2.3 Parameters and Defined Values

<Gpiold>:		GPIO Index range: 1-44
<GpioVal>:		I/O state
	0	<Gpiold> is reset/low
	1	<Gpiold> is set/high

22.2.4 Parameter Storage

None.

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22.2.5 Examples

Command	Responses
AT+WIOR=1 *Note: Reads I/O (number 1) value*	+WIOR: 0 OK *Note: GPIO number 1 is reset/low*

22.2.6 Notes

By default (e.g. after a reset), the I/O ports configuration is set by the +WIOM command.

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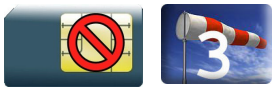
22.3 Write GPIO value +WIOW



22.3.1 Description

This Wavecom proprietary command sets the requested GPIO state.

This command is allowed only on an output GPIO not allocated by an Open AT® embedded application or by a feature.

22.3.2 Syntax

Action command

AT+WIOW=<Gpiold>,<GpioVal>

OK

Read command

None

Test command

AT+WIOW=?

OK

22.3.3 Parameters and Defined Values

<Gpiold>:		GPIO Index range: 1-44
<GpioVal>:		I/O state
	0	<Gpiold> is reset/low
	1	<Gpiold> is set/high

22.3.4 Parameter storage

None.

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22.3.5 Examples

Command	Responses
AT+WIOW=2,0 *Note: Sets I/O (number 2) to low*	OK *Note: GPIO state is written*

22.3.6 Notes

By default (e.g. after a reset), the I/O ports configuration is set by the +WIOM command.

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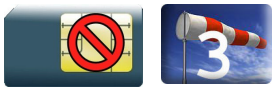
22.4 Wavecom Interrupt Pin Configuration +WIPC



22.4.1 Description

This Wavecom proprietary command configures an interrupt pin as an interruption or an I/O pin.

On the Wireless CPU, two interruption pins are available : INT0 (multiplexed with GPIO3) and INT1(multiplexed with GPIO25).

22.4.2 Syntax

Action command

AT+WIPC=<InterruptId>,<Mode>[,<EdgeState>[,[<ProcessingMode>[,<DebounceTiming>]]]

OK

Read command

AT+WIPC?

+WIPC: <InterruptId>,<Mode>[,<EdgeState>,<ProcessingMode>[,<DebounceTiming>]]

[+WIPC: <InterruptId>,<Mode>[,<EdgeState>,<ProcessingMode>[,<DebounceTiming>]][…]]

OK

Test command

AT+WIPC=?

+WIPC: (list of supported <InterruptId>s), (list of supported <Mode>s), (list of supported <EdgeState>s), (list of supported <ProcessingMode>s), (list of supported <DebounceTiming>s)

OK

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22.4.3 Parameters and Defined Values

<InterruptId>:		interrupt pin identification
	0	interrupt INT0
	1	interrupt INT1
<mode>:		requested configuration
	0	the PIN is configured as GPIO
	1	the PIN is configured as Interruption (default)
<EdgeState>:		interruption raising mode
	0	interruption happens with high to low edge (default)
	1	interruption happens with low to high edge
	2	interruption happens with both edge (high to low and low to high edge): de-bounce processing is applied
<ProcessingMode>:		
	0	de-bounce (default)
	1	by pass
	2	stretching
<DebounceTiming>:		de-bounce duration in units of 7.8 ms
	1-7	default value: 1

22.4.4 Parameter Storage

The <mode>, <EdgeState>, <processingMode> and <DebounceTiming> parameters are stored in EEPROM without using the AT&W command.

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22.4.5 Examples

Command	Responses
AT+WIOM?	+WIOM: 1,0 +WIOM: 2,0 +WIOM: 3,2 +WIOM: 4,2 +WIOM: 5,2 +WIOM: 6,2 +WIOM: 7,2 +WIOM: 8,2 +WIOM: 9,2 +WIOM: 10,2 +WIOM: 11,2 +WIOM: 12,2 +WIOM: 13,2 +WIOM: 14,0 +WIOM: 15,0 +WIOM: 16,0 +WIOM: 17,0 +WIOM: 18,2 +WIOM: 19,0 +WIOM: 20,0 +WIOM: 21,0 +WIOM: 22,0 +WIOM: 23,0 +WIOM: 24,0 +WIOM: 25,2 +WIOM: 26,0 +WIOM: 27,0 +WIOM: 28,0 +WIOM: 29,0 +WIOM: 30,0 +WIOM: 31,0 +WIOM: 32,0 +WIOM: 33,0

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Command	Responses
	+WIOM: 34,0 +WIOM: 35,0 +WIOM: 36,2 +WIOM: 37,2 +WIOM: 38,2 +WIOM: 39,2 +WIOM: 40,2 +WIOM: 41,2 +WIOM: 42,2 +WIOM: 43,2 +WIOM: 44,0 OK *Note: GPIO 3,4,5,6,7,8,9,10,11,12,13,18,25,36,37,38,39,40,41,42,43 are used by a feature. All others are configured as inputs.*
AT+WIPC?	+WIPC: 0,1,0,0,1 +WIPC: 1,1,0,0,1 OK *Note: By default, GPIO3/INT0 and GPIO25/INT1 are configured as interruption pins (high to low edge, de-bounce processing mode with a duration equal to 7.8 ms)*
AT+WIND=2048 *Note : Interrupt on INT0* *Note : Interrupt on INT1*	OK *Note: Activate the +WIND indications for interruption* +WIND: 12,0 +WIND: 12,1
AT+WIPC=1,0	OK *Note: Configure GPIO25/INT1 as GPIO. Only GPIO3/INT0 is configured as interruption pin*
AT+WIPC?	+WIPC: 0,1,0,0,1 +WIPC: 1,0 OK *Note: GPIO25/INT1 is configured as GPIO*
AT+WIPC=0,1,0,1 *Note: the parameter <ProcessingMode> is set to by-pass*	OK

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Command	Responses
AT+WIPC?	+WIPC: 0,1,0,1 +WIPC: 1,0 OK

22.4.6 Notes

When the INTERRUPT or OFFWHENUNPLUG feature is activated, the two interrupt pins can be configured independently as interrupt pin or GPIO.

When the NOINTERRUPT feature is activated, the two interrupt pins are configured as GPIOs even if the value returned by AT+WIPC? is not equal to 0.

The value returned by AT+WIPC? indicates the interrupt pins configuration when the INTERRUPT or OFFWHENUNPLUG is activated.

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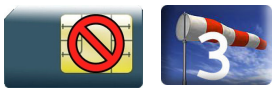
23 Battery Commands

23.1 Analog digital converters measurements +ADC



23.1.1 Description

This Wavecom proprietary command retrieves the measurements of ADC A, ADC B, ADC C and ADC D in mV.

23.1.2 Syntax

Action command

None

Read command

AT+ADC?

+ADC: <ADCValA>,<ADCValB>,<ADCValC>[,<ADCValD>]

OK

Test command

AT+ADC=?

OK

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23.1.3 Parameters and Defined Values

<ADCValA>:	battery (VBATT pin) voltage (in mV) integer value
<ADCValB>:	battery temperature (BAT_TEMP pin) range: 0-2000 (in mV)
<ADCValC>:	auxiliairy pin (ADC_AUX) voltage for customer usage range: 0-2000 (in mV)
<ADCValD>	PA_TEMP : Wireless CPU temperature (Power Amplifier) range: 0-2000 (in mV) available for Q2687 only

23.1.4 Parameter Storage

None.

23.1.5 Examples

Command	Responses
AT+ADC=? *Note: Asks for the list of possible values*	OK
AT+ADC? *Note: Asks for the current values for Q2686*	+ADC: 3500,412,520 OK *Note: Adc A, Adc B, Adc C*
AT+ADC? *Note: Asks for the current values for Q2687*	+ADC: 3500,412,520,812 OK *Note: Adc A, Adc B, Adc C and Adc D*

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23.2 Wavecom Battery Charge Management +WBCM

23.2.1 Description

This Wavecom proprietary command is used to manage the battery charging operations (start and stop the charge, enable or disable unsolicited +WBCI battery charge Indications) and to set the battery charge parameters.

Note:

Unsolicited responses for battery charge are only returned through one port (except +WBCI: 0 and +WBCI: 1). If these responses are already activated on a port and if the activation/deactivation is made on another port, the command will return "+CME ERROR: 552" specific error.

23.2.2 Syntax

- For <Mode>=0 or 1:

Action command
AT+WBCM=<Mode>[,<ChargeInd>]
OK

- For <Mode>=2:

AT+WBCM=<Mode>
+WBCI: <Status1>,<BattLevel>
OK

- For <Mode>=3, <ChargeMode>=0:

Action command
AT+WBCM=<Mode>[,[<ChargeInd>][,[<BattLevelMax>], [<BattLevelMin>],[<TPulseInCharge>], [<WBCITimer>],[<BattIntRes>, [<BattChangeLevel>]]]]
OK

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- For <Mode>=3, <ChargeMode>=1:

Action command
AT+WBCM=<Mode>[,[<ChargeInd>][,[<TimeDeltaTempMeas>], **[<BattLevelMax>],[<BattLevelMin>],[<VoltPulseMax>],** **[<BatteryTempMaxVolt>,[<BatteryTempMinVolt>],[<Charging_Current>],** **[<DedicatedVoltStart>],[<BatteryPulseChargingTimeout>],** **[<BatteryFastChargingTimeout>],<WBCITimer>],** **[<BattIntRes>,[<BattChangeLevel>]]]**
OK

- For <Mode>=4:

Action command
AT+WBCM=<Mode>[,<ChargeMode>]
[+WBCM: <Mode>,<ChargeMode>]
OK

- For <ChargeMode>=0:

Read command
AT+WBCM?
+WBCM: <Mode>,<ChargeInd>,<BattLevelMax>,<BattLevelMin>, <TPulseInCharge>,<TPulseOutCharge>,<BattIntRes>,<BattLevelFilter>
OK

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- For <ChargeMode>=1:

Read command

AT+WBCM?

```
+WBCM: <Mode>,<ChargeInd>,<TimeDeltaTempMeas>,<BattLevelMax>
<BattLevelMin>,<VoltPulseMax>,<BatteryTempMaxVolt>,
<BatteryTempMinVolt>,<Charging_Current>,<DedicatedVoltStart>,
BatteryPulseChargingTimeout>,<BatteryFastChargingTimeout>,
<WBCITimer>,<BattIntRes>,<BattChangeLevel>
OK
```

Test command

AT+WBCM=?

```
OK
```


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23.2.3 Parameters and Defined Values

<mode>:		requested operation
	0	stop the battery charging (default).
	1	start the battery charging
	2	get the current battery voltage
	3	set the battery charge parameters
	4	choose the type of charging
<ChargeInd>:		battery charge unsolicited indication mode
	0	disable the battery charge unsolicited indications (default value)
	1	enable the battery charge unsolicited indications.
	2	enable the extended battery charge unsolicited indications
<ChargeMode>:		charging algorithm
	0	NI-CD, NI-MH
	1	Li-ion
	2	get the charging algorithm
<BattLevelMax>:		maximum level for the battery voltage in mV When reached, the battery is considered as charged range: 3800-4300 (default value: 4200)
<BattLevelMin>:		minimum level for the battery voltage in mV When reached, the battery is considered as discharged and the product is turned off (with the +CPOF command behavior) range: 3200-3800 (default value: 3200)
<TPulseInCharge>:		time in ms between pulses for the pulsed charge range: 100-10000 (default value: 100)
< WBCITimer >:		time in ms between +WBCI unsolicited responses in or out of charge (for <ChargeInd>=1) range: 1000-10000 (default value: 2000)
<BattIntRes>:		useless

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<BattChangeLevel>:	battery changed level in mV The +WBCI: 3 indication only occurs if battery level has reached this value range: 100-500 (default value: 0) For value 0, +WBCI indication is not filtered with battery level changes
<TimeDeltaTempMeas>:	Delta time (Dt) interval in mn to measure battery Delta Temperature (DT) range: 1-5 (default value: 3)
<BattLevelMax>:	maximum level for the battery voltage in mV When reached, the battery is considered as charged. range: 3800-4300 (default value: 4200) cannot be changed during the battery charging (when <Mode>=1)
<BattLevelMin>:	minimum level for the battery voltage in mV When reached, the battery is considered as discharged and the product is turned off (with the +CPOF command behavior). range: 3200-3800 (default value: 3200) cannot be changed during the battery charging (when <Mode>=1)
<VoltPulseMax>:	charging pulse maximum voltage in mV It represents the maximum over-voltage supported by the battery PCM (Protection Circuit Module) range: 4200-4608 (default value: 4608)
<BatteryTempMaxVolt>:	highest value for battery temperature sensor voltage in mV (lowest temperature with a NTC) with an accuracy of +/-20mv, depending on the ADC tolerance default value: 1438 (3°C)
<BatteryTempMinVolt>:	lowest value for battery temperature sensor voltage in mV (highest temperature with a NTC) with an accuracy of +/-20mv, depending on the ADC tolerance default value: 601 (42°C)
<ChargingCurrent>:	useless
<DedicatedVoltStart:	useless

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<BatteryPulseChargingTimeout>:		maximum duration in minutes of the pulse charging range: 60-90 (default value: 90)
<BatteryFastChargingTimeout>:		maximum duration in minutes of the constant current charge range: 60-90 (default value: 90)
<Status1>:		battery status returned by AT+WBCM=2 command
	2	battery currently in charge, the <BattLevel> parameter is also present
	3	battery currently out of charge, the <BattLevel> parameter is also present

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<Status2>:		battery status returned as +WBCI unsolicited response
	0	minimum battery level reached. The battery is considered as discharged The product is turned off (as with the +CPOF command) if a charger is not plugged. Else the charge automatically begins not dependent on the parameter <ChargeInd>
	1	maximum battery level reached (the battery is considered as charged) or charging discontinuation The battery charging is stopped not dependent on the parameter <ChargeInd>
	2	battery currently in charge, the <BattLevel> parameter is also present
	3	battery currently out of charge, the <BattLevel> parameter is also present
	4	charger has been plugged, appears only when <ChargeInd> is set to 2
	5	charger has been unplugged, appears only when <ChargeInd> is set to 2
	6	unusual voltage or temperature (Li-ion charging algorithm only), appears only when <ChargeInd> is set to 2
<BattLevel>:		current battery voltage in mV during or out of charging range: 2800-4300

23.2.4 Parameter Storage

All parameters except <Status> and <BattLevel> are stored in EEPROM without using the AT&W.command The default value can be restored using AT&F.

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23.2.5 Example

Command	Responses
AT+WBCM?	+WBCM: 0,0,4200,3500,100,5000,0,200 OK *Note: Current values (depend on ChargeMode parameter); in this case, the charging mode is Ni-Cd/Ni-MH*
AT+WBCM=0 *Note: Stop the battery charging*	OK
AT+WBCM=4,0 *Note: Configure the battery charging in Ni-Cd/Ni-MH mode*	OK
AT+WBCM=1,1 *Note: Start the battery charging with charge indications*	OK
	+WBCI: 2,4060 *Note: Unsolicited charge indication: the current battery voltage is 4.06 V.*
AT+WBCM=1,1 *Note: Start the battery charging with charge indications on another port*	+CME ERROR: 552 *Note: The charge indications are already activated on another port.*
AT+WBCM=1,0 *Note: Start the battery charging without charge indications*	OK
AT+WBCM=4,2 *Note: Get the charging mode*	+WBCM: 4,0 OK *Note: The charging mode is Ni-Cd/Ni-MH*

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Command	Responses
AT+WBCM=2 *Note: Get the battery voltage during the charging*	+WBCI: 2,4110 OK *Note: The current battery voltage is 4.11 V*
	+WBCI: 1 *Note: The battery voltage has reached the max level. The battery is considered as charged and the charging is stopped.*
AT+WBCM=0,1 *Note: Enable the battery charge unsolicited indications out of charge*	OK
	+WBCI: 3,4195 *Note: The current battery voltage is 4.195 V.*
AT+WBCM=3,0,4200,,500,3000,0,500 *Note: Configure the battery charging parameters (depends on ChargeMode parameter); in this case the charging mode is Ni-Cd/Ni-MH*	OK
	+WBCI: 0 *Note: The battery voltage has reached the minimum level. The battery is considered as discharged. If a charger is not plugged, the product is turned off, with the +CPOF command behavior. Else the charge automatically begins.*

23.2.6 Notes

Please check charger and battery recommendations.

If the battery charging is started without charger plugged or with an abnormal temperature or voltage, the charging does not start. +WBCI: 3 unsolicited indications are sent. After solving the anomaly, it is necessary to start again the battery charging.

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<BatteryTempMaxVolt> indicative temperature values:

°C	mV	°C	mV	°C	mV
0	1495	5	1399	10	1293
1	1477	6	1378	11	1271
2	1458	7	1357	12	1249
3	1438	8	1336	13	1226
4	1419	9	1315	14	1203

These values are obtained with the NTC equal to the Pull-up (Wavecom recommends 100K) and the NTC is polarized with the VCC_1V8 signal. Please refer to the battery application note and the Customer Design Guidelines for more information

<BatteryTempMinVolt> indicative temperature values:

°C	mV	°C	mV	°C	mV
31	817	36	714	41	619
32	796	37	694	42	601
33	775	38	675	43	584
34	754	39	656	44	567
35	734	40	637	45	550

These values are obtained with the NTC equal to the Pull-up (Wavecom recommends 100K) and the NTC is polarized with the VCC_1V8 signal. Please refer to the battery application note and the Customer Design Guidelines for more information

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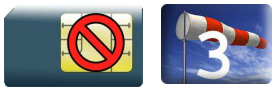
23.3 Wavecom Autodiag +WDIAG



23.3.1 Description

This Wavecom proprietary command enables to control the Wireless CPU self diagnostic.

23.3.2 Syntax

Action command

AT+WDIAG=
<type>,<mode>[,<period>,<trig1>,<trig2>,<trig3>,<trig3_freq>]

OK

Read command

AT+WDIAG?

+WDIAG:
<type>,<mode>,<period>,<trig1>,<trig2>,<trig3>,<trig3_freq>

OK

Test command

AT+WDIAG=?

OK

Unsolicited response

+WDIAGI: <type>,<indication>[,<value>]

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23.3.3 Parameters and Defined Values

<type >:		ADC type
	0	battery voltage autodiag (default value)
	1	ADC auxiliary autodiag
	2	Wireless CPU temperature (Power Amplifier) in mV (available for Q2687 only)
<mode>:		selfdiagnostic activation mode
	0	stop (default value)
	1	start
<period>:		period of ADC reading in seconds
	0	best effort, approximately 50 readings per second (default value)
	1 - 3600	fixed period in seconds
<trig1>:		minimum threshold When this threshold is reached, unsolicited response +WDIAGI is sent to the user application.
	0	trigger deactivated (default value)
	3200 - 4300	threshold in mV (for <type> = 0)
	100 - 2000	threshold in mV (for <type> = 1 or 2)
<trig2>:		maximum threshold When this threshold is reached, unsolicited response +WDIAGI is sent to the user application.
	0	trigger deactivated (default value)
	3200 - 4300	threshold in mV (for <type> = 0)
	100 - 2000	threshold in mV (For <type> = 1 or 2)
<trig3>:		delta threshold When the delta of the last <trig3freq> ADC readings exceeds the threshold, unsolicited response +WDIAGI is sent to the user application.
	0	trigger deactivated (default value)
	10 - 3000	threshold in mV
<trig3_freq>:		number of last values used for the delta calculation
	0	5 (default value)
	1	10
	2	20

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<indication>:		type of event
	0	current value (not available in best effort mode)
	1	ADC value is under the minimum threshold value (<trig1>)
	2	ADC value is above the minimum threshold value (<trig1>) (only after an unsolicited response with <indication>=1)
	3	ADC value is under the maximum threshold value (<trig2>)
	4	ADC value is under the maximum threshold value (<trig2>) (only after an unsolicited response with <indication>=3)
	5	The delta between two values among the <trig3freq> last values is more important than the delta threshold value (<trig3>)
<value>:		ADC value in mV range: 1-8000 for <indication> = 0: the current ADC value for <indication> = 2: the minimum ADC value read while the minimum threshold has been exceeded. for <indication> = 4: the maximum ADC value read while the maximum threshold has been exceeded. for <indication> = 5: the delta ADC value read

23.3.4 Parameter Storage

The parameters are stored in EEPROM using the AT&W.command The default value can be restored using AT&F.

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23.3.5 Examples

Command	Responses
AT+WDIAG=0,1,0,3000,4000,0 *Note: ADC selfdiagnostic start in "best effort" for a min and a max trig*	OK *Note: Done*
AT+WDIAG? *Note: Current value*	+WDIAG: 0,1,0,3000,4000,0,0 OK *Note: Done*
AT+WDIAG=0,1,60,0,0,50,0 *Note: ADC selfdiagnostic start with a 60s frequency for a delta trig*	OK *Note: Done*
AT+WDIAG? *Note: Current value*	+WDIAG: 0,1,60,0,0,50,0 OK *Note: Done*
AT+WDIAG=0,0 *Note: ADC selfdiagnostic stop*	OK *Note: Done*

23.3.6 Notes

Unsolicited responses for self diagnostic are only returned through one port. If these responses are already activated on a port and if the activation is made on another port, the command will return "+CME ERROR: 552" specific error.

Values over 4650 mV are not used

After a +WBCI=0 indication (minimum battery level reached), the selfdiagnostic is stopped.

Only one <type> can be activated at the same time.

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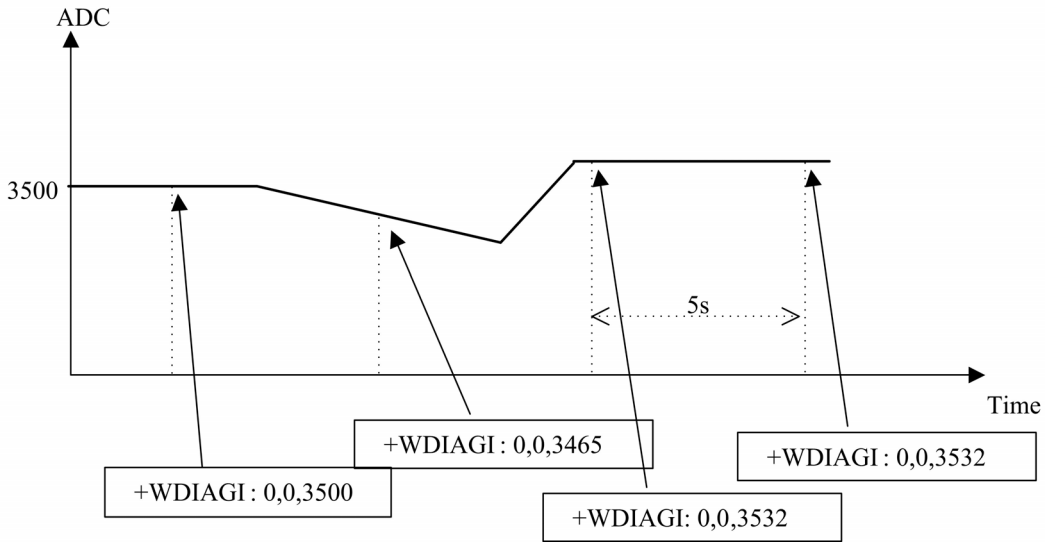
Examples of selfdiagnostic feature behaviour

- Example 1

AT+WDIAG=0,1,5,0,0,0,0

Note: ADC selfdiagnostic started with a 5s period.



