NOKIA 30
GSM CONNECTIVITY TERMINAL
AT COMMAND GUIDE

NOKIA

Contents

1. INTRODUCTION

This document describes the AT commands that can be used to operate the Nokia 30 GSM Connectivity Terminal.

All the mandatory and optional ITU-T V.25ter /1/, ETS GSM 07.07 /2/, and ETS GSM 07.05 /3/ commands that are applicable to the Nokia 30 are included in the Nokia 30 command set. The 'de facto' commands that are widely used with modems are also supported. Note that the ITU-T V.25ter is a combination of three TIA standards (TIA-602, TIA-615, IS-131).

The Nokia 30 can be used as an adapter for a Group 3 facsimile terminal that supports facsimile Service Classes 1, 2 and 2.0. The supported facsimile AT commands are listed according to the standards in which they are specified: Service Class 1 TIA-578-A /4/, Service Class 2.0 TIA-592 /5/ and Service Class 2 TIA SP-2388 /6/. TIA SP-2388 is a draft of a future standard, but here it is referred to as a public standard.

The Nokia 30 can be operated using a compatible computer or other devices with a 9-pin RS232 connector. AT commands are also available on 3 V level on the M2M System Connector of the Nokia 30 terminal.

For more detailed information about the Nokia 30 GSM Connectivity Terminal, other Nokia M2M products and application development, please visit our website at http://www.forum.nokia.com or http://www.americas.forum.nokia.com and M2M links.

2. DATA CONNECTIONS

The Nokia 30 supports non-transparent data connections. It also supports High Speed Circuit Switched Data (HSCSD) and General Packet Radio Data (GPRS) in non-transparent mode. Time slot usage is presented as the number of up and down links. The Nokia 30 terminal data transfer modes are presented in Table 1.

Table 1. The Nokia 30 data transfer modes.

Data transfer mode	Mode	Data rate
Non-transparent data	Asynchronous data	9600 kbps
	Asynchronous data	14400 kbps
	Asynchronous data HSCSD	Multislot Class 6 (1+1, 2+1, 2+2 and 3+1)
	Asynchronous data GPRS	Multislot Class 6 (1+1, 1+2, 2+2 and 3+1)

3. AT COMMAND SYNTAX

For basic information on the AT command syntax, refer to section *V.25ter* and to GSM 07.07 section 4. This chapter describes the three different AT command formats and the default value mechanisms for their parameters.

3.1 REGISTER COMMANDS

Table 2. Register command format in command description subsections			
	Command	**Response**	**<n> values**
Set	Sn=<n>		x..y (default z)
Read	Sn?	<n>	xxx..yyy

The register command factory default value (&F) is given in parentheses under the column '<n> values'. The existence of a register command can be queried by giving a command without equal signs or question marks (i.e. ATS3 returns OK, but it does not change the <n> setting). <n> cannot be omitted when its value is set (i.e. ATS3= returns ERROR).

3.2 BASIC COMMANDS

Table 3. Basic command format in command description subsections		
	Command	**Description**
Set/ Execute	CMD[x]	for value x
	CMDy	for value y

The commands D (dial), A (answer) and O (return to online data state) also include columns for possible result codes.

The basic command (no '+' prefix) &F default value is underlined. If no value is underlined, the setting of that command is not stored in the non-volatile memory (the command &Y is an exception). If the command parameter is in brackets (usually zero), the parameter can be omitted.

3.3 EXTENDED COMMANDS

Table 4. Extended command format in command description subsections				
	Command	**Response**	**Default**	**+cme error/+cms error**
Set/execute	+CMD[=<x>,...]	[+CMD: <y>,...]	[x,...]	[x]
Read	+CMD?	+CMD: <z>[,...]		[x]
Test	+CMD=?	[+CMD: ...]		[x]

The extended command (‘+’ prefix) parameter default values are given in a separate column. If the default value is not in brackets, the default value is the &F default value of the corresponding parameter. When such a parameter is omitted from a command, its value remains the same as before. If the default value is in brackets, this value shall be used when the parameter is omitted from the command line. The setting of such a parameter is not stored in the memory. If a parameter has no default value, it must always be given.

NOTE: Voice (+V) and fax (+F) commands do not follow this format exactly.

GSM commands can also return a +CME ERROR or +CMS ERROR final result code, when the error is related to the ME or network functionality. The last column indicates whether these codes can be returned. The presentation of +CME ERROR can be controlled with the +CMEE command.

4. TE-TA INTERFACE COMMANDS

4.1 V.25TER

4.1.1 S3 Command line termination character

	Command	Response	<n> values
Set	S3=<n>		0..127 (default 13)
Read	S3?	<n>	000..127

The S3 command sets the decimal IA5 value of command line termination used by the DCE as a part of the header, trailer and terminator for result codes and information text, along with the S4 parameter (see the description of the V command for usage).

If the value of S3 is changed on a command line, the result code issued in response to that command line will use the new value of S3. For example, if S3 was previously set to 13 and the command line “ATS3=50” is issued, the result code issued will use the character with the ordinal value 50 (IA5 3/2) in place of the CR.

4.1.2 S4 Response formatting character

	Command	Response	<n> values
Set	S4=<n>		0..127 (default 10)
Read	S4?	<n>	000..127

The S4 command sets the decimal IA5 value of the character generated by the DCE as a part of the header, trailer and terminator for result codes and information text, along with the S3 parameter (see the description of the **V** command for usage).

If the value of S4 is changed in a command line, the result code issued in response to that command line will use the new value of S4.

4.1.3 S5 Command line editing character

	Command	Response	<n> values
Set	S5=<n>		0..127 (default 8)
Read	S5?	<n>	000..127

The S5 command sets the decimal IA5 value of the character recognised by the DCE as a request to delete the immediately preceding character from the command line.

4.1.4 E Command echo

	Command	Description
Set	E[0]	No echo
	E1	Echo

The E command determines whether or not the DCE echoes characters received from the DTE during the command state and the online command state.

4.1.5 Q Result code suppression

	Command	Description
Set	Q[0]	Transmit codes
	Q1	Suppress codes

The Q command determines whether the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final or unsolicited result code – header, result text, line terminator, or trailer – is transmitted. Information text transmitted in response to commands is not affected by this command.

4.1.6 V DCE response format

	Command	Description
Set	V[0]	Numeric V.25ter basic syntax result codes, limited headers and trailers
	V1	Verbal V.25ter basic syntax result codes, full headers and trailers

The V command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether the result codes are transmitted in numerical or verbal format. The text portion of information responses is not affected by this setting. The command S3 and S4 settings affect header and trailer formatting. Note that the result codes defined in GSM 07.07 and 07.05 only have verbal values.

