

Appendixes to AT Commands Interface Guide for OS 6.60 release

Revision: 003
Date: April 2006

OPEN AT

wavecom
Make it wireless

Operating Systems | Integrated Development Environments | Plug-Ins | Wireless CPUs | Services

wavecom
Make it wireless

Appendixes to AT Commands Interface Guide for OS 6.60 release

Revision:	**003**
Date:	**April 11, 2006**
Reference:	**WM_DEV_OAT_UGD_003**

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Trademarks

®, WAVECOM®, WISMO®, Open AT® and certain other trademarks and logos appearing on this document, are filed or registered trademarks of Wavecom S.A. in France or in other countries. All other company and/or product names mentioned may be filed or registered trademarks of their respective owners.

Copyright

This manual is copyrighted by WAVECOM with all rights reserved. No part of this manual may be reproduced in any form without the prior written permission of WAVECOM.

No patent liability is assumed with respect to the use of the information contained herein.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Overview

This document contains the technical appendixes for AT Commands Interface Guide for OS 6.60 document, third release (file WM_ASW_OAT_UGD_003.pdf). This is the third revision of the document for this software release and also indicates the general AT commands.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Document History

Revision	Date	History of the evolution	
001	January 4, 2006	Creation. First edition for OS 6.60 AT software	
002	February 6, 2006	Update for Preliminary edition	
003	April 11, 2006	Update for Standard edition	

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Contents

1 CODES AND VALUES 7

1.1 ME error result code: +CME ERROR 7
1.2 Message service failure result code: +CMS ERROR 8
1.3 Specific error result codes 9
1.4 Failure Cause from GSM 04.08 recommendation (+CEER) 10
1.5 Specific Failure Cause for +CEER 12
1.6 GSM 04.11 Annex E-2: Mobile originating SM-transfer 13
1.7 Unsolicited result codes 15
1.8 Final result codes 16
1.9 Intermediate result codes 16
1.10 Parameters storage 17
1.11 GSM sequences list 22
1.12 Operator names 25
1.13 CPHS Information field 42
1.14 CSP constants 43

2 EXAMPLES 47

2.1 Examples with the PIN required 47
2.2 Examples where a voice call is originated 48
2.3 Example with incoming calls 49
2.4 Example of a call forwarding 49
2.5 Example of a multiparty call 50
2.6 Examples about phonebooks 51
2.7 Examples about short messages 58
2.8 Examples about Fax class 2 59
2.9 +CSIM and +CRSM Examples 61

3 TECHNICAL APPENDIXES 63

3.1 Working modes 63
3.2 Multiplexing mode 67

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

3.3 Support of SIM ToolKit by the M.E. 75
3.4 Structure of TERMINAL PROFILE 76
3.5 Command Type and Next Action Indicator. 80
3.6 Coding of Alpha fields in the SIM for UCS2 80
3.7 Specifications of Power down Control mechanism through serial Ports (physical ⇔ RS232 ports or virtual ⇔ CMUX ports) 82
3.8 Description of Multi-Flow behavior 88
3.9 USB CDC feature 90

4 COMMAND EXECUTION AND DEPENDENCE TO SIM 93

4.1 General commands 93
4.2 Call Control commands 94
4.3 Network service commands 94
4.4 Security commands 94
4.5 Phonebook commands 95
4.6 Short Messages commands 95
4.7 Supplementary Services commands 96
4.8 Data commands 96
4.9 Fax commands 96
4.10 Class 2 Commands 97
4.11 V24-V25 commands 97
4.12 Specific AT commands 98
4.13 SIM Toolkit commands 99
4.14 GPRS commands 99

5 INTEROPERABILITY 100

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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
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
106	ME is blacklisted by the network.	+CGATT
107	MS is not allowed to operate in GPRS.	+CGATT

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

<error>	Meaning	Resulting from the following commands
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
330	SC address unknown	+CSCA?, +CMSS, +CMGS
340	no +CNMA acknowledgement expected	+CNMA

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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
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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

<error>	Meaning	Resulting from the following commands
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

1.4 Failure Cause from GSM 04.08 recommendation (+CEER)

Cause value	Diagnostic
1	Unassigned (unallocated) number
3	No route to destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Cause value	Diagnostic
27	Destination out of order
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred with in the CUG
57	Bearer capability not authorized
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal to or greater than ACMmax
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
100	Conditional IE error
101	Message not compatible with protocol state
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Inter-working, unspecified
224	MS requested detach

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Cause value	Diagnostic
• 225	NWK requested Detach
• 226	Unsuccessful attach cause NO SERVICE
• 227	Unsuccessful attach cause NO ACCESS
• 228	Unsuccessful attach cause GPRS SERVICE REFUSED
• 229	PDP Deactivation requested by NWK
• 230	PDP Deactivation because LLC link activation Failed
• 231	PDP Deactivation cause NWK reactivation with same TI
• 232	PDP Deactivation cause GMM abort
• 233	PDP Deactivation cause LLC or SNDCP failure
• 234	PDP Unsuccessful activation cause GMM error
• 235	PDP Unsuccessful activation cause NWK reject
• 236	PDP Unsuccessful activation cause NO NSAPI available
• 237	PDP Unsuccessful activation cause SM refuse
• 238	PDP Unsuccessful activation cause MMI ignore
• 239	PDP unsuccessful activation cause Nb Max Session Reach

All other values in the range	will be treated as cause
[0,31]	31
[32,47]	47
[48,63]	63
[64,79]	79
[80,95]	95
[96,111]	111
[112,127]	127

1.5 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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.6 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.
47	Resources unavailable, unspecified	This cause is used to report a resource unavailable event only when no other cause applies.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Error #	Error label	Description
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.

All values other than specified should be treated as error #41.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.7 Unsolicited result codes

Verbose result code	Numeric (V0 set)	Description
+CALA: < time string>,<index>	As verbose	Alarm notification
+CBM: <length><pdu> (PDU) or +CBM:<sn>,<mid>,<dcs>,<page>,<pages>... (Text mode)	As verbose	Cell Broadcast Message directly displayed
+CBMI: "BM",<index>	As verbose	Cell Broadcast Message stored in mem at location <index>
+CCCM: <ccm>	As verbose	Current Call Meter value
+CCED: <values>	As verbose (specific)	Cell Environment Description indication
+CCWA:<number>,<type>, <class> [,<alpha>]	As verbose	Call Waiting number
+CDS: <fo>, <mr>... (text mode) or +CDS: <length>,... (PDU)	As verbose	SMS status report after sending a SMS
+CDSI: <mem>,<index>	As verbose	Incoming SMS Status Report after sending a SMS, stored in <mem> ("SR") at location <index>
+CKEV: <keynb>	As verbose	Key press or release
+CLAV	As verbose	Language change
+CLIP: <number>, <type> [,,,<alpha>]	As verbose	Incoming Call Presentation
+CMT : <oa>... (text mode) or +CMT: [<alpha>,]... (PDU)	As verbose	Incoming message directly displayed
+CMTI: <mem>,<index>	as verbose	Incoming message stored in <mem> ("SM") at location <index>
+CREG : <stat>[,<lac>,<ci>]	As verbose	Network registration indication
+CRING: <type>	As verbose	Incoming call type (VOICE, FAX ...)
+CSQ: <RxLev>,99	As verbose	Automatic RxLev indication with AT+CCED=1,8 command
+CSSU: <code2>[<number>,<type>]	As verbose	Supplementary service notification during a call
+STIN: <ind>	As verbose (specific)	SIM Toolkit Indication
+WIND: <IndicationNb> [,<CallId>]	As verbose (specific)	Specific unsolicited indication (SIM Insert/Remove, End of init, Reset, Alerting, Call creation/release)
+WVMI: <LineId>,<Status>	As verbose (specific)	Voice Mail Indicator notification (cf. **+CPHS** command)

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Verbose result code	Numeric (V0 set)	Description
+WDCI: <LineId>,<Status>	As verbose (specific)	Diverted call indicator
RING	2	Incoming call signal from network
+WBCI	As Verbose (specific)	Battery charge indication
+CIEV	As Verbose (specific)	Indicator event reporting
+CUSD: <m>,[<str>,<dcs>]	As verbose	USSD unsolicited response

1.8 Final result codes

Verbose result code	Numeric (V0 set)	Description
+CME ERROR: <err>	As verbose	Error from GSM 07.05 commands
+CMS ERROR: <err>	As verbose	Error from SMS commands (07.07)
BUSY	7	Busy signal detected
ERROR	4	Command not accepted
NO ANSWER	8	Connection completion timeout
NO CARRIER	3	Connection terminated
OK	0	Acknowledges correct execution of a command line
RING	2	Incoming call signal from network

1.9 Intermediate result codes

Verbose result code	Numeric (V0 set)	Description
+COLP:<number>,<type>	as verbose	Outgoing Call Presentation
+CR: <type>	as verbose	Outgoing Call report control
+ILRR: <rate>	as verbose	Local TA-TE data rate
CONNECT 300	10	Data connection at 300 bauds
CONNECT 1200	11	Data connection at 1200 bauds
CONNECT 1200/75	12	Data connection at 1200/75 bauds
CONNECT 2400	13	Data connection at 2400 bauds
CONNECT 4800	14	Data connection at 4800 bauds
CONNECT 9600	15	Data connection at 9600 bauds
CONNECT 14400	16	Data connection at 14400 bauds
+CSSI : <code1>[,<index>]	As verbose	Supplementary service notification during a call setup

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.10 Parameters storage

Command	Parameters storage mode: AT&W (E2P)	Command (E2P)	AT+CSAS (SIM, E2P)	AT&F (SIM, E2P)	Default values
General commands					
+CLAE	X			X	+CLAE: 0
+CLAN					"AUTO"* *,"AUTO" means language from 1st entry of EF-LP SIM card. "Auto" is not returned by the read-command.,*
+CMEE	X			X	0
+CRSL		X		X	6
+CSCS	X			X	"PCCP437"
+WPCS	X			X	"TRANSPARENT"
Call Control commands					
%D		X		X	0
ATS0	X			X	0 (no auto-answer)
+CICB	X			X	2 (speech)
+CSNS	X			X	0 (voice)
+ECHO		X		X	+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
+SIDET	X			X	+SIDET: 1,25
+SPEAKER	X			X	SPEAKER: 1
+VGR	X			X	+VGR: 6
+VGT	X			X	+VGT: 1
+CSTA	X			X	+CSTA: 129
Network Service commands					
+COPS	X	X		X	0,2
+CREG	X			X	0

Confidential©
This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Phonebook commands					
+CSVM		X		X	0
+WAIP	X			X	0
+WCOS		X			0

SMS commands					
+CNMI			X	X	0,1,0,0,0
+CMGF	X			X	1 (text)
+CMMS					0
+CSCA			X		SIM dependant (phase 2)
+CSDH	X			X	0
+CSMP			X	X	1,167,0,0
+CSMS		X			0
+WUSS		X		X	0

Supplementary Services commands					
+CCUG		X			0,0,0
+CCWA	X			X	0
+CLIP	X			X	0
+COLP	X			X	0
+CSSN	X			X	0,0
+CUSD		X		X	0

Data commands					
%C	X			X	0
\N	X			X	0
+CBST	X			X	0,0,1
+CR	X			X	0
+CRC	X			X	0
+CRLP	X			X	61,61,48,6,1
+DOPT	X			X	1,1
+DS	X			X	3,0,2048,20
+DR	X			X	0
+ILRR	X			X	0

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Fax Class 2 commands					
+FBOR	X			X	0
+FCQ	X			X	0
+FCR	X			X	1
+FDCC,+FDIS	X			X	0,5,0,0,2,0,0,0,0
+FPHCTO	X			X	30

V24 – V25 commands					
&C	X				1
&D	X				2
&S	X				1
E	X				1
Q	X			X	0
V	X			X	1
+ICF	X				3,4
+IFC	X				2,2
+IPR	X				115200

Specific commands					
+ADC		X		X	0
+CLVL	X			X	+CLVL: 6
+CMER	X			X	,0,,0
+CPHS		X		X	1,0 for VMI 2,0 for MBN 4,0 for DCI
+WADF		X		X	+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
+WBCM		X		X	Normal charging mode 0,0,4200,3200,100,2000,0,0 Fast charging mode 0,0,3,4200,3200,4608,1514, 633,500,4000,90,90,2000,0, 0
+WBHV		X		X	0,0 1,0 2,0
+WCCS		X			CUSTOM table is the same as PCCP437 to GSM table.
+WCDM		X		X	0,0

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

+WCDP		X		X	0
					Q2686H
+WDIAG		X		X	Type → 0 freq → 0 trig1 → 0 trig2 → 0 trig3 → 0 trig3_freq → 0
+WDGR,	X			X	+WDGR: 1,64 +WDGR: 2,64
+WDGT					+WDGT: 1,64
+WIND	X			X	0
+WIOM					Q2686H Wireless CPU) +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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

		X			+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
+WIPC		X			+WIPC: 0,1,0,0,1 +WIPC: 1,1,0,0,1
+WRIM		X		X	+WRIM : 0
+WVR		X			7,7
+WMFM		X			+WMFM: 0,2,1,1 +WMFM: 0,2,2,0 +WMFM: 0,2,3,0 +WMFM: 1,2,4,0 +WMFM: 1,2,4,1 OK UART 1 opened UART 2 & USB closed Data flows are dynamic
+WHCNF		X		X	 +WHCNF: 0,1 +WHCNF: 1,1,
+WOPEN		X		X	mode: 0
+WREGC		X		X	+WREGC : 0

SIM Toolkit commands					
+STSF		X			0,"1F6BFFFF1F0100573E",3,0

GPRS commands					
+CGAUTO	X			**X**	3
+CGCLASS		X			"B"
+CGDCONT		x			
+CGEREP	X			X	0
+CGREG	X			**X**	0
+CGSMS		X			1
+WGPRS		X			0,1 1,0 3,0 5,0 6,0

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.11 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.