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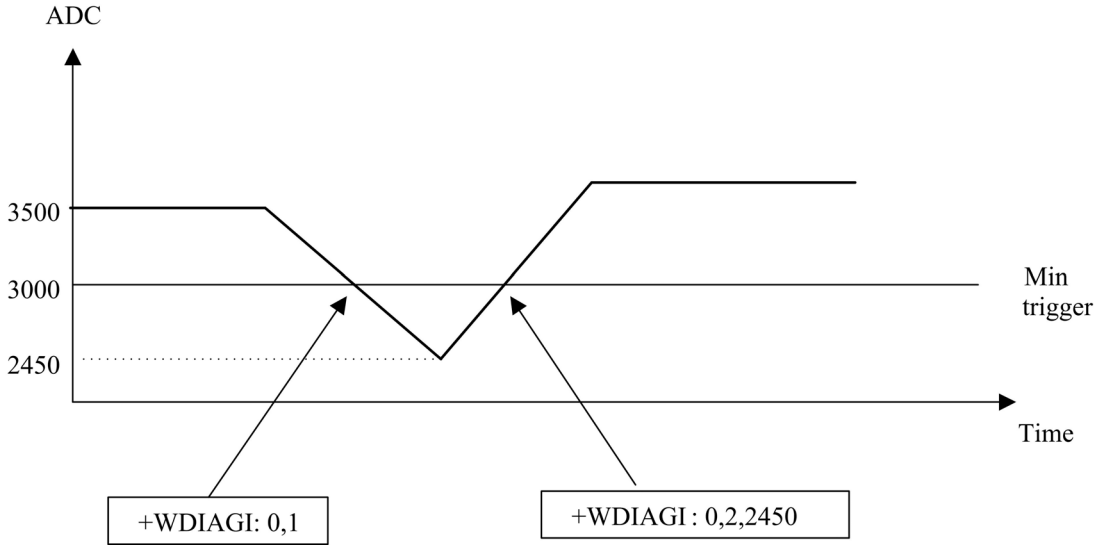
- Example 2

AT+WDIAG=0,1,0,3000,0,0,0

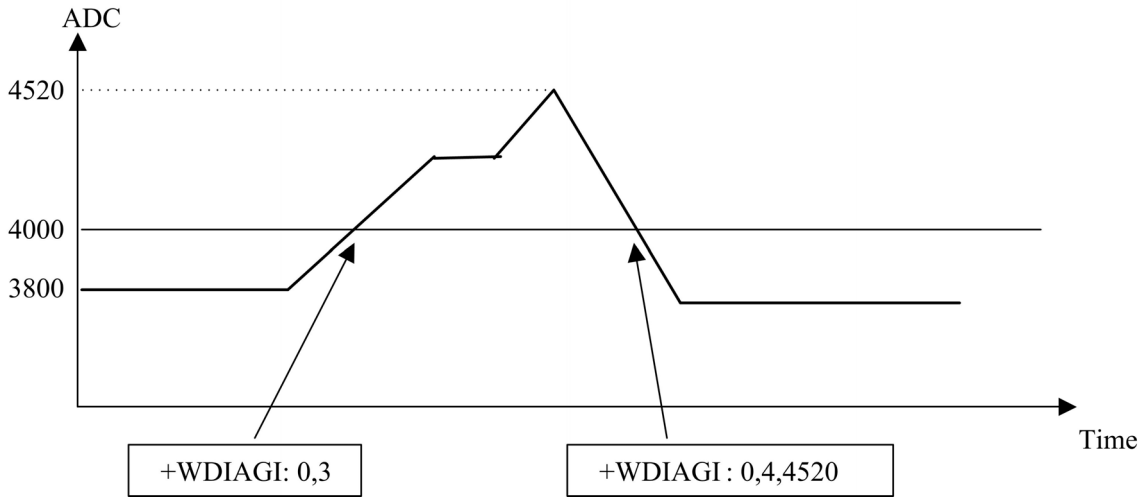
Note: ADC selfdiagnostic started in "best effort" with a 3000 mV minimum threshold.



- Example 3

AT+WDIAG=0,1,0,0,4000,0,0

Note: ADC selfdiagnostic started in "best effort" with a 4000 mV maximum threshold



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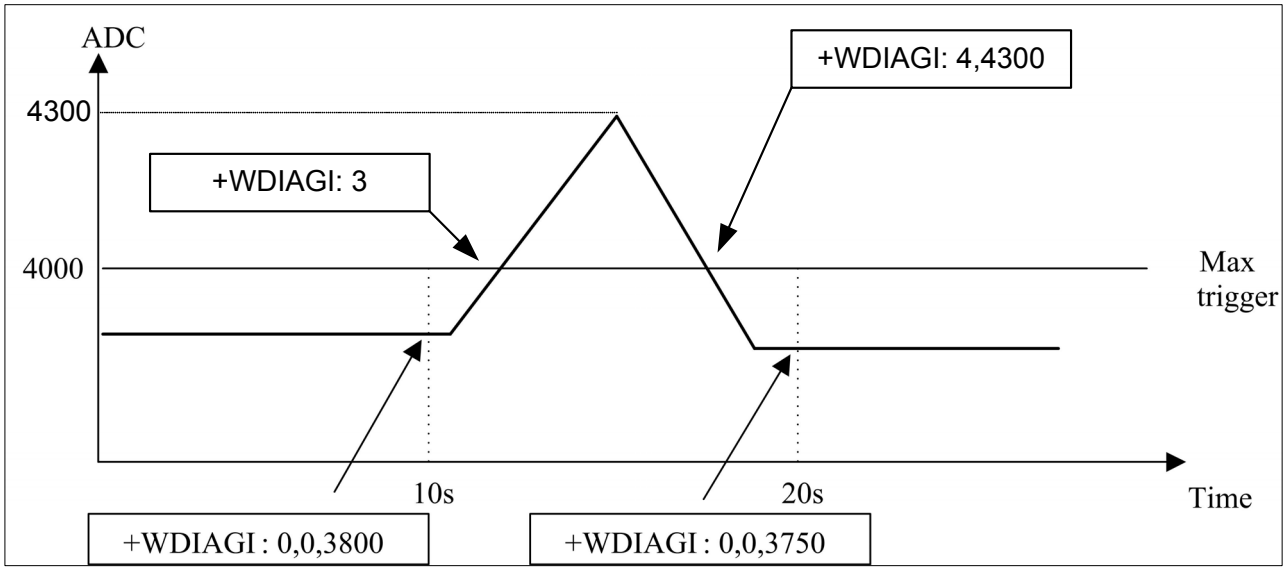
- Example 4

AT+WDIAG=0,1,10,0,4000,0,0

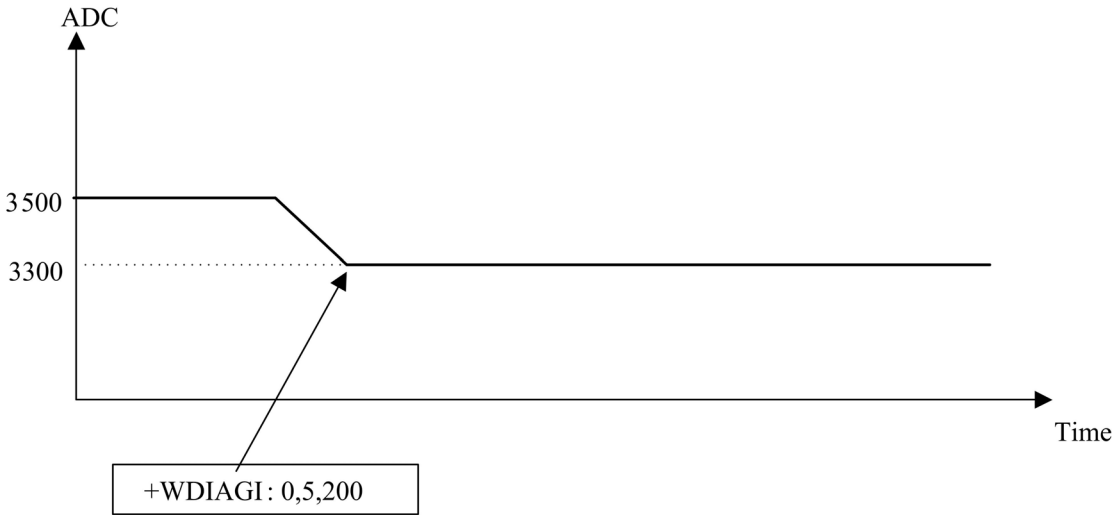
Note: ADC selfdiagnostic started with a 10s period for a 4000 mV maximum threshold.



- Example 5

AT+WDIAG=0,1,0,0,0,100,1

Note: ADC selfdiagnostic started in "best effort" with a 100 mV delta threshold.



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24 CPHS Commands

24.1 CPHS Command: +CPHS

24.1.1 Description

This Wavecom proprietary command is used to activate, deactivate or interrogate a CPHS feature (e.g. voice mail indicator, mail box number...)

It also activates the following unsolicited responses:

- +WMVI which indicates the status of the LINE 1, LINE 2, DATA or FAX mailboxes.
- +WDCI which provides the call forwarding flags.

24.1.2 Syntax

- For <Mode>=0 or 1:

Action command
AT+CPHS=<Mode>,<FctId>
OK

- For <Mode>=2 and <FctId>=1:

Action command
AT+CPHS=<Mode>,<FctId>
+WVMI: <LineId>,<VoiceMailStatus>
[+WVMI: <LineId>,<VoiceMailStatus>[…]]
OK

- For <Mode>=2 and <FctId>=2:

Action command
AT+CPHS=<Mode>,<FctId>
+WMBN: <Lineld>,[<number>],[<type>],[<name>],<NumberStatus>
[+WMBN: <Lineld>,[<number>],[<type>],[<name>],<NumberStatus>[…]]
OK

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- For <Mode>=2 and <FctId>=3:

Action command
AT+CPHS=<Mode>,<FctId>
+WALS: <Lineld>
OK

- For <Mode>=2 and <FctId>=4:

Action command
AT+CPHS=<Mode>,<FctId>
+WDCI: <LineId>,<DivertedStatus>
[+WDCI: <LineId>,<DivertedStatus>[…]]
OK

- For <Mode>=2 and <FctId>=5:

Action command
AT+CPHS=<Mode>,<FctId>[,<type format>]
+WNON: <type format>,<operator name>
OK

- For <Mode>=2 and <FctId>=6:

Action command
AT+CPHS=<Mode>,<FctId>[,<data field>]
+WCPI: <data field>,<InfoStatus>
OK

- For <Mode>=2 and <FctId>=7:

Action command
AT+CPHS=<Mode>,<FctId>,<Service>
+WCSP: <Service>,<ServiceStatus>
OK

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Read command

AT+CPHS?

+CPHS: <FctId>[,<Status>]

[+CPHS: <FctId>[,<Status>][…]]

OK

Test command

AT+CPHS=?

OK

Unsolicited response

+WVMI: <LineId>,<VoiceMailStatus>

Unsolicited response

+WDCI: <LineId>,<DivertedStatus>

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24.1.3 Parameters and Defined Values

<Mode>:		requested operation this parameter has not effect for alternate line service, Network Operator Name, CPHS information and Customer Profile Service features (<FctId>=3,5,6,7). default value: 0 for <FctId>=1,2,4
	0	deactivate a CPHS feature
	1	activate a CPHS feature
	2	interrogate a CPHS status
< FctId>:		CPHS feature CPHS feature the Customer Service Profile and Alternate Line Service features are activated if the field is set in CPHS information and CSP files. The Network Operator Name is activated if at least one of the two format names exist (long or short format).This is done at initialization.
	1	voice mail indicator
	2	mail box number
	3	alternate line service
	4	diverted call indicator
	5	network operator name
	6	CPHS Information
	7	Customer Service Profile
<Status>:		CPHS feature state
	0	disabled
	1	enabled
<LineId>:		line identity
	1	line 1
	2	line 2
	3	data
	4	fax

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<VoiceMailStatus>:		voice mail status
	0	no message waiting
	1	at least one message is waiting
<number>:		phone number in ASCII format string type
<type>:		TON/NPI address byte
	129	national number
	145	international number
<name>:		name of mailbox string type the +WPCS command affects the format of the mailbox <name> entry the maximum length is SIM dependent
<NumberStatus>:		Indicates if <number> can be updated or not
	0	update is not possible
	1	update is possible
<DivertedStatus>:		divert Call Status
	0	disabled
	1	enabled
<type format>:		<operator name> format
	0	long format (default value)
	1	short format
<operator name>:		operator name string type
<data field>:		CPHS information field bit number range: 0-25 (default value if omitted: 0) If <data field> field is equal to 0, the whole CPHS information field will be displayed in <InfoStatus> parameter Please refer to section “CPHS information field” in the appendices

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<InfoStatus>:		CPHS information field status
	0	service is not customer-accessible
	1	service is customer-accessible
	"xxxxxxxx"	whole CPHS information bit field hexadecimal string (8 digits)
<Service>:		CSP field bit number range: 1-81 Please refer to section “CSP constants” in the appendices.
<ServiceStatus>:		CSP bit status
	0	service is not customer-accessible
	1	service is customer-accessible

24.1.4 Parameter Storage

The <Mode> parameter is stored in EEPROM without using the AT&W.command The default value can be restored using AT&F.

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24.1.5 Examples

Command	Responses
AT+CPHS? *Note: Interrogate the status of CPHS functionality*	+CPHS: 1,0 *Note: The voice mail indicator functionality is deactivated* +CPHS: 2,0 *Note: The mail box number functionality is deactivated* +CPHS: 3,1 *Note: The alternate line service functionality is activated* +CPHS: 4,0 *Note: The divert call indicator functionality is deactivated* +CPHS: 5,1 *Note: The network operator name functionality is activated* +CPHS: 6,1 *Note: The CPHS information functionality is activated* +CPHS: 7,1 *Note: The customer service profile functionality is activated* OK
AT+CPHS=1,1 *Note: Activate the voice mail indicator functionality*	OK

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Command	Responses
AT+CPHS? *Note: Interrogate the status of CPHS functionality*	+CPHS: 1,1 *Note: The voice mail indicator functionality is activated* +CPHS: 2,0 *Note: The mail box number functionality is deactivated* +CPHS: 3,1 *Note: The alternate line service functionality is activated* +CPHS: 4,0 *Note: The divert call indicator functionality is deactivated* +CPHS: 5,1 *Note: The network operator name functionality is activated* +CPHS: 6,1 *Note: The CPHS information functionality is activated* +CPHS: 7,1 *Note: The customer service profile functionality is activated* OK
	+WVMI: 1,1 *Note: A message is waiting on line 1* +WVMI: 2,1 *Note: A message is waiting on line 2*
AT+CPHS=1,4 *Note: Activate the divert call indicator functionality* ***** The call forwarding is active on line 1 ******	OK +WDCI: 1,1 *Note: Call forwarding is activated on line 1*

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Command	Responses
AT+CPHS=2,1 *Note: Interrogate the status of voice mail indicator functionality*	+WVMI: 1,1 *Note: A message is waiting on line 1* +WVMI: 2,1 *Note: a message is waiting on line 2* +WVMI: 3,0 *Note: No data waiting* +WVMI: 4,0 *Note: No fax waiting* OK
AT+CPHS=1,2 *Note: Activate the mail box number functionality*	OK
AT+WALS=1 *Note: Interrogate the status of activated line*	+WALS: 2 OK *Note: The current line is number 2*
AT+CPHS=0,4 *Note: Deactivate the divert call indicator functionality*	OK

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Command	Responses
AT+CPHS? *Note: Interrogate the status of CPHS functionality*	+CPHS: 1,1 *Note: The voice mail indicator functionality is activated* +CPHS: 2,1 *Note: The mail box number functionality is activated* +CPHS: 3,1 *Note: The alternate line service functionality is activated* +CPHS: 4,0 *Note: The divert call indicator functionality is deactivated* +CPHS: 5,1 *Note: The network operator name functionality is activated* +CPHS: 6,1 *Note: The CPHS Information functionality is activated* +CPHS: 7,1 *Note: The Customer Service Profile functionality is activated* OK
AT+CPHS=2,2 *Note: Get current values*	+WMBN: 1,"19254871234",129,,1 *Note: Mail box number for line 1* +WMBN: 2,,,1 *Note: Mail box number for line 2* +WMBN: 3,,,1 *Note: Mail box number for data line* +WMBN: 4,,,1 *Note: Mail box number for fax line* OK *Note: Only line1 can be updated*
AT+CPHS=2,5 *Note: Get the operator name*	+WNON: 0,"Orange F" OK

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Command	Responses
AT+CPHS=2,7,9 *Note: Get the current status for barring of all outgoing calls*	+WCSP: 9,1 OK *Note: Barring of all outgoing calls is customer accessible.*
AT+CPHS=2,6 *Note: Get the current status for all CPHS info field*	+WCPI: 0,"0033000F" OK
AT+CPHS=2,6,13 *Note: Get the current status for call forward activated indicator for line 1*	+WCPI: 13,1 OK

24.1.6 Note

This command may answer "+CME ERROR: 3" if the CPHS feature is disabled or if the SIM card does not support this CPHS feature.

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24.2 Wavecom CPHS Mail Box Number +WMBN

24.2.1 Description

This Wavecom proprietary command sets the different mailbox numbers in SIM. The +CPHS command can be used to know which mailbox numbers can be updated.

24.2.2 Syntax

Action command

AT+WMBN=<Lineld>[,<number>,[<type>],[<name>]]

OK

Read command

AT+WMBN?

OK

Test command

AT+WMBN=?

OK

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24.2.3 Parameters and Defined Values

<LineId>:		line associated to the mailbox
	1	line 1
	2	line 2
	3	data
	4	fax
<number>:		phone number ASCII format up to 20 digits
<type>:		TON/NPI address byte
	129	national number
	145	international number
<name>:		name of mailbox string type the +WPCS command affects the format of the mailbox <name> entry. the maximum length is SIM dependent.

24.2.4 Parameter Storage

None.

24.2.5 Examples

Command	Responses
AT+CPHS=2,2 *Note: Gets the current mail box numbers in SIM*	+WMBN:1,"0123456789",129,"Home",1 +WMBN:2,"9876543210",129,"Work",1 +WMBN:3,,,,1 +WMBN:4,,,,1 OK
AT+WMBN=1,"+0033122334455",145 *Note: Sets mailbox number for line 1*	OK *Note: Mailbox number for line 1 is set*
AT+WMBN=2 *Note: Erases mailbox number & name for line 2*	OK

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Command	Responses
AT+CPHS=2,2 *Note: Gets the current mail box numbers again*	+WMBN: 1,"+33122334455",145,,1 +WMBN: 2,,,,,1 +WMBN: 3,,,,,1 +WMBN: 4,,,,,1 OK

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24.3 Wavecom Alternate Line Service: +WALS

24.3.1 Description.

This Wavecom proprietary command allows to set and to get an active line. The +CPHS command can be used to know which line is activated.

24.3.2 Syntax

Action command

AT+WALS=<CmdType>[,<Lineld>]

[+WALS: <Lineld>]

OK

Read command

AT+WALS?

+WALS: <Lineld>

OK

Test command

AT+WALS=?

+WALS: (list of supported <CmdType>s),(list of supported <Lineld>s)

OK

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24.3.3 Parameters and Defined Values

<CmdType>:		requested operation
	0	sets active line
	1	gets active line
<LineId>:		line number used only with <CmdType>=0
	1	line 1
	2	line 2

24.3.4 Parameter Storage

The <LineId> parameter is stored in EEPROM without using the AT&W.command

24.3.5 Examples

Command	Responses
AT+WALS=?	+WALS: (0-1),(1-2) OK
AT+WALS=0,1 *Note: Activate line 1*	+WALS:1 OK
AT+WALS=1 *Note: Get the current activated line*	+WALS:1 OK
AT+CPHS? *Note: Get the current activated line*	+WALS:1 OK

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25 Fax Commands

25.1 Introduction

The fax service provided by the product is class 1 compliant. However, only the core commands defined by ITU T.31 are supported. This means that commands such as AT+FAR, +FCC, etc. are not supported.

Autobauding must be enabled to set up the product for fax.

All the following commands return an ERROR response code if they are not issued during communication.

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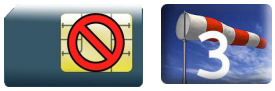
25.2 Transmit Speed +FTM



25.2.1 Description

This command sets the fax transmit speed.

25.2.2 Syntax

Action command

AT+FTM=<speed>

OK

Read command

None

Test command

AT+FTM=?

(list of supported <speed>s)

OK

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25.2.3 Parameters and Defined Values

<speed>:		fax transmit speed
	24	2400 bps (modem type V.27ter)
	48	4800 bps (modem type V.27ter)
	72	7200 bps (modem type V.29)
	73	7200 bps (long) (modem type V.17)
	74	7200 bps (short) (modem type V.17)
	96	9600 bps (modem type V.29)
	97	9600 bps (long) (modem type V.17)
	98	9600 bps (short) (modem type V.17)
	121	12000 bps (long) (modem type V.17)
	122	12000 bps (short) (modem type V.17)
	145	14400 bps (long) (modem type V.17)
	146	14400 bps (short) (modem type V.17)

25.2.4 Parameter Storage

None.

25.2.5 Examples

Command	Responses
AT+FTM=145 *Note: Set fax speed at 14400 bps for a V.17 type modem*	OK
AT+FTM=? *Note: Get possible values*	(24,48,72,73,74,96,97,98,121,122,145,146) OK

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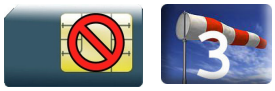
25.3 Receive Speed +FRM



25.3.1 Description

This command sets the fax receive speed.

25.3.2 Syntax

Action command
AT+FRM=<speed>
OK

Read command
None

Test command
AT+FRM=?
(list of supported <speed>s)
OK

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25.3.3 Parameters and Defined Values

<speed>:		fax receive speed
	24	2400 bps (modem type V.27ter)
	48	4800 bps (modem type V.27ter)
	72	7200 bps (modem type V.29)
	73	7200 bps (long) (modem type V.17)
	74	7200 bps (short) (modem type V.17)
	96	9600 bps (modem type V.29)
	97	9600 bps (long) (modem type V.17)
	98	9600 bps (short) (modem type V.17)
	121	12000 bps (long) (modem type V.17)
	122	12000 bps (short) (modem type V.17)
	145	14400 bps (long) (modem type V.17)
	146	14400 bps (short) (modem type V.17)

25.3.4 Parameter Storage

None.

25.3.5 Examples

Command	Responses
AT+FRM=? *Note: Get possible values*	(24,48,72,73,74,96,97,98,121,122,145,146) OK
AT+FRM=145 *Note: Set fax speed at 14400 bps for a V.17 type modem*	OK

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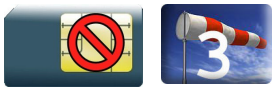
25.4 HDLC Transmit Speed +FTH



25.4.1 Description

This command sets the fax transmit speed using the HDLC protocol.

25.4.2 Syntax

Action command
AT+FTH=<speed>
OK

Read command
None

Test command
AT+FTH=?
(list of supported <speed>s)
OK

25.4.3 Parameters and Defined Values

<speed>:		HDLC fax transmit speed
	3	V.21 channels 300 bps

25.4.4 Parameter Storage

None.