4.1.7 X Result code selection and call progress monitoring control

	Command	Description
Set	X[0]	OK, CONNECT, RING, NO CARRIER, ERROR codes enabled
	X1	Also CONNECT 1200, CONNECT 2400 enabled
	X2	Same as value 1
	X3	Also BUSY enabled
	X4	Also NO ANSWER enabled
	X5	Also CONNECT 4800 (or higher data rates), CARRIER, DELAYED, BLACKLISTED enabled

The X command defines the call progress result codes that are sent from the Nokia 30 terminal to the DTE. When BUSY, NO ANSWER, DELAYED or BLACKLISTED are not enabled, so NO CARRIER is used instead. When CONNECT <rate> with a correct data <rate> is not enabled, CONNECT is used instead. This command only affects the presentation of the result codes mentioned in this table.

4.1.8 &C Circuit 109 (received line signal detector) behaviour

	Command	Description
Set	&C[0]	Always on
	&C1	Normal operation

The &C command determines how the state of circuit 109 relates to the detection of a received line signal from the remote end. Changing the parameter will take effect immediately in both command and online command states.

In the &C1 mode of operation, circuit 109 is on during the connection. Circuit 109 is also known as a DCD or carrier signal.

4.1.9 &D Circuit 108 (data terminal ready) behaviour

	Command	Description
Set	&D[0]	DTR on->off ignored
	&D1	DTR on->off causes transition to online command state if a call is in progress
	&D2	DTR on->off causes hang up
	&D3	DTR on->off causes hang up and performs reset, like Z

The &D command determines how the DCE responds when circuit 108/2 is changed from ON to OFF during the online data state. Circuit 108 is also known as the DTR signal.

4.1.10 +IPR Fixed DTE rate

	Command	Response	Default
Set	+IPR=<rate>		0
Read	+IPR?	+IPR: <rate>	
Test	+IPR=?	+IPR: (0,1200,2400,4800,9600,14400,19200,28800,38400,57600,115200), ()	

The +IPR command sets the data rate at which the DCE will accept commands. The specified rate takes effect immediately following the issuance of the current command line.

NOTE: The reset commands Z and &F do not change this setting.

Defined values

<rate> is the bit transmission rate per one second

4.1.11 +ICF DTE-DCE character framing

	Command	Response	Default
Set	+ICF=<format>, <parity>		[0,3]
Read	+ICF?	+ICF: <format>,<parity>	
Test	+ICF=?	+ICF: (0-6),(0-3)	

The +ICF command is used to determine the local serial port start-stop character framing that the Nokia 30 uses when accepting DTE commands and when transmitting information text and a result.
NOTE: The reset commands Z and &F do not change this setting.

Defined values

<format> determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.

0	auto detect
1	8 data, 2 stop
2	8 data, 1 parity, 1 stop
3	8 data, 1 stop
4	7 data, 2 stop

5	7 data, 1 parity, 1stop
6	7 data, 1 stop

<parity> determines how the parity bit is generated and checked, if present.

0	odd
1	even
2	mark
3	space

The parity can be set only for format values 2 and 5.

4.1.12 +IFC DTE-DCE local flow control

	Command	Response	Default
Set	+IFC=<dce-by-dte>,<dte-by-dce>		2,2
Read	+IFC?	+IFC: <dce-by-dte>,<dte-by-dce>	
Test	+IFC=?	+IFC: (0-3),(0-2)	

The +IFC controls the operation of local flow control between the DTE and the Nokia 30.

Defined values

<dce-by-dte>specifies the method to be used by the DTE to control the flow of received data from the Nokia 30

<dte-by-dce>specifies the method to be used by the Nokia 30 to control the flow of transmitted data from the DTE

0	No flow control
1	Software flow control (XON/XOFF)
2	Hardware flow control (RTS/CTS)
3	Software flow control (XON/XOFF), with flow control characters also passed to the remote DCE

4.1.13 +ILRR DTE-DCE local rate reporting

	Command	Response	Default
Set	+ILRR=<n>		0
Read	+ILRR?	+ILRR: <n>	
Test	+ILRR=?	+ILRR: (0,1)	

The +ILRR command controls whether the extended-format “+ILRR:<rate>” information text is transmitted from the Nokia 30 to the DTE. The <rate> reported represents the current

DTE-DCE rate. If enabled, the intermediate result code is transmitted after any error control or data compression reports are transmitted and before any final result code (i.e. CONNECT) is transmitted.

4.2 DE FACTO

4.2.1 S25 Detect DTR change time

	Command	Response	<n> values
Set	S25=<n>		0..255 (default 0)
Read	S25?	<n>	000..255

The S25 command sets the time in seconds for reacting to the DTR signal change. The value 255 inhibits the signal change recognition. See also the &D command.

4.2.2 &S DSR signal behaviour

	Command	Description
Set	&S[0]	Always on
	&S1	No effect

The &S command is ignored, the DSR is always ON.

4.2.3 &K Select flow control

	Command	Description
Set	&K[0]	No flow control
	&K3	Hardware flow control (RTS/CTS)
	&K4	Software flow control (XON/XOFF)

The &K command changes the same setting as the +IFC. The use of +IFC is recommended.

5. GENERIC COMMANDS

5.1 V.25TER

5.1.1 Z Reset to default configuration

	Command	Description
Execute	Z[0]	reset to stored profile 0
	Z1	reset to stored profile 1

The settings that are not stored in a profile (refer to &W) will be reset to their factory defaults (refer to &F). The implementation is according to GSM 07.07 section 5.7.

5.1.2 &F Set to factory-defined configuration

	Command	Description
Execute	&F[0]	reset to factory defaults

This command instructs the Nokia 30 to set default values to all parameters. The command parameters that are reset to their factory defaults are: S3, S4, S5, E, Q, V, X, &C, &D, +IFC, +ILRR, S25, &S, +CSCS, S0, S7, S8, S10, +DS, +DR, S2, S12, +CSTA, +CMOD, +CBST, +CRLP, +CR, +CRC, +CSNS, +CREG, +COPS (only <format>), +CLIP, +CLIR, +COLP, +CCWA (only <n>), +CUSD (only <n>), +CSSN, +CMER, +CPBS, +CMEE, +CSMS, +CPMS, +CMGF, +CSCA, +CSMP, +CSDH, +CSCB, +CNMI.

5.1.3 I Request identification information

	Command	Response	Description
Execute	I[0]	Nokia Mobile Phones	same as +GMI
	I1	IMEI	same as +GSN
	I2	Vx.xx dd-mm-yy TME-3 © NMP	same as +GMR
	I3	Nokia 30	same as +GMM
	I4..I13		Ignored values

5.1.4 +GMI Request TA manufacturer identification

	Command	Response
Execute	+GMI	Nokia Mobile Phones

5.1.5 +GMM Request TA model identification

	Command	Response
Execute	+GMM	Nokia 30

5.1.6 +GMR Request TA revision identification

	Command	Response
Execute	+GMR	Vx.xx dd-mm-yy TME-3 © NMP

5.1.7 +GSN Request TA serial number identification

	Command	Response
Execute	+GSN	IMEI

5.1.8 +GCAP Request complete capabilities list

	Command	Response
Execute	+GCAP	+GCAP: +CGSM, +FCLASS, +DS +W

Defined values

+CGSM This is not a command to be used, but it refers to the support of the GSM 07.07 AT command set. Implementation is according to GSM 07.07 section 5.7.