1.11.1 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#**

1.11.2 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#**

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

1.11.3 Call barring

Please refer to SC values below in this paragraph. BS values are the same as above, see §1.11.2.

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*#**

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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)

1.11.4 Call waiting

BS values are the same as above, see §1.11.2.

Activate	**43BS#**
Check status	**#43BS#**
Deactivate	**#43*BS#**

1.11.5 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#**

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.12 Operator names

This list is extracted from the SE13 (May 11th 2004 edition) and the NAPRD_10_2_6_2 documents. Note that Country Initials may vary for the same MCC (Mobile Country Code) without any impact. The following list is sorted by MCC and MNC.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
GRC	202	01	GR COSMOTE	C-OTE
GRC	202	05	vodafone GR	voda GR
GRC	202	09	GR Q-TELECOM	Q-TELCOM
GRC	202	10	TIM GR	TIM
NLD	204	04	vodafone NL	voda NL
NLD	204	08	NL KPN	NL KPN
NLD	204	12	NL Telfort	NL Tlfrt
NLD	204	16	T-Mobile NL	TMO NL
NLD	204	20	Orange NL	Orange
BEL	206	01	BEL PROXIMUS	PROXI
BEL	206	10	B mobistar	mobi*
BEL	206	20	BASE	BASE
FRA	208	01	Orange F	Orange
FRA	208	03	Orange	Orange
FRA	208	10	F SFR	SFR
FRA	208	20	F – BOUYGUES TELECOM	BYTEL
AND	213	03	STA-MOBILAND	M-AND
ESP	214	01	vodafone ES	voda ES
ESP	214	03	E AMENA	AMENA
ESP	214	07	MOVISTAR	MSTAR
HUN	216	01	H PANNON GSM	PANNON
HUN	216	30	T-Mobile H	TMO H
HUN	216	70	vodafone HU	voda HU
BIH	218	03	BA-ERONET	ERONET
BIH	218	05	MOBI'S	MOBI'S
BIH	218	90	BH GSMBIH	GSMBIH
HRV	219	01	T-Mobile HR	T-Mobile
HRV	219	10	HR VIP	VIP
SCG	220	01	YU MOBTEL	MOBTEL
SCG	220	02	ProMonte	ProMonte
SCG	220	03	YUG 03	SCGTS

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
SCG	220	04	MONET	MONET
ITA	222	01	I TIM	TIM
ITA	222	10	vodafone IT	voda IT
ITA	222	88	I WIND	I WIND
ITA	222	99	3 ITA	3 ITA
ROU	226	01	RO CONNEX	CONNEX
ROU	226	03	RO Cosmorom	Cosmorom
ROU	226	10	RO ORANGE	ORANGE
CHE	228	01	Swisscom	SWISS
CHE	228	02	sunrise	sunrise
CHE	228	03	orange CH	ORANGE
CHE	228	07	In&Phone	In&Phone
CZE	230	01	T-Mobile CZ	TMO CZ
CZE	230	02	EUROTEL – CZ	ET – CZ
CZE	230	03	OSKAR	OSKAR
SVK	231	01	Orange SK	Orange
SVK	231	02	EUROTEL-SK	ET-SK
AUT	232	01	A1	A1
AUT	232	03	T-Mobile A	TMO A
AUT	232	05	one	one
AUT	232	07	A tele.ring	telering
AUT	232	10	3 AT	3 AT
GBR	234	10	O2 – UK	O2 – UK
GBR	234	15	vodafone UK	voda UK
GBR	234	20	3 UK	3 UK
GBR	234	30	T-Mobile UK	TMO UK
GBR	234	31	T-Mobile UK	TMO UK
GBR	234	32	T-Mobile UK	TMO UK
GBR	234	33	Orange	Orange
GBR	234	50	JT GSM	JT GSM
GBR	234	55	Cable & Wireless Guernsey	C&W
GBR	234	58	Manx Pronto	Pronto
DNK	238	01	TDC MOBIL	DK TDC
DNK	238	02	DK SONOFON	SONO
DNK	238	06	3 DK	3 DK
DNK	238	20	TELIA DK	TELIA
DNK	238	30	Orange	Orange
SWE	240	01	TELIA S	TELIA

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
SWE	240	02	3 SE	3 SE
SWE	240	04	SWEDEN	SWE
SWE	240	05	Sweden 3G	Sweden3G
SWE	240	07	S COMVIQ	IQ
SWE	240	08	vodafone SE	voda SE
SWE	240	10	SpringMobil SE	Spring
NOR	242	01	N Telenor	TELENOR
NOR	242	02	N NetCom GSM	N COM
FIN	244	03	FINNET	FINNET
FIN	244	05	FI elisa	elisa
FIN	244	12	FINNET	FINNET
FIN	244	14	FI AMT	FI AMT
FIN	244	91	FI SONERA	SONERA
LTU	246	01	OMNITEL LT	OMT
LTU	246	02	LT BITE GSM	BITE
LTU	246	03	TELE2	TELE2
LVA	247	01	LV LMT GSM	LMT GSM
LVA	247	02	LV TELE2	TELE2
EST	248	01	EE EMT GSM	EMT
EST	248	02	EE RLE	RLE
EST	248	03	TELE2	TELE2
RUS	250	01	MTS-RUS	MTS
RUS	250	02	MegaFon RUS	MegaFon
RUS	250	04	SIBCHALLENGE RUS	RUS_SCN
RUS	250	05	SCS RUS	SCS
RUS	250	07	RUS SMARTS	SMARTS
RUS	250	10	RUS DTC	DTC
RUS	250	11	ORENSOT	ORENSOT
RUS	250	12	RF FAR EAST	RF Feast
RUS	250	13	RUS Kuban-GSM	KUGSM
RUS	250	14	RUS Di-ex	Di-ex
RUS	250	15	RUS SMARTS	SMARTS
RUS	250	16	RUS16	NTC
RUS	250	17	RUS 17	ERMAK
RUS	250	19	RUS_BASHCELL	BASHCELL
RUS	250	20	RUS 20	MOTIV
RUS	250	28	Bee Line	Bee Line
RUS	250	39	Uraltel	RUS39

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
RUS	250	44	RUS North Caucasian GSM	NC-GSM
RUS	250	92	Primetelefone RUS	Primtel
RUS	250	99	Bee Line	Bee Line
UKR	255	01	UA UMC	UMC
UKR	255	02	UKR-WellCOM	WellCOM
UKR	255	03	UA-KYIVSTAR	UA-KS
UKR	255	05	UA-GT	GT
BLR	257	01	BY VELCOM	VELCOM
BLR	257	02	MTS BY	MTS
MDA	259	01	MD VOXTEL	VOXTEL
MDA	259	02	MD MOLDCELL	MDCELL
POL	260	01	Plus GSM	PLUS
POL	260	02	Era	Era
POL	260	03	PL IDEA	IDEA
DEU	262	01	T-Mobile D	TMO D
DEU	262	02	Vodafone.de	voda DE
DEU	262	03	E-Plus	E-Plus
DEU	262	07	o2 – de	o2 – de
DEU	262	08	o2 – de	o2 – de
GIB	266	01	GIBTEL GSM	GIBTEL
PRT	268	01	vodafone P	voda P
PRT	268	03	P OPTIMUS	OPTIM
PRT	268	06	P TMN	TMN
LUX	270	01	L LUXGSM	LUXGSM
LUX	270	77	L TANGO	TANGO
LUX	270	99	L-VOX.mobile	VOX.LU
IRL	272	01	vodafone IE	voda IE
IRL	272	02	02 – IRL	02 –IRL
IRL	272	03	IRL – METEOR	METEOR
ISL	274	01	IS SIMINN	SIMINN
ISL	274	02	Og Vodafone	Vodafone
ISL	274	03	Og Vodafone	Vodafone
ISL	274	04	Viking	Viking
ALB	276	01	AMC – AL	A M C
ALB	276	02	vodafone AL	voda AL
MLT	278	01	vodafone MT	voda MT
MLT	278	21	go mobile	gomobile
CYP	280	01	CY CYTAGSM	CY-GSM

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
CYP	280	10	areeba	areeba
GEO	282	01	GEO-GEOCELL	GCELL
GEO	282	02	MAGTI-GSM-GEO	MAGTI
ARM	283	01	RA-ARMGSM	ARMMO1
ARM	283	04	RA 04	RA 04
BGR	284	01	M-TEL GSM BG	M-TEL
BGR	284	05	BG GLOBUL	GLOBUL
TUR	286	01	TR TURKCELL	TCELL
TUR	286	02	TR TELSIM	TELSIM
TUR	286	03	AVEA	AVEA
TUR	286	04	TR AYCELL	AYCELL
FRO	288	01	Føroya Tele	FT-GSM
FRO	288	02	KALL	KALL
GRL	290	01	TELE Greenland	TELE GRL
SVN	293	40	SI vodafone	SI voda
SVN	293	41	MOBITEL	MOBITEL
SVN	293	70	SI VEGA 070	VEGA 070
MKD	294	01	MKD-MOBIMAK	MOBI-M
MKD	294	02	MKD COSMOFON	COSMOFON
LIE	295	01	FL GSM	FLGSM
LIE	295	02	Orange FL	OFL
LIE	295	05	FL1	FL1
LIE	295	77	LI TANGO	TANGO
CAN	302	370	Fido	Fido
CAN	302	720	Rogers AT&T Wireless	ROGERS
SPM	308	01	SPM AMERIS	AMERIS
USA	310	20	US – Union Telephone	Union Tel
USA	310	26	T-Mobile	TMO
USA	310	30	Centennial Communications	CENT USA
USA	310	31	T-Mobile	TMO
USA	310	40	USATX	CONCHO
USA	310	46	USA SIMMETRY	SIMMETRY
USA	310	50	DIGICEL	JAM DC
USA	310	70	Highland	HIGHLAND
USA	310	80	USA 080	Corr
USA	310	90	Edge Wireless	Edge
USA	310	100	US PLATEAU	PLATEAU
USA	310	150	Cingular	Cingular

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
USA	310	160	T-Mobile	T-Mobile
USA	310	170	Cingular	Cingular
USA	310	180	West Central Wireless	West Central
USA	310	190	USA Dutch Harbor	D-HARBOR
USA	310	200	T-Mobile	TMO
USA	310	210	T-Mobile	TMO
USA	310	220	T-Mobile	TMO
USA	310	230	T-Mobile	TMO
USA	310	240	T-Mobile	TMO
USA	310	250	T-Mobile	TMO
USA	310	260	T-Mobile	TMO
USA	310	270	T-Mobile	TMO
USA	310	310	T-Mobile	TMO
USA	310	311	FARMERS	FARMERS
USA	310	320	USA – CellularOne	Cell
USA	310	340	USA 340	WestLink
USA	310	350	Carolina Phone	Carolina
USA	310	380	AT&T Wireless	AT&T
USA	310	390	Yorkville Telephone	Yorkville
USA	310	400	USA i CAN	iCAN_GSM
USA	310	410	Cingular	Cingular
USA	310	420	Cincinnati Bell Wireless	CBW
USA	310	450	Cell One of NE Colorado	NECCI
USA	310	460	USA ONELINK	ONELINK
USA	310	490	SunCom	SunCom
USA	310	500	PSC Wireless	PSC
USA	310	530	USA–WVA WIRELESS	WVW
USA	310	560	Cellular One DCS	Cell One
USA	310	580	T-Mobile	T-Mobile
USA	310	590	USA – Extended Area	ROAMING
USA	310	610	Epic Touch	EpicTouch
USA	310	630	USA AmeriLink	AMERLINK
USA	310	640	USA AE Airadigm	ARDGMC
USA	310	660	T-Mobile	TMO
USA	310	670	Wireless 2000 PCS	W 2000 PCS
USA	310	680	NPI Wireless	NPI
USA	310	690	USA – Immix Wireless	IMMIX
USA	310	740	TELEMETRIX	TLXT

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
USA	310	760	PTSI	PTSI
USA	310	770	Iowa Wireless USA	IWS
USA	310	780	AirLink PCS	AirLink
USA	310	790	USA Pinpoint	Pinpoint
USA	310	800	T-Mobile	T-Mobile
USA	310	870	US	PACE
USA	310	880	USAACSI	ACSIAC
USA	310	900	Texas Cellular	TXCELL
USA	310	910	USAFC	FCSI
USA	310	940	Digital Cellular	DCT
USA	310	950	USA XIT Cellular	XIT
USA	310	980	AT&T Wireless	AT&T
USA	311	00	Wilkes USA	WILKES
USA	311	01	Wilkes USA	WILKES
USA	311	05	Wilkes USA	WILKES
USA	311	30	Indigo	Indigo
USA	311	70	USAEC	EASTER
USA	311	80	Pine Cellular	PINECell
USA	311	90	USASXLP	SXLP
USA	311	110	High Plains	HPW
USA	311	130	Cell One Amarillo	C1AMARIL
USA	311	140	Sprocket	Sprocket
USA	311	160	EMW	EMW
USA	311	170	PetroCom	PetroCom
USA	311	180	Cingular	Cingular
USA	311	190	USAC1ECI	C1ECI
USA	311	210	FARMERS	FARMERS
USA	311	250	USA i CAN	i CAN_GSM
USA	332	11	Blue Sky	Blue Sky
MEX	334	03	MX MOVISTAR GSM	MOVISTAR
MEX	334	20	Mx Telcel GSM	TELCEL
JAM	338	05	JM DIGICEL	DIGICEL
JAM	338	180	C&W	C&W
FRA	340	01	F-Orange	Orange
GLP	340	08	AMIGO	AMIGO
FRA	340	20	BOUYGTEL-C	BOUYG-C
BRB	342	50	JM Digicel	Digicel
BRB	342	600	C&W	C&W