25.4.5 Examples

Command	Responses
AT+FTH=3 *Note: Set fax speed at 300 bps*	OK
AT+FTH=? *Note: Get possible values*	(3) OK

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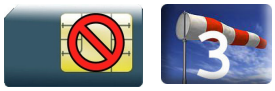
25.5 HDLC Receive Speed +FRH



25.5.1 Description

This command sets the fax receive speed using the HDLC protocol.

25.5.2 Syntax

Action command
AT+FRH=<speed>
OK

Read command
None

Test command
AT+FRH=?
(list of supported <speed>s)
OK

25.5.3 Parameters and Defined Values

<speed>:		HDLC fax receive speed
	3	V.21 channels 300 bps

25.5.4 Parameter Storage

None.

25.5.5 Examples

Command	Responses
AT+FRH=3 *Note: Set fax speed at 300 bps*	OK
AT+FRH=? *Note: Get possible values*	(3) OK

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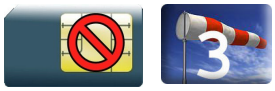
25.6 Stop Transmission and Wait +FTS



25.6.1 Description

This command stops the transmission for a specified period.

25.6.2 Syntax

Action command
AT+FTS=<n>
OK

Read command
None

Test command
AT+FTS=?
(list of supported <n>s)
OK

25.6.3 Parameters and Defined Values

<n>:		fax transmit silence period
	0-255	silence period (unit is 10 ms)

25.6.4 Parameter Storage

None.

25.6.5 Examples

Command	Responses
AT+FTS=? *Note: Test command*	(0-255) OK
AT+FTS=50 *Note: Stops transmission and waits for 0.5s*	OK

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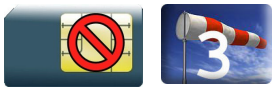
25.7 Receive Silence +FRS



25.7.1 Description

This command causes the modem to stop listening to the network and report back to the DTE after the specified period.

It is aborted if any character is received from the application.

25.7.2 Syntax

Action command
AT+FRS=<n>
OK

Read command
None

Test command
AT+FRS=?
(list of supported <n>s)
OK

25.7.3 Parameters and Defined Values

<n>:		fax receive non listening period
	0-255	non listening period (unit is 10ms)

25.7.4 Parameter Storage

None.

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25.7.5 Examples

Command	Responses
AT+FRS=? *Note: Get possible values*	(0-255) OK
AT+FRS=50 *Note: Stops listening and waits for 0.5s*	OK

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26 Fax class 2 Commands

26.1 Transmit Data +FDT

26.1.1 Description

This command prefixes data transmission.

26.1.2 Syntax

Action command

AT+FDT

OK

Read command

None

Test command

None

26.1.3 Parameters and Defined Values

None.

26.1.4 Parameter Storage

None.

26.1.5 Examples

None.

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26.2 Receive Data +FDR

26.2.1 Description

This command initiates data reception.

26.2.2 Syntax

Action command
AT+FDR
OK

Read command
None

Test command
None

26.2.3 Parameters and Defined Values

None.

26.2.4 Parameter Storage

None.

26.2.5 Examples

None.

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26.3 Transmit Page Punctuation +FET

26.3.1 Description

This command punctuates page and document transmission after the +FDT command. It indicates that the current page is complete, and if there are additional pages to send.

The +FET unsolicited response reports post page message response.

26.3.2 Syntax

Action command

AT+FET=<ppm>

OK

Read command

None

Test command

None

Unsolicited response

+FET: <ppm>

26.3.3 Parameters and Defined Values

<ppm>:		post page message
	0	another page next, same document
	1	another document next
	2	no more pages or documents
	3	another partial page next
	4	another page, procedure interrupt
	5	another document, procedure interrupt
	6	all done, procedure interrupt

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26.3.4 Parameter Storage

None.

26.3.5 Examples

Command	Responses
AT+FET=0 *Note: Send another page of the same document*	OK

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26.4 Page Transfer Status Parameters +FPTS

26.4.1 Description:

This command sets post page transfer response.

The +FPTS unsolicited response reports received page transfer status.

26.4.2 Syntax

Action command

AT+FPTS=<ppr>

OK

Read command

None

Test command

None

Unsolicited response

+FPTS: <ppr>

26.4.3 Parameters and Defined Values

<ppr>:		post page transfer response
	1	page good
	2	page bad; retry requested
	3	page good; retrain requested
	4	page bad; interrupt requested
	5	page good; interrupt requested

26.4.4 Parameter Storage

None.

26.4.5 Examples

None.

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26.5 Terminate Session +FK

26.5.1 Description:

This command causes the product to terminate the session.

26.5.2 Syntax

Action command

AT+FK

OK

Read command

None

Test command

None

26.5.3 Parameters and Defined Values

None.

26.5.4 Parameter Storage

None.

26.5.5 Examples

None.

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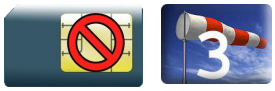
26.6 Page Transfer Bit Order +FBOR



26.6.1 Description:

This command sets the bit order for negotiation and fax page transfer. The order is related to the bit order on radio link.

26.6.2 Syntax

Action command

AT+FBOR=<n>

OK

Read command

AT+FBOR?

<n>

OK

Test command

AT+FBOR=?

(list of supported <n>s)

OK

26.6.3 Parameters and Defined Values

<n>:

	Bit order for negotiation	Bit order for page transfer
0	same (default)	same (default)
1	same	reverse
2	reverse	same
3	reverse	reverse

26.6.4 Parameter Storage

The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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26.6.5 Examples

Command	Responses
AT+FBOR=?	(0-3) OK
AT+FBOR=0 *Note: Set bit order to 0*	OK *Note: Bit order set at default settings*
AT+FBOR?	0 OK

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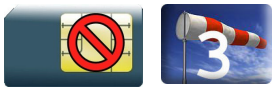
26.7 Buffer Size Report +FBUF



26.7.1 Description:

This command requests the size of the exchange buffer between the modem and the fax application.

26.7.2 Syntax

Action command
None

Read command
AT+FBUF?
<buffer size>
OK

Test command
None

26.7.3 Parameters and Defined Values

<buffer size>:	size of the exchange buffer in bytes integer type

26.7.4 Parameter Storage

None.

26.7.5 Examples

Command	Responses
AT+FBUF? *Note: Get current buffer size*	1024 OK *Note: Current buffer size is 1024 bytes*

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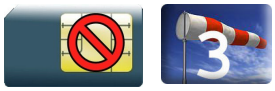
26.8 Copy Quality Checking +FCQ



26.8.1 Description:

This command controls copy quality checking for receiving faxes.

26.8.2 Syntax

Action command
AT+FCQ=<n>
OK

Read command
AT+FCQ?
<n>
OK

Test command
AT+FCQ=?
(list of supported <n>s)
OK

26.8.3 Parameters and Defined Values

<n>:		copy quality mode
	0	copy quality checking (default value)

26.8.4 Parameter Storage

The <n> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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26.8.5 Examples

Command	Responses
AT+FCQ=?	(0) OK

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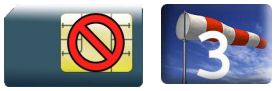
26.9 Capability to Receive +FCR



26.9.1 Description:

This commands controls the capability of the modem to accept incoming faxes.

26.9.2 Syntax

Action command
AT+FCR=<n>
OK

Read command
AT+FCR?
<n>
OK

Test command
AT+FCR=?
(list of supported <n>s)
OK

26.9.3 Parameters and Defined Values

<n>:		capability to receive mode
	0	The modem will not accept incoming faxes.
	1	The modem will accept incoming faxes (default value)

26.9.4 Parameter Storage

The <n> parameter is stored in EEPROM using AT&W command. The default value can be restored using AT&F.

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26.9.5 Examples

Command	Responses
AT+FCR=?	(0,1) OK
AT+FCR=1	OK
AT+FCR?	1 OK

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26.10 Current Session Parameters +FDIS

26.10.1 Description:

This command allows the DTE to configure the capabilities used for the current session.

The +FDIS unsolicited response reports remote capabilities.

The +FDCS unsolicited response reports current session capabilities.

26.10.2 Syntax

Action command

**AT+FDIS=[<vr>][,[
][,[<wd>][,[<ln>][,[<df>][,[<ec>][,[<bf>][,[<st>]]]]]]]]**

OK

Read command

AT+FDIS?

<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

OK

Test command

AT+FDIS=?

(list of supported <vr>s),(list of supported
s),(list of supported <wd>s),(list of supported <ln>s),(list of supported <df>s),(list of supported <ec>s),(list of supported <bf>s),(list of supported <st>s)

OK

Unsolicited response

+FDCS: <remote_vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

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Unsolicited response
`+FDIS: <remote_vr>, ,<wd>,<ln>,<df>,<ec>,<bf>,<st>`

26.10.3 Parameters and Defined Values

<vr>:		vertical resolution
	0	normal: 98 LPI (default value)
	1	fine: 196 LPI
<remote_vr>:		remote vertical resolution (bitfield)
	0x01	R8 ´ 7.7 l/mm, Fine (196 LPI)
	0x02	R8 ´ 15.4 l/mm
	0x04	R16 ´ 15.4 l/mm
	0x08	200 dpi ´ 100 l/25.4 mm
	0x10	200 dpi ´ 200 l/25.4 mm
	0x20	200 dpi ´ 400 l/25.4 mm
	0x40	300 dpi ´ 300 l/25.4 mm
** :**		bit rate
	0	2400 bps (modem type V.27 ter)
	1	4800 bps (modem type V.27 ter)
	2	7200 bps (modem type V.29)
	3	9600 bps (modem type V.29, V.17). (default value if "DATA144" feature IS NOT supported)
	4	12000 bps (modem type V.33, V.17) only when product supports "DATA144" feature
	5	14400 bps (modem type V.33, V.17). (default value if "DATA144" feature IS supported) only when product supports "DATA144" feature
<wd>:		page width
	0	1728 pixels in 215 mm (default value)
	1	2048 pixels in 255 mm
	2	2432 pixels in 303 mm

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<ln>:		page length	
	0	A4, 297 mm	
	1	B4, 364 mm	
	2	unlimited (default value)	
<df>:		data compression format	
	0	1-D modified Huffman (default value)	
	1	2-D modified read	
	2	2-D uncompressed mode	
	3	2-D modified modified read	
<ec>:		error correction	
	0	disable Fax ECM	
<bf>:		binary file transfer	
	0	disable	
<st>:		scan time per line	
		if <vr>=0	if <vr>=1
	0	0 ms (default)	0 ms (default)
	1	5 ms	5 ms
	2	10 ms	5 ms
	3	10 ms	10 ms
	4	20 ms	10 ms
	5	20 ms	20 ms
	6	40 ms	20 ms
	7	40 ms	40 ms

26.10.4 Parameter Storage

The parameters are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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26.10.5 Examples

Command	Responses
AT+FDIS=?	(0,1),(0-5),(0-2),(0-2),(0-3), (0),(0),(0-7) OK
AT+FDIS=,4 *Note: Change bit rate*	OK
AT+FDIS?	0,4,0,2,0,0,0,0 OK

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26.11 DCE Capabilities Parameters +FDCC

26.11.1 Description:

This command allows the DTE to configure the capabilities used for the any session.

26.11.2 Syntax

Action command

**AT+FDCC=[<vr>][,[
][,[<wd>][,[<ln>][,[<df>][,[<ec>][,[<bf>][,[<st>]]]]]]]]**

OK

Read command

AT+FDCC?

<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

OK

Test command

AT+FDCC=?

(list of supported <vr>s),(list of supported
s),(list of supported <wd>s),(list of supported <ln>s),(list of supported <df>s),(list of supported <ec>s),(list of supported <bf>s),(list of supported <st>s)

OK

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26.11.3 Parameters and Defined Values

<vr>:		vertical resolution
	0	normal: 98 LPI (default value)
	1	fine: 196 LPI
 :		bit rate
	0	2400 bps (modem type V.27 ter)
	1	4800 bps (modem type V.27 ter)
	2	7200 bps (modem type V.29)
	3	9600 bps (modem type V.29, V.17). (default value if "DATA144" feature IS NOT supported)
	4	12000 bps (modem type V.33, V.17) only when product supports "DATA144" feature
	5	14400 bps (modem type V.33, V.17). (default value if "DATA144" feature IS supported) only when product supports "DATA144" feature
<wd>:		page width
	0	1728 pixels in 215 mm (default value)
	1	2048 pixels in 255 mm
	2	2432 pixels in 303 mm
<ln>:		page length
	0	A4, 297 mm
	1	B4, 364 mm
	2	unlimited (default value)
<df>:		data compression format
	0	1-D modified Huffman (default value)
	1	2-D modified read
	2	2-D uncompressed mode
	3	2-D modified modified read

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<ec>:		error correction	
	0	disable Fax ECM	
<bf>:		binary file transfer	
	0	disable	
<st>:		scan time per line	
		if <vr>=0	if <vr>=1
	0	0 ms (default)	0 ms (default)
	1	5 ms	5 ms
	2	10 ms	5 ms
	3	10 ms	10 ms
	4	20 ms	10 ms
	5	20 ms	20 ms
	6	40 ms	20 ms
	7	40 ms	40 ms

26.11.4 Parameter Storage

The parameters are stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

26.11.5 Examples

Command	Responses
AT+FDCC=?	(0,1),(0-5),(0-2),(0-2),(0-3), (0),(0),(0-7) OK
AT+FDCC=,4 *Note: Change bit rate*	OK
AT+FDCC?	0,4,0,2,0,0,0,0 OK

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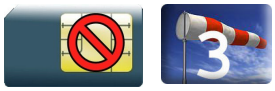
26.12 Local ID String +FLID



26.12.1 Description:

This command defines or queries the local ID string.

26.12.2 Syntax

Action command
AT+FLID=<string>
OK

Read command
AT+FLID?
<string>
OK

Test command
AT+FLID=?
(<nb_characters>),(list of supported <ascii_code>s)
OK

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26.12.3 Parameters and Defined Values

<string>:	local ID string string type default value: empty string
<nb_characters>:	maximum number of characters integer type default value: 20
<ascii_code>:	allowed ASCII code range: 32-127

26.12.4 Parameter Storage

The <string> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

26.12.5 Examples

Command	Responses
AT+FLID=?	(20),(32-127) OK
AT+FLID="local ID string"	OK
AT+FLID?	local ID string OK

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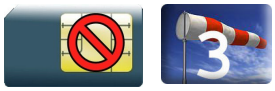
26.13 Page Transfer Timeout Parameter +FPHCTO



26.13.1 Description:

This command sets the time interval during which the modem expects another page before it assumes there are no more pages and aborts.

26.13.2 Syntax

Action command

AT+FPHCTO=<time_out>

OK

Read command

AT+FPHCTO?

<time_out>

OK

Test command

AT+FPHCTO=?

(list of supported <time_out>s)

OK

26.13.3 Parameters and Defined Values

<time_out>:	waiting period for another page in units of 100 ms. range: 0-255 (default value: 30)

26.13.4 Parameter Storage

The <time_out> parameter is stored in EEPROM using the AT&W command. The default value can be restored using AT&F.

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26.13.5 Examples

Command	Responses
AT+FPHCTO=?	(0-255) OK
AT+FPHCTO=50	OK
AT+FPHCTO?	50 OK

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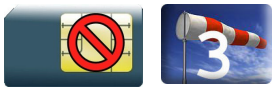
26.14 Additional Fax Class 2 indication messages



26.14.1 Description:

The following messages are used to indicate DCE Responses. They are used in communication only.

The +FCON response indicates a connection with a fax machine.

The +FCFR response indicates confirmation to receive.

The +FTSI response reports the received transmit station ID string.

The +FCSI response reports the received called station ID string.

The +FHNG response reports the hang-up cause. It indicates that the call has been terminated

26.14.2 Syntax

Unsolicited response
+FCON

Unsolicited response
+FCFR

Unsolicited response
+FTSI: "<string>"

Unsolicited response
+FCSI: "<string>"

Unsolicited response
+FHNG: <cause>

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26.14.3 Parameters and Defined Values

<cause>:		hang-up cause
	0-9	normal end of connection.
	10-19	transmit phase A error
	20-39	transmit phase B error
	40-49	transmit phase C error
	50-69	transmit phase D error
	70-89	receive phase B error
	90-99	receive phase C error
	100-119	receive phase D error
<string>:		remote ID string string type

26.14.4 Parameter Storage

None.

26.14.5 Examples

None.

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AT COMMANDS INTERFACE GUIDE FOR OS 6.61

APPENDIXES

Reference:	WM_DEV_OAT_UGD_014
Revision:	004
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1 Codes and Values

1.1 ME Error Result Code: +CME ERROR

<error> is defined as below:

<error>	Meaning	Resulting from the following commands
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	PH-SIM PIN required (SIM lock)	All GSM 07.07 commands (+CME ERROR: 5)
10	SIM not inserted	All GSM 07.07 commands (+CME ERROR: 10)
11	SIM PIN required	All GSM 07.07 commands (+CME ERROR: 11)
12	SIM PUK required	All GSM 07.07 commands (+CME ERROR: 12)
13	SIM failure	All GSM 07.07 commands (+CME ERROR: 13)
16	Incorrect password	+CACM, +CAMM, +CPUC, +CLCK, +CPWD, +CPIN, +CPIN2 (+CME ERROR: 16)
17	SIM PIN2 required	+CPBW (FDN), +CLCK (FDN),
18	SIM PUK2 required	+CACM, +CAMM, +CPUC, +CPBW (FDN), +CPIN, +CPIN2, +CLCK (FDN), +CPWD
20	Memory full	+CPBW, +WOLM, ATD
21	Invalid index	+CPBR, +CPBW, ATD>[mem]index, +WMGO, +WPGW, +WOLM
22	Not found	+CPBF, +CPBP, +CPBN, +CGSN, +WOPN, ATD>[mem]"name"
24	Text string too long	+CPBW, +CPIN, +CPIN2, +CLCK, +CPWD, +WPGW, +WCCS, +WIMEI
26	Dial string too long	+CPBW, ATD, +CCFC
27	Invalid characters in dial string	+CPBW
30	No network service	+VTS, +COPS=?, +CLCK, +CCFC, +CCWA, +CUSD
32	Network not allowed – emergency calls only	+COPS
40	Network personalization PIN required (Network lock)	All GSM 07.07 commands (+CME ERROR: 40)
42	Network personalization PIN required (Network subset lock)	All GSM 07.07 commands (+CME ERROR: 42)
44	Network personalization PIN required (Service Provider lock)	All GSM 07.07 commands (+CME ERROR: 44)
46	Network personalization PIN required (Corporate lock)	All GSM 07.07 commands (+CME ERROR: 46)
103	Incorrect MS identity.	+CGATT

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<error>	Meaning	Resulting from the following commands
106	ME is blacklisted by the network.	+CGATT
107	MS is not allowed to operate in GPRS.	+CGATT
111	MS is not allowed to operate in the requested PLMN.	+CGATT
112	MS is not allowed to make location updating in this area.	+CGATT
113	Roaming in this location area is not allowed.	+CGATT
132	service option not supported (#32)	+CGACT +CGDATA ATD*99
133	requested service option not subscribed (#33)	+CGACT +CGDATA ATD*99
134	service option temporarily out of order (#34)	+CGACT +CGDATA ATD*99
148	unspecified GPRS error	All GPRS commands
149	PDP authentication failure	+CGACT +CGDATA ATD*99
150	invalid mobile class	+CGCLASS +CGATT

1.2 Message Service Failure Result Code: +CMS ERROR

<er> is defined as below:

<er>	Meaning	Resulting from the following commands
1 to 127	Error cause values from the GSM recommendation 04.11 Annex E-2	+CMGS, +CMSS
301	SMS service of ME reserved	+CSMS (with +CMS: ERROR 301)
302	Operation not allowed	All SMS commands (+CMSS, +CMGL, +CPMS, +CSMP...
303	Operation not supported	All SMS commands
304	Invalid PDU mode parameter	+CMGS, +CMGW
305	Invalid text mode parameter	+CMGS, +CMGW, +CMSS
310	SIM not inserted	All SMS commands
311	SIM PIN required	All SMS commands
312	PH-SIM PIN required	All SMS commands
313	SIM failure	All SMS commands
316	SIM PUK required	All SMS commands
317	SIM PIN2 required	All SMS commands
318	SIM PUK2 required	All SMS commands
321	Invalid memory index	+CMGR, +CMSS, +CMGD
322	SIM or ME memory full	+CMGW

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<er>	Meaning	Resulting from the following commands
330	SC address unknown	+CSCA?, +CMSS, +CMGS
340	no +CNMA acknowledgement expected	+CNMA

1.3 Specific Error Result Codes

<error>	Meaning	Resulting from the following commands
500	unknown error.	All commands
512	MM establishment failure (for SMS).	+CMGS, +CMSS (+CMS ERROR: 512)
513	Lower layer failure (for SMS)	+CMGS, +CMSS (+CMS ERROR: 513)
514	CP error (for SMS).	+CMGS, +CMSS (+CMS ERROR: 514)
515	Please wait, init or command processing in progress.	All commands ("+CME ERROR: 515" or "+CMS ERROR: 515") except ATH0, ATH1, AT+WIOR, AT+WIOW, AT+CFUN=1, AT+CLCC, AT+WAC, AT+CPAS, AT+VGR, AT+VTS, AT+SPEAKER.
517	SIM Toolkit facility not supported.	+STGI
518	SIM Toolkit indication not received.	+STGI
519	Reset the product to activate or change a new echo cancellation algorithm.	+ECHO, +VIP
520	Automatic abort about get PLMN list for an incoming call.	+COPS=?
526	PIN deactivation forbidden with this SIM card.	+CLCK
527	Please wait, RR or MM is busy. Retry your selection later.	+COPS
528	Location update failure. Emergency calls only.	+COPS
529	PLMN selection failure. Emergency calls only.	+COPS
531	SMS not sent: the <da> is not in FDN phonebook, and FDN lock is enabled. (for SMS)	+CMGS, +CMSS (+CMS ERROR: 531)
532	the embedded application is activated so the objects flash are not erased	+WOPEN
533	Missing or Unknown APN	ATD*99 +GACT +CGDATA

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<error>	Meaning	Resulting from the following commands
536	Class locked: a command has been launched from a port, the effect is to lock all commands belonging to the same class. If another port launches a command of this class, this error will occur as long as the class is not released (at first command's completion time)	All commands
537	Phonebook group full.	+CPBW
538	Not Enough Space to copy SMS	+WMCP
539	Invalid SMS	+CMGR
541	Open AT® application and AT software version do not match	+WOPEN
543	CMUX connection is refused by remote, after a restart of CMUX protocol by modem , due to a 27.010 connection loss during virtual channels establishment.	+CMUX
544	CMUX connection Timeout (no answer from the remote) ie no DLC0 opened response.	+CMUX
545	A CMUX session has been started on a physical UART, and user tries to start another CMUX session on other physical UART. The error, *+CME ERROR: 545* is raised on the UART where *at+cmux* command is trying to be started again.	+CMUX
546	Emergency call is not allowed without SIM	+COPS
547	Emergency call is allowed without SIM	+COPS
548	No flash objects to delete	+WOPEN
549	The phone number of the requested phonebook entry is empty	ATD><index>[;], ATD><phonebook><index>[;]
550	Unable to resize the Application & Data storage place, since the new required size would overlap with the current Open AT® application storage place.	+WOPEN
551	Service abort request has failed	AT +WAC
552	Unsolicited responses for autodiag or charge indications are already activated on another port	+WDIAG, +WBCM
553	The PUK 1 code is burned but PIN 1/CHV 1 code is OK	+CPIN, +CKPD, D (sequence)
554	The SIM is blocked (PIN 1/CHV 1 and PUK 1 codes are burned)	All GSM 07.07 commands

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<error>	Meaning	Resulting from the following commands
555	AT command aborted by a POWER OFF (the AT command treatment should be partial)	+COPS, +CPIN, +CPIN2, +CMGL, +CMGR, +CMGD, +WDCP, +WLPR, +WLPW, +CCID, +CSIM, +CRSM, +CLCK, +CACM, +CAMM, +CPUC, +WMSC, +WMCP, +CPOL, +CSQ, +CCED
[redacted]	AT command aborted by a SIM Extract (the AT command treatment should be partial)	+COPS, +CPIN, +CPIN2, +CMGL, +CMGR, +CMGD, +WDCP, +WLPR, +WLPW, +CCID, +CSIM, +CRSM, +CLCK, +CACM, +CAMM, +CPUC, +WMSC, +WMCP, +CPOL

1.4 Specific Failure Cause for +CEER

Cause value	Diagnostic
240	FDN is active and number is not in FDN
241	Call operation not allowed
252	Call barring on outgoing calls
253	Call barring on incoming calls
254	Call impossible
255	Lower layer failure

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1.5 GSM 04.11 Annex E-2: Mobile Originating SM-transfer

These error causes could appear for **SMS commands** (+CMGS, +CMSS, +CMGD...)