+FCLASS A command to query the support of different facsimile classes

+DS Data Compression

5.2 DE FACTO

5.2.1 &V View configuration

	Command	Description
Execute	&V	Show current and stored profile settings (all command parameter values defined under &F plus &Y setting)

5.2.2 &W Store configuration

	Command	Description
Execute	&W[0]	Store to profile 0
	&W1	Store to profile 1

The &W command stores the current parameter values in the given profile. The command parameters that are stored in a profile are the same as those listed under the &F command, except for the parameters of the following commands that are not stored: +CMOD, +CSCA, +CSMP.

5.2.3 &Y Select power-up configuration

	Command	Description
Set	&Y[0]	Power-up uses profile 0
	&Y1	Power-up uses profile 1

The &Y command defines the profile from which parameters are loaded when the Nokia 30 is activated. This setting is not part of the settings that are stored in a profile. The &F command does not affect this setting.

5.3 GSM 07.07

5.3.1 +CGMI Request ME manufacturer identification

	Command	Response
Execute	+CGMI	Nokia Mobile Phones
Test	+CGMI=?	

5.3.2 +CGMM Request ME model identification

	Command	Response	+cme error
Execute	+CGMM	Nokia 30	x
Test	+CGMM=?		

5.3.3 +CGMR Request ME revision identification

	Command	Response	+cme error
Execute	+CGMR	Vx.xx dd-mm-yy TME-3 © NMP	x
Test	+CGMR=?		

5.3.4 +CGSN Request ME serial number identification

	Command	Response	+cme error
Execute	+CGSN	IMEI	X
Test	+CGSN=?		

5.3.5 +CSCS Select TE character set

	Command	Response	Default
Set	+CSCS= <chset>		"PCCP437"
Read	+CSCS?	+CSCS: <chset>	
Test	+CSCS=?	+CSCS: ("GSM","HEX","IRA","PCCP437","PCDN","8859-1")	

The +CSCS command informs the Nokia 30 of the character set that is used by the DTE.

Defined values

<chset> DTE character set:

"GSM" GSM default alphabet (GSM 03.38 subclass 6.2.1); this setting easily causes software flow control (XON/XOFF) problems.

"HEX" Character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters that in decimals are 3, 47 and 230; no conversions of the original ME character set should be carried out.

"IRA"	International reference alphabet (ITU-T T.50)
"PCCP*437*"	PC character set Code Page 437
"PCDN"	PC Danish/Norwegian character set
"8859-*1*"	ISO 8859 Latin 1 character set

5.3.6 +WS46 Select wireless network

	Command	Response
Set	+WS46=[12]	
Read	+WS46?	12
Test	+WS46=?	(12)

The +WS46 command can be used to set and query a selected or supported wireless network. Only the value 12 ‘GSM digital cellular’ is supported.

6. CALL CONTROL COMMANDS

6.1 V.25TER

6.1.1 D Dial

	Command	Possible verbose result codes (V1)	Numeric (V0)	Description
Execute	D<dial-string>	BLACKLISTED	14	Calls to the number are forbidden until manual reset
		BUSY	7	Called party is busy
		CONNECT	1	Data/fax call established; rate 300 bps (or X forbids rate display)
		CARRIER	16	
		CONNECT 1200	5	Data/fax call established; rate 1200 bps
		CONNECT 2400	10	Data/fax call established; rate 2400 bps
		CONNECT 4800	11	Data/fax call established; rate 4800 bps
		CONNECT 9600	12	Data/fax call established; rate 9600 bps
		CONNECT 14400	17	Data call established; rate 14400 bps
		CONNECT 19200	18	Data call established; rate 19200 bps
		CONNECT 28800	19	Data call established; rate 28800 bps
		CONNECT 38400	20	Data call established; rate 38400 bps
		DELAYED	13	Calls to the number are temporarily forbidden
		ERROR	4	Command cannot be carried out
		NO ANSWER	8	Called party does not answer
		NO CARRIER	3	Call could not be established
		OK	0	Command aborted or voice call started with semicolon character

The original description of the D command is specified in the V.25ter standard, but implementation is according to the modifications specified in GSM 07.07. Before one of the above codes can be returned, some of the following may precede it: +CSSI, +COLP, +CR (or CARRIER), +DR, or +ILRR (in that order). The dial command is also used to control alternating mode calls (see GSM 07.07 section 6.6 and annexes E and F).
NOTE: The +VTS command or comma modifier (i.e. “ATD,1234”; in this case the first comma does not cause a pause) can be used to send DTMF digits.

<dial-string> characters	Values	Description
V.25ter dialling digits	0123456789+#*	Accepted as valid digits (* and # can only be at the beginning)
	ABCD	Cause ERROR
V.25ter modifiers	,	In the case of a voice call: originate call to the number preceding a comma, wait for a remote answer, pause for a length specified with the S8 register, and send numbers after the comma as DTMF digits; further commas cause a pause specified with the S8 register (all commas are ignored in the case of data call)
	T P ! W @	Accepted but ignored
V.25ter semicolon	;	Voice call originating (must be the last character of command line)
GSM 07.07 modifiers	>	Direct dialling from the phonebook (must be the first character after D) (see next table)
	i	Allow calling line ID presentation for this call
	I	Restrict calling line ID presentation for this call
	G	Control CUG information for this call; use +CCUG values
De facto	L	Redial the number last dialled

NOTE: I is the only case-sensitive dial string character.

Direct dialling command	Description	+cme error
D>*mem*<n>[i/I][G][;]	Originate call to the phone number found in the location <n> in a specific memory *mem*, which is one of the two letter memory abbreviations as returned by +CPBS=? (without double quotes); the location range can be queried with +CPBR=?; note that in the case of a SIM ADN memory (SM), D>SIM<n> should also be accepted (due to inconsistency in 07.07)	X
D><n>[i/I][G][;]	Originate call to the phone number in memory location <n>; the memory selected with +CPBS is used	X

6.1.2 T Select tone dialling

	Command
Execute	T

The T command is ignored. Implementation is according to GSM 07.07 section 6.18.

6.1.3 P Select pulse dialling

	Command
Execute	P

The P command is ignored. Implementation is according to GSM 07.07 section 6.18.