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
BRB	342	810	AT&T Wireless	AT&T
ATG	344	30	APUA-PCS ANTIGUA	APUA-PCS
ATG	344	920	C&W	C&W
ATG	344	930	AT&T Wireless	AT&T
CYM	346	140	C&W	C&W
VGB	348	570	CCT Boatphone	CCTBVI
BMU	350	02	BTC MOBILITY LTD.	MOBILITY
BMU	350	10	AT&T Wireless	AT&T
GRD	352	30	AT&T Wireless	AT&T
GRD	352	50	Digicel	DIGICEL
GND	352	110	C&W	C&W
GRD	352	130	TWTCGN	TWTCGN
MS	354	860	C&W	C&W
KNA	356	110	C&W	C&W
LCA	358	30	AT&T Wireless	AT&T
SLU	358	110	C&W	C&W
VCT	360	10	AT&T Wireless	AT&T
VCT	360	110	C&W	C&W
ANT	362	51	Telcell GSM	Telcell
ANT	362	69	ANT CURACAO TELECOM GSM	CT GSM
ANT	362	91	UTS Wireless Curacao N.V.	UTS
ABW	363	01	SETAR GSM	SETARGSM
BHS	364	39	BaTelCell	BaTelCel
AIA	365	840	C&W	C&W
DMA	366	20	AT&T Wireless	AT&T
DMA	366	110	C&W	C&W
CUB	368	01	CU/C_COM	C_COM
DO	370	01	orange	orange
TTO	374	12	TSTT	TSTT
TCA	376	350	C&W	C&W
AZE	400	01	AZE – AZERCELL GSM	ACELL
AZE	400	02	BAKCELL GSM 2000	BKCELL
KAZ	401	01	KZ K-MOBILE	K-MOBILE
KAZ	401	02	KZ KCELL	KCELL
BTN	402	11	BT B-Mobile	B-Mobile
IND	404	01	Hutch	Hutch
IND	404	02	AirTel	AirTel
IND	404	03	AirTel	AirTel

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
IND	404	04	IDEA	IDEA
IND	404	05	Hutch	Hutch
IND	404	07	IDEA	IDEA
IND	404	10	AirTel	AirTel
IND	404	11	Hutch	Hutch
IND	404	12	IDEA	IDEA
IND	404	13	Hutch	Hutch
IND	404	14	INA SPICE	SPICE
IND	404	15	Hutch	Hutch
IND	404	19	IDEA	IDEA
IND	404	20	Orange	Orange
IND	404	21	BPL MOBILE	BPL MOBILE
IND	404	22	IDEA	IDEA
IND	404	24	IDEA	IDEA
IND	404	27	BPL MOBILE	BPL MOBILE
IND	404	30	Hutch	Hutch
IND	404	31	AirTel	AirTel
IND	404	34	CellOne	CellOne
IND	404	38	CellOne	CellOne
IND	404	40	IND AIRTEL	AIRTEL
IND	404	41	INA RPG	RPG
IND	404	42	INA AIRCEL	AIRCEL
IND	404	43	BPL MOBILE	BPL MOB
IND	404	44	INA SPICE	SPICE
IND	404	45	AirTel	AirTel
IND	404	46	BPL MOBILE	BPL MOB
IND	404	49	AirTel	AirTel
IND	404	51	CellOne	CellOne
IND	404	53	CellOne	CellOne
IND	404	54	CellOne	CellOne
IND	404	55	CellOne	CellOne
IND	404	56	IDEA	IDEA
IND	404	57	CellOne	CellOne
IND	404	58	CellOne	CellOne
IND	404	59	CellOne	CellOne
IND	404	60	Hutch	Hutch
IND	404	62	CellOne	CellOne
IND	404	64	CellOne	CellOne

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
IND	404	66	CellOne	CellOne
IND	404	68	IN-DOLPHIN	DOLPHIN
IND	404	69	IN-DOLPHIN	DOLPHIN
IND	404	70	INDH1	Oasis
IND	404	71	CellOne	CellOne
IND	404	72	CellOne	CellOne
IND	404	73	CellOne	CellOne
IND	404	74	CellOne	CellOne
IND	404	75	CellOne	CellOne
IND	404	76	CellOne	CellOne
IND	404	77	CellOne	CellOne
IND	404	78	IDEA	IDEA
IND	404	79	CellOne	CellOne
IND	404	80	CellOne	CellOne
IND	404	81	CellOne	CellOne
IND	404	84	Hutch	Hutch
IND	404	86	Hutch	Hutch
IND	404	88	Hutch	Hutch
IND	404	90	AirTel	AirTel
IND	404	92	AirTel	AirTel
IND	404	93	AirTel	AirTel
IND	404	94	AirTel	AirTel
IND	404	95	AirTel	AirTel
IND	404	96	AirTel	AirTel
IND	404	97	AirTel	AirTel
IND	404	98	AirTel	AirTel
IND	405	51	IND AirTel	AIRTEL
IND	405	52	IND AirTel	AIRTEL
IND	405	53	IND AirTel	AIRTEL
IND	405	54	IND AirTel	AIRTEL
IND	405	55	IND AirTel	AIRTEL
IND	405	66	Hutch	Hutch
PAK	410	01	PK MK	PMCL
PAK	410	03	PK-UFONE	UFONE
PAK	410	04	PAK – PL	PAKTEL
PAK	410	07	PK WARID	WARIDTEL
AFG	412	01	AF AWCC	AWCC
AFG	412	20	ROSHAN	ROSHAN

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
SRI	413	01	Mobitel	MOBITEL
SRI	413	02	SRI DIALOG	DIALOG
SRI	413	03	SRI – CELLTEL	CELLTEL
MMR	414	01	MM 900	MPTGSM
LBN	415	01	RL Cellis	CLLIS
LBN	415	03	RL MTC Lebanon	MTC LIBAN
JOR	416	01	Fastlink	FSTLNK
JOR	416	77	JO MobCom	MobCom
SYR	417	01	SYRIATEL	SYRIATEL
SYR	417	02	areeba	areeba
SYR	417	09	SYR MOBILE SYR	MOBILE
IRQ	418	00	ASIACELL	ASIACELL
IRQ	418	02	SanaTel	SanaTel
IRQ	418	05	ASIACELL	ASIACELL
IRQ	418	08	SanaTel	SanaTel
IRQ	418	20	Atheer Iraq	ATHEER
IRQ	418	30	IRAQNA	IRAQNA
KWT	419	02	KT MTCNet	MTC
KWT	419	03	KT WATANIYA	WATANIYA
KSA	420	01	ALJAWAL	KSA
YEM	421	01	SabaFon	SABAFON
YEM	421	02	SPACETEL	SPACETEL
OMN	422	02	OMAN MOBILE	OMAN
UAE	424	02	UAE ETISALAT	ETSLT
ISR	425	01	IL ORANGE	ORANGE
ISR	425	02	IL Cellcom	Cellcom
ISR	425	05	JAWWAL-PALESTINE	JAWWAL
BHR	426	01	BATELCO	BATELCO
BHR	426	02	MTC VODAFONE BH	MTC-VFBH
QAT	427	01	QAT QATARNET	Q-NET
MNG	428	99	MN MobiCom	MobiCom
IRN	432	11	IR-TCI	432 11
IRN	432	14	IR KISH	KIFZO
IRN	432	19	IR MTCE	MTCE
UZB	434	02	UZMACOM	UZMGSM
UZB	434	04	UZB DAEWOO-GSM	DW-GSM
UZB	434	05	UZB CSOCOM GSM	COSCOM
UZB	434	07	UZB-UZD	UZDGSM

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
TJK	436	01	Somoncom	Somoncom
TJK	436	02	Indigo-T	INDIGO
TJK	436	03	TJK MLT	MLT
TJK	436	04	Babilon-M	Babilon
TJK	436	05	TJT – Tajik Tel	TajikTel
KGZ	437	01	BITEL KGZ	BITEL
JPN	440	10	JP DoCoMo	DoCoMo
JPN	440	20	Vodafone JP	Voda JP
KOR	450	02	KR KTF	KTF
KOR	450	08	KR KTF	KTF
VNM	452	01	VN MOBIFONE	VMS
VNM	452	02	VN VINAPHONE	GPC
VNM	452	04	VNM and VIETTEL	VIETTEL
HKG	454	00	CSL	CSL
HKG	454	03	3 HK	3
HKG	454	04	3-DUALBAND	3
HKG	454	06	SmarTone	SmarTone
HKG	454	10	HK NEW WORLD	NWPCS
HKG	454	12	HK PEOPLES	PEOPLES
HKG	454	15	SmarTone 3G	SMC 3G
HKG	454	16	HK SUNDAY	SUNDAY
HKG	454	18	HK CSL	CSL
MAC	455	00	SmarTone	SmarTone
MAC	455	01	MAC-CTMGSM	CTMGSM
MAC	455	03	Hutchison MAC	HT Macau
KHM	456	01	MOBITEL – KHM	MT-KHM
KHM	456	02	KHM-Hello GSM	KHM-SM
KHM	456	18	CAMBODIA SHINAWATRA	CAMSHIN
LAO	457	01	LAO GSM	LAO GSM
LAO	457	02	ETL MOBILE NETWORK	ETLMNW
LAO	457	03	45703	LATMOBIL
LAO	457	08	TANGO LAO	TANGO
CHN	460	00	CHINA MOBILE	CMCC
CHN	460	01	CHN-CUGSM	CU-GSM
TWN	466	01	Far EasTone	FET
TWN	466	06	TWN Tuntex GSM 1800	TUNTEX
TWN	466	68	AceS	AceS
TWN	466	88	KGT-Online	KGT

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
TWN	466	89	T3G	T3G
TWN	466	92	Chunghwa	CHT
TWN	466	93	TWN MOBITAI	TW MOB
TWN	466	97	TWN GSM 1800	TCC
TWN	466	99	TransAsia	TransAsi
PRK	467	03	KP SUN	SUNNET
BGD	470	01	BGD-GP	GP
BGD	470	02	BGD AKTEL	AKTEL
BGD	470	03	BD ShebaWorld	SHEBA
MDV	472	01	MV DHIMOBILE	D-MOBILE
MYS	502	12	MY MAXIS	MY MAXIS
MYS	502	16	DiGi	DiGi
MYS	502	19	MY CELCOM	CELCOM
AUS	505	01	Telstra Mobile	Telstra
AUS	505	02	YES OPTUS	Optus
AUS	505	03	vodafone AU	voda AU
AUS	505	06	3 AUS	3 AUS
IDN	510	00	AceS	AceS
IDN	510	01	IND INDOSAT	INDOSAT
IDN	510	08	LIPPO TEL	LIPPOTEL
IDN	510	10	IND TELKOMSEL	T-SEL
IDN	510	11	IND – Excelcom	proXL
IDN	510	21	IND INDOSAT	INDOSAT
TLS	514	02	TLS-TT	TT
PHL	515	01	ISLACOM	ISLACOM
PHL	515	02	Globe Telecom-PH	GLOBE
PHL	515	03	SMART	SMART
PHL	515	05	PH Sun Cellular	SUN
PHL	515	11	AceS	AceS
THA	520	01	TH GSM	TH GSM
THA	520	15	TH ACT 1900	ACT-1900
THA	520	18	TH-DTAC	DTAC
THA	520	20	AceS	AceS
THA	520	23	TH GSM 1800	GSM 1800
THA	520	99	Orange Th	Orange
SGP	525	01	SingTel	SingTel
SGP	525	02	SingTel-G18	SingTel
SGP	525	03	SGP-M1-3GSM	M1-3GSM

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
SGP	525	05	STARHUB-SGP	STARHUB
BRN	528	11	BRU-DSTCom	DSTCom
NZL	530	01	vodafone NZ	voda NZ
PNG	537	01	PNGBMobile	Bmobile
TON	539	01	U-CALL	U-CALL
VUT	541	01	VUT SMILE	SMILE
FJI	542	01	FJ VODAFONE	VODAFONE
AS	544	11	Blue Sky	Blue Sky
KIR	545	09	KL-Frigate	KI-FRIG
NCL	546	01	NCL MOBILIS	MOBNCL
FRA	547	20	F-VINI	VINI
COK	548	01	CK KOKANET	KOKANET
FSM	550	01	FSM Telecom	FSMTC
EGY	602	01	EGY MobiNiL	MobiNiL
EGY	602	02	vodafone EG	voda EG
DZA	603	01	ALGERIAN MOBILE NETWORK	AMN
DZA	603	02	Djezzy	Djezzy
DZA	603	03	DZA-WTA	WTA
MOR	604	00	MOR MEDITEL	MEDITEL
MOR	604	01	MOR IAM	IAM
TUN	605	02	TUNISIE TELECOM	TUNTEL
TUN	605	03	TUNISIANA	TUNSIANA
LBY	606	00	LIBYANA	LIBYANA
GMB	607	01	GAMCEL	GAMCEL
GMB	607	02	AFRICELL	AFRICELL
SEN	608	01	SN ALIZE	ALIZE
SEN	608	02	SN-SENTEL SG	SENTEL
MRT	609	01	MR MATTEL	MATTEL
MRT	609	10	MAURITEL	MAURITEL
MLI	610	01	MALITEL ML	MALITEL
MLI	610	02	IKATEL ML	IKATEL
GIN	611	02	GN LAGUI	LAGUI
CIV	612	03	Orange CI	Orange
CIV	612	05	TELECEL-CI	TELCEL
BFA	613	02	BF Celtel	celtel
NER	614	01	SAHELCOM	SAHELCOM
NER	614	02	NE CELTEL	NECELTEL
NER	614	03	NE TELECEL	TELECEL