Error #	Error label	Description
1	**Unassigned (unallocated) number**	The destination requested by the Mobile Station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).
8	**Operator determined barring**	The MS has tried to send a mobile originating short message when the MS's network operator or service provider has forbidden such transactions.
10	**Call barred**	The outgoing call barred service applies to the short message service for the called destination.
21	**Short message transfer rejected**	The equipment sending this cause does not wish to accept this short message, although it could have accepted the short message since the equipment sending. This cause is neither busy nor incompatible.
27	**Destination out of service**	The destination indicated by the Mobile Station cannot be reached because the interface to the destination is not functioning correctly. The term "not functioning correctly" indicates that a signaling message was unable to be delivered to the remote user; e.g., a physical layer or data link layer failure at the remote user, user equipment off-line, etc.
28	**Unidentified subscriber**	The subscriber is not registered in the PLMN (e.g.. IMSI not known)
29	**Facility rejected**	The facility requested by the Mobile Station is not supported by the PLMN.
30	**Unknown subscriber**	The subscriber is not registered in the HLR (e.g.. IMSI or directory number is not allocated to a subscriber).
38	**Network out of order**	The network is not functioning correctly and the condition is likely to last a relatively long period of time; e.g., immediately reattempting the short message transfer is not likely to be successful.
41	**Temporary failure**	The network is not functioning correctly and the condition is not likely to last a long period of time; e.g., the Mobile Station may wish to try another short message transfer attempt almost immediately.
42	**Congestion**	The short message service cannot be serviced because of high traffic.

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Error #	Error label	Description
47	**Resources unavailable, unspecified**	This cause is used to report a resource unavailable event only when no other cause applies.
50	**Requested facility not subscribed**	The requested short message service could not be provided by the network because the user has not completed the necessary administrative arrangements with its supporting networks.
69	**Requested facility not implemented**	The network is unable to provide the requested short message service.
81	**Invalid short message transfer reference value**	The equipment sending this cause has received a message with a short message reference which is not currently in use on the MS-network interface.
95	**Invalid message, unspecified**	This cause is used to report an invalid message event only when no other cause in the invalid message class applies.
96	**Invalid mandatory information**	The equipment sending this cause has received a message where a mandatory information element is missing and/or has a content error (both cases are undistinguishable).
97	**Message type non-existent or not implemented**	The equipment sending this cause has received a message with a message type it does not recognize either because this is a message not defined or defined but not implemented by the equipment sending this cause.
98	**Message not compatible with short message protocol state**	The equipment sending this cause has received a message such that the procedures do not indicate that this is a permissible message to receive while in the short message transfer state.
99	**Information element non-existent or not implemented**	The equipment sending this cause has received a message which includes unrecognized information elements because the information element identifier is not defined or it is defined but not implemented by the equipment sending the cause. However, the information element is not required to be present in the message so that the equipment sends the cause to process the message.
111	**Protocol error, unspecified**	This cause is used to report a protocol error event only when no other cause applies.
127	**Inter-working, unspecified**	There has been inter-working with a network which does not provide causes for actions it takes; thus, the precise cause for a message which is being sent cannot be ascertained.

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All values other than specified should be treated as error #41.

1.6 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
+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

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1.7 GSM Sequences List

In accordance with **GSM 02.30**, the product supports the following GSM sequences, which can be used through the ATD and the +CKPD commands.

1.7.1 Security

Change PIN code	****04*** *OLDPIN* ***** *NEWPIN* ***** *NEWPIN* **#**
Change PIN2 code	****042*** *OLDPIN2* ***** *NEWPIN2* ***** *NEWPIN2* **#**
Unlock PIN code	****05*** *PUK* ***** *NEWPIN* ***** *NEWPIN* **#**
Unlock PIN2 code	****052*** *PUK2* ***** *NEWPIN2* ***** *NEWPIN2* **#**
Show the IMEI number	***#06#**

1.7.2 Call Forwarding

Please refer to SC and BS values below in this paragraph.

Activate	***SC#**
or	**SC*BS#**
Register and activate	****SC*** *PhoneNumber* **#**
or	****SC*** *PhoneNumber* ***BS#**
or	****SC*** *PhoneNumber* ***[BS]*T#**
or	**SC** *PhoneNumber* **#**
or	**SC** *PhoneNumber* **BS#**
or	**SC** *PhoneNumber* **[BS]T#**
Check status	***#SC#**
or	**#SC*BS#**
Deactivate	**#SC#**
or	**#SC**BS#**
Unregister and deactivate	**##SC#**
or	**##SC**BS#**

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Service Codes (SC)	
002	all call forwarding
004	all conditional call forwarding
21	call forwarding unconditional
61	call forwarding on no answer
62	call forwarding on not reachable
67	call busy

Network Service Codes (BS)	
No code	All tele- and bearer services
10	All tele-services
11	Telephony
12	All data tele-services
13	Fax services
16	Short Message Services
17	Voice Group Call Service
18	Voice Broadcast Service
19	All tele-services except SMS
20	All bearer services
21	All asynchronous services
22	All synchronous services
24	All data circuit synchronous
25	All data circuit asynchronous

Note: The no-reply condition timer (T), is only used for SC = 002, 004 or 61.

1.7.3 Call Barring

Please refer to SC values below in this paragraph. BS values are the same as above, see §1.7.2.

Activate	***SC*** *Password* **#**
or	***SC*** ***Password*BS#**
Check status	***#SC#**
or	**#SC*BS#**
Deactivate	**#SC*** *Password* **#**
or	**#SC*** *Password* ***BS#**
Change password for call barring	****03*330*** *OLDPWD* ***** *NEWPWD* ***** *NEWPWD* **#**
or	****03**** *OLDPWD* ***** *NEWPWD* ***** *NEWPWD* **#**
or	**03330*OLDPWDNEWPWD***NEWPWD**#**
or	**03*** *OLDPWD* ***** *NEWPWD* ***** *NEWPWD* **#**

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Service Codes (SC)	
33	call barring of outgoing call
330	all barring service (only for deactivation)
331	call barring of outgoing international call
332	call barring of outgoing international calls except to HPLMN
333	all outgoing barring service (only for deactivation)
35	call barring of incoming calls
351	call barring of incoming calls if roaming
353	all incoming barring service (only for deactivation)

1.7.4 Call Waiting

BS values are the same as above, see §1.7.2.

Activate	**43BS#**
Check status	**#43BS#**
Deactivate	**#43*BS#**

1.7.5 Number Presentation

CLIP check status	***#30#**
CLIR check status	***#31#**
Suppress CLIR for a voice call	***31#***PhoneNumber*
Invoke CLIR for a voice call	**#31#***PhoneNumber*
COLP check status	***#76#**

1.8 Operator Names

For more information, refer to the following documentation:

- SE13 (22nd August,2005)
- NAPRD 2.6.8

Note:

The Country Initials may vary for the same MCC (Mobile Country Code) without any impact.

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1.9 CPHS Information Field

CPHS Information		
Data field	Bit Field	Meaning
0	None	All information
1	0	CSP service activated and allocated
2	1	SST service activated and allocated
3	2	Mailbox Number service activated and allocated
4	3	Operator Name Shortform service activated and allocated
5	4	Information Numbers service activated and allocated
6	5	RFU
7	6	RFU
8	7	RFU
9	8	Voice Message Waiting indicator for Line 1
10	9	Voice Message Waiting indicator for Line 2
11	10	Data Message Waiting indicator
12	11	Fax Message Waiting indicator
13	12	Call Forward Activated indicator for Line 1
14	13	Call Forward Activated indicator for Line 2
15	14	Call Forward Activated indicator for Data
16	15	Call Forward Activated indicator for Fax
17	16	Reserved
18	17	Reserved
19	18	Reserved
20	19	Reserved
21	20	Line 1 Mailbox Number available
22	21	Line 2 Mailbox Number available
23	22	Data Mailbox Number available
24	23	Fax Mailbox Number available
25	24	EF Mn Updateable

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1.10 CSP Constants

1.10.1 Service Group: Call Offering

Service	External value
Call Forwarding Unconditional	1
Call Forwarding On User Busy	2
Call Forwarding on No Reply	3
Call Forwarding On User Not Reachable	4
Call Transfer	5

1.10.2 Service Group: Call Restriction

Service	External value
Barring of All Outgoing Calls	9
Barring of Outgoing International Calls	10
Barring of Outgoing International Calls except those directed to the Home PLMN country	11
Barring of All Incoming Calls when Roaming Outside the Home PLMN country	12
BIC roam	13

1.10.3 Service Group: Other Supplementary Services

Service	External value
Multi-Party Service	17
Closed User Group	18
Advice Of Charge	19
Preferential CUG	20
CUG Outgoing Access	21

1.10.4 Service Group: Group Completion

Service	External value
Call Hold	25
Call Waiting	26
Completion of Call to Busy Subscriber	27
Restriction of the menus allowing use of user to user signaling	28

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1.10.5 Service Group: Teleservices

Service	External value
Short Message – Mobile Terminated	33
Short Message – Mobile Originated	34
Short Message – Cell Broadcast	35
Restricts menu options for the ability to set reply path active on outgoing Short Messages	36
SMS Delivery Confirmation	37
Restriction of menus for SMS Protocol ID options	38
Validity Period, restriction of menus for SMS Validity period options	39

1.10.6 Service Group: CPHS Teleservices

Service	External value
Alternate Line Service	41

1.10.7 Service Group: CPHS Features

Service	External value
Reserved: SST in phase 1 CPHS	49

1.10.8 Service Group: Number Identification

Service	External value
Calling Line Identification Presentation	57
Connected Line Identification Restriction	59
Connected Line Identification Presentation	60
Malicious Call Indicator	61
CLI per call mode – default block CLI – menu to send CLI	63
CLI per call mode – default send CLI – menu to block CLI	64

1.10.9 Service Group: Phase 2+ Services

Service	External value
Menus concerned with GPRS functionality	65
Menus concerned with High Speed Circuit Switched Data functionality	66
ASCI Voice Group call menus	67

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Service	External value
ASCI Voice Broadcast service menus	68
Multi Subscriber profile menus	69
Multiple band: Restriction of menus allowing user to select a particular GSM 900/ 1800 or 1900 band	70

1.10.10 Service Group: Value Added Services

Service	External value
Restriction of menu options for manual PLMN selection	73
Restriction of menu options for Voice Mail or other similar menus	74
Restriction of menu options for the ability to send Short messages with type Paging	75
Restriction of menu options for the ability to send Short messages with type Email	76
Restriction of menu options for Fax calls	77
Restriction of menu options for Data calls	78
Restriction of menus allowing the user to change language	80

1.10.11 Service Group: Information Numbers

Service	External value
The ME shall only present Information numbers to the user if this field is set to FF	81

Note:

External values not used in these tables are reserved for further use.

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2 Examples

This chapter gives illustrative examples of the general AT commands used for a communication. The presentation of commands and responses is as close as possible to what a user can see on its test monitor. Blank lines have been intentionally removed. The characters on the left margin are DTE generated. Middle column characters are modem generated.

2.1 Examples with the PIN Required

2.1.1 When the ME has to be powered ON.

AT+CMEE=1	*Enable the report mobile equipment errors*
OK	
AT+CREG=1	*Report registration*
OK	
AT+CPAS	*Query ME Status*
+CPAS: 5	*(ME is asleep)*
OK	
AT+CFUN=1	*Set ME to full functionality*
OK	
AT+COPS=0	*Ask for automatic operator selection and registration.*
+CME ERROR: 11	*SIM PIN required.*
AT+CPIN=1234	*User entered a wrong PIN*
+CME ERROR: 16	*Incorrect password.*
AT+CPIN=0000	
OK	*PIN Ok*
AT+COPS=0	*Ask for automatic operator selection and registration.*
OK	
+CREG:1	*Registered on the network*
AT+COPS=3,0	*Select the long name alphanumeric format.*
OK	
AT+COPS?	*Get the operator name*
+COPS: 0,0,"I OMNITEL"	
OK	

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2.1.2 When the ME has already been powered on.

AT+CMEE=1 *Enable the report mobile equipment errors*

OK

AT+CPAS *Get the ME Status*

+CPAS: 0 *ME is ready to receive commands*

OK

AT+CPIN? *Is ME requiring a password?*

+CPIN: SIM PIN *Yes, SIM PIN required*

AT+CPIN=0000

OK *PIN Ok*

2.2 Examples where a Voice Call is Originated.

2.2.1 When the ME is powered on and the SIM PIN has been entered.

AT+CMEE=1 *Enable the reporting of mobile equipment errors*

OK

AT+WIND=63 *Ask to display the general indications.*

OK

AT+CPIN? *Is ME requiring a password?*

+CPIN: READY *product is ready*

ATD0607103543; *Make a voice call*

+WIND: 5,1 *Indication of call*

+WIND: 2 *Remote party is ringing.*

OK *Call setup was successful*

Conversation...

ATH *Release the call*

OK

2.2.2 When a voice call is attempted from a phonebook:

ATD>"John Pamborn";

+CME ERROR: 22 *The "John Pamborn" entry is not found.*

ATD>"Joel Guerry";

+WIND: 5,1 *Indication of outgoing call.*

+WIND: 2 *Remote party is ringing.*

OK *Call setup was successful*

Conversation...

ATH *Release the call*

OK

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2.3 Example with Incoming Calls

2.3.1 When the ME is powered on and the SIM PIN has been entered.

AT+CMEE=1 *Enable the report mobile equipment errors*
OK
AT+WIND=63 *Ask to display the general indications.*
OK
AT+CLIP=1 *Enable the calling line identification presentation.*
OK
AT+CRC=1 *Enable extended format of incoming indication.*
OK
AT+CNUM *Query own number (voice number) or MSISDN.*
+CNUM: "Speech","+33608971019",145
OK
Call this number from another equipment.
+WIND: 5, 1 *Indication of call (Ring)*
+CRING: VOICE *Type of call is VOICE.*
+CLIP: "+33607103543",145,,,"John Panborn" *Identification of the remote party.*
+CRING: VOICE
ATA *Answer the call.*
OK
...Conversation...
NO CARRIER *The call has been released by the remote party.*
+WIND: 6,1 *Indication of call release.*

2.4 Example of a Call Forwarding

2.4.1 When the ME is powered on and the SIM PIN has been entered.

AT+CMEE=1 *Enable the report mobile equipment errors*
OK
AT+CCFC=1,3,"0607492638" *Register to a call forwarding when ME is busy.*
OK
AT+CCFC=2,3,"0149293031",129 *Register to a call forwarding when it does answer.*
+CME ERROR: 30 *No network service*
AT+CCFC=1,2 *Interrogate*
+CCFC: 1,1,"+33607492638",145 *Call forwarding active for a voice call.*
AT+CCFC=1,4 *Delete call forwarding ME busy*
OK

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2.5 Example of a Multiparty Call

When the ME is powered on and the SIM PIN has been entered.

AT+CMEE=1 *Enable the report mobile equipment errors*

OK

AT+WIND=63 *Ask to display the general indications.*

OK

AT+CCWA=1,1 *Enable call waiting.*

OK

ATD>"John Panborn";

+WIND: 5,1 *Indication of call.*
+WIND: 2 *Remote party is ringing.*

OK *Call setup was successful*

...Conversation (call1)...

+WIND: 5,2 *Indication of another call.*

+CCWA: "+33595984834",145,"Dolores Claiborne" *Another call is waiting.*

AT+CHLD=2 *Put first call on hold and answer the second one.*

OK

...Conversation (call2)...

AT+CHLD=3 *Every call is part of a multiparty conversation.*

OK

AT+CHLD=11 *Release the first call (with John Panborn) and recover the second call (with Dolores Claiborne)*

...Conversation (call2)...

ATH *Release the second call.*

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2.6 Examples about Phonebooks

For each example illustrated in this section: at the beginning the ME is powered on and the SIM PIN has been entered.

2.6.1 Example 1: The whole phonebook of the ME is read

Command	Response
AT+CPBS=? *Note: Query supported phonebook memories*	+CPBS: ("SM","FD","ON") OK *Note: ADN, FDN, and MSISDN phonebooks supported.*
AT+CPBS="SM" *Note: Select ADN phonebook.*	OK
AT+CPBR=? *Note: Read the index range and the length of the elements.*	+CPBR: (1-80),20,14 OK *Note: 80 locations (from 1 to 80), max length of 20 for the phone number, 14 characters max for the text.*
AT+CPBR=1,80 *Note: Read all entries (only the set ones are returned).*	+CPBR: 1,"0346572834",129,"Dolores Claiborne" +CPBR: 2,"1284374523",129,"Thad Beaumont" +CPBR: 3, "1243657845",129,"John Panborn" OK

2.6.2 Example 2: Erase or Write a Phonebook Entry

Command	Response
AT+CPBW=? *Note: Get the phonebook type.*	+CPBW: (1-80),20,(129,145),14 OK *Note: 80 locations, max length of 20 for the phone number, TON/NPI of 129 or 145 and 14 characters max for the text.*
AT+CPBW=3 *Note: Erase location 3*	OK

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Command	Response
AT+CPBW=3,"4356729012",129,"Carry" *Note: Write at location 3.*	OK
AT+CPBR=1,80 *Note: Read all entries (only the ones set are returned).*	+CPBR:1,"0346572834",129,"Dolores Claiborne" +CPBR:2,"1284374523",129,"Thad Beaumont" +CPBR: 3,"4356729012",129,"Carry" OK

2.6.3 Example 3: Find Phonebook Entries

Command	Response
AT+CPBF=? *Note: Get the phonebook type.*	+CPBF: 20,14 OK *Note: Max length of 20 for the phone number, 10 characters for the text.*
AT+CPBF="D" *Note: Read entries starting with "D".*	+CPBF: 1,"0346572834",129,"Dolores Clairborne" OK
AT+CPBF="W" *Note: Read entries with "W".*	+CME ERROR: 22 *Note: Entry not found.*

2.6.4 Example 4: Phonebook and Custom Character Set

The Custom To Extended GSM conversion table and the Extended GSM To Custom conversion table can be used to display the extended GSM characters:

| ^ € { } [ ] ~ \

To manage one of these extended characters, the character 0x1B must be set in the right place (in the position corresponding to the value of the ASCII code) in the Custom to GSM conversion table (instead of 0x20 (space ASCII code)).

For example, the ASCII code of \ (backslash) is 0x5C, the character 0x1B must be set at the position 0x5C of the Custom to GSM conversion table. The range of character 0x5C in this table is 92. So to update the table the command AT+WCCS=1,0,92 will be used.

In the other way, write the space ASCII code 0x20 in the right place in the Custom to GSM conversion table if an extended character is not needed.