6.1.4 A Answer response

	Command	Possible verbose result codes (V1)	Numeric (V0)	Description
Execute	A	CONNECT	1	Data/fax call established; rate 300 bps (or X forbids rate display)
		CONNECT 1200	5	Data/fax call established; rate 1200 bps
		CONNECT 2400	10	Data/fax call established; rate 2400 bps
		CONNECT 4800	11	Data/fax call established; rate 4800 bps
		CONNECT 9600	12	Data/fax call established; rate 9600 bps
		CONNECT 14400	17	Data call established; rate 14400 bps
		CONNECT 19200	18	Data call established; rate 19200 bps
		CONNECT 28800	19	Data call established; rate 28800 bps
		CONNECT 38400	20	Data call established; rate 38400 bps
		CONNECT 48000	21	Data call established; rate 48000 bps
		CONNECT 56000	22	Data call established; rate 56000 bps
		ERROR	4	Command cannot be carried out
		CARRIER	16	Call will be established
		NO CARRIER	3	Call could not be established
		OK	0	Command aborted

A command instructs the Nokia 30 to immediately connect to the line and to start the phone call. Any additional commands that appear after A on the same command line are ignored.

Not all the result codes are in V.25ter. Before one of the above codes can be returned, some of the following may precede it/them: +CR (or CARRIER), +DR, or +ILRR (in that order). The answer command is also used to control alternating mode calls (see GSM 07.07 section 6.6).

6.1.5 H Hook control

	Command	Description
Execute	H[0]	hang up all calls (except possible waiting call) if only single mode calls are in progress, or switch to voice mode if alternate mode call is active

Implementation is according to GSM 07.07 section 6.18.

6.1.6 O Return to online data state

	Command	Possible verbose result codes (V1)	Numeric (V0)	Description
Execute	O	CONNECT	1	Data/fax call established; rate 300 bps (or X forbids rate display)
		CONNECT 1200	5	Data/fax call established; rate 1200 bps
		CONNECT 2400	10	Data/fax call established; rate 2400 bps
		CONNECT 4800	11	Data/fax call established; rate 4800 bps
		CONNECT 9600	12	Data/fax call established; rate 9600 bps
		CONNECT 14400	17	Data call established; rate 14400 bps
		CONNECT 19200	18	Data call established; rate 19200 bps
		CONNECT 28800	19	Data call established; rate 28800 bps
		CONNECT 38400	20	Data call established; rate 38400 bps
		ERROR	4	Command cannot be carried out
		CARRIER	16	Call will be established
		NO CARRIER	3	Call could not be established
		OK	0	Command aborted

The O command returns the Nokia 30 to the online data state from the online command mode. Implementation is according to GSM 07.07 section 6.18.

6.1.7 S0 Automatic answer

	Command	Response	<n> values
Set	S0=<n>		0..255 (default 0)
Read	S0?	<n>	000..255

The S0 command sets the number of rings (RING or +CRING result codes) that are emitted before automatic answering is enabled. 0 disables auto answering.

6.1.8 S6 Pause before blind dialling

	Command	Response	<n> values
Set	S6=<n>		2..10
Read	S6?	002	002

The S6 command is ignored. The implementation is according to GSM 07.07 section 6.18.

6.1.9 S7 Connection completion timeout

	Command	Response	<n> values
Set	S7=<n>		0..255 (default 60)
Read	S7?	<n>	000..255

The S7 command sets the number of seconds allocated to the completion of call answering or an originating procedure before the procedure is aborted. Implementation is according to GSM 07.07 section 6.18.

6.1.10 S8 Comma dial modifier time

	Command	Response	<n> values
Set	S8=<n>		0..255 (default 2)
Read	S8?	<n>	000..255

The S8 command specifies the time in seconds that the DCE should pause during the signalling of call-addressing information to the network (dialling) when a "**,**" (comma) dial modifier is encountered in a dial string of the D command. Implementation is according to GSM 07.07 section 6.18.

6.1.11 S10 Automatic disconnect delay

	Command	Response	<n> values
Set	S10=<n>		0..255 (default 100)
Read	S10?	<n>	000..255

The S10 command sets the time in tenths of a second that the Nokia 30 will remain connected to the line after it has indicated the absence of the received line signal. If the received line signal is detected before the time specified in the S10 expires, the Nokia 30

remains connected to the line and the call continues. Implementation is according to GSM 07.07 section 6.18.

6.1.12 L Monitor speaker loudness

	Command
Execute	L[0]..L3

The L command is ignored. Implementation is according to GSM 07.07 section 6.18.

6.1.13 M Monitor speaker mode

	Command
Execute	M[0]..M2

The M command is ignored. Implementation is according to GSM 07.07 section 6.18.

6.1.14 +DS Data compression

	Command	Response	Default
Set	+DS=<dir>,<neg>,<P1>,<P2>		0,0,2048,20
Read	+DS?	+DS: <dir>,<neg>,<P1>,<P2>	
Test	+DS=?	+DS: (0-3),(0,1),(512-2048),(6-32)	

The +DS command controls the V.42 *bis* data compression function.
NOTE: The V.42 bis data compression must be supported by the network.

Defined values

<dir> The desired direction(s) of the operation of the data compression function; from the DTE's point of view:

0	Negotiated…no compression
1	Transmit only
2	Receive only
3	Both directions, accept any direction

<neg> specifies whether the DCE should continue to operate if the desired result is not obtained:

0 Do not disconnect if Rec. V.42 bis is not negotiated by the remote DCE as specified in <dir>
1 Disconnect if Rec. V.42 bis is not negotiated by the remote DCE as specified in <dir>

<P1> the maximum number of dictionary entries which should be negotiated

<P2> the maximum string length to be negotiated

6.1.15 +DR Data compression reporting

	Command	Response	Default
Set	+DR=<mode>		0
Read	+DR?	+DR: <mode>	
Test	+DR=?	+DR: (0,1)	

The +DR command controls the presentation of the +DR intermediate result code.

Defined values

<mode> data compression reporting:

0 disabled
1 enabled, i.e. + DR result code transmitted

6.2 DE FACTO

6.2.1 B CCITT/Bell mode

	Command
Execute	B[0]..B1

The B command is ignored.

6.2.2 S1 Ring count

	Command	Response	<n> values
Read	S1?	<n>	000..255

The S1 command returns the number of rings (RING or +CRING result codes) counted after the last MT call setup.

6.2.3 S2 Escape code character

	Command	Response	<n> values
Set	S2=<n>		0..127 (default 43)
Read	S2?	<n>	000..127

The S2 command specifies the character to be used in the escape sequence. The default character is a plus sign. See also the +++ Escape command.

6.2.4 S12 Escape guard time

	Command	Response	<n> values
Set	S12=<n>		0..255 (default 50)
Read	S12?	<n>	000..255

The S12 command sets the guard time before and after the escape sequence. The value is in fiftieths of a second (the default is one second). See also the +++ Escape command.