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
TGO	615	01	TG-TOGO CELL	TGCELL
BEN	616	02	TELECEL BENIN	TLCL-BEN
BEN	616	03	BJ BENINCELL	BENCELL
BEN	616	04	BELL BENIN COMMUNICATION	BBCOM
MRU	617	01	CELLPLUS-MRU	CELL +
MRU	617	10	EMTEL-MRU	EMTEL
LBR	618	01	LBR Lonestar Cell	LoneStar
LBR	618	02	LIBERCELL	LIBERCEL
LBR	618	03	Celcom GSM	Celcom
SLE	619	01	CELTEL SL	CELTEL
SLE	619	02	MILLICOM SL	MILLICOM
GHA	620	01	GH SPACEFON	SPACE
GHA	620	02	GH ONEtouch	ONEtouch
GHA	620	03	GH-MOBITEL	mobitel
NGA	621	20	ECONET NG	ECONET
NGA	621	30	MTN – NG	MTN-NG
NGA	621	40	NG Mtel	Mtel
NGA	621	50	Glo NG	glo
TCD	622	01	CELTEL TCD	CELTEL
TCD	622	02	TD LIBERTIS	LIBERTIS
CMR	624	01	MTN CAM	62401
CMR	624	02	Orange CAM	Orange
CPV	625	01	CPV MOVEL	CMOVEL
STP	626	01	STP CSTmovel	CSTmovel
GNQ	627	01	GNQ01	GETESA
GAB	628	01	628 01/LIBERTIS	LIBERTIS
GAB	628	02	GAB TELECEL	TELECEL
GAB	628	03	CELTEL GA	CELTEL
COG	629	01	CELTEL	CELTEL RC
COG	629	10	COG LIBERTIS	LIBERTIS
COD	630	01	VODACOM CD	VODACOM
COD	630	02	CELTEL DRC	CELTEL
COD	630	04	CELLCO GSM	CELLCO
COD	630	89	CD OASIS	OASIS
AGO	631	02	UNITEL	UNITEL
SEZ	633	01	SEYCEL	633-01
SEZ	633	10	SEZ AIRTEL	AIRTEL
SDN	634	01	MobiTel SDN	MobiTel

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
RWA	635	10	R-CELL	RCELL
ETH	636	01	ETH-MTN	ET-MTN
SOM	637	01	SOMTELESOM	TELESOM
SOM	637	04	SOMAFONE	SOMAFONE
SOM	637	82	Telsom Mobile	telsom
DJI	638	01	DJ EVATIS	EVATIS
KEN	639	02	Safaricom	SAF-COM
KEN	639	03	YES!	YES!
TZA	640	02	MOBITEL – TZ	MOBITEL
TZA	640	03	ZANTEL-TZ	ZANTEL
TZA	640	04	VodaCom	VodaCom
TZA	640	05	celtel	celtel
UGA	641	01	UG CelTel	CELTEL
UGA	641	10	MTN-UGANDA	MTN-UG
UGA	641	11	UTL-Mango	UTL-Mango
BDI	642	01	Spacetel BI	SPACETEL
BDI	642	02	BUSAFA	SAFARIS
BDI	642	82	TELECEL-BDI	BDITL
MOZ	643	01	MOZ – mCel	mCel
MOZ	643	04	VodaCom-MZ	VodaCom
ZMB	645	01	ZM CELTEL	CELTEL
ZMB	645	02	TELECEL ZM	TELECEL
MDG	646	01	MG Madacom	Madacom
MDG	646	02	MG ANTARIS	ANTARIS
REU	647	00	Orange re	Orange
REU	647	02	F-OMT	OMT
FRA	647	10	SFR REUNION	SFR RU
ZWE	648	01	ZW NET*ONE	NETONE
ZWE	648	03	TELECEL ZW	TELECEL
ZWE	648	04	ZW ECONET	ECONET
NAM	649	01	MTC NAMIBIA	MTCNAM
MWI	650	01	MW CP 900	CP 900
MWI	650	10	CELTEL MW	CELTEL
LSO	651	01	VCL COMMS	VCLCOM
LSO	651	02	LS-ECONET-EZI-CEL	EZI-CEL
BWA	652	01	BW MASCOM	MASCOM
BWA	652	02	Orange	Orange
SWZ	653	10	Swazi-MTN	SwaziMTN

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
COM	654	01	HURI	HURI
ZAF	655	01	VodaCom-SA	VODA
ZAF	655	07	Cell C	Cell C
ZAF	655	10	MTN-SA	MTN
BLZ	702	67	BTL	BTL
BLZ	702	68	INTELCO	INTELCO
GTM	704	02	Comcel_GSM	COMCEL
GTM	704	03	MoviStar	MoviStar
ESV	706	01	ESV PERSONAL	PERSONAL
SLV	706	02	Digicel	DIGICEL
SLV	706	03	TELEMOVIL	TM
SLV	706	04	MoviStar	MoviStar
ESV	706	10	ESV PERSONAL	PERSONAL
HND	708	01	Megatel GSM	ALOHN
HND	708	02	CELTELHND	CELTEL
HND	708	30	HND	HAT – 200
NIC	710	21	ENITEL	ENITEL
NIC	710	73	SERCOM	SERCOM
CRI	712	01	I.C.E.	I.C.E.
PAN	714	01	PANCW	PANCW
PE	716	10	TIM PERU	TIM
ARG	722	07	UNIFON	UNIFON
ARG	722	34	AR PERSONAL	AR TP
ARG	722	35	PORT-HABLE	P-HABLE
ARG	722	310	ARG CTI Movil	CTIMovil
BRA	724	02	TIM BRASIL	TIM
BRA	724	03	TIM BRASIL	TIM
BRA	724	04	TIM BRASIL	TIM
BRA	724	05	Claro	Claro
BRA	724	15	BRA SCTL	SCTL
BRA	724	16	BRA BrTCelular	BrTCel
BRA	724	23	TELEMIG CEL	TELEMIGC
BRA	724	24	AMAZONIA	AMAZONIA
BRA	724	31	Oi	Oi
BRA	724	32	CTBC CEL	CTBC
BRA	724	33	CTBC CEL	CTBC
BRA	724	34	CTBC CEL	CTBC
CHL	730	01	CL ENTEL PCS	ENTEL

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Country Initials	MCC	MNC	Preferred Presentation of Country Initials and Mobile Network Name	Abbreviated Mobile Network Name
CHL	730	02	TELEFONICA	TMOVIL
CHL	730	10	CL ENTEL PCS	ENTEL
COL	732	101	COLOMBIA – COMCEL S.A	COMCEL
COL	732	111	COL MOVIL	COL_MOVIL
COL	732	103	OLA	OLA
VEN	734	01	VZ INFO	INFONT
VEN	734	02	DIGITEL TIM	DIGITEL
BOL	736	01	NUEVATEL	VIVA
BOL	736	02	EMOVIL	BOMOV
GUY	738	01	GUY TW	TWTGUY
GUY	738	02	GUY CLNK PLS	CLNK PLS
ECU	740	01	PORTA GSM	PORTAGSM
PGY	744	01	HOLA PARAGUAY S.A	HPGYSA
PGY	744	02	PRY Porthable	Porth
PRY	744	04	Telecel GSM	Telecel
PRY	744	05	PY Personal	Personal
SUR	746	02	SR.TELESUR.GSM	TeleG
URY	748	10	URYAMWU	AMWU
TKM	795	02	Altyn Asyr	TM Cell
	901	05	Thuraya	Thuraya
NOR	901	12	MCP Maritime Com	MCP

1.13 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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

CPHS Information		
Data field	Bit Field	Meaning
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

1.14 CSP constants

1.14.1 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

1.14.2 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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Service	External value
Barring of All Incoming Calls when Roaming Outside the Home PLMN country	12
BIC roam	13

1.14.3 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

1.14.4 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

1.14.5 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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.14.6 Service Group: CPHS Teleservices

Service	External value
Alternate Line Service	41

1.14.7 Service Group: CPHS Features

Service	External value
Reserved: SST in phase 1 CPHS	49

1.14.8 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

1.14.9 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
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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

1.14.10 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

1.14.11 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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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	

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.*

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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”) *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 *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
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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

2.6.3 Example 3: Find phonebook entries

Command	Response
AT+CPBF=? *Note: Get the phonebook type.*	+CPBF: 20,14 *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.

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*

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Command	Response
AT+WCCS=1,0,0,255 >2020202020202020200A20200D202020202020205F20202020202020202020202021222302252627282928 2A2B2C2D2E2F30313233343536373839 3A3B3C3D3E3F00414243444546474849 4A4B4C4D4E4F505152535455565758595 A20202020112061626364656667686968 6A6B6C6D6E6F707172737475767778797 A20202020202020202020202020202020 2020202020202020202020272720202020 2020202020202020202020202020202020 2020202020204020012403205F20202020 202D202020202020272020202020202020 2020604141414141 5B0E1C09451F454549494949445D4F4F4F4F5C200B5555555E59201E7F6161617B0F1D6304056565076969692 07D086F6F6F7C200C0675757E792079	OK
AT+WCCS=1,1,0,127 >40A324A5E8E9F9ECF2C70AD8F80DC5E5205F2020202020202020202020C6E6DFC920212223A425262728292A2B2C2D2E2F30313233343536373839 3A3B3C3D3E3FA1414243444546474849 4A4B4C4D4E4F505152535455565758595 AC4D6D1DCA7BF6162636465666768696 A6B6C6D6E6F707172737475767778797 AE4F6F1FCE0 *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*

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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*
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 N*ote: 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*

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

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*

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Command	Response
AT+WCCS=1,0,0,255<CR> >20202020202020202020A20200D202020202020205F20202020202020202020202021222302252 62728292A2B2C2D2E2F303132333435363738393 3A3B3C3D3E3F00414243444546474849 4A4B4C 4D4E4F505152535455565758595A1B1B1B1B11 20616263646566676869 6A6B6C6D6E6F7071727 37475767778797A1B1B1B1B201B20202020202 02020202020202020202020272720202020202020 20202020202020402001240 3205F20202020202 D2020202020202720202020202020202020206041 4141415B0E1C09451F454549494949445D4F4F4 F4F5C200B5555555E59201E7F6161617B0F1D63 04056565076969692 07D086F6F6F7C200C06757 57E792079 <CTRL-Z>	OK
AT+WCCS=1,1,0,127<CR> >40A324A5E8E9F9ECF2C70AD8F80DC5E5205F2 02020202020202020C6E6DFC920212223A425 262728292A2B2C2D2E2F303132333435363738 3 93A3B3C3D3E3FA1414243444546474849 4A4B4 C4D4E4F505152535455565758595AC4D6D1DCA 7BF6162636465666768696A6B6C6D6E6F707172 737475767778797AE4F6F1FCE0 <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*

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

wavecom Confidential©
This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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	

wavecom Confidential©
This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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"

AT+CSIM=10,"A0F2000016"

+CSIM=48,"..."

2.9.2 DF Telecom selection and then status

AT+CSIM=14,"A0A40000027F10"

+CSIM=4,"9F16"

AT+CSIM=10,"A0F2000016"

+CSIM=48,"..."

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"

AT+CSIM=10,"A0C000000F"

+CSIM=34,"..."