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Command	Response
AT+CPBS? *Note: Query the current phonebook*	+CPBS: 3,80 OK *Note: ADN selected, 3 entries stored*
AT+WPCS? *Note: Query the current phonebook char set*	+WPCS: "TRANSPARENT" OK *Note: Transparent mode selected*
AT+CPBR=1	+CPBR: 1,"0146290800",129,"S bastien" OK *Note: GSM character "é" is not displayed*
AT+WCCS=1,0,0,255 **>202020202020202020200A20200D202020202020205F202020202020202020202020212223022526272829 2A2B2C2D2E2F30313233343536373839 3A3B3C3D3E3F00414243444546474849 4A4B4C4D4E4F50515253545556575859 5A20202020112061626364656667686 96A6B6C6D6E6F70717273747576777879 7A20202020202020202020202020202020202020202020272720202020202020202020202020204020012403205F20202020202D20202020202027202020202020202020206041414141 5B0E1C09451F454549494949445D4F4F4F4F5C200B5555555E59201E7F6161617B0F1D630405656507696969207D086F6F6F7C200C0675757E792079**	OK

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Command	Response
AT+WCCS=1,1,0,127 **>40A324A5E8E9F9ECF2C70AD8F80DC5E520 5F20202020202020202020C6E6DFC920212 223A425262728292A2B2C2D2E2F30313233 3435363738393A3B3C3D3E3FA1414243444 5464748494A4B4C4D4E4F50515253545556 5758595AC4D6D1DCA7BF616263646566676 8696A6B6C6D6E6F707172737475767778797 7AE4F6F1FCE0** *Note: Set the custom character set tables to enable a GSM to default font conversion*	OK
AT+WPCS="CUSTOM" *Note: Use the custom character set*	OK
AT+CPBR=1	+CPBR: 1,"0146290800",129,"Sébastien" OK *Note: GSM character "é" is correctly displayed*

2.6.5 Example 5: Use the Extended Phonebook

Command	Response
AT+WCOS?	+WCOS: 0 OK *Note: Phonebook not extended*
AT+CPBS?	+CPBS: "SM",10,20 OK *Note: Selected phonebook: ADN*
AT+CPBW=1,"0123456",,"test"	OK *Note: Write an entry in SIM*
AT+CPBR=1	+CPBR: 1,"0123456",129,"test" OK *Note: Read an entry in SIM*

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Command	Response
AT+CPBW=1,"0123456",,"test",1	+CME ERROR: 3 *Note: +WCOS=0; you can't write a phonebook group*
AT+WCOS=1	OK *Note: Phonebook extended in SIM*
AT+CPBW=1,"0123456",,"test",1	OK *Note: Write an entry in SIM*
AT+CPBR=1	+CPBR: 1, "0123456", 129, "test", 1 OK *Note: Read an entry in SIM (extended)*
AT+WCOS=0	OK
AT+WCOS?	+WCOS: 0 OK *Note: Phonebook not extended*
AT+CPBR=1	+CPBR: 1,"0123456",129,"test" OK *Note: Read an entry in SIM (not extended)*
AT+CPBS="ME"	OK *Note: Selected phonebook: ME (Flash)*
AT+WCOS=1	OK *Note: Phonebook extended*
AT+CPBW=1, "+331290909", 145, "Fred", "0141284549", 129, "0600003210", 129, "0141280000", 129, "019876543210", 129, "fred@mywebaddress.com", "Becker Street London",1	OK *Note: Write an entry in Flash*

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Command	Response
AT+CPBR=1	+CPBR: 1, "+331290909", 145,"Fred", "0141284549", 129, "0600003210", 129, "0141280000", 129, "019876543210", 129, "fred@mywebaddress.com", "Becker Street London",1 OK
AT+WCOS=0	OK
AT+CPBR=1	+CPBR: 13,"+331290909",145,"Fred" OK *Note: Read an entry in Flash (not extended)*

To use the extended ME phonebook, you must do:

AT+CPBS="ME"

AT+WCOS=1

To use the extended ADN phonebook, you must do:

AT+CPBS="SM"

AT+WCOS=1

To use the not extended phonebook, you must do:
AT+WCOS=0

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2.6.6 Example 6: Phonebook and Custom Character Set

Command	Response
AT+CPBS? *Note: Query the current phonebook*	+CPBS: 3,80 OK *Note: ADN selected, 3 entries stored*
AT+WPCS? *Note: Query for the current phonebook character set*	+WPCS: "TRANSPARENT" OK *Note: Transparent mode selected*
AT+CPBW=1,"0146290800",129,"test of { }"	
AT+CPBR=1	+CPBR: 1,"0146290800",129," test of " OK *Note: GSM characters "{"and "}" are not displayed*
AT+WCCS=1,0,0,255<CR> **>202020202020202020200A20200D202020202020205F20202020202020202020202122230225262728292A2B2C2D2E2F303132333435363738393A3B3C3D3E3F00414243444546474849 4A4B4C4D4E4F50515253545556575859 5A1B1B1B1B1120616263646566676869 6A6B6C6D6E6F70717273747576777879 7A1B1B1B1B201B202020202020202020202020202020202727202020202020202020202020202040200124032 05F20202020202D20202020202027202020202020202020206041414141 5B0E1C09451F454549494949445D4F4F4F4F5C200B5555555E59201E7F6161617B0F1D630405656507696969207D086F6F6F7C200C0675757E792079** **<CTRL-Z>**	OK

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Command	Response
AT+WCCS=1,1,0,127<CR> **>40A324A5E8E9F9ECF2C70AD8F80DC5E5205F2020202020202020202020C6E6DFC920212223A425262728292A2B2C2D2E2F303132333435363738393A3B3C3D3E3FA1414243444546474849 4A4B4C4D4E4F505152535455565758595AC4D6D1DCA7BF616263646566676869 6A6B6C6D6E6F70717273747576777879 7AE4F6F1FCE0** **<CTRL-Z>** *Note: Set the custom character set tables to enable a GSM to default font conversion*	OK
AT+WPCS="CUSTOM" *Note: Use the custom character set*	OK
AT+CPBR=1	+CPBR: 1,"0146290800",129,"test of { }" OK *Note: GSM characters "{" and "}" are correctly displayed*

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2.6.7 Example 7: MT Phonebook (read only)

Command	Response
AT+CPBS="MT"	OK *Note: Select MT phonebook*
AT+WCOS=1 *Note: Select extended entries*	OK
AT+CPBF="" *Note: Read all entries*	+CPBF: 1,"0987654321",129," Carry",0 +CPBF: 2;"9876543210",129,"John",0 +CPBF: 31,"0346572834",129,"Dolores Claiborne","9876543210",129,"",,"",,"6547891230",129, "dolores@mywebaddress.com"," Becker Street London",0 +CPBF: 32, "6547892012", 129, "Pierre", "", ,"",,"9874521021",129,"",,,"Pierre@mywebaddress.com", "",0 OK
AT+WCOS=0 *Note: Select extended entries: not extended*	OK
AT+CPBF="" *Note: Read all entries*	+CPBF: 1,"0987654321",129," Carry" +CPBF: 2;"9876543210",129,"John" +CPBF: 31,"0346572834",129,"Dolores Claiborne" +CPBF: 32,"6547892012",129,"Pierre" OK

Index: 1 and 2 → SM phonebook entries

Index: 31 and 32 → ME phonebook entries

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2.7 Examples about Short Messages

2.7.1 Send a Short Message

AT+CNMI=0,1,1,1,0 *SMS-DELIVERs are directly stored, SMS-STATUS- REPORTs are displayed*

OK

AT+CSMP=17,169,0,0 *SMS-SUBMIT message with a validity period (one day)*

OK

AT+CMGF=1 *Text mode to send a Short Message*

OK

AT+CSCA="+33608080706" *Set Service Center Address to +33608080706*

OK

AT+CMGS=0601290800 *Send a SMS-SUBMIT to mobile phone*

Product sends a 4 characters sequence: 0x0D 0x0A 0x3E 0x20

This is the first text line *Edit first line and press carriage return (<CR>, 0x0D)*

This is the last text line *Edit last line and send message by pressing <ctrl-Z> (0x1A)*

+CMGS: 5 *Success: message reference 5 is returned from the SMS Service Center*

+CDS: 2,5,"0601290800",129,"99/05/01 14:15:10+04"

Success: report of successful message delivery received

2.7.2 Read Short Messages

AT+CMGF=1 *Text mode to read Short Messages*

AT+CMGL="ALL" *List all stored messages*

+CMGL: 1,"REC READ","+336290918",,"99/05/01 14:15:10+04"

I will be late *This is the first message*

+CMGL: 2,"REC UNREAD","+336290918",,"99/05/01 14:19:44+04"

Traffic jam on Broadway *This is the second message*

OK

AT+CMGR=1 " " *Read the first message*

+CMGR: "REC READ","+336290918",,"99/05/01 14:19:44+04"

OK

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2.8 Examples about Fax Class 2

2.8.1 Send a Fax Class 2

AT+FCLASS=2 *Select fax class 2*

OK

AT+FLID="LocalFax"

OK

ATD0601234567 *Call establishment*

+FCON *Connection OK*

[+FCSI: "RemoteFax"]

+FDIS:0,3,0,2,0,0,0,0

OK

AT+FDT *Beginning of the data transfer*

+FDCS:0,3,0,2,0,0,0,0

CONNECT

<0x11h> *Send carrier*

First page data terminated by <0x10h><0x03h>

OK *Page transmitted*

AT+FET=0 *Send another page*

+FPTS:1 *First page acquitted*

OK

AT+FDT

CONNECT

<0x11h> *Send carrier*

Second page data terminated by <0x10h><0x03h>

OK *Page transmitted*

AT+FET=2 *No more page*

+FPTS:1 *First page acknowledged*

+FHNG:0 *Normal end of connection*

OK

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2.8.2 Receive a Fax Class 2

AT+FCR=1
OK
AT+FLID="LocalFax"
OK
RING *Incoming call*
ATA *Answer*
+FCON *Connection OK*
[+FTSI: "RemoteFax"]
+FDCS:0,3,0,2,0,0,0,0
OK
AT+FDR
+FCFR
+FDCS:0,3,0,2,0,0,0,0
CONNECT
<0x12h> *Receive page carrier*
First page data terminated by
<0x10h><0x03h>
OK *Page received*
+FPTS:1 *First page acknowledged*
+FET:0 *To receive another page*
OK
AT+FDR
+FDCS:0,3,0,2,0,0,0,0
CONNECT
<0x12h> *Receive page carrier*

Second page data terminated by
<0x10h><0x03h>
OK *Page received*
+FPTS:1 *Second page acknowledged*
+FET:2 *No more page to receive*
OK
AT+FDR
+FHNG:0 *Normal end of connection*
OK

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2.9 +CSIM and +CRSM Examples

NOTE: if SIM answer is not specified in the following examples, it will mean that the answer will depend on the SIM content.

2.9.1 DF GSM Selection and then Status

AT+CSIM=14,"A0A40000027F20"

+CSIM=4,"9F16"

OK

AT+CSIM=10,"A0F2000016"

+CSIM=48,"…"

OK

2.9.2 DF Telecom Selection and then Status

AT+CSIM=14,"A0A40000027F10"

+CSIM=4,"9F16"

OK

AT+CSIM=10,"A0F2000016"

+CSIM=48,"…"

OK

2.9.3 EF ADN Selection and then Status

DF Telecom selection is mandatory just before the following AT commands.

AT+CSIM=14,"A0A40000026F3A"

+CSIM=4,"9F0F"

OK

AT+CSIM=10,"A0C000000F"

+CSIM=34,"…"

OK

2.9.4 Status Commands

Status – No File Id – without P1,P2, P3

AT+CRSM=242

Status – 6F3A (EF ADN) – without P1, P2, P3

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AT+CRSM=242,28474

Status – 6F07 (EF IMSI) – without P1, P2, P3

AT+CRSM=242,28423

Status – 3F00 (MF) – without P1, P2, P3

AT+CRSM=242,16128

Status – 7F10 (DF Telecom) – without P1, P2, P3

AT+CRSM=242,32528

Status – 7F20 (DF GSM) – without P1, P2, P3

AT+CRSM=242,32544

2.9.5 Get Response Commands

Get Response – (EF ADN) – without P1, P2, P3

AT+CRSM=192,28474

Get Response – (EF IMSI) – without P1, P2, P3

AT+CRSM=192, 28423

Get Response – (MF) – without P1, P2, P3

AT+CRSM=192,16128

Get Response – (DF Telecom) – without P1, P2, P3

AT+CRSM=192,32528

Get Response – (DF GSM) – without P1, P2, P3

AT+CRSM=192,32544

Get Response – 6F07 (EF IMSI)

AT+CRSM=192, 28423,0,0,15

2.9.6 Read Record CSommands

Read Record – EF ADN (Pin Code validated)

AT+CRSM=178,28474,1,4,28

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2.10 + WBHV Examples

2.10.1 Restart the Module

AT+CFUN=1

OK

2.10.2 Interrogate Modem Configuration

AT+WBHV?

+WBHV: 0,0

+WBHV: 1,0

+WBHV: 2,0

+WBHV: 3,0,0

OK

2.10.3 Activate ENS Feature

There is no STK session open yet.

AT+WBHV=3,1

+CME ERROR: 3

2.10.4 Open a STK Session

AT+STSF=2,"5FFFFFFF7F"

OK

AT+STSF=1

OK

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2.10.5 Activate ENS Feature

AT+WBHV=3,1

OK

AT+WBHV=3

+WBHV: 3,1,1 // module reset is needed

OK

2.10.6 Restart the Module and Interrogate ENS Feature Mode

AT+CFUN=1

OK

AT+WBHV=3

+WBHV: 3,1,0

OK

2.10.7 Deactivate ENS Feature

AT+WBHV=3,0

OK

AT+WBHV=3

+WBHV: 3,0,1 *// module reset is needed*

OK

2.10.8 Restart the Module and Interrogate Modem ENS Feature Mode

AT+CFUN=1

OK

AT+WBHV=3

+WBHV: 3,0,0 *// module reset is not needed*

OK

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2.10.9 Activate and Deactivate the Feature

AT+WBHV=3,1

OK

AT+WBHV=3

+WBHV: 3,1,1 *// module reset is needed*
OK

AT+WBHV=3,0

OK

AT+WBHV=3

+WBHV: 3,0,0 *// module reset is not needed*
OK

2.10.10 Restore Factory Settings

Case 1: ENS feature is already deactivated

AT+WBHV=3

+WBHV: 3,0,0 *// module reset is not needed*
OK

AT&F

OK

AT+WBHV=3

+WBHV: 3,0,0 *// module reset is not needed*
OK

Activate the ENS feature

AT+WBHV=3,1

OK

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AT+WBHV=3

```
+WBHV: 3,1,1              // module reset is needed
OK
```

AT&F *// restore the factory settings again*

```
OK
```

AT+WBHV=3

```
+WBHV: 3,0,0              // module reset is not needed for the new setting
OK
```

Case 2: ENS feature is already activated

AT+WBHV=3

```
+WBHV: 3,1,0              // module reset is not needed
OK
```

AT&F

```
OK
```

AT+WBHV=3

```
+WBHV: 3,0,1              // module reset is needed for the new setting
OK                        // since the ENS feature mode before AT&F is '1'
```


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2.11 Full AT GPRS Commands Examples

2.11.1 Activation of an IP PDP Context

- Example 1:

```
AT+CGDCONT=1,"IP","internet";+CGDCONT=2,"IP","abc.com"
OK
ATD*99***1#
CONNECT
```

- Example 2:

```
AT+CGCLASS="CG"
OK
+CGREG: 1
AT+CGDCONT=1,"IP","internet"
OK
AT+CGQREQ=1,1,4,5,2,14
OK
AT+CGQMIN=1,1,4,5,2,14
OK
AT+CGATT=1
OK
AT+CGACT=1,1
OK
```

Note:

+CGDATA: the goal of this command is the same as ATD*99***

```
AT +CGDATA=1
CONNECT
.....
```

Data transfer

```
.....
```


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```
+CGEV: NW DETACH
```

2.11.2 Network Request

AT+CGAUTO=0

OK