6.2.5 +++ Escape

During the online data state, it is possible to enter the online command state by giving three identical characters (defined by S2register; the default is ‘+’) in a sequence. Before and after the sequence, there must be a pause of at least the time defined by the S12 register. By setting S12 to zero, an escape sequence detection can be disabled.

6.3 GSM 07.07

6.3.1 +CSTA Select type of address

	Command	Response	Default
Set	+CSTA=<type>		129
Read	+CSTA?	+CSTA: <type>	
Test	+CSTA=?	+CSTA: (129, 145)	

The +CSTA command selects the type of number according to GSM specifications. The dial command D always uses this setting, except for when the dial string includes the international access code character (+). In this case, the type of address sent to the network defaults to 145.

Defined values

<type> type of number, refer to GSM 04.08 10.5.4.7:

129	Unknown/telephony
145	International/telephony

6.3.2 +CMOD Call mode

	Command	Response	Default
Set	+CMOD=<mode>		0
Read	+CMOD?	+CMOD: <mode>	
Test	+CMOD=?	+CMOD: (0-3)	

The +CMOD command selects the call mode of the next dialling commands (D) or for the next answering command (A). The mode can either be single or alternating. When single mode is selected, the call originating and hang up procedures are similar to the procedures specified in the ITU-T Recommendations V.25ter, T.31 and T.32. In the GSM system, voice calls can be followed by alternating voice/data and alternating voice/fax calls.
NOTE: The +CMOD should be set to zero after a successfully completed alternating mode call. It should also be set to zero after a call has not been answered. The power-up, factory (&F) and user resets (Z) should also set the value to zero. This reduces the possibility of accidentally originating or answering alternating mode calls.
NOTE: Alternating call answering operations from an external UI may change the +CMOD values.

Defined values

<mode>:

0	single mode
1	alternating voice/fax (teleservice 61)
2	alternating voice/data (bearer service 61)
3	voice followed by data (bearer service 81)

6.3.3 +CHUP Hang up call

	Command
Execute	+CHUP
Test	+CHUP=?

The +CHUP is an assured procedure to terminate an alternating mode call.

6.3.4 +CBST Select bearer service type

	Command	Response	Default
Set	+CBST=<speed>, <name>,<ce>		0,0,1
Read	+CBST?	+CBST: <speed>,<name>,<ce>	
Test	+CBST=?	+CBST: (0-7,12,14-16,34,36,38,39,43,47-51,65,66,68,70,71,75,79-81), (0,2),(1)	

The +CBST command selects the bearer service with a data rate and the connection element to be used when data calls are originated. The values may also be used during a mobile terminated data call setup, especially in the case of single numbering scheme calls (refer +CSNS).

Defined values

<speed>:

0	autobauding (automatic selection of the speed; this setting is possible in case of a 3.1 kHz modem and non-transparent service)
1	300 bps (V.21)
2	1200 bps (V.22)
3	1200/75 bps (V.23)
4	2400 bps (V.22bis)
5	2400 bps (V.26ter)
6	4800 bps (V.32)

7 9600 bps (V.32)
12 9600 bps (V.34)
14 14400 bps (V.34)
15 19200 bps (V.34)
16 28800 bps (V.34)
34 1200 bps (V.120)
36 2400 bps (V.120)
38 4800 bps (V.120)
39 9600 bps (V.120)
43 14400 bps (V.120)
47 19200 bps (V.120)
48 28800 bps (V.120)
49 38400 bps (V.120)
50 48000 bps (V.120)
51 56000 bps (V.120)
65 300 bps (V.110)
66 1200 bps (V.110)
68 2400 bps (V.110 or X.31 flag stuffing)
70 4800 bps (V.110 or X.31 flag stuffing)
71 9600 bps (V.110 or X.31 flag stuffing)
75 14400 bps (V.110 or X.31 flag stuffing)
79 19200 bps (V.110 or X.31 flag stuffing)
80 28800 bps (V.110 or X.31 flag stuffing)

<name>:

0 data circuit asynchronous (UDI or 3.1 kHz modem)
2 PAD Access (asynchronous) (UDI)

<ce>:

1 non-transparent

6.3.5 +CRLP Radio link protocol

	Command	Response	Default
Set	+CRLP=<iws>,<mws> ,<T1>,<N2>[,<ver> ,<T4>]		61,61,48,6
Read	+CRLP?	+CRLP: <iws>,<mws>,<T1>,<N2><CR><LF>	
Test	+CRLP=?	+CRLP: (0-61),(0-61),(39-255),(1-255) <CR><LF>	

The +CRLP command sets the used radio link protocol (RLP) parameters when non-transparent data calls are originated.

The read command returns the current settings.

The test command returns the values supported by the Nokia 30 as a compound value.

Defined values

<ver> : RLP version number in integer format; when version indication is not present, it shall equal 0

<iws> Interworking Function (IWF) to MS Window size

<mws> MS to IWF Window size

<T1> acknowledgement timer in units of 10 ms

<N2> retransmission attempts

<T4>: resequencing period in units of 10 ms

6.3.6 +CR Service reporting control

	Command	Response	Default
Set	+CR=<mode>		0
Read	+CR?	+CR: <mode>	
Test	+CR=?	+CR: (0,1)	

The +CR command controls the return of the intermediate result code +CR: <serv>. If enabled, the intermediate result code is transmitted during the connect negotiation when the Nokia 30 has determined the speed and quality of service that will be used, and before any error control or data compression reports are transmitted or any final result code (e.g. CONNECT) is transmitted.

Defined values

<mode>:

0 disables reporting
1 enables reporting

<serv>:

REL ASYNC asynchronous non-transparent

6.3.7 +CEER Extended error report

	Command	Response
Execute	+CEER	+CEER: <report>
Test	+CEER=?	

The +CEER command returns the reason for the last call setup or in-call modification failure, or the reason for the last call release. <report> is the textual representation of the network cause value as listed in GSM 04.08 annex H.

6.3.8 +CRC Cellular result codes

	Command	Response	Default
Set	+CRC=<mode>		0
Read	+CRC?	+CRC: <mode>	
Test	+CRC=?	+CRC: (0,1)	

The +CRC command controls whether the extended format of an incoming call indication is used. When enabled, an incoming call is indicated with the unsolicited result code +CRING: <type> instead of the normal RING.

Defined values

<mode>:

0	disables extended format
1	enables extended format

<type>:

FAX	facsimile (TS 62)
VOICE	normal voice (TS 11)
VOICE/REL ASYNC	voice followed by data (BS 81)
ASYNC	normal data (BS 81)
REL ASYNC	normal data (BS 81)
ALT VOICE/REL ASYNC	alternating voice/data, voice first (BS 61)
ALT REL ASYNC/VOICE	alternating voice/data, data first (BS 61)
ALT VOICE/FAX	alternating voice/fax, voice first (TS 61)
ALT FAX/VOICE	alternating voice/fax, fax first (TS 61)

6.3.9 +CHSR Current call parameters reporting

	Command	Response	Default
Set	+CHSR=<mode>		1
Read	+CHSR?	+CHSR: <mode>	
Test	+CHSR=?	+CHSR: (0,1)	

When the CHSR=1 is set, the current HSCSD configuration is written in the terminal window every time the HSCSD configuration changes or a new HSCSD call is initiated. To disable the feature, key in at+chsr=0.