2.9.4 Status commands

Status – No File Id – without P1,P2, P3

AT+CRSM=242

Status – 6F3A (EF ADN) – without P1, P2, P3

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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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 commands

Read Record – EF ADN (Pin Code validated)

AT+CRSM=178,28474,1,4,28

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

The Wireless CPU automatically switches back to idle state after all Open AT® treatments.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

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

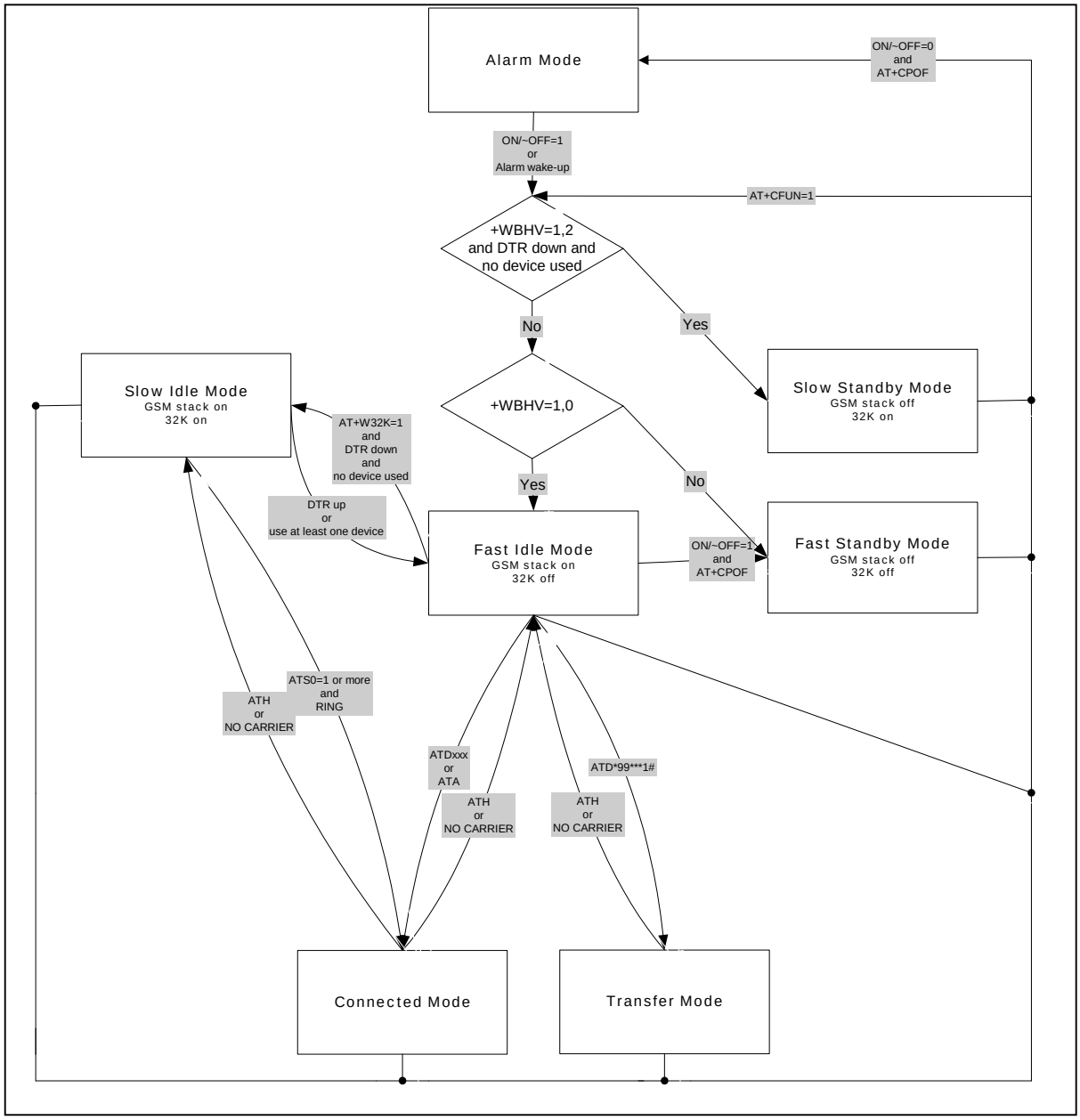
The table below sums up feature availability in each mode.

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	-	√	√	√	√	√	√

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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 " which is a part of the samples given in ADS 1.2 release. This Dhrystone algorithm is executed for at least 2 seconds.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

3.2.1.1 Restrictions

- Only basic option and UIH framing is supported.
- Only convergence layers type 1 and 3 are supported.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

- 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.

3.2.1.2 Specific behaviors

- In multiplex mode, AT configuration commands (as AT+CMEE for example), (see : [2]§ 1.10) will be applied to all logical channels.
- In multiplex mode, unsolicited result code (see : [2]§ 1.7) will be transmitted to all logical channels
- AT commands are grouped by classes (SMS, phonebook, GRPS, 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 GPS is used in internal mode in UART2, it is not possible to start MUX on UART2. In the same way, if MUX is started on UART2, it is not possible to use GPS in internal mode.
- 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.
- If TMT (Terminal Emulator) is launched on a specific UART, it is not possible to start MUX on this UART.TMT must be first close on this UART. On the opposite, as soon as CMUX is started, HAPC can be started on a DLCi.
- 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.

- Two timeouts are implemented for CMUX connection :

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

- 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.

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. *Example:* Parameter *<port_speed>*=8
+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.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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).

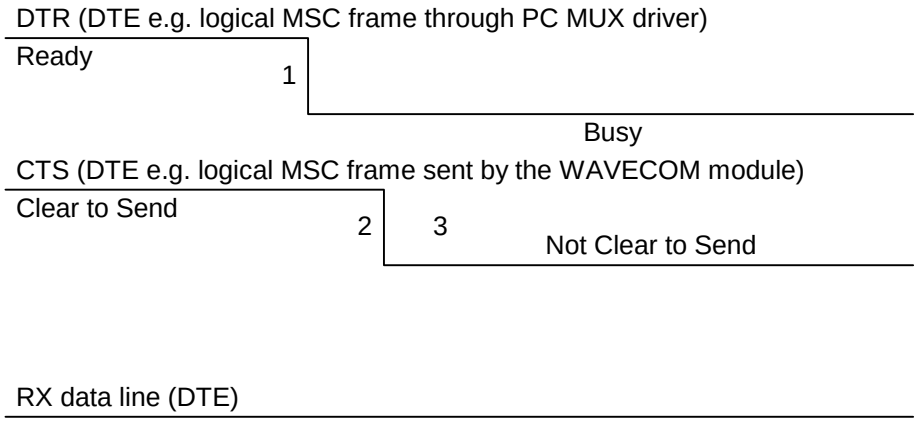
⇔ **Physical signals (such as DTR)** of the UART on which it has been activated **are not monitored** by Wavecom Wireless CPU (DCE).

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.



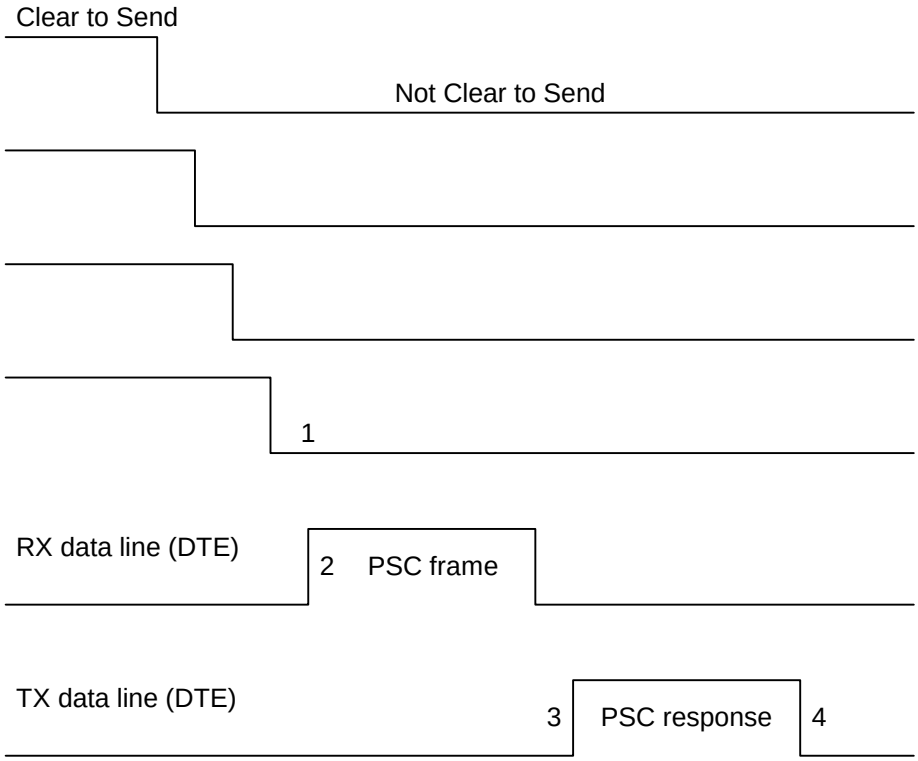
1 : The application (DTE) drops DTR to indicate a busy state (a protocol MSC frame is sent by the PC CMUX driver on the concerned DLCI)

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..

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

8 : Application replies with a PSC response

8 : 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:

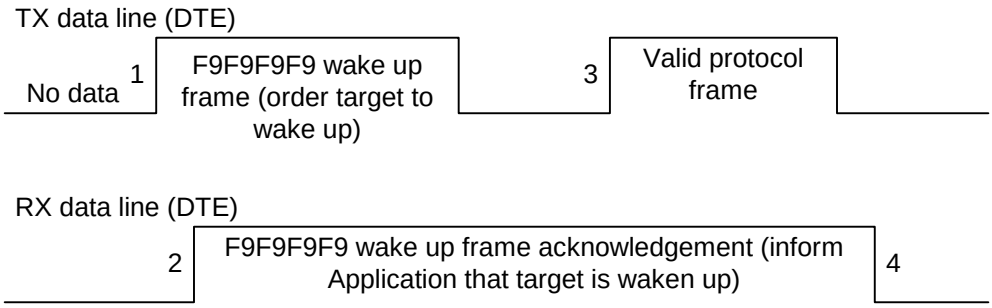
3.2.6.1 Wake up by DTE (e.g. desktop PC) wakes up Wireless CPU with a 27.010 Wake up frame

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 !

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.



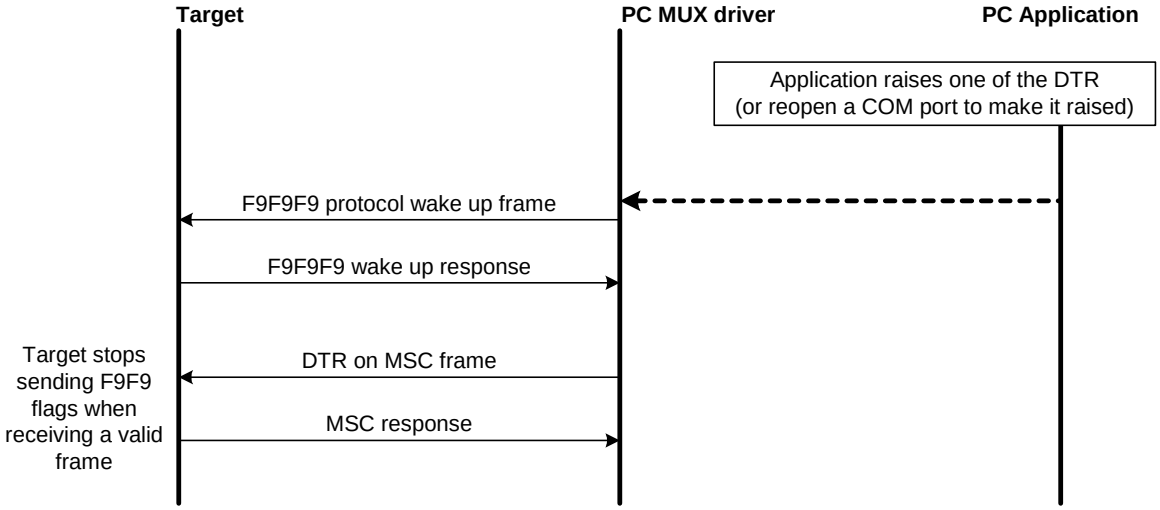
1 : DTE sends 27.010 protocol F9F9F9F9 frame to wake up the asleep target.

2 : DCE replies with 27.010 F9F9F9F9 wake up frame as acknowledgment and waits for a valid frame.

8 : 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)

8 : DCE stops sending F9F9F9F9 answer after receiving this valid frame.



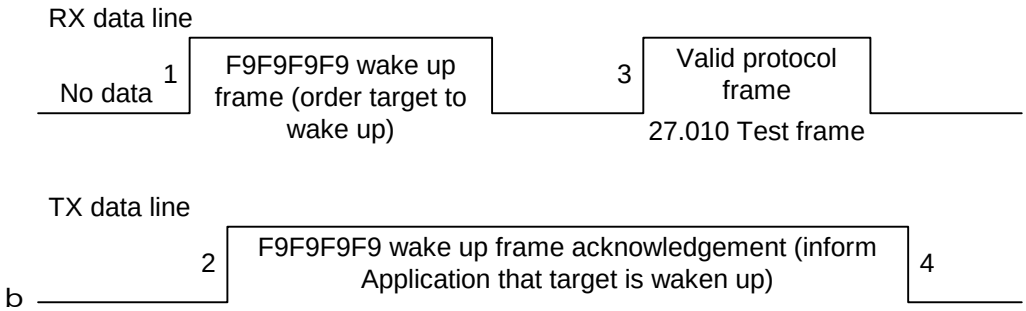
Note: If the valid frame is a DATA frame, the Wireless CPU does not detect any DTR change and sleeps on again with the PSC frame.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

The protocol **preliminary wake up sequence** is described below:



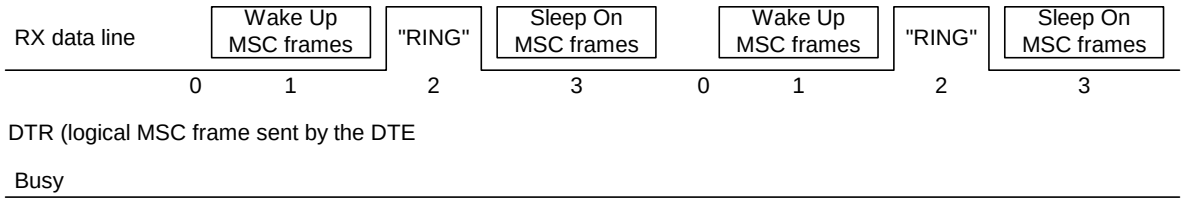
1 : DCE sends 27.010 protocol F9F9F9F9 frame to wake up the asleep Application.

2 : DTE replies with 27.010 F9F9F9F9 wake up frame as acknowledgment and waits for a valid frame.