```
+CRING: GPRS "IP", "211.45.89.152"
```

AT+CGANS=1

CONNECT

…….Data transfer

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2.12 Unit test cases for AT + WOPEN=8 mode

- Without application binary

AT+WOPEN=0

OK

AT+WOPEN=4

OK

AT+WOPEN=1

OK

AT+WOPEN?
+WOPEN: 1

OK

AT+WOPEN=8,0,0,0

+WOPEN: 8,0,0,0

OK

AT+WOPEN=8

+WOPEN: 8,0,0,0

OK

AT+CFUN=1

OK

(Press any key, module starts normally)

- With application binary

AT+WOPEN=1

OK

AT+wopen=8

+WOPEN: 8,0,0,0

AT+WOPEN=8,0,0,0

OK

AT+CFUN=1

(Press any key, module and OAT application start normally)

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- *With* application binary

AT+WOPEN=1

OK

AT+WOPEN=8,1,10,12

OK

AT+WOPEN=8

+WOPEN: 8,1,10,12

OK

Press the keys 10 and 12, nothing occurs

AT+CFUN=1

OK

Press any keys except key 10 and 12, module and OAT application start normally

AT+CFUN=1

OK

Press the keys 10 and 12, module starts but OAT application does not start

AT+WOPEN=7

+WOPEN: 7,14

OAT application starting was cancelled by OAT Safe Boot

AT+CFUN=1

OK

Don't press any keys, module and OAT application start normally

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3 Technical appendixes

3.1 Working Modes

3.1.1 Working Mode Description

Wireless CPU can work in different modes. Each one is characterized by:

- power consumption,
- Open AT® power processing,
- feature availability.

3.1.1.1 Fast Idle Mode

This is the default mode for Wireless CPU.

There is no feature restriction in this mode.

3.1.1.2 Slow Idle Mode

This mode is a low power consumption mode. In this mode the Wireless CPU has restricted access to peripheral interfaces, thereby UARTs, USB, SPIs, I2C, GPIOs, ADCs and Buzzer are not available.

To enable or disable this mode use AT+W32K command.

The mode activation and deactivation is initiated when the customer device is connected to the serial interface (DTE). DTR pin must be pulled DOWN for requesting activation of the Slow idle mode. To deactivate this mode DTR pin must be pulled UP. All details are described in chapter 3.7 'Specifications of Power down Control mechanism through serial Ports (physical ⇔ RS232 ports or virtual ⇔ CMUX ports)'.

When this mode is activated, the Wireless CPU requires 1 to 15 seconds to power down consumption. In this state, a 32 kHz internal clock is used during the inactivity stage.

Then, the Wireless CPU can automatically wake up on unsolicited events such as:

- GSM paging,
- external interruption,
- key press,
- alarm,
- Open AT® timer expiration.

During the wake up period, the Wireless CPU will have the same characteristic as Fast idle mode in terms of power consumption and Open AT® power processing.

The Wireless CPU automatically switches back to idle state after all Open AT® treatments.

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3.1.1.3 Fast Standby Mode

In this mode, SIM device and GSM/GPRS features like GSM voice or data call, SMS, GPRS data transfer are not available. The embedded application is running and the serial port remains active (AT commands are available). If any data has to be transmitted over the network, this mode has to be turned off.

To switch the Wireless CPU to this mode use "AT+WBHV=1,1" command. The Wireless CPU must be restarted in order to take the new behavior into account.

To disable this mode, use the "AT+WBHV=1,0" command and restart the Wireless CPU.

3.1.1.4 Slow Standby Mode

This mode is a low power consumption mode. It combines Fast standby mode and Slow idle mode in terms of feature availability.

In this mode, SIM device and GSM/GPRS features like GSM voice or data call, SMS, GPRS data transfer are not available. In addition, the Wireless CPU has restricted access to peripheral interfaces, thereby UARTs, USB, SPIs, I2C, GPIOs, ADCs and Buzzer are not available.

In this mode, the Wireless CPU can automatically wake up on unsolicited events such as:

- external interruption,
- key press,
- alarm,
- Open AT® timer expiration.

During the wake up period, the Wireless CPU has the same characteristics as Fast Standby mode in terms of power consumption and Open AT® power processing.

The Wireless CPU automatically switches back to idle state after all Open AT® treatments.

To switch the Wireless CPU to this mode, use "AT+WBHV=1,2" command. The module must be restarted in order to take the new behavior into account.

To disable this mode, use "AT+WBHV=1,0" command and restart.

3.1.1.5 GSM Connected Mode

Wireless CPU is in this mode during circuit switch voice or data call.

3.1.1.6 GPRS Transfer Mode

Wireless CPU is in this mode during packet data transmission.

3.1.1.7 Alarm Mode

This mode is a low power consumption mode. The only feature which is available in this mode is the alarm wake up.

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To use it, an alarm wake up has to be previously recorded by AT+CALA command before switching to this mode.

To activate the Wireless CPU in this mode, use" AT+CPOF" command, when the ON/OFF switch is LOW.

Deactivate this mode by placing the ON/OFF switch to HIGH or after alarm wake up.

3.1.2 Working Mode Features

The table below sums up feature availability in each mode.

Features	Alarm Mode	Fast Idle Mode	Slow Idle Mode	Fast Standby Mode	Slow Standby Mode	Connected Mode	Transfer Mode
Alarm	√	√	√	√	√	√	√
Wake-up Open AT® application on timer events	-	√	√	√	√	√	√
GSM/GPRS paging (alert from the network for incoming call, incoming SMS or incoming GPRS data)	-	√	√	-	-	√	√
SIM	-	√	-	-	-	√	√
UARTs	-	√	-	√	-	√	√
USB	-	√	-	√	-	√	√
SPIs	-	√	-	√	-	√	√
I2C	-	√	-	√	-	√	√
GPIO	-	√	-	√	-	√	√
ADCs	-	√	-	√	-	√	√
Buzzer	-	√	-	√	-	√	√
Keypad	-	√	√	√	√	√	√
External IT	-	√	√	√	√	√	√
Flash led	-	√	√	√	√	√	√

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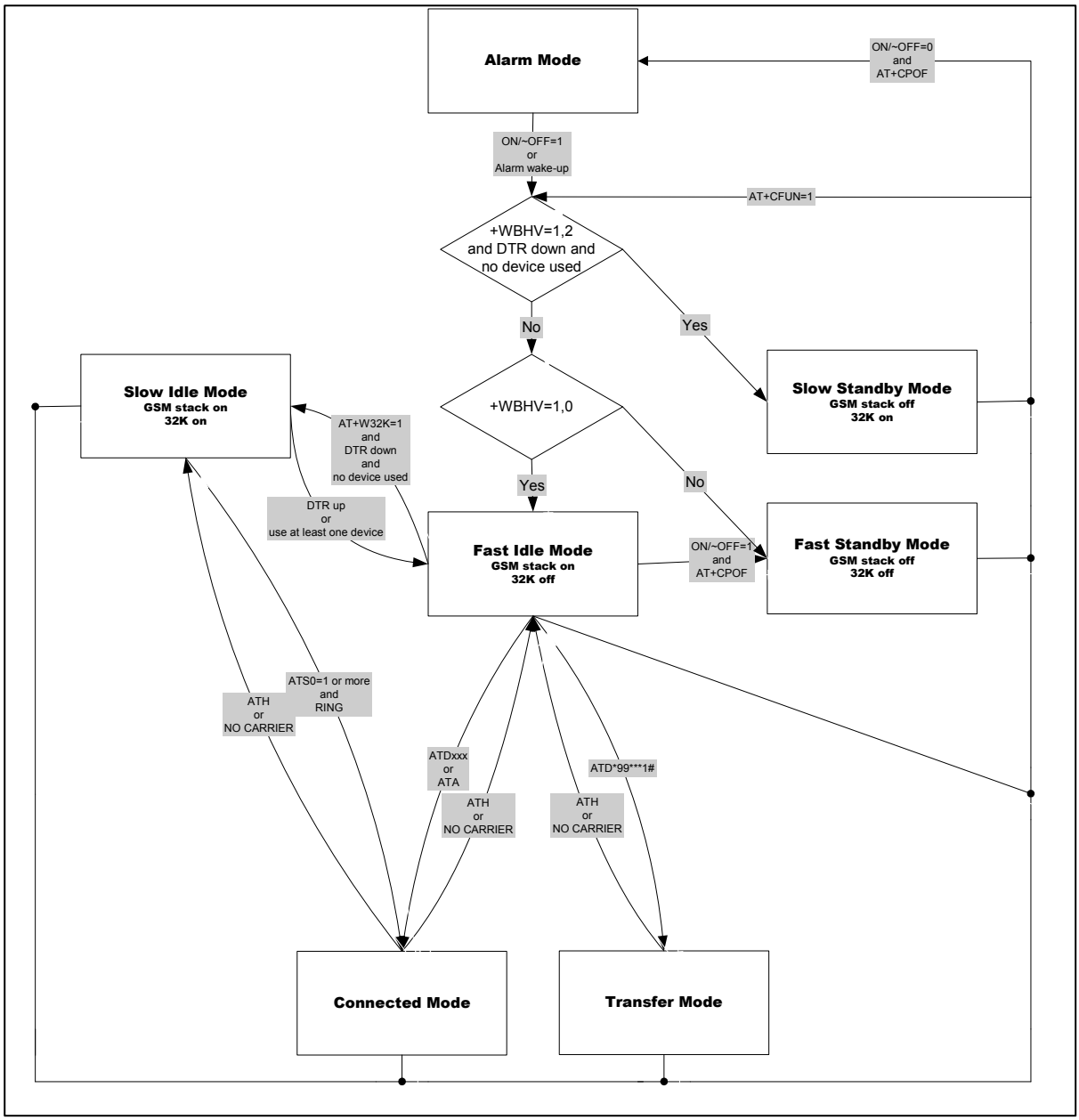
3.1.3 Transition Diagram

This diagram sums up the transition between different modes.



3.1.4 Open AT® Power Processing Performance

The Open AT® power processing performance is evaluated thanks to a Dhrystone Open AT® application. The source code of this application is extracted from "dhryansi "

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which is a part of the samples given in ADS 1.2 release. This Dhrystone algorithm is executed for at least 2 seconds.

Measurement has been performed:

- in front of a network for "Transfer Mode",
- in front of a CMU tester for all other modes.

Working modes	Open AT® processing power	Unit
Alarm Mode	N/A	MIPS
Idle Mode (Fast or Slow)	20	MIPS
Standby Mode (Fast or Slow)	21	MIPS
Connected Mode	17	MIPS
Transfer Mode class 10 (3Rx/2Tx)	15	MIPS

3.1.5 Power Consumption Performance

Power consumption performance are described in the Wireless CPU Product Technical Specification document (refer to 'Wismo Quik Q2686 Product Technical Specification', ref. WM_PRJ_Q2686_PTS_001, revision 005).

3.2 Multiplexing Mode

3.2.1 Description

The AT+CMUX command is used to manage (enable or disable) the 3GPP TS 27.010 multiplexing protocol control channel. It allows to multiplex up to 4 logical channels on a single UART. Two UARTS are available on Wireless CPUs, but multiplexing can apply to only one. The client application may handle, by this mean, up to 5 channels (4 logical multiplexed channels on a UART, and 1 physical channel on the other UART).

Notes on speed and autobauding:

- The response is returned at the speed of the received AT`+CMUX` command (prior to entering `<mode>`).
- It is recommended that whenever the multiplexer control channel is released, the modem should assume an interface rate for autobauding purposes irrespective of any previous higher speed having been selected.
- If a `+CMUX` command is issued whilst in any multiplexer mode then that `+CMUX` command is ignored and the modem will return an `+CME ERROR: <err>` response.

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3.2.1.1 Restrictions

- Only basic option and UIH framing is supported.
- Only convergence layers type 1 and 3 are supported.
- Autobauding is not compatible with multiplex mode. It is neither possible to start multiplexing when autobauding is active (AT+IPR=0), nor to set autobauding during multiplex mode, since the multiplexer uses only a fixed baud rate. In the same way, the bit rate can not be changed through AT+IPR command while multiplex mode is active. Therefore, AT+IPR=<rate> should not be used, and will have no effect.
- Before starting multiplexing mode, port speed must be configured by AT+IPR=<rate> command, to be compliant with defined values for <port _speed> parameter (in the volume 1, refer to "Multiplexing Mode +CMUX" section, "Parameters and Defined Values" section).

3.2.1.2 Specific Behaviors

- In multiplexing mode, AT configuration commands (as AT+CMEE for example), (see: [2]§ 1.10) will be applied to all logical channels.
- In multiplexing mode, unsolicited result code (see: [2]§ 1.7) will be transmitted to all logical channels
- AT commands are grouped by classes (SMS, phonebook, GPRS, SIM TOOL KIT, ... See [2] §3.7.1) and launching an AT command from a port, has for the effect to lock all commands belonging to the same class. If another port launches an AT command of the locked class, an +CME ERROR: 536 will occur as long as the class is not released (at first command's completion time).
- If Bluetooth is started, it is not possible to start CMUX on UART2. In the same way, it MUX is started on UART2, it is not possible to start Bluetooth.
- After an *at+cfun=1* during a CMUX session, CMUX is automatically restarted by the modem with previous parameters, and all previous opened DLCs are reopened, with the speed of *at+ipr?* Command.
- DCD, RI and DTR signals are managed virtually:
  When V24 sets DCD,RI or DTR signal, a MSC frame is sent to remote part, to indicate a virtual state change .Everything is logical, no physical signals are involved.
- +++ Escape Sequence is always possible to get offline.
- Flow control is managed physically or virtually by MSC.
  By default, the Wireless CPU manage a hardware flow control on a UART, and this flow control becomes virtual on logical channels when some DLCs are opened.

At CMUX session stop, Wavecom the Wireless CPU automatically goes back into AT mode, without having to reset the Wireless CPU.

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- Two timeouts are implemented for CMUX connection:

  - CMUX start connection: 30 seconds.
    After this timeout, MUX is closed, and previous physical port is reopened.
  - DLC inactivity timeouts: 5 minutes.
    This timeout is armed only if no DLC are opened, to avoid to be blocked into only DLC0 opening channel state. After this timeout, MUX is closed, and previous physical port is reopened.

3.2.2 Results

AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>]]]]]]], will respond OK when parameters are in the range, and number of parameters are in correct syntax.
Note: The 230400 (<port_speed> = 6), 460800 (<port_speed> = 7) and 921600 (<port_speed> = 8) speeds are added in AT+CMUX=? and AT+CMUX? responses.

The 230400, 460800 and 921600 speeds are added in AT+IPR=? and AT+IPR? responses.

AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>]]]]]]], will respond ERROR when:

ERROR Responses	Meaning
+CME ERROR: 3	✓ Operation not allowed: *Example:* Trying to start a MUX session during autobauding. ✓ Parameters or number of parameters are out of range.
+CME ERROR: 543	CMUX connection is refused by remote, after a restart of CMUX protocol by modem , due to a 27.010 connection loss during virtual channels establishment.
+CME ERROR: 544	CMUX connection Timeout (no answer from the remote) ie no DLC0 opened response.
+CME ERROR: 545	A CMUX session has been started on a physical UART, and user tries to start another CMUX session on other physical UART. The error, *+CME ERROR: 545* is raised on the UART where *at+cmux* command is trying to be started again.

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3.2.3 Execution Conditions

Before reception of errors of §2.1, AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>]]]]]]] first reply OK.

3.2.4 Power Down Control (Sleep Mode)

CMUX feature is based on ETSI 27.010 specifications that provide Sleep-On/Wake-Up procedure through 27.010 multiplexing protocol. It suits the description of the serial port sleep mode mechanism (Please refer to §3.7 Specifications of Power Down Control mechanism through serial Ports (physical ⇔ RS232 ports or virtual ⇔ CMUX ports)).

To match sleep mode specifications (as specified in §3.7.4), Wavecom Wireless CPU handles 27.010 MSC protocol frames that are dependent of each emulated port (associated to a particular DLCI).

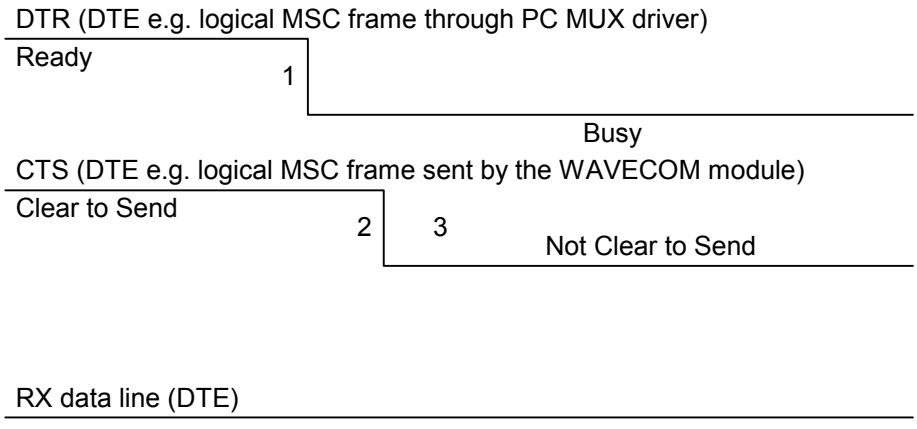
⇔ **Physical signals (such as DTR)** of the UART on which it has been activated **are not monitored** by Wavecom Wireless CPU (DCE).

To cope with Wavecom sleep mode, 27.010 sleep mode procedures are authorized only when all activated emulated/virtual ports are in Serial Sleep mode state ⇔ emulated application DTR and CTS are low on each port, no AT response is to be sent...

CMUX wake-up/sleep-on frames as specified in 27.010 recommendations applies to all activated DLC since those particular frames (PSC frames) are sent/received over the DLCI 0, which is the control channel.

3.2.5 Sleep Mode Activation

For all opened DLCI, each connected application on each DLC should set its DTR low in order to have the Wireless CPU sleep.



1: The application (DTE) drops DTR to indicate a busy state (a protocol MSC frame is sent by the PC CMUX driver on the concerned DLCI)

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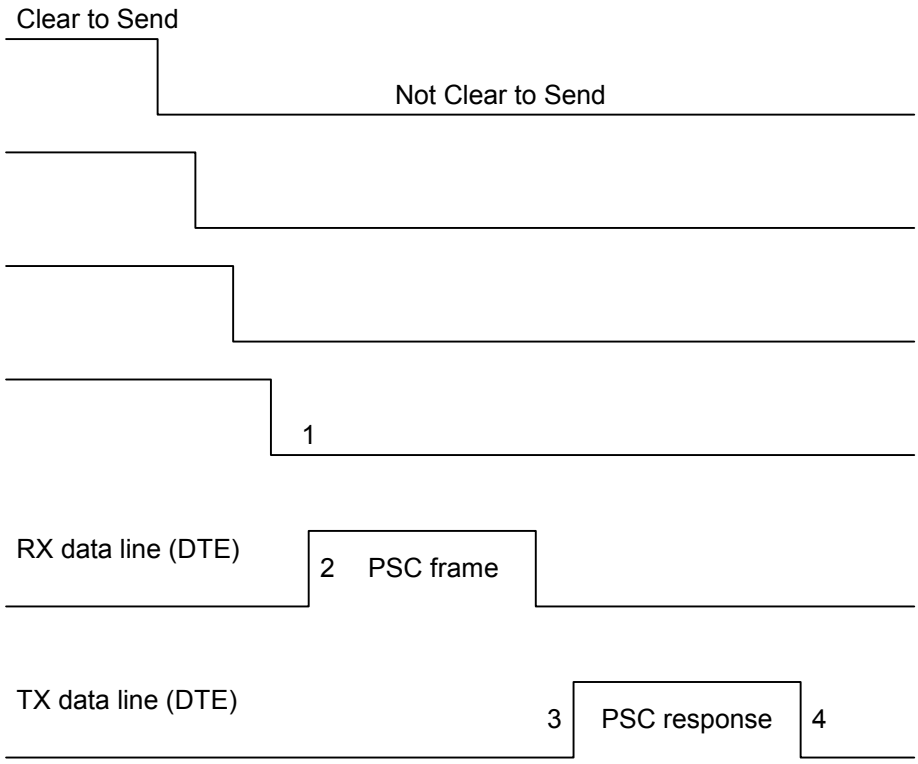
2: Wavecom Wireless CPU (DCE) checks if there are any pending AT response to send.

8 : When DTR is low and there are no more AT responses, the DCE sets CTS to low..

Once the last opened DLCI detects the DTR drop from the PC application, the CMUX driver starts sending a 27.010 PSC protocol frame, and waits for its response before allowing the entire system to go into Sleep Mode state.



1:: All the logical CTS are set high (each connected application can see CTS low)

2: Last CTS drop causes Wavecom Wireless CPU (DCE) CMUX driver to send a PSC frame and to wait for the PSC response.

: Application replies with a PSC response

: All Wavecom Wireless CPU serial virtual ports are in sleep mode state.

3.2.6 Wake Up Procedure

There are two different ways of waking up the Wireless CPU:

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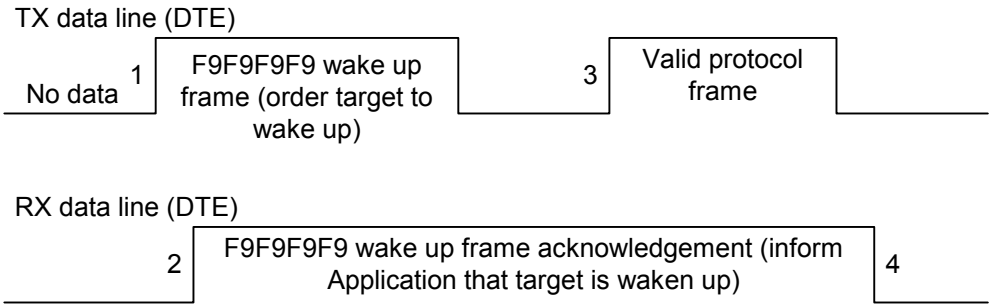
3.2.6.1 Wake up by DTE (e.g. desktop PC) wakes up Wireless CPU with a 27.010 Wake up frame

In order to wake up the Wireless CPU, the client application has to trigger one of its connected DTR high like the physical scheme.

When wanting to send the DTR MSC protocol frame, the DTE MUST first sends F9F9F9 wake up frames, waiting for Wireless CPU response, and then sends as a valid frame the DTR on MSC frame.

Otherwise, the Wireless CPU might sleep on again if all DTR are detected low !



1:: DTE sends 27.010 protocol F9F9F9F9 frame to wake up the asleep target.

2:: DCE replies with 27.010 F9F9F9F9 wake up frame as acknowledgment and waits for a valid frame.

: DTE sends a valid 27.010 frame in order to have the target stop its acknowledgment.

(It is required that the first valid frame is a MSC frame that raise application DTR)

: DCE stops sending F9F9F9F9 answer after receiving this valid frame.