6.3.10 +CSNS Single numbering scheme

	Command	Response	Default
Set	+CSNS=<mode>		0
Read	+CSNS?	+CSNS: <mode>	
Test	+CSNS=?	+CSNS: (0-7)	

The +CSNS command selects the bearer or teleservice to be used when a mobile terminated single numbering scheme call is established, i.e. when a call without a bearer capability element is received.

The parameter values set with the +CBST command should be used when <mode> equals a data service. If the +CBST parameter is set to a value that is not applicable to single numbering calls, the parameter should be mapped to the closest valid value.

Defined values

<mode>:

0	voice
1	alternating voice/fax, voice first (TS 61)
2	fax (TS 62)
3	alternating voice/data, voice first (BS 61)
4	data
5	alternating voice/fax, fax first (TS 61)
6	alternating voice/data, data first (BS 61)
7	voice followed by data (BS 81)

6.3.11 +CHSD HSCSD device parameters

	Command	Response	+cme error
Execute	+CHSD	+CHSD: <mclass>,<maxRx>,<maxTx>,<sum>,<codings>	x
Test	+CHSD=?		

Defined values

<mclass>: integer type; multislot class

<maxRx>: integer type; the maximum number of receive time slots that the ME can use

<maxTx>: integer type; the maximum number of transmit time slots that the ME can use

<sum>: integer type; the total number of receive and transmit time slots that the ME can use at the same time (per TDMA frame). The following applies in a HSCSD call:

1 ≤ (receive slots) + (transmit slots) ≤ <sum>

<codings> a sum of integers, each representing a supported channel coding

4	9.6k full rate data traffic channel
8	14.4k full rate data traffic channel
12	both 9.6k and 14.4k supported

6.3.12 +CHSN HSCSD Parameter command syntax

	Command	Response	+cme error
Execute	+CHSN=[<wAiur>[,<wRx>[,<topRx>[,<codings>]]]]	+CHSN: <wAiur>,<wRx>,<topRx>,<codings>	x
Test	+CHSN=?	+CHSN: (1-6),(1-3),(0-3),(4,8)	

The set command controls parameters for non-transparent HSCSD calls. Changing <topRx> or <codings> value during a call does not affect the current call. Changing <wAiur> or <wRx> affects the current call only if <topRx> was non-zero when a call was established.

Defined values

<wAiur>: integer type; desired air interface user rate. The default value 0 indicates that the TA shall calculate a proper value from the currently selected fixed network user rate (<speed> subparameter from +CBST command), <codings>, and <wRx> (or <maxRx> from +CHSD command if <wRx>=0). Other values:

1	9600 bps
2	14400 bps
3	19200 bps
4	28800 bps
6	43200 bps

<wRx>: integer type; desired amount of receive time slots. The default value 0 indicates that the TA shall calculate a proper value from the currently selected <wAiur> and <codings>

<topRx>: integer type; top value for <wRx> that the user is going to request during the next established non-transparent HSCSD call. The default value 0 indicates that the user is not going to change <wAiur>/<wRx> during the next call

<codings>: a sum of integers, each representing a channel coding that is accepted for non-transparent HSCSD calls. The default value 0 indicates that all the supported codings are accepted (refer +CHSD command for other values)

<codings>: is a sum of integers, each representing a supported channel coding:

4	9.6k full rate data traffic channel
8	14.4k full rate data traffic channel
12	Both 9.6k and 14.4k supported

<maxAiur>: integer type; the maximum value for <wAiur> (assuming that all supported channel codings are accepted and that the maximum number of time slots is used)

<modify>:

0	<wAiur>/<wRx> modification during call is not supported (<topRx> accepts only 0)
1	<wAiur>/<wRx> modification during call is supported by ME/TA

NOTE! The non-transparent/transparent data service shall be selected by the at+cbst command.

6.3.13 +CHSC HSCSD Current call parameters

	Command	Response
Execute	+CHSC	+CHSC: <rx>,<tx>,<aiur>,<coding>
Test	+CHSC=?	

Defined values

<rx>: integer type; the number of receive time slots currently in use

<tx>: integer type; the number of transmit time slots currently in use

<aiur>: integer type; the current air interface user rate (in the case of a transparent service, this equals a fixed network user rate). Refer to the +CHSN command for the possible values.

<coding>: current channel coding (Refer to the +CHSD command for the possible values). +CVHU voice hang up control

When there is no call in progress, all parameter values are zero.

6.3.14 +CV120 V.120 rate adaptation protocol

	Command	Response	Default
Set	+CV120=<rah>,<mfm>,<mode>, <llineg>,<assign>,<negtype>		,1
Read	+CV120?	+CV120: <rah>,<mfm>,<mode>, <llineg>,<assign>,<negtype>	
Test	+CV120=?	+CV120: (1),(0,1),(1),(0),(0),(0)	

6.3.15 +CVHU Voice Hang Up Control

	Command	Response	Default
Set	+CVHU=<mode>		0
Read	+CVHU?	+CVHU: <mode>	
Test	+CVHU=?	+CVHU: (0-2)	

By default, Nokia products should ignore the DTR drop, but should disconnect from the ATH during a call that is in voice mode. (GSM 07.07 section 6.).

7. NETWORK SERVICE COMMANDS (GSM 07.07)

7.1 +CREG NETWORK REGISTRATION

	Command	Response	Default	+cme error
Set	+CREG=<n>		0	
Read	+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>]		x
Test	+CREG=?	+CREG: (0-2)		

The +CREG command controls the presentation of the unsolicited result code +CREG: <stat> when <n>=1 and the ME network registration status changes, or the code +CREG: <stat>[,<lac>,<ci>] when <n>=2 and the network cell changes.

The read command returns the status of a result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the ME. The location information elements <lac> and <ci> are returned only when <n>=2 and the ME is registered in the network.

Defined values

<n>:

0 disable network registration unsolicited result code
1 enable network registration unsolicited result code +CREG: <stat>
2 enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>]

<stat>:

0 Not registered, the ME is not currently searching for a new operator to register with
1 Registered, home network
2 Not registered, but ME is currently searching for a new operator to register with
3 Registration denied
4 Unknown
5 Registered, roaming

<lac> string type; a two-byte location area code in hexadecimal format (e.g. "00C3" equals 193 in decimal)

<ci>: string type; a two-byte cell ID in hexadecimal format

7.2 +COPS OPERATOR SELECTION

	Command	Response	Default	+cme error
Set	+COPS=<mode>, <format>,<oper>		[0,2]	x
Read	+COPS?	+COPS: <mode>[,<format>,<oper>]		x
Test	+COPS=?	+COPS: [(<stat>,,,<oper>) [,...]],,(0,1),(2)		x

The +COPS command forces an attempt to select and register the GSM network operator. <mode> is used to select whether the selection is automatically carried out by the Nokia 30 or whether it is forced by this command to the operator <oper>, given in numeric 2 <format>. The selected operator name format shall also apply to the further read commands (+COPS?).