8 : DCE sends a valid 27.010 test frame in order to have the target stop its acknowledgment.

8 : 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.

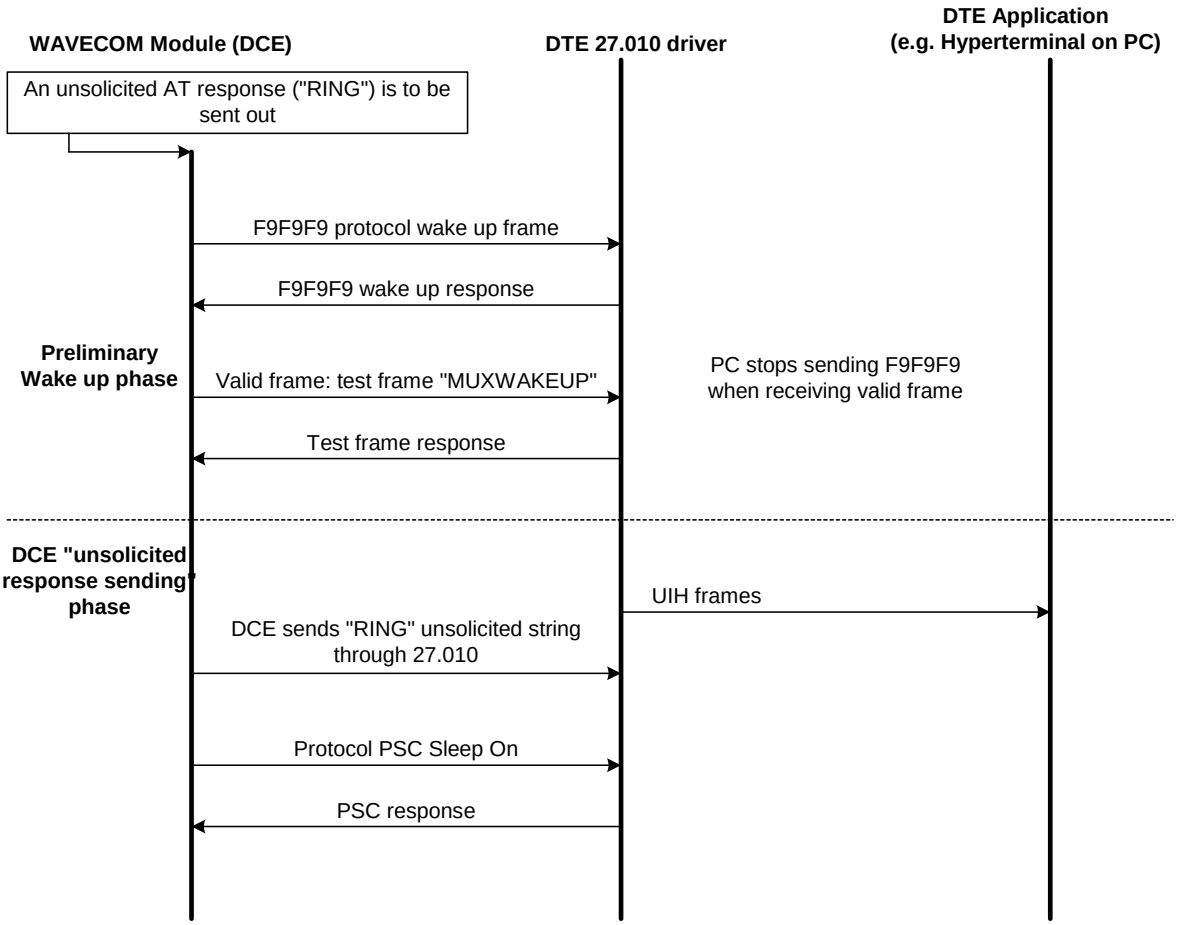
1 : DCE starts sending F9F9F9 wake up frame, waiting for its response and sending a valid test frame (0x4D ,0x55, 0x58, 0x57, 0x41, 0x4B, 0x45, 0x55, 0x50 = MUXWAKEUP). (Once waken up, the RI is sent before the RING string in our case)

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.



This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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
b	Proactive command: RUN AT COMMAND
c	Proactive command: LAUNCH BROWSER Event download: Browser termination
d	Soft key support

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

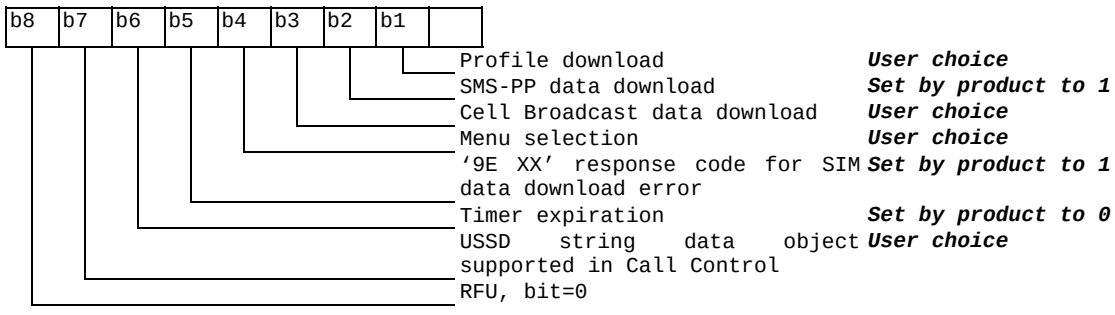
Letter classes	Command/function description
e	Proactive command: OPEN CHANNEL Proactive command: CLOSE CHANNEL Proactive command: RECEIVE DATA Proactive command: SEND DATA Proactive command: GET CHANNEL STATUS Event download: Data available Event download: Channel status

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		•	•	•	•	•	•							•	

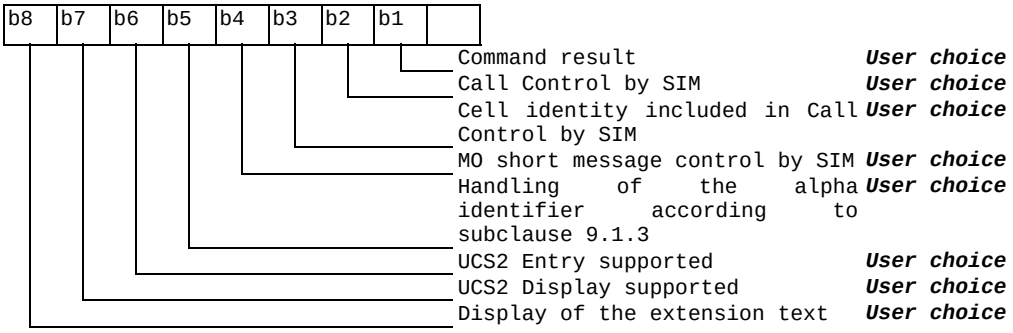
3.4 Structure of TERMINAL PROFILE

First byte (Download):

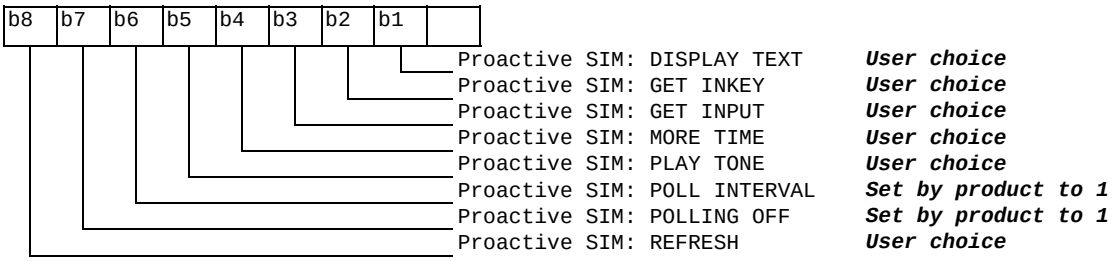


This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

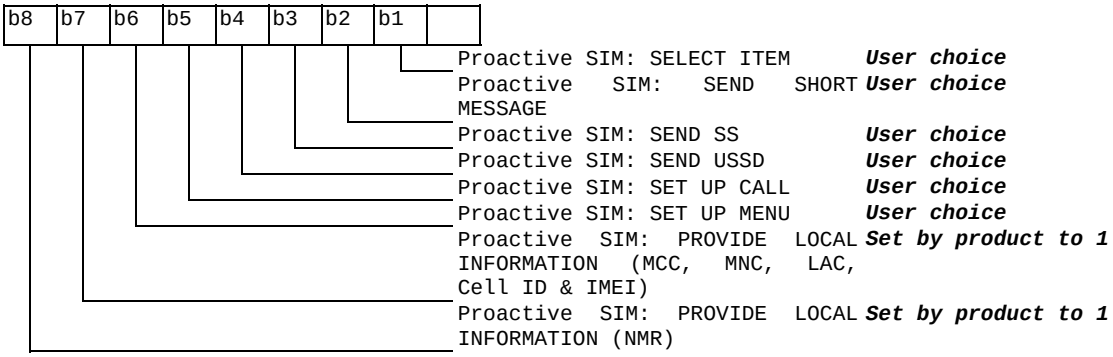
Second byte (Other):



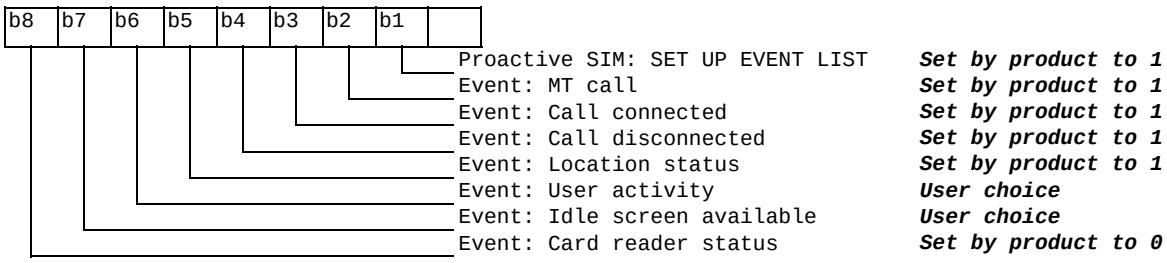
Third byte (Proactive SIM):



Fourth byte (Proactive SIM):

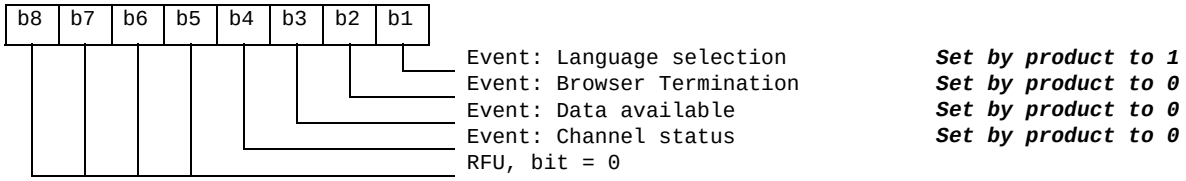


Fifth byte (Event driven information):

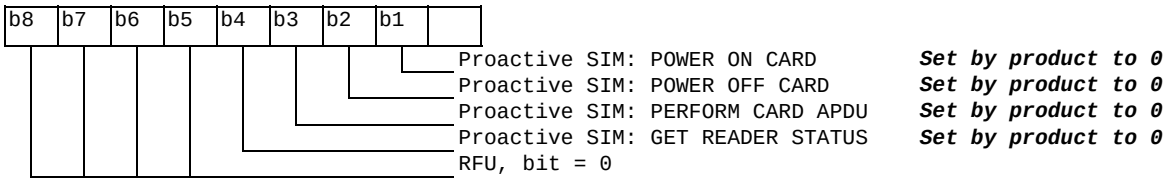


Confidential©
This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

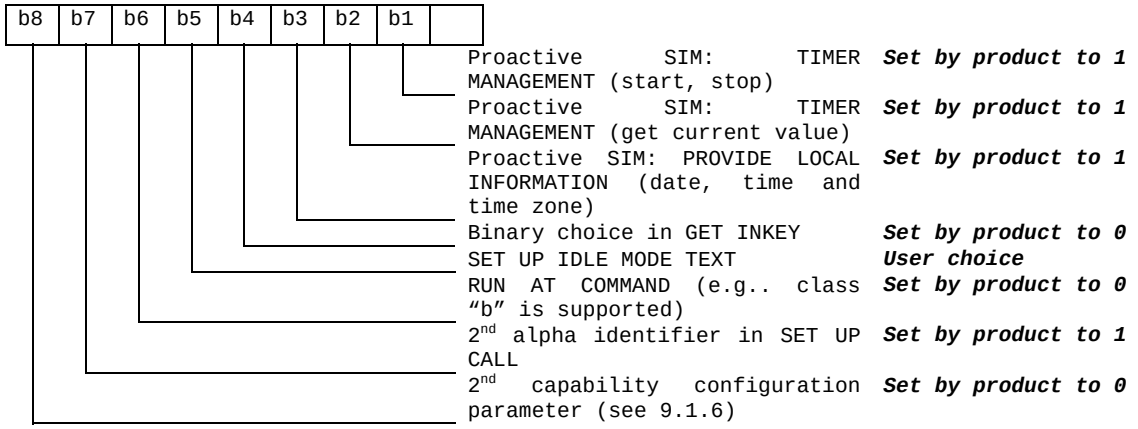
Sixth byte: (reserved for Event driven information extensions)



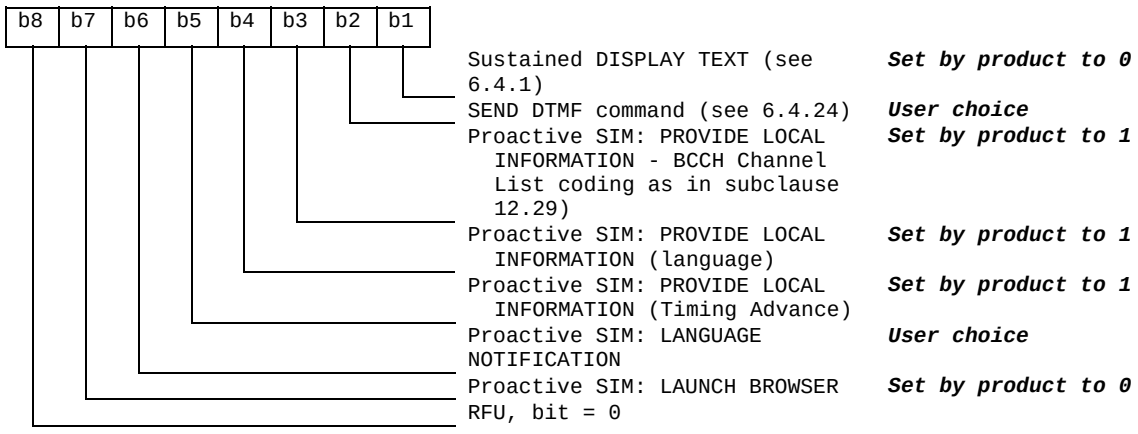
Seventh byte (Multiple card proactive commands) for class "a"



Eighth byte (Proactive SIM):

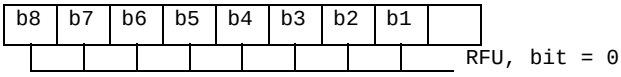


Ninth byte:



This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Subsequent bytes:



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.