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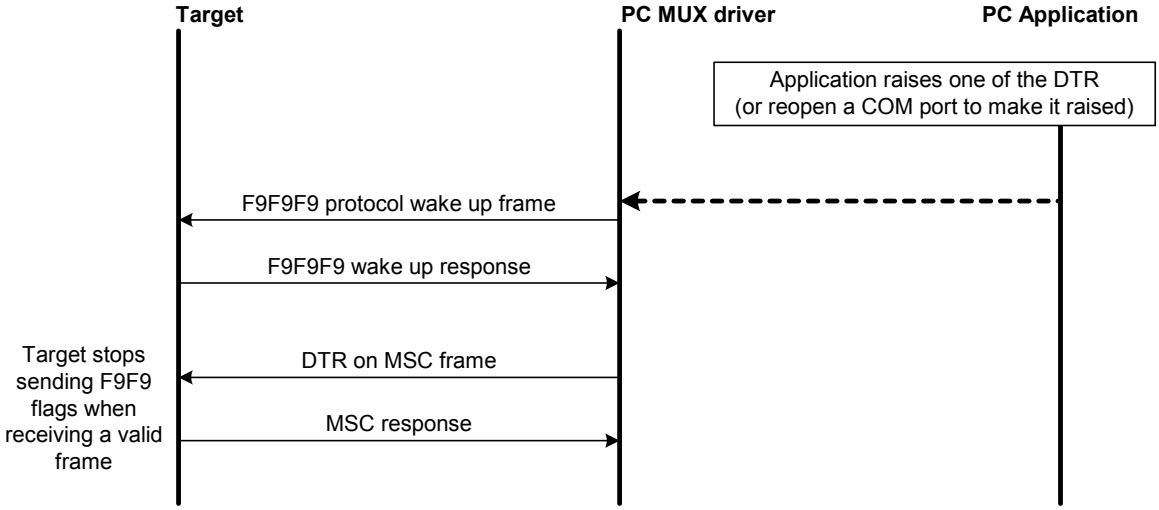
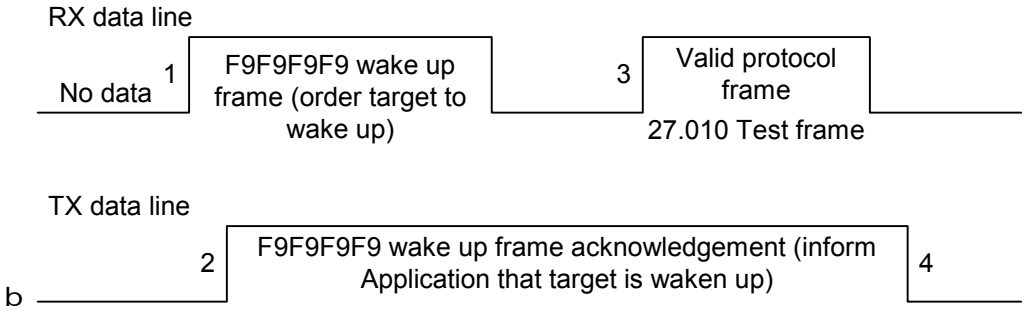


Note: If the valid frame is a DATA frame, the Wireless CPU does not detect any DTR change and sleeps on again with the PSC frame.

3.2.6.2 Wake up by Wavecom Wireless CPU (DCE) (unsolicited AT response" e.g. "RING" is to be sent)

The Wireless CPU wakes up the DTE with a 27.010 protocol wake up frame first and then sends its unsolicited indication.

The protocol **preliminary wake up sequence** is described below:



1: DCE sends 27.010 protocol F9F9F9F9 frame to wake up the asleep Application.

2: DTE replies with 27.010 F9F9F9F9 wake up frame as acknowledgment and waits for a valid frame.

: DCE sends a valid 27.010 test frame in order to have the target stop its acknowledgment.

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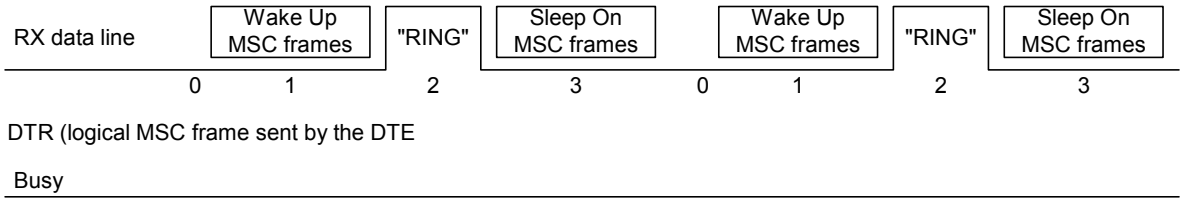
: DTE stops sending F9F9F9F9 answer after receiving the valid frame.

The entire "unsolicited string" wake up sequence and sending is described below:



0: The DCE is disturbed with an incoming call.

1: DCE starts sending F9F9F9 wake up frame, waiting for its response and sending a valid test frame (0x4D ,0x55, 0x58, 0x57, 0x41, 0x4B, 0x45, 0x55, 0x50 = MUXWAKEUP). (Once waken up, the RI is sent before the RING string in our case)

2: The unsolicited response message is sent.

8 : After the unsolicited response has been sent, the port is in sleep mode again (no more AT response and DTR low). Then DCE sends PSC to sleep on and waits for its response.

During the preliminary Wake Up sequence, if no F9F9F9 is received within T3 timer, the Wireless CPU takes the decision to close all the ports assuming that there is no more CMUX driver in the remote side.

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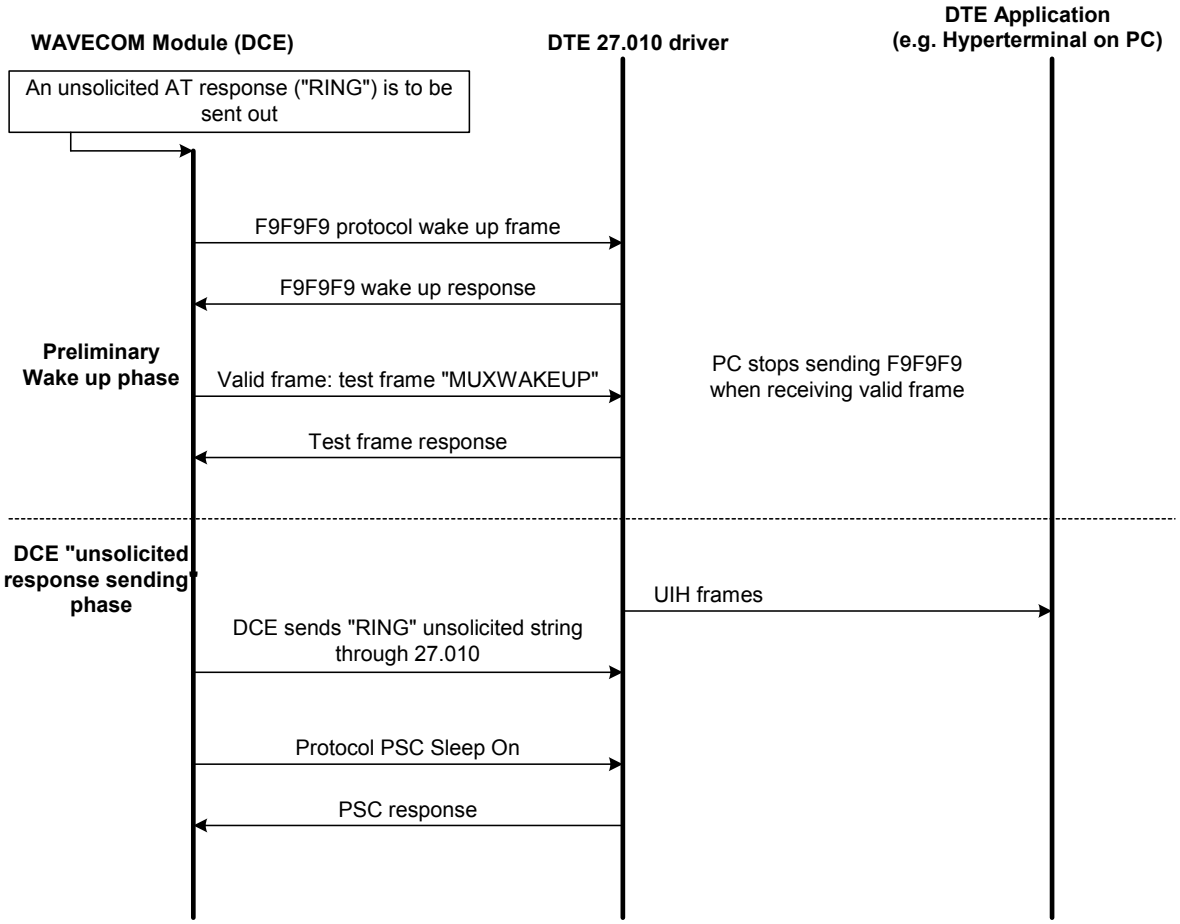

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3.3 Support of SIM ToolKit by the M.E.

This has been extracted from the GSM Technical specification 11.14.

TABLE 1 – Support of SIM Toolkit classes

Command description		Classes 1	2	3
CALL CONTROL			X	X
CELL BROADCAST DOWNLOAD			X	X
DISPLAY TEXT			X	X
EVENT DOWNLOAD				
- MT call				X
- Call connected				X
- Call disconnected				X
- Location status				X
- User activity				X
- Idle screen available				X
GET INKEY			X	X
GET INPUT			X	X
GET READER STATUS	$(MultipleCard)$			Lc
MENU SELECTION			X	X
MO SHORT MESSAGE CONTROL				X
MORE TIME			X	X
PERFORM CARD APDU	$(MultipleCard)$			Lc
PLAY TONE			X	X
POLLING OFF			X	X
POLL INTERVAL			X	X
POWER ON CARD	$(MultipleCard)$			Lc
POWER OFF CARD	$(MultipleCard)$			Lc
PROVIDE LOCAL INFORMATION			X	X
REFRESH		X	X	X
RUN AT COMMAND	$(AT$)			Lc
SELECT ITEM			X	X
SEND SHORT MESSAGE			X	X
SEND SS			X	X
SEND USSD				X
SET UP CALL			X	X
SET UP EVENT LIST				X
SET UP IDLE MODE TEXT	$(IdleModeText)$			X
SET UP MENU			X	X
SMS-PP DOWNLOAD		X	X	X
TIMER MANAGEMENT	$(Timer)$			Lc
TIMER EXPIRATION	$(Timer)$			Lc

The table below indicates the commands of the supported letter classes:

TABLE 2 – Support of SIM Toolkit classes (Not supported)

Letter classes	Command/function description
a	Proactive command: GET READER STATUS
	Proactive command: PERFORM CARD APDU
	Proactive command: POWER ON CARD
	Proactive command: POWER OFF CARD Event download: Card reader status

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Letter classes	Command/function description
b	Proactive command: RUN AT COMMAND
c	Proactive command: LAUNCH BROWSER
	Event download: Browser termination
d	Soft key support
e	Proactive command: OPEN CHANNEL
	Proactive command: CLOSE CHANNEL
	Proactive command: RECEIVE DATA
	Proactive command: SEND DATA
	Proactive command: GET CHANNEL STATUS
	Event download: Data available
	Event download: Channel status

TABLE 2 - Compatibility between available Terminal Responses and Proactive Commands

		Proactive commands														
		Setup Menu	Display Text	Get Inkey	Get Input	Setup Call	Play Tone	Select Item	Refresh	Send SS	Send SMS	Send USSD	Setup event list	Setup idle mode text	Send DTMF	Lang Notification
	Terminal Reponses	(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(95)	Backward Move		•	•	•			•								
(96)	Command beyond ME capabilities	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
(97)	ME currently unable to process command	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
(98)	No response from the user		•	•	•			•								
(99)	SIM session terminated by the user		•	•	•	•	•	•							•	

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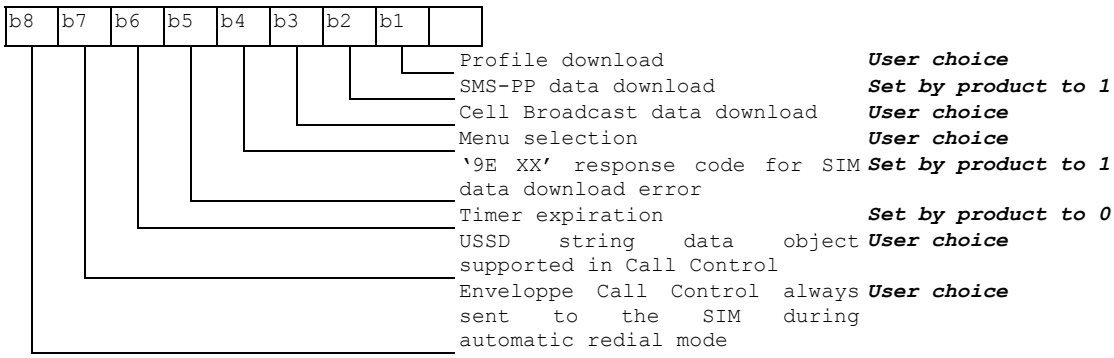
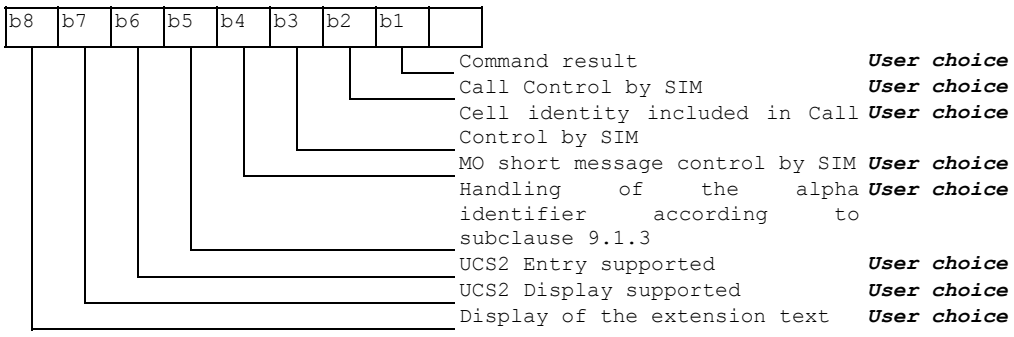
3.4 Structure of TERMINAL PROFILE

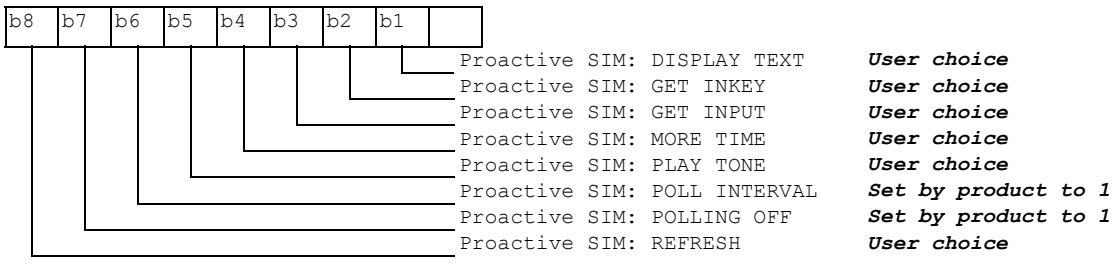
First byte (Download):



Second byte (Other):



Third byte (Proactive SIM):



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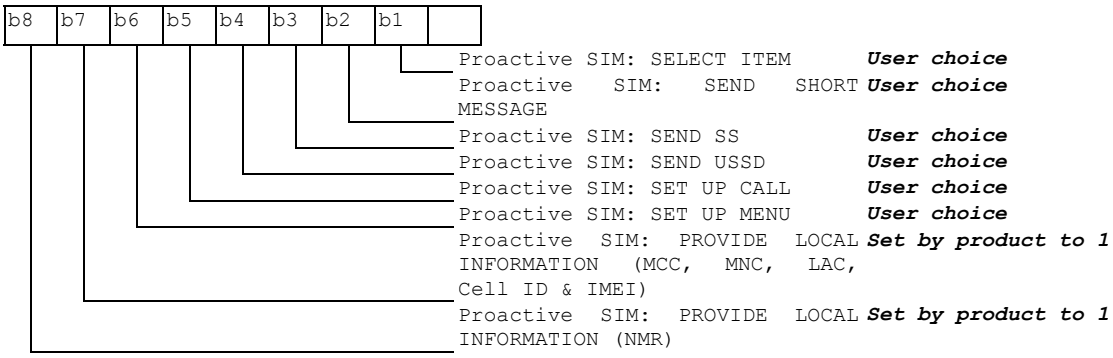
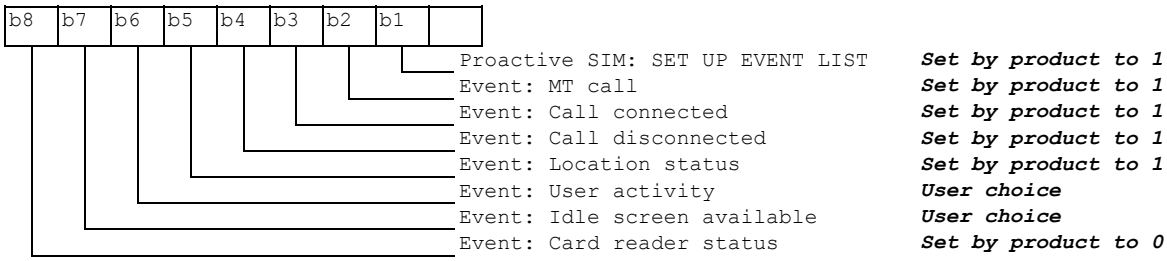
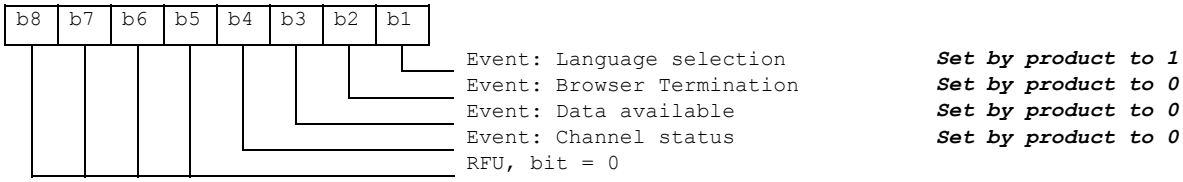
Fourth byte (Proactive SIM):



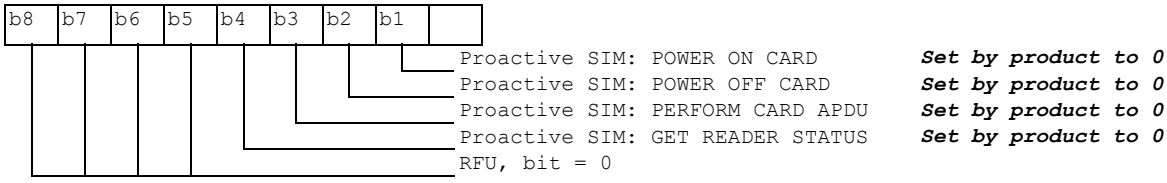
Fifth byte (Event driven information):



Sixth byte: (reserved for Event driven information extensions)



Seventh byte (Multiple card proactive commands) for class "a"



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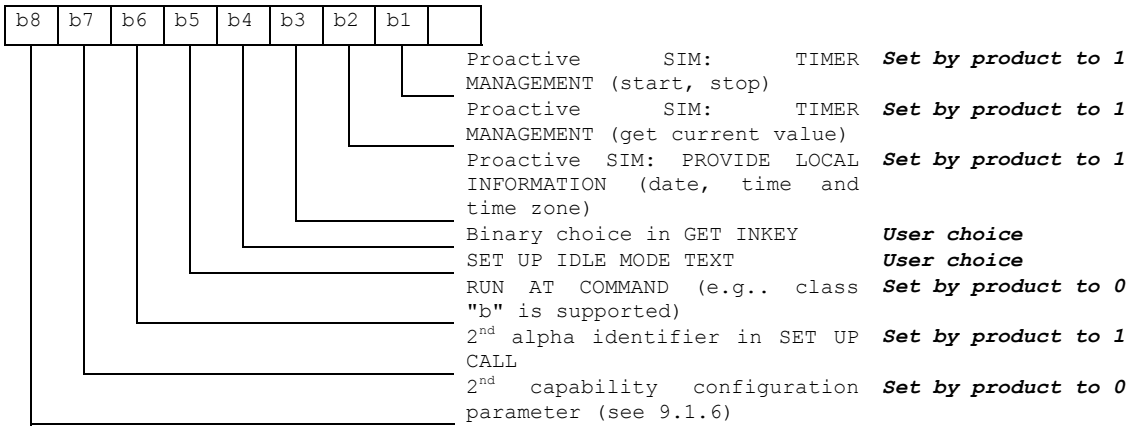
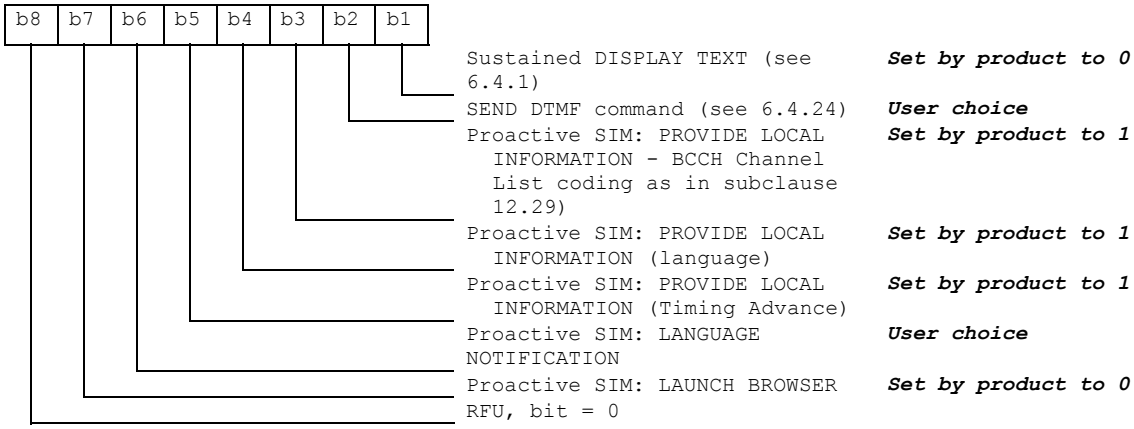
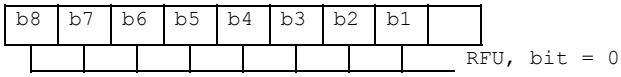
Eighth byte (Proactive SIM):



Ninth byte:



Subsequent bytes:



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Information about BCCH channel list

(this is an extract of GSM Rec.11.14)

Byte(s)	Description	Length
1	BCCH channel list tag	1
2	Length (X) of bytes following	1
3 to X+2	BCCH channel list	X

8 BCCH channel list

Contents: the list of absolute RF channels for BCCH carriers, as known by the ME from the SYSTEM INFORMATION messages. The BCCH channel list is composed of one to three BCCH channel sub lists, each sub list is derived from the set of frequencies defined by reference neighbor cells description information element or elements. In the latter case the set is the union of the different subsets defined by the neighbor cells description information elements (see TS 04.08 [8]). The length of the BCCH channel list field depends on the length of the received BCCH channel list derived from the different SYSTEM INFORMATION messages to be considered.

Coding: Each ARFCN *(Absolute Radio Frequency Channel Number)* is represented by 10 bits. Spare bit(s) are to be filled with 0.

<table>
<tr><th></th><th>Bit 8</th><th>Bit 7</th><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Bit 3</th><th>Bit 2</th><th>Bit 1</th></tr>
<tr><td>Byte 1</td><td colspan="8">ARFCN#1 (high part)</td></tr>
<tr><td>Byte 2</td><td colspan="2">ARFCN#1 (low part)</td><td colspan="6">ARFCN#2 (high part)</td></tr>
<tr><td>Byte 3</td><td colspan="4">ARFCN#2 (low part)</td><td colspan="4">ARFCN#3 (high part)</td></tr>
<tr><td>...</td><td colspan="8">...</td></tr>
<tr><td>Byte X-1</td><td colspan="4">ARFCN#m-1 (low part)</td><td colspan="4">ARFCN#m (high part)</td></tr>
<tr><td>Byte X</td><td colspan="6">ARFCN#m (low part)</td><td>Spare bit (0)</td><td>Spare bit(0)</td></tr>
</table>

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Examples

SIM applications should take into account that early implementations of SIM application toolkit may have coded this field differently, because of an inconsistency between the content and the coding of this element in previous versions of 11.14. The SIM is able to identify Mes that are using the coding described above by evaluating the indication "BCCH Channel List coding" in the TERMINAL PROFILE command.

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3.5 Command Type and Next Action Indicator.

This table has been extracted from the GSM Technical specification 11.14.

Value	Name		Used for Type of Command coding	used for Next Action Indicator coding
'00'			-	-
'01'	REFRESH		X	
'02'	MORE TIME		X	
'03'	POLL INTERVAL		X	
'04'	POLLING OFF		X	
'05'	SET UP EVENT LIST		X	
'10'	SET UP CALL		X	X
'11'	SEND SS		X	X
'12'	SEND USSD		X	X
'13'	SEND SHORT MESSAGE		X	X
'14'	SEND DTMF		X	
'15'	LAUNCH BROWSER	class "c"	X	
'20'	PLAY TONE		X	X
'21'	DISPLAY TEXT		X	X
'22'	GET INKEY		X	X
'23'	GET INPUT		X	X
'24'	SELECT ITEM		X	X
'25'	SET UP MENU		X	X
'26'	PROVIDE LOCAL INFORMATION		X	
'27'	TIMER MANAGEMENT		X	
'28'	SET UP IDLE MODEL TEXT		X	X
'30'	PERFORM CARD APDU	class "a"	X	X
'31'	POWER ON CARD	class "a"	X	X
'32'	POWER OFF CARD	class "a"	X	X
'33'	GET READER STATUS	class "a"	X	X
'34'	RUN AT COMMAND	class "b"	X	
'35'	LANGUAGE NOTFIICATION		X	
'40'	OPEN CHANNEL	class "e"	X	X
'41'	CLOSE CHANNEL	class "e"	X	X
'42'	RECEIVE DATA	class "e"	X	X
'43'	SEND DATA	class "e"	X	X
'44'	GET CHANNEL STATUS	class "e"	X	X
'81'	End of the proactive session		not applicable	X

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3.6 Coding of Alpha Fields in the SIM for UCS2

The coding can take one of the three following structures, or GSM default alphabet. If the ME supports UCS2 coding of alpha fields in the SIM, it will support all three coding schemes for character sets containing 128 characters or less. For character sets containing more than 128 characters, the ME will at least support the first coding scheme. Within a record, only one coding scheme, either GSM default alphabet, or one of the three described below, can be used.

1. **If the first byte in the alpha string is '0x80'**, then the other bytes are 16 bit UCS2 characters. The most significant byte (MSB) of the UCS2 character is coded in the lower numbered byte of the alpha field, and the less significant byte (LSB) of the UCS2 character is coded in the higher numbered alpha field byte. In other words, byte 2 of the alpha field contains the most significant byte (MSB) of the first UCS2 character, and byte 3 of the alpha field contains the less significant byte (LSB) of the first UCS2 character (as shown below). Unused bytes shall be set to 'FF': if the alpha field has an even length in bytes, the last (unusable) byte will be set to 'FF'.

Example 1

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'80'	$Ch1_{MSB}$	$Ch1_{LSB}$	$Ch2_{MSB}$	$Ch2_{LSB}$	$Ch3_{MSB}$	$Ch3_{LSB}$	'FF'	'FF'

2. **If the first byte of the alpha string is '0x81'**, then the 2nd byte contains a value indicating the number of characters in the string. The 3rd byte contains an 8 bit number which defines bits 15 to 8 of a 16 bit base pointer, where bit 16, and bits 7 to 1 would be set to zero. These sixteen bits represent a base pointer to a "half-page" in the UCS2 code space, to be used with some or all of the remaining bytes in the string. The 4th and subsequent bytes in the string contain coding as follows:
    - if bit 8 of the byte is set to zero, the remaining bits of the byte contain a GSM Default Alphabet character
    - if bit 8 of the byte is set to one, the remaining bits are an offset value to add to the 16 bit base pointer defined by byte 3, and the resulting 16 bit value is a UCS2 code point, and defines a UCS2 character.

Example 2

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'81'	'05'	'13'	'53'	'95'	'A6'	'28'	'FF'	'FF'

In the example above

- Byte 2 indicates there are 5 characters in the string

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- Byte 3 indicates bits 15 to 8 of the base pointer, and indicates a bit pattern of 0hhh shah h000 0000 as the 16 bit base pointer number. Bengali characters for example start at code position 0980 (0*000 1001 1*000 0000), which is indicated by the coding '13' in byte 3 (shown by the italicized underlined digits).
- Byte 4 indicates GSM Default Alphabet character '53', e.g.. "S".
- Byte 5 indicates a UCS2 character offset to the base pointer of '15', expressed in binary as follows 001 0101, which, when added to the base pointer value results in a sixteen bit value of 0000 1001 1001 0101, e.g.. '0995', which is the Bengali letter KA.
- Byte 8 contains the value 'FF': as the string length is 5, this a valid character in the string, where the bit pattern 111 1111 is added to the base pointer, yielding to a sixteen bit value of 0000 1001 1111 1111 for the UCS2 character (that is '09FF').
- Byte 9 contains the padding value OxFF.

3. **If the first byte of the alpha string is set to '0x82'**, then the 2nd byte contains the length of the string (number of characters).The 3rd and 4th bytes contain a 16 bit number which defines the complete 16 bit base pointer to a "half-page" in the UCS2 code space, for use with some or all of the remaining bytes in the string. The 5th and subsequent bytes in the string contain coding as follows:
   - if bit 8 of the byte is set to zero, the remaining seven bits of the byte contain a GSM Default Alphabet character,
   - if bit 8 of the byte is set to one, the remaining seven bits are an offset value added to the base pointer defined in bytes 3 and 4, and the resulting 16 bit value is a UCS2 code point, and defines a UCS2 character.

Example 3

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'82'	'05'	'05'	'30'	'2D'	'82'	'D3'	'2D'	'31'

In the example above:

- Byte 2 indicates there are 5 characters in the string
- Bytes 3 and 4 contain a 16 bit base pointer number of '0530', pointing to the first character of the Armenian character set.
- Byte 5 contains a GSM Default Alphabet character of '2D', which is a dash "-".
- Byte 6 contains a value '82', which indicates it is an offset of '02' added to the base pointer, resulting in a UCS2 character code of '0532', which represents Armenian character Capital BEN.

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- Byte 7 contains a value 'D3', an offset of '53', which when added to the base pointer results in a UCS2 code point of '0583', representing Armenian Character small PIWR.

3.7 Specifications of Power Down Control mechanism through serial Ports (physical ⇔ RS232 ports or virtual ⇔ CMUX ports)

3.7.1 What is new on X55 and further software releases

V24 Sleep mode and Wavecom 32K mode used to be a one and only functionality. Since v24 now supports several ports (physical or virtual), Wavecom products are allowed to enter 32K low consumption mode only when all of these ports are individually ready to enter such a mode.

3.7.2 Definitions.

3.7.2.1 Serial Port Sleep Mode State

This mode reflects the particular V24 state of a port (physical or virtual) regarding the possibility to enter or not 32K low consumption mode.

- This **mode is entered** automatically when:
  - The port is in AT command mode. (no GSM/GPRS communication is in progress on it).
  - No AT response is to be sent to the DTE.
  - The connected DTE is no more ready to communicate on it (meaning DTE sets DTR low).

- This **mode is left** automatically when some unsolicited responses are to be sent to the DTE.

The connected DTE is ready to communicate on it (meaning DTE sets DTR high).

CTS is set when in this mode, the DCE does not allow the DTE to send data to the involved serial port (meaning low on that port).

3.7.2.2 Serial Ports Sleep Mode Global State

This mode reflects the state of all the internal serial ports regarding their ability to enter 32K low consumption mode.

It is a Boolean (asleep or not) that authorizes or not GSM/GPRS protocol and Hardware Layers to enter 32K low consumption mode.

This mode is entered and left automatically depending on the state of all currently available serial ports (virtual or physical).