The read command returns the current mode and the currently selected operator. If no operator is selected, <format> and <oper> are omitted.

The test command returns a list of quadruplets, each representing an operator that is present in the network. A quadruplet consists of an integer indicating the availability of the operator <stat> and a numeric representation of the operator. The list of operators should be in the following order: home network, networks referenced in SIM and other networks.

After the operator list is returned, the Nokia 30 returns lists of the supported <mode> and <format>. These lists shall be delimited from the operator list by two commas.

Defined values

<mode>:

0 automatic (<oper> field is ignored)
1 manual (<oper> field should be present)

<format>:

2 numeric <oper>

<oper> The numeric format is the GSM Location Area Identification number (refer to GSM 04.08 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A, plus a two BCD digit network code, which is administration-specific; a returned <oper> shall not be in Binary Coded Decimal (BCD) format, but in IRA characters converted from BCD; hence the number has the following structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)

<stat>:

0	unknown
1	available
2	current
3	forbidden

7.3 +CLCK FACILITY LOCK

	Command	Response	Default	+cme error
Execute	+CLCK=<fac>,<mode>, <passwd>,<class>	when <mode>=2: +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> [...]]]	[,,,7]	x
Test	+CLCK=?	+CLCK: ("PS","SC","AO","OI","OX", "AI","IR","AB","AG","AC")		

The +CLCK command enables and disables or queries the state of SIM/ME security features (PIN or security code query or fixed dialling feature) or call barring supplementary services. The <fac> values “AB”, “AG” and “AC” are only applicable for <mode>=0. Only the security code levels ‘phone’ and ‘none’ can be handled with this command. If the ‘memory’ level is set and the status is queried (+CLCK="PS", 2), the AT interface shall indicate ‘not active’ (+CLCK: 0). When the SS status request response coming from the network indicates that the SS is active for a specific data bearer services (e.g. ‘circuit async’), the AT interface should only indicate ‘data’ (<class>=2). (The ‘not active’ case is displayed only when the SS is not active to any service; i.e. +CLCK: 0,7.)

The test command returns facility values supported by the Nokia 30 as a compound value.

Defined values

<fac>:

"PS"	PH-SIM, lock Phone to SIM card. The ME queries for a password when a SIM card other than the previous SIM card is inserted; the ME may remember a certain amount of previously-used cards and, therefore, does not necessarily ask for a password when a previously used card is inserted.
"SC"	SIM, lock SIM card. SIM queries for a password in a ME power-up and when this lock command is issued.
"AO"	BAOC, Bar All Outgoing Calls. Please refer to GSM02.88, clause 1

"OI"	BOIC, Bar Outgoing International Calls. Please refer to GSM 02.88, clause 1
"OX"	BOIC-exHC, Bar Outgoing International Calls except to Home Country. Please refer to GSM 02.88, clause 1.
"AI"	BAIC, Bar All Incoming Calls. Please refer to GSM 02.88, clause 2.
"IR"	BIC-Roam, Bar Incoming Calls when roaming outside the home country. Please refer to GSM 02.88, clause 2.
"AB"	All barring services, applicable only for <mode>=0. Please refer to GSM 02.30.
"AG"	All outgoing barring services, applicable only for <mode>=0. Please refer to GSM 02.30.
"AC"	All incoming barring services, applicable only for <mode>=0. Please refer to GSM 02.30.

<mode>:

0	unlock
1	lock
2	query status

<status>:

0	not active
1	active

<passwd> string type; should be the same as the password specified for the facility from the Nokia 30 user interface or with the Change Password +CPWD command

<class*x*> is a sum of integers, each representing a class of information (the default value 7 equals all classes):

1	voice (telephony)
2	data (usually refers to all bearer services; with <mode>=2 this may only refer to some bearer service)
4	fax (facsimile services)

7.4 +CPWD CHANGE PASSWORD

	Command	Response	+cme error
Execute	+CPWD=<fac>,<oldpwd>,<newpwd>		x
Test	+CPWD=?	+CPWD: ("PS",10),("SC",8),("AB",4),("P2",8)	

The +CPWD command sets a new password for the lock function facility defined by the Facility Lock +CLCK command. Note that the target lock has to be in <mode>=1.

The test command returns a list of pairs that present the available facilities and the maximum length of their passwords.

Defined values

<fac>:

"PS" PH-SIM lock phone to SIM card
"SC" SIM lock SIM card
"AB" All barring services
"P2" SIM PIN2

<oldpwd>, <newpwd> string type; <oldpwd> should be the same as the password specified for the facility from the ME user interface or for using the Change Password +CPWD command. <newpwd> is the new password

7.5 +CLIP CALLING LINE IDENTIFICATION PRESENTATION

	Command	Response	Default
Set	+CLIP=<n>		0
Read	+CLIP?	+CLIP: <n>,<m>	
Test	+CLIP=?	+CLIP: (0,1)	

The +CLIP command refers to the GSM supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. The +CLIP command enables or disables the presentation of the CLI. It has no effect on the execution of the CLIP supplementary service in the network.

When the presentation of the CLI is enabled (and the calling subscriber allows it), the +CLIP: number>,
<type> response is returned after every RING (or +CRING: <type>; refer to "Cellular result codes +CRC") result code.

The read command gives the status of <n> and triggers an interrogation of the provision status of the CLIP service according to GSM 02.81 (given in <m>). The test command returns the values supported by the Nokia 30 as a compound value.

Defined values

<n> parameter sets/shows the result code presentation status in the Nokia 30:

0 disable
1 enable

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

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

<number> string type phone number of a format specified by <type>

<type> type of address octet in integer format (refer to GSM 04.08 subclause 10.5.4.7):

129 unknown/telephony
145 international/telephony

7.6 +CLIR CALLING LINE IDENTIFICATION RESTRICTION

	Command	Response	Default
Set	+CLIR=<n>		0
Read	+CLIR?	+CLIR: <n>,<m>	
Test	+CLIR=?	+CLIR: (0-2)	

The +CLIR command refers to the CLIR service according to GSM 02.81 that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.

The set command overrides the CLIR subscription when the temporary mode is provisioned as a default adjustment for all subsequent outgoing calls. This adjustment can be revoked by using the opposite command. If this command is used by a subscriber without a provision of CLIR in the permanent mode, the network will act according to GSM 02.81.