	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1
Byte 1	ARFCN#1 (high part)							
Byte 2	ARFCN#1 (low part)		ARFCN#2 (high part)					
Byte 3	ARFCN#2 (low part)				ARFCN#3 (high part)			
...	...							
Byte X-1	ARFCN#m-1 (low part)				ARFCN#m (high part)			
Byte X	ARFCN#m (low part)						Spare bit (0)	Spare bit(0)

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

Confidential©
This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

described above by evaluating the indication "BCCH Channel List coding" in the TERMINAL PROFILE command.

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

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.

8 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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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
- 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,

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

- 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.
- 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 document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

- 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).

- 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.

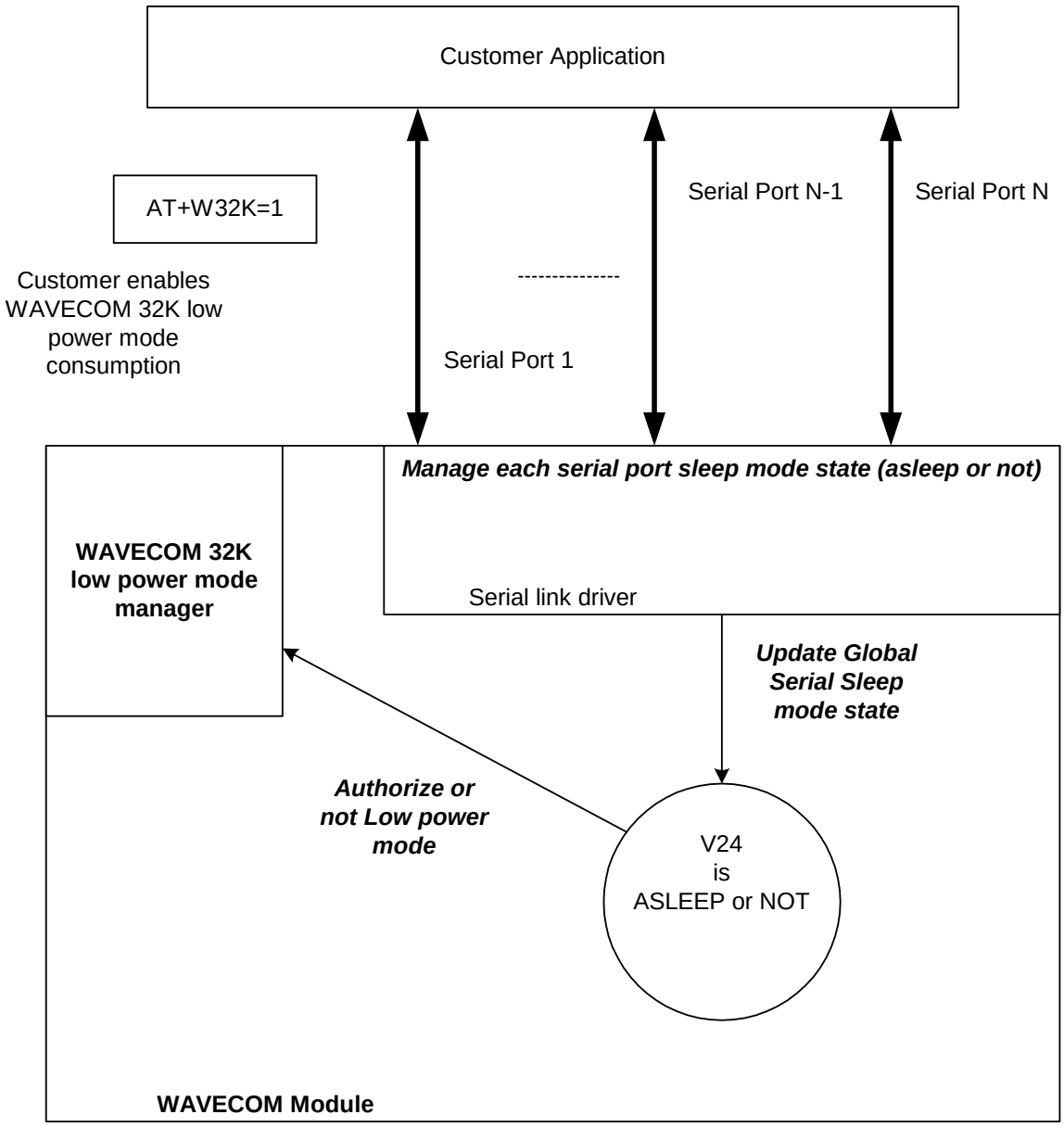
During, this little time (which is operator dependant), UARTs are activated again so that DTR state changes can be processed.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.



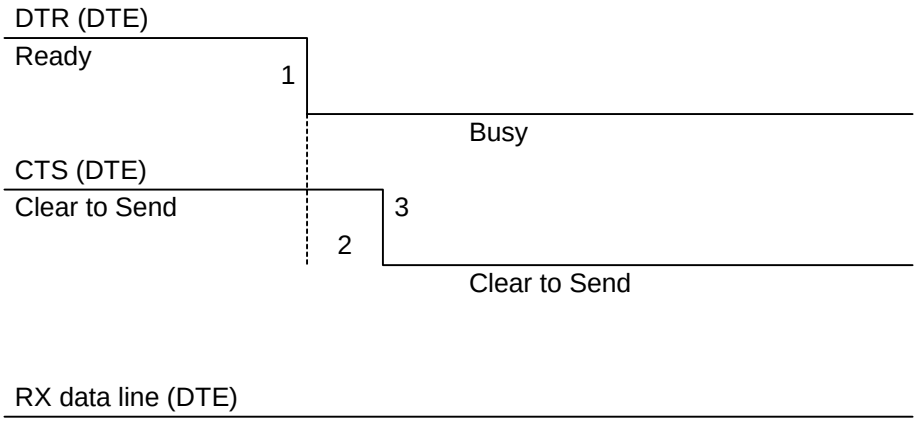
3.7.4 Case of single serial port use

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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

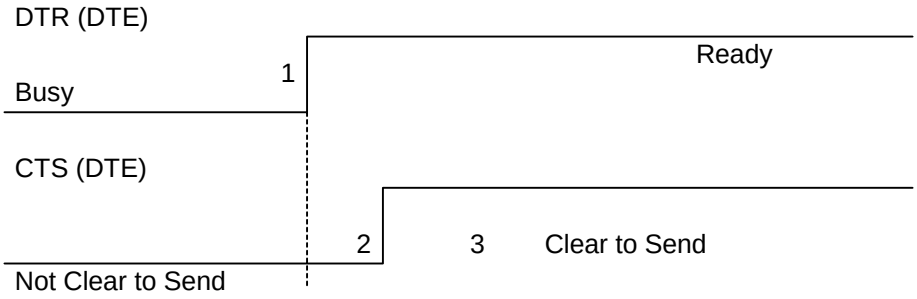
2 : Wavecom Wireless CPU (DCE) detects DTR drop and check if there are still AT responses to send on that port.

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



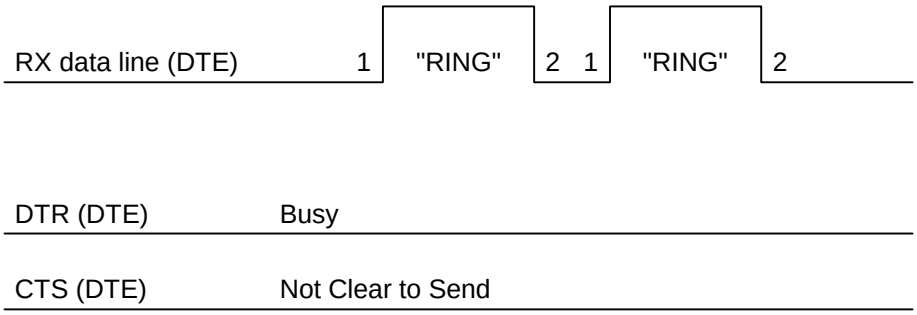
1 : The application raises its DTR signal to indicate a ready state (meaning DTE wants to communicate with the DCE).

2 : Wavecom Wireless CPU (DCE) takes into account the DTR signal change. (MSR IRQ for physical port or protocol frame for CMUX)

8 : V24 triggers the DTE CTS signal to allow AT commands again. (CTS is high)

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

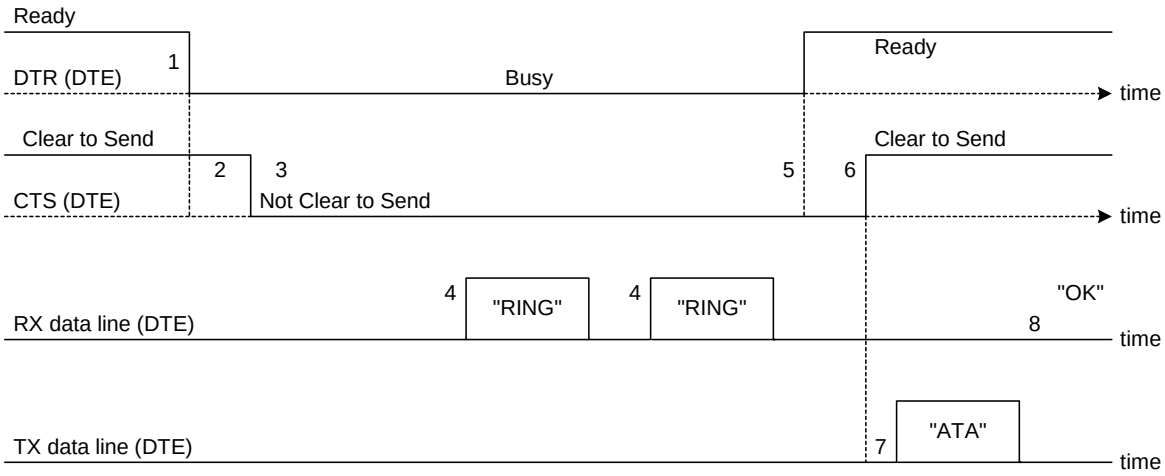
3.7.4.2.2 On DCE initiative : Wake up by AT unsolicited indications (e.g. "RING " indicator)



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.

8 : 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.**

8 : An incoming call occurs. As a consequence, unsolicited AT indications (e.g. "RING") are sent to the DTE.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Note that even if RING are sent, Serial Port remains in Sleep Mode state.

8 : 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.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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, +WSSW, +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
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

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

Class name	Related commands
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.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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.

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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

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 alway
		Space	replies: "+ICF: 2,4"
8	2	None	+ICF: 1,4
		Odd	+ICF: 2,0
		Even	+ICF: 2,1
		Mark	Not supported alway
		Space	replies: "+ICF: 2,4"
7	1	None	+ICF: 6,4
		Odd	+ICF: 5,0
		Even	+ICF: 5,1
		Mark	Not supported alway
		Space	replies: "+ICF: 5,4"
7	2	None	+IFC: 4,4
		Odd	+IFC: 5,0
		Even	+IFC: 5,1
		Mark	Not supported alway
		Space	replies: "+ICF: 5,4"
8 or 7	1.5	None	Not supported alway
		Odd	replies "+ICF: 2,4"
		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.

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

4 Command execution and dependence to SIM

These arrays list all the AT command. For each, a column indicates the command execution condition (if +WIND:4 must have occurred OK, for example). SIM dependency column indicates if the command behavior will vary if another card is used (for example, it will be the case for phonebook reading commands). The Intermediate column indicates if intermediate responses can occur for the considered command.