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- Global V24 sleep **mode is entered** when all v24 available ports are in sleep mode state.
- Global V24 sleep **mode is left** when **at least one** of the v24 available ports is not in sleep mode state.

3.7.2.3 Wavecom 32K Low Consumption Mode

This mode is based on a slower clock (32KHz) that is used instead of 13MHz clock. Most of hardware blocks are stopped. It is aimed at reducing the power consumption.

This mode is entered and left automatically if the feature is allowed.

To activate this mode, the "+W32K" AT command must be used.

It is authorized or not by peripherals (such as UARTs, Buses, ...) and mainly driven by GSM/GPRS protocols and Hardware Layers: this mode is entered when no GSM/GPRS activity is required (no communication is in progress, no paging is in progress, ...).

Regarding UARTs and serial ports activity, 32K low consumption mode may be entered as soon as V24 sleep mode global state is "asleep".

Wavecom Wireless CPU decides on its own to leave 32K low consumption at each GSM/GPRS paging occasion.

During, this little time (which is operator dependant), UARTs are activated again so that DTR state changes can be processed.

When this mode is activated, no data can be exchanged on RXD and TXD lines. Only Modem status changes can be monitored (DTR and RTS changes) by the DCE.

3.7.3 Summary

To summarize the 3 definitions, the following schematics describe the functional links between, **serial port sleep mode single state** manager, **serial ports sleep mode global state** manager and **W32K sleep mode** manager.

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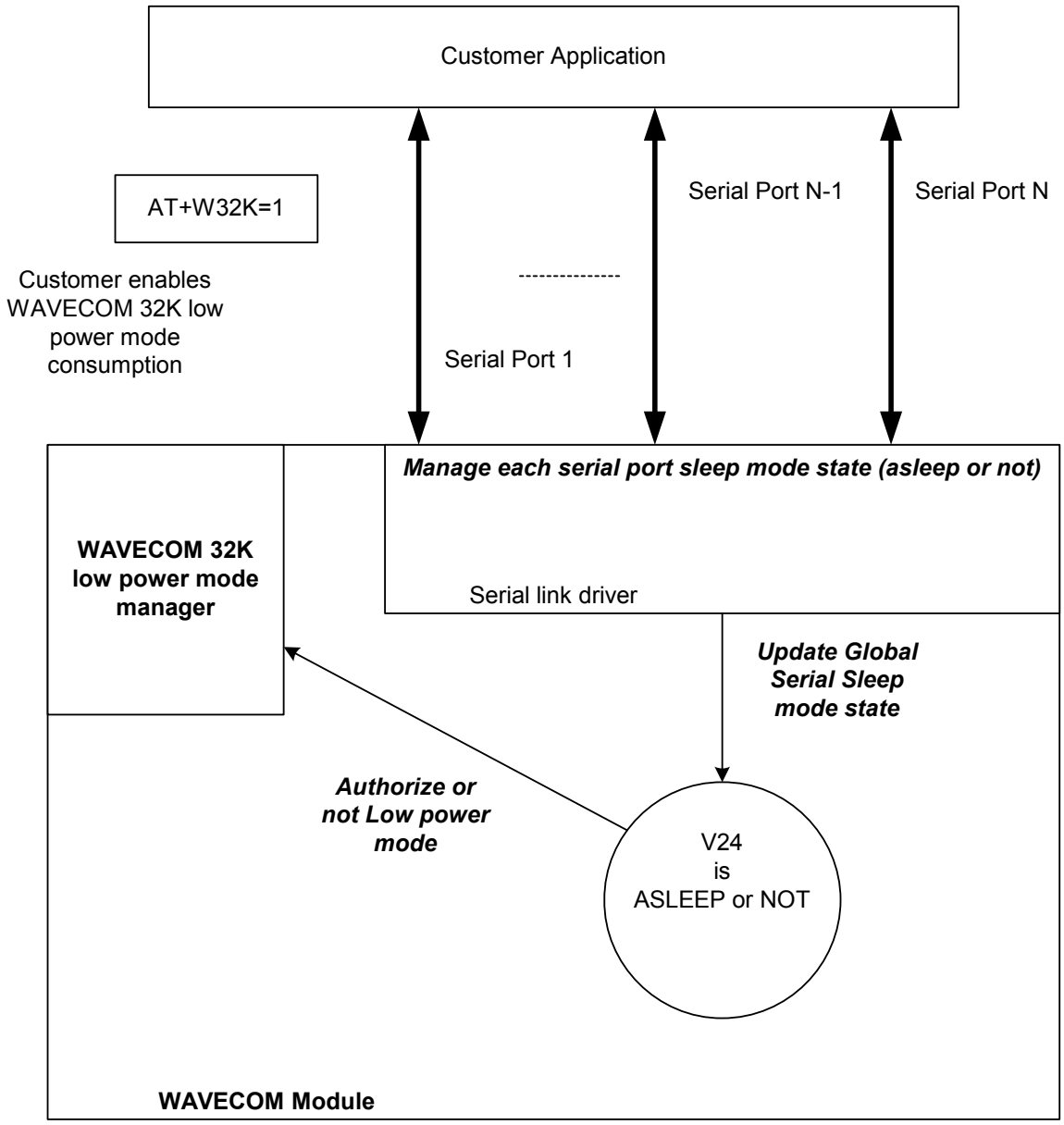

3.7.4 Case of Single Serial Port Use

This section describes the expected behavior for a single serial port (physical or virtual). Please remember that this behavior is independent of W32K feature activation.

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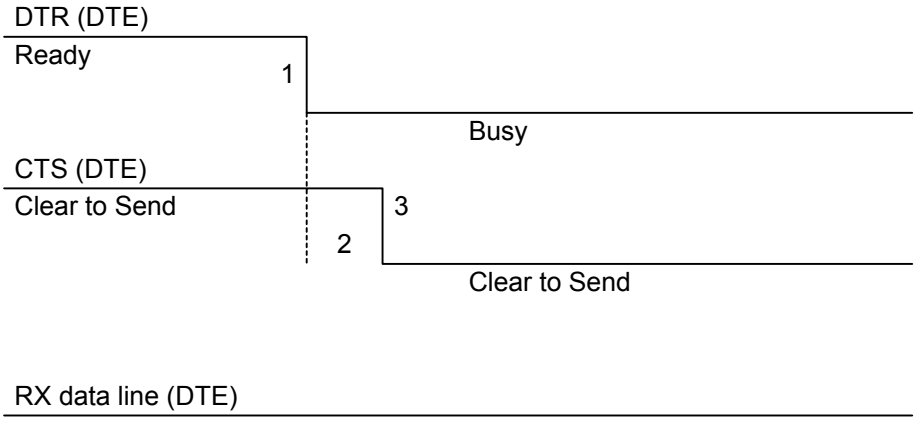
3.7.4.1 Sleep on Procedure

In order to place a serial port in Sleep Mode state, the DTE just has to drop its DTR signal to indicate that it is Busy. Then, Wavecom Wireless CPU (DCE) sets the DTE CTS low.



1: The application drops its DTR to indicate a busy state

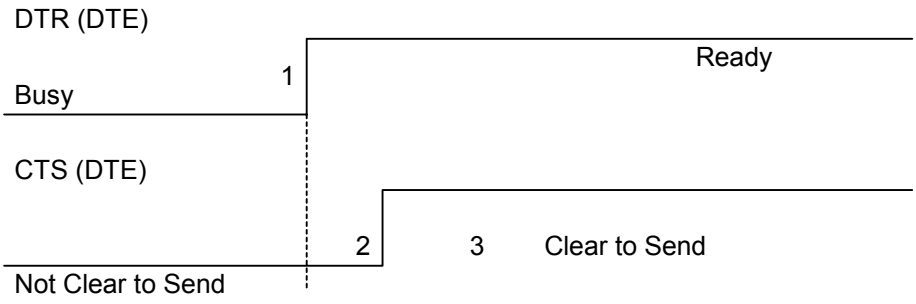
2: Wavecom Wireless CPU (DCE) detects DTR drop and check if there are still AT responses to send on that port.

8 : When DTR is low and there are no more AT response, the DCE sets the application (DTE) CTS low. (At this point, the associated serial port is in Sleep Mode state)

Note: While in data mode, the CTS does not follow the DTR.

3.7.4.2 Wake up Procedures

3.7.4.2.1 On DTE initiative: Wake up by DTR Raise



1: The application raises its DTR signal to indicate a ready state (meaning DTE wants to communicate with the DCE).

2: Wavecom Wireless CPU (DCE) takes into account the DTR signal change. (MSR IRQ for physical port or protocol frame for CMUX)

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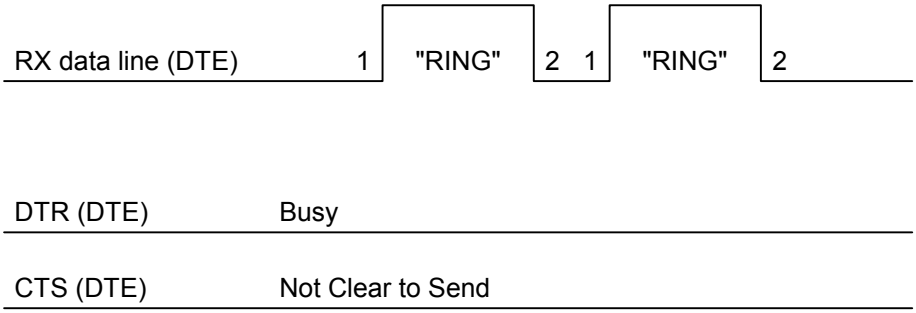
8 : V24 triggers the DTE CTS signal to allow AT commands again. (CTS is high)

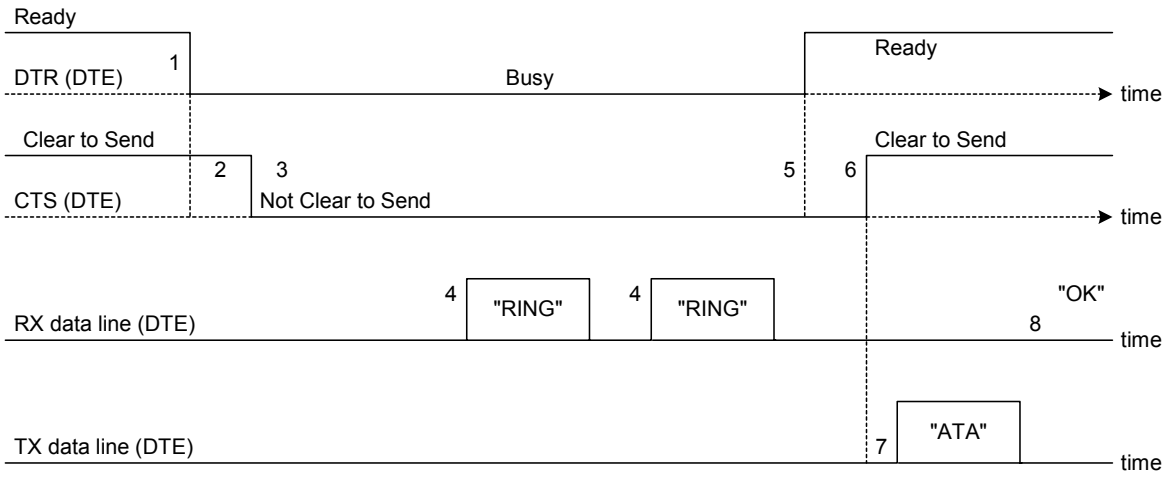
3.7.4.2.2 On DCE initiative: Wake up by AT unsolicited indications (e.g. "RING " indicator)



1: An incoming call occurs. Consequently unsolicited indications ("RING") are sent to the DTE.

8 : As soon as unsolicited indication has been sent, the port switches back to sleep mode state (as long as there is no more AT command response to send and that DTR remains High)

3.7.4.3 Complete Sequence Behavior



1: The application (DTE) drops its DTR to indicate to DCE a busy state

2: Wavecom Wireless CPU (DCE) computes and check if there are still AT responses to send on that port.

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: Since no more AT response is to be sent, the DCE sets CTS to low so that application (DTE) can not send any data to the Wavecom Wireless CPU (DCE). ⇔ **At this stage, the associated serial port is in Sleep Mode state.**

: An incoming call occurs. As a consequence, unsolicited AT indications (e.g. "RING") are sent to the DTE.

Note that even if RING are sent, Serial Port remains in Sleep Mode state.

: Customer application (DTE) wants to answer to "RING" unsolicited AT indications. It **MUST** raise first DTR to wake up the serial Port.

6: On Wavecom Wireless CPU (DCE), detection of DTR rise informs that customer application (DTE) wants to get out from sleep mode state. DCE sets CTS high so that customer application (DTE) can send again data to Wavecom Wireless CPU.

Note that at this stage, Serial Port is no more in Sleep Mode state.

7: Customer application (DTE) replies to RING indication with "ATA" command.

8: Wavecom Wireless CPU (DCE) acknowledges and processes the command.

Note that this behavior applies whether W32K is activated or not.

3.7.4.4 Transition State (from Asleep to Awake)

When unsolicited AT responses are to be sent (e.g. "RING" indication), V24 software elements enters a transition state that places the global sleep mode state in the "Awake State". Thus, until unsolicited responses are sent, the Wavecom Wireless CPU can not enter Low power mode consumption (W32K). As a consequence, RTS signal MUST remain High to allow the transmission of the unsolicited response.

Note: mind that unsolicited responses are broadcasted on all available serial ports ⇔ **when unsolicited responses are to be sent (e.g. "RING")** on a serial port **and** signals are not managed (e.g. **RS232 cable is disconnected** whereas associated V24 serial port is still registered) **then Wavecom Wireless CPU is not allowed to enter W32K low power mode consumption.**

3.7.5 Case of Several Serial Ports Use

The behavior specified in §3.7.4 applies to each of the activated serial ports (physical or virtual e.g. CMUX).

Note: When Wavecom 32K low power mode is activated (AT+W32K=1), **Wireless CPU really enters low power mode when all activated serial ports are set to sleep mode state**.

3.7.6 UART2 Exception (on all Wireless CPUs)

Physical block of the UART2 only provides Wireless CPU with RX/TX and CTS/RTS signals so that DTR can not be wired on UART2 serial port.

Since only RXD/TXD and RTS/CTS are available, there is no way to enter/leave sleep mode on this particular port.

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Thus, UART2 is not scanned to manage global Serial Sleep mode state. As a consequence, **data can be lost on UART2 if W32k is activated**.

⇔ **WARNING:** When only UART2 is activated, activation of W32K mode is forbidden.

Note: When emulating one (or more) virtual port(s) over UART2 using CMUX feature, it is then possible to use W32K mode.

3.8 Description of Multi-Flow Behavior

Multi-flows allows the Wireless CPU to treat commands from various sources (or flows):

- UART ports
- USB port
- embedded Open-AT® applications.
- CMUX virtual ports

AT commands are organized in classes , and multi-flow allows the simultaneous execution of commands of different classes coming from the possible sources:

- commands belonging to the same class can not be treated as the same time. When a command of a class is treated, the Wireless CPU will respond "busy" to any command of the same class until the first command processing has completed.
- when a flow is waiting for the treatment of a command, it is busy until the command execution completion.

Example:

1) The Wireless CPU receives a command of class AT_CLASS_PHONEBOOK on UART1. The processing of the command starts, and a response from the phonebook entity is expected. No other command of the AT_CLASS_PHONEBOOK class can be processed, and the UART1 port is busy.
2) The Wireless CPU receives then a command from USB port, of another class. It is able to immediately process this second command.
3) When the phonebook entity answers, the first command's processing completes. UART1 port and AT_CLASS_PHONEBOOK class are released.

Notes:

- concatenation of commands remains possible,
- the Repeat command (A/) runs independently for each flow,
- an embedded Open-AT® application or "+WMFM" AT command may change data redirection.

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3.8.1 Commands Classes

There are 27 commands classes, presented in the array below:

Class name	Related commands
AT_CLASS_A_SLASH	A/
AT_CLASS_COM	+CHLD, +VTD, +VTS, +WATH, A, D, DL, H, O
AT_CLASS_CPHS	+CPHS, +WALS, +WMBN
AT_CLASS_DATA	+CRLP, +DOPT
AT_CLASS_FAX	+FBOR, +FBUF, +FCQ, +FCR, +FDCC, +FDIS, +FPHCT, +FRH, +FRM, +FRS, +FTH, +FTM, +FTS, FLID
AT_CLASS_GPRS	+CGACT, +CGANS, +CGATT, +CGAUT, +CGCLA, +CGDATA, +CGDCONT, +CGERE, +CGPAD, +CGQMI, +CGQRE, +CGREG, +CGSMS, +GCAP, +WGPRS;+CGCMOD
AT_CLASS_LOCATION	+WLOC
AT_CLASS_MAIN	%D, &C, &D, &E, &F, &S, &T, &V, &W, +ADC, +ATGH;+CALA, +CBST, +CCLK, +CEER, +CGMI, +CGMM, +CGMR, +CGSN, +CICB, +CIND, +CLAE;+CLAN;+CLCC, +CLVL;+CMEC, +CMEE, +CMER, +CMUT, +CMUX+CPAS, +CR, +CRC, +CREG, +CRMP, +CRSL, +CSCS, +CSNS, +CSTA;+CSVM, +ECHO, +FCLASS, +ICF, +IFC, +ILRR, +IPR, +SIDET, +SPEAK, +VGR, +VGT, +VIP, +W32K, +WAC, +WADF;+WBCM, +WCCS, +WCDM, +WCDP, +WCFM, +WCTM, +WDGR; +WDGT; +WDOP, +WDTMF, +WDWL, +WFM, +WHWV, +WIMEI, +WIND, +WIOM, +WIOR, +WIOW, +WLCK, , +WMSN, +WPCS, +WREGC;+WRIM, +WRST, +WSCAN, +WSST, , +WSTR, +WSVN, +WTONE, +WVR, E, I, Q, S, V, Z, +WMFM, +WOPEN, +WCOS
AT_CLASS_NETWORK	+CCED, +COPN, +COPS, +CPLS, +CPOL, +CSQ, +WMBS, +WOPN, +WOLM
AT_CLASS_PHONEBOOK	+CNUM, +CPBF, +CPBN, +CPBP, +CPBR, +CPBS, +CPBW, +WAIP, +WDCP
AT_CLASS_PHONEBOOK	WPGW, WPGR, WPGS
AT_CLASS_POFF	+CFUN, +CPOF, +WBHV
AT_CLASS_RIL	+CRSM, +CSIM
AT_CLASS_RS	+CPWL
AT_CLASS_SECURITY	+CLCK, +CPIN, +CPIN2, +CPINC, +CPWD
AT_CLASS_SIM	+CCID, +CIMI, +WLPR, +WLPW

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Class name	Related commands
AT_CLASS_SMS	+CMGD, +CMGF, +CMGL, +CMGR, +CMGS, +CMGW, +CMSS, +CNMA, +CNMI, +CPMS, +CRES, +CSAS, +CSCA, +CSCB, +CSDH, +CSMP, +CSMS, +WCBM, +WMGO, +WMSC, +WUSS, +WMCP
AT_CLASS_SS	+CACM, +CAMM, +CAOC, +CCFC, +CCUG, +CCWA, +CKPD, +CLIP, +CLIR, +COLP, +CPUC, +CSSN, +CUSD
AT_CLASS_STLK	+STGI, +STGR, +STIN, +STSF
AT_CLASS_V24B	%C, \N, +DR, +DS

3.8.2 Remark on Error 536

When a class is locked and when another command belonging to the same class arrives, the Wireless CPU answers +CME ERROR: 536.

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3.9 USB CDC feature

3.9.1 Software Specification

The Q2686 Wireless CPU implements an Abstract Control Modem as specified in the Communication Device Class 1.1 specification, therefore a host can use the Q2686 either as a modem device or as a virtual communication port (VCOM).

3.9.2 Managing the USB Feature

3.9.2.1 Enabling the USB Port

To activate the USB feature, in CDC mode, the application must send the AT+WMFM=0,1,3 command to the Wireless CPU. The Wireless CPU replies:

- OK if the USB stack successfully started,
- +CME ERROR: 3 if the USB stack failed to start.

From here there is 2 possibilities:

1 – The Wireless CPU is wired to the host, the device enumeration is done: if the enumeration is successfully completed, a VCOM and a modem device (viewable in the devices manager) are created at the host side otherwise the failure is notified to the user (by the host).

2 – The Wireless CPU is not wired to the host: the USB stack is waiting for the USB cable plugging. As soon as the cable is plugged, the enumeration stage described above starts.

3.9.2.2 Disabling the USB Port

To deactivate the USB feature the application must send the AT+WMFM=0,0,3 command by using either the UART1 or the UART2.

Two cases are supported:

1- The USB stack is running in CDC mode: if the stack is successfully stopped the Q2686 replies OK otherwise it replies '+CME ERROR: 3' (note the USB stack is still running in CDC mode).

2- The USB stack is stopped: the Q2686 replies unconditionally '+CME ERROR: 3'.

A Q2686 reset, whatever its origin, stops the USB stack. If the user has saved the USB CDC configuration in EEPROM the stack will be restarted while the Q2686 is rebooting.

Stopping the USB stack and then disabling the CDC device implies that the VCOM and modem are getting unavailable at the host side. The applications using these resources must be closed since the piece of software drivers they are using does not longer exist.

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3.9.2.3 Use of E2P Parameter

It is to be noticed that each "+WMFM" action referring to serial port opening/closure is stored in E2P thanks the WAtMFPortsState record.

This record contains the state of USB CDC stack (active or not) for next start up of the Wireless CPU in the third meaningless bit.

3.9.3 USB Restrictions

The Wavecom implementation does not, currently support, the remote wake up feature.

The Wavecom implementation does not, currently, support the low power mode.

3.9.4 Supported Applications

In a general way all the applications using a serial port can be used on the USB serial port. Some tests have been conducted with the following applications:

- hyper terminal
- Y-Modem / X-Modem / Z-Modem
- TMT
- DockLight

Delrina Fax (select the Wavecom USB modem)

3.9.5 AT Command Restrictions

When using the USB port to manage the modem the following commands are either not supported or have a specific behavior.

- AT+ICF - character format

AT+ICF? The list of supported USB emulated serial port settings are stated (highlighted in green) in the following table. The settings highlighted in orange must not be used.

Data number	Stop number	Kind of Parity	AT+ICF? responses
8	1	None	+ICF: 3,4
		Odd	+ICF: 2,0
		Even	+ICF: 2,1
		Mark	Not supported always replies: "+ICF: 2,4"
		Space	
8	2	None	+ICF: 1,4
		Odd	+ICF: 2,0
		Even	+ICF: 2,1

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Data number	Stop number	Kind of Parity	AT+ICF? responses
		Mark	Not supported always replies: "+ICF: 2,4"
		Space	
7	1	None	+ICF: 6,4
		Odd	+ICF: 5,0
		Even	+ICF: 5,1
		Mark	Not supported always replies: "+ICF: 5,4"
		Space	
7	2	None	+IFC: 4,4
		Odd	+IFC: 5,0
		Even	+IFC: 5,1
		Mark	Not supported always replies: "+ICF: 5,4"
		Space	
8 or 7	1.5	None	Not supported always replies "+ICF: 2,4"
		Odd	
		Even	
		Mark	
		Space	

AT+ICF=? will provide the same responses as it is sent on UART1 or 2.

- **AT+CFUN=1 - Wireless CPU reset**

Normally (when using UART1/2 to manage the Wireless CPU) the OK response is sent to the application **after** the Wireless CPU reset.

When using the emulated serial port a such response is not provided ! In addition the Wireless CPU reset will cause the USB stack stopping. From the host's point of view it is similar to a USB cable disconnection. As consequence the host is going to un-install the Wavecom USB driver and the application will reference a non valid driver.

- **AT+WDWL - firmware download**

This command is unsupported when using the USB serial emulated port.

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4 Interoperability

All the commands listed below are only used for interoperability with other applications. They have no action and always reply OK.

Command	Responses
ATB	OK
ATC	OK
ATG	OK
ATL	OK
ATM	OK
ATN	OK
ATP	OK
ATT	OK
ATW	OK
ATX	OK
ATY	OK
AT\K	OK
AT&E	OK
AT&G	OK
AT&K	OK
AT&P	OK
AT&Q	OK
AT&R	OK
AT&Y	OK
AT+GOI	OK
AT+GCI	OK

END OF THE DOCUMENT

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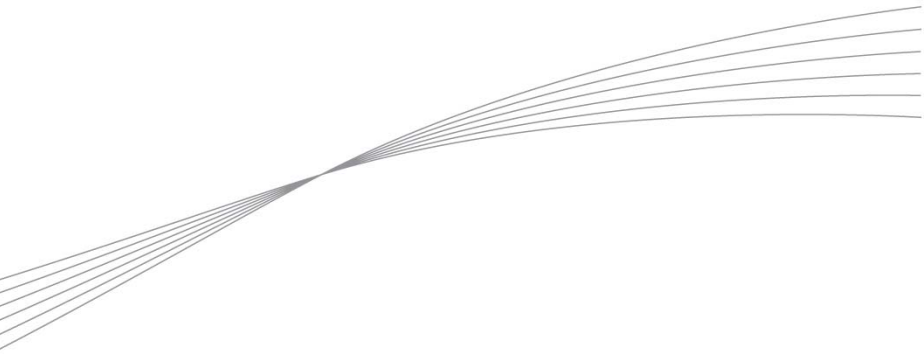

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Make it wireless

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