4.1 General commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CGMI	+WIND: 3	N	N
AT+CGMM	+WIND: 3	N	N
AT+CGMR	+WIND: 3	N	N
AT+CGSN	+WIND: 3	N	N
AT+CSCS	+WIND: 4	N	N
AT+WPCS	+WIND: 4	N	N
AT+CIMI	+WIND: 4	Y	N
AT+CCID	+WIND: 1	Y	N
AT+GCAP	+WIND: 3	N	N
A/	Depends on previous command	Depends on previous command	N
AT+CPOF	+WIND: 3 without SIM, +WIND: 1 with SIM	N	N
AT+CFUN	+WIND: 3	N	N
AT+CPAS	+WIND: 3	N	N
AT+CMEE	+WIND: 3	N	N
AT+CKPD	Depends of the sequence used	Y/N	N
AT+CCLK	+WIND: 3	Y	N
AT+CALA	+WIND: 3	N	Y
AT+CRMP	+WIND: 3	N	N
AT+CRSL	+WIND: 3	N	N
AT+CMUX		N	N
AT+CLAE	After PIN entered	Y	Y
AT+CLAN	After PIN entered	Y	Y

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

4.2 Call Control commands

AT commands	Conditions	SIM dependence	Intermediate
ATD	Depends of sequence used	Y/N	Y
ATH	+WIND: 3	N	N
ATA	+WIND: 3	N	N
AT+CEER	+WIND: 4	Y	N
AT+VTD	+WIND: 3	N	N
AT+VTS	+WIND: 5	N	N
ATDL	+WIND: 3	N	Y
AT%D	+WIND: 3	N	N
ATS0	+WIND: 3	N	N
AT+CICB	+WIND: 3	N	N
AT+CSNS	+WIND: 3	N	N
AT+VGR	+WIND: 3	N	y
AT+VGT	+WIND: 3	N	y
AT+CMUT	+WIND: 5	N	N
AT+SPEAKER	+WIND: 3	N	Y
AT+ECHO	+WIND: 3	N	y
AT+SIDET	+WIND: 3	N	Y
AT+VIP	+WIND: 3	N	N
AT+CSTA	After PIN entered	y	Y

4.3 Network service commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CSQ	+WIND: 3	N	N
AT+COPS	+WIND: 4	Y	N
AT+CREG	+WIND: 3	N	Y
AT+WOPN	+WIND: 3	N	N
AT+CPLS	PIN	Y	N
AT+CPOL	After PIN entered	Y	Y
AT+COPN	After PIN entered	N	N

4.4 Security commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CPIN	+WIND: 1	Y	N
AT+CPIN2	after PIN entered	Y	N
AT+CPINC	+WIND: 1	Y	N
AT+CLCK	+WIND: 4	Y	N
AT+CPWD	+WIND: 4	Y	N

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

4.5 Phonebook commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CPBS	+WIND: 4	Y	N
AT+CPBR	+WIND: 4	Y	Y
AT+CPBF	+WIND : 4	Y	Y
AT+CPBW	+WIND: 4	Y	N
AT+CPBP	+WIND : 4	Y	Y
AT+CPBN	+WIND: 4	Y	Y
AT+CNUM	+WIND: 4	Y	N
AT+WAIP	+WIND: 3	N	N
AT+WDCP	+WIND: 4	Y	N
AT+CSVM	+WIND: 4	N	N
AT+WCOS	+WIND: 3	N	N
AT+WPGW	+WIND: 4	N	N
AT+WPGR	+WIND: 4	N	Y
AT+WPGS	+WIND: 4	N	Y

4.6 Short Messages commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CSMS	+WIND: 16	Y	N
AT+CNMA	+WIND: 16	Y	N
AT+CPMS	+WIND: 16	Y	N
AT+CMGF	+WIND: 3	N	N
AT+CSAS	+WIND: 3	Y	N
AT+CRES	+WIND: 3	Y	N
AT+CSDH	+WIND: 16	Y	N
AT+CNMI	+WIND: 16	Y	N
AT+CMGR	+WIND: 16	Y	Y
AT+CMGL	+WIND: 16	Y	Y
AT+CMGS	+WIND: 16	Y	N
AT+CMGW	+WIND: 16	Y	Y
AT+CMSS	+WIND: 16	Y	N
AT+CSMP	+WIND: 16	Y	N
AT+CMGD	+WIND: 16	Y	N
AT+CSCA	+WIND: 16	Y	N
AT+CSCB	+WIND: 16	Y	N
AT+WCBM	+WIND: 16	Y	N
AT+WMSC	+WIND: 16	Y	Y
AT+WMGO	+WIND: 16	Y	N
AT+WUSS	+WIND: 3	N	N
AT+WMCP	+WIND: 16	Y	N
AT+CMMS	+WIND: 3	Y	N

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

4.7 Supplementary Services commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CCFC	+WIND: 4	Y	N
AT+CLCK	+WIND: 4	Y	N
AT+CPWD	+WIND: 4	Y	N
AT+CCWA	+WIND: 4	Y	N
AT+CLIR	After PIN entered	Y	N
AT+CLIP	After PIN entered	Y	N
AT+COLP	After PIN entered	Y	N
AT+CAOC	After PIN entered	Y	Y
AT+CACM	After PIN entered	Y	N
AT+CAMM	After PIN entered	Y	N
AT+CPUC	After PIN entered	Y	N
AT+CHLD	+WIND: 5,2	Y	N
AT+CLCC	+WIND: 3	N	N
AT+CSSN	+WIND: 3	N	N
AT+CUSD	+WIND: 3	N	N
AT+CCUG	+WIND: 4	Y	Y

4.8 Data commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CBST	+WIND: 3	N	N
AT+FCLASS	+WIND: 3	N	N
AT+CR	+WIND: 3	N	N
AT+CRC	+WIND: 3	N	N
AT+ILRR	After PIN entered	N	N
AT+CRLP	+WIND: 3	N	N
AT+DOPT	+WIND: 3	N	N
AT%C	+WIND: 3	N	N
AT+DS	+WIND: 3	N	N
AT+DR	+WIND: 3	N	N
\N	+WIND: 3	N	N

4.9 Fax commands

AT commands	Conditions	SIM dependence	Intermediate
AT+FTM	+WIND: 3	N	N
AT+FRM	+WIND: 3	N	N
AT+FTH	+WIND: 3	N	N
AT+FRH	+WIND: 3	N	N
AT+FTS	+WIND: 3	N	N
AT+FRS	+WIND: 3	N	N

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

4.10 Class 2 Commands

AT commands	Conditions	SIM dependence	Intermediate
AT+FDT	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FDR	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FET	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FPTS	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FK	+CLCC:X,X,0,2,X (fax call)	N	N
AT+FBOR	+WIND: 3	N	N
AT+FBUF	+WIND: 3	N	N
AT+FCQ	+WIND: 3	N	N
AT+FCR	+WIND: 3	N	N
AT+FDIS	+WIND: 3	N	N
AT+FDCC	+WIND: 3	N	N
AT+FLID	+WIND: 3	N	N
AT+FPHCTO	+WIND: 3	N	N

4.11 V24-V25 commands

AT commands	Conditions	SIM dependence	Intermediate
AT+IPR	+WIND: 3	N	N
AT+ICF	+WIND: 3	N	N
AT+IFC	+WIND: 3	N	N
AT&C	+WIND: 3	N	N
AT&D	+WIND: 3	N	N
AT&S	+WIND: 3	N	N
ATO	+CLCC:X,0,0,1,X (data call)	N	N
ATQ	+WIND: 3	N	N
ATV	+WIND: 3	N	N
ATZ	+WIND: 3	N	N
AT&W	+WIND: 3	N	N
AT&T	+WIND: 3	N	N
ATE	+WIND: 3	N	N
AT&F	+WIND: 3	N	N
AT&V	+WIND: 3	N	N
ATI	+WIND: 3	N	N

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

4.12 Specific AT commands

AT commands	Conditions	SIM dependence	Intermediate
AT+CCED	+WIND: 3	N	N
AT+ADC	None	N	N
AT+CLVL	+WIND: 3	N	Y
AT+CMER	+WIND: 3	N	N
AT+CIND	+WIND: 3	N	N
AT+CMEC	+WIND: 3	N	N
AT+WLPR	+WIND: 1	N	N
AT+WLPW	+WIND: 1	N	N
AT+WIOR	+WIND: 3	N	Y
AT+WIOW	+WIND: 3	N	N
AT+WIOM	+WIND: 3	N	Y
AT+WAC	+WIND: 3	N	N
AT+WADF	+WIND: 3	N	Y
AT+WTONE	+WIND: 3	N	N
AT+WDTMF	+WIND: 3	N	N
AT+WDWL	+WIND: 3	N	N
AT+WVR	+WIND: 3	N	N
AT+WHWV	+WIND: 3	N	N
AT+WDOP	+WIND: 3	N	N
AT+WIND	+WIND: 3	N	N
AT+WIPC	+WIND: 3	N	y
AT+WSTR	+WIND: 3	N	N
AT+WSCAN	+WIND: 3	N	N
AT+WRIM	+WIND: 3	N	Y
AT+W32K	+WIND: 3	N	N
AT+WCDM	+WIND: 3	N	N
AT+WSSW	+WIND: 3	N	N
AT+WCCS	+WIND: 4	N	N
AT+WDGR	+WIND: 3	N	Y
AT+WDGT	+WIND: 3	N	Y
AT+WLCK	None (PIN for auto CNL)	N (Y for auto CNL)	N
AT+CPHS	+WIND: 4	Y	N
AT+WBCM	+WIND: 3	N	N
AT+WFM	+WIND: 3	N	N
AT+WCFM	+WIND: 3	N	N
AT+WCDP	+WIND: 3	N	N
AT+WMBN	PIN	Y	N
AT+WALS	+WIND: 4	Y	N
AT+WOPEN	+WIND: 3	N	Y
AT+WRST	+WIND: 3	N	N
AT+WSST	+WIND: 3	N	N
AT+WLOC	PIN Code	Y	N
AT+WATH	+WIND: 3	N	N
AT+WIMEI	+WIND: 3	N	N
AT+WSVN	+WIND: 3	N	N
AT+WMBS	+WIND: 3	N	N

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

AT commands	Conditions	SIM dependence	Intermediate
AT+WMFM	+WIND: 3	No	Y
AT+WBHV	+WIND: 3	N	N
AT+WHCNF	+WIND: 3	N	Y
AT+WREGC	+WIND: 3	N	Y

4.13 SIM Toolkit commands

AT commands	Conditions	SIM dependence	Intermediate
AT+STSF	+WIND: 3	N	N
AT+STIN	+WIND: 4	Y	N
AT+STGI	+WIND: 4	Y	N
AT+STGR	+WIND: 4	Y	N

4.14 GPRS commands

AT commands	Conditions	SIM dependence	Intermediate
ATGH	+WIND: 3	N	N
AT+CGDCONT	+WIND: 4		
AT+CGQREQ	+WIND: 4		
AT+CGQMIN	+WIND: 4		
AT+CGATT	+WIND: 4		
AT+CGACT	+WIND: 4	Y	N
AT+CGCMOD	+WIND: 4	Y	N
AT+CGDATA	+WIND: 4		
AT+CGCLASS	+WIND: 3	N	N
AT+CGCLASS	+WIND: 4		
AT+CGSMS	+WIND: 4		
AT+CGREP	+WIND: 4		
AT+CGREG	+WIND: 4		
AT+CGAUTO	+WIND: 4		
AT+CGANS	+WIND: 4		
AT+CGADDR	+WIND: 4		
AT+WGPRS	+WIND: 3	None	N

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.

5 Interoperability

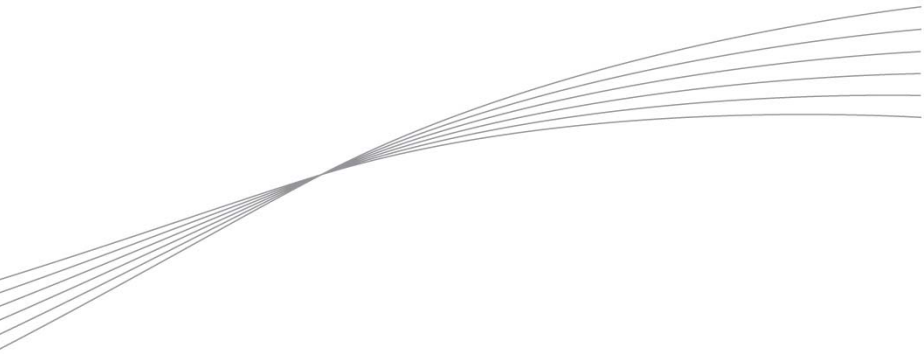
All the commands listed below are only used for interoperability with other applications. They have no action and always reply OK.

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

§

This document is the sole and exclusive property of WAVECOM. Not to be distributed or divulged without prior written agreement. Ce document est la propriété exclusive de WAVECOM. Il ne peut être communiqué ou divulgué à des tiers sans son autorisation préalable.



wavecom

Make it wireless

WAVECOM S.A. - 3 esplanade du Foncet - 92442 Issy-les-Moulineaux Cedex - France - Tel: +33(0)1 46 29 08 00 - Fax: +33(0)1 46 29 08 08
Wavecom, Inc. - 4810 Eastgate Mall - Second Floor - San Diego, CA 92121 - USA - Tel: +1 858 362 0101 - Fax: +1 858 558 5485
WAVECOM Asia Pacific Ltd. - Unit 201-207, 2nd Floor, Bio-Informatics Centre – No.2 Science Park West Avenue - Hong Kong Science Park, Shatin - New Territories, Hong Kong