The read command gives the default adjustment for all outgoing calls (given in <n>) and triggers an interrogation of the provision status of the CLIR service (given in <m>).

The test command returns the supported values.

Defined values

<n> sets the adjustment for outgoing calls:

0	the presentation indicator is used according to the subscription of the CLIR service
1	CLIR invocation
2	CLIR suppression

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

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

7.7 +COLP CONNECTED LINE IDENTIFICATION PRESENTATION

	Command	Response	Default
Set	+COLP=<n>		0
Read	+COLP?	+COLP: <n>,<m>	
Test	+COLP=?	+COLP: (0,1)	

The +COLP command refers to the GSM supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile-originated call. The command enables or disables the presentation of the COL. It has no effect on the execution of the COLR supplementary service in the network.

When enabled (and the called subscriber allows), the +COLP: <number>, <type> intermediate result code is returned before any +CR or V.25ter responses.

The read command gives the status of <n> and triggers an interrogation of the provision status of the COLP service according to GSM 02.81 (given in <m>).

The test command returns the supported values.

Defined values

<n> sets/shows the result code presentation status in the Nokia 30:

0	disable
1	enable

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

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

<number> string type phone number of a format specified by <type>

<type> type of address octet in integer format (refer GSM 04.08 subclause 10.5.4.7):

129 unknown/telephony
145 international/telephony

7.8 +CCWA CALL WAITING

	Command	Response	Default	+cme error
Set	+CCWA=<n>,<mode>,<class>	when <mode>=2: +CCWA: <status>,<class1> [<CR><LF>+CCWA: <status>,<class2> [...]]	0[,,7]	x
Read	+CCWA?	+CCWA: <n>		
Test	+CCWA=?	+CCWA: (0,1)		

The +CCWA command allows the controlling of the Call Waiting supplementary service according to GSM 02.83. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2), the response line for the 'not active' case (<status>=0) should only be returned if the service is not active for any <class>. The parameter <n> is used to disable and enable the presentation of an unsolicited result code. +CCWA: <number>,<type>,<class> when the call waiting service is enabled.

The interaction of this command with other commands based on other GSM supplementary services is described in the GSM standard.

The test command returns the supported values.

Defined values

<n> sets/shows the result code presentation status:

0 disable
1 enable

<mode> when not given, the network is not interrogated:

0 disable
1 enable
2 query status

<class*x*> is a sum of integers, each representing a class of information (the default value 7 equals all classes):

1 voice (telephony)
2 data (usually refers to all bearer services; with <mode>=2 this may only refer to some bearer services)
4 fax (facsimile services)

<status>:

0 not active
1 active

<number> string type phone number of a calling address in the format specified by <type>

<type> type of address octet in integer format (refer GSM 04.08 10.5.4.7):

129 unknown/telephony
145 international/telephony

7.9 +CUSD UNSTRUCTURED SUPPLEMENTARY SERVICE DATA

	Command	Response	Default	+cme error
Set	+CUSD=<n>,<str>,<dcs>	+CUSD: <m>[,<str>,<dcs>]	0[,,0]	x
Read	+CUSD?	+CUSD: <n>		
Test	+CUSD=?	+CUSD: (0,1)		

The +CUSD command allows the controlling of the Unstructured Supplementary Service Data (USSD) according to GSM 02.90. Both network and mobile-initiated operations are supported. The parameter <n> is used to disable and enable the presentation of an unsolicited result code (network-initiated operation) +CUSD: <m>,<str>,<dcs>.

When <str> is given, a mobile-initiated USSD string or a response USSD string to a network-initiated operation is sent to the network. In the case of a successful mobile-initiated operation, the response USSD string coming from the network is returned before the final result code.

The test command returns the supported values.

Defined values

<n> sets/shows the result code presentation status:

0 disable
1 enable

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

- if <dcs> indicates that the GSM 03.38 default alphabet is used:
- if the TE character set is not "HEX" (refer to the Select TE Character Set +CSCS command): the Nokia 30 converts the GSM alphabet into the current TE character set according to the rules of GSM 07.05, Annex A
- if the TE character set is "HEX": the Nokia 30 converts each 7-bit character of the GSM alphabet into two IRA-character long hexadecimal numbers (e.g. character Π (GSM 23) is presented as 17 (IRA 49 and 55))
- if <dcs> indicates that an 8-bit data coding scheme is used: the Nokia 30 converts each 8-bit octet into two IRA-character long hexadecimal numbers (e.g. octet with the integer value 42 is presented to the TE as two characters 2A (IRA 50 and 65))

<dcs> GSM 03.38 Cell Broadcast Data Coding Scheme in integer format (default 0)

<m>:

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

1 further user action required (network-initiated USSD-Request, or further information needed after mobile-initiated operation)

7.10 +CSSN SUPPLEMENTARY SERVICE NOTIFICATIONS

	Command	Response	Default
Set	+CSSN=<n>,<m>		0,0
Read	+CSSN?	+CSSN: <n>,<m>	
Test	+CSSN=?	+CSSN: (0,1),(0,1)	

The +CSSN command controls the presentation of the +CSSI intermediate result code and the +CSSU unsolicited result code.

The test command returns the supported values.

Defined values

<n> sets/shows the +CSSI result code presentation status:

0 disable
1 enable

<m> sets/shows the +CSSU result code presentation status:

0 disable
1 enable

7.11 +CCFC CALL FORWARDING NUMBER AND CONDITIONS

	Command	Response	default	+cme error
Execute	+CCFC=<reason>, <mode>,<number>, <type>,<class>, <subaddr>, <satype>, <time>	When <mode>=2: +CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][<CR><LF>] +CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [...]]	[,,, 129/145,7 ,,128,20]	x
Test	+CCFC=?	+CCFC: (0-5)		

This command controls call forwarding supplementary services. The <reason> values 4 and 5 are only applicable for <mode>=0. When the status request response from the network indicates that the SS is active for specific data bearer services (e.g. ‘circuit async’), the AT interface should only indicate ‘data’ (<class>=2) (the ‘not active’ case is only displayed when the SS is not active to any service; i.e. +CCFC: 0,7).

Defined values

<reason>:

0 unconditional
1 mobile busy
2 no reply
3 not reachable
4 all call forwarding (GSM 02.30)
4 all conditional call forwarding (GSM 02.30)

<mode>:

0 disable

1 enable

2 query status

3 registration

4 erasure

<number>: string-type phone number of forwarding address in the format specified by <type>

<type>: type of address octet in integer format (GSM 04.08, subclause 10.5.4.7). The default value is 145 when the dialling string includes the international access code character "+"; otherwise the default value is129

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

<satype>: type of sub-address octet in integer format (GSM 04.08, subclause 10.5.4.8). The default value is 128.

<classx> a sum of integers each representing a class of information (the default value 7 equals all classes):

1 voice

2 data

4 fax

also all other values below 128 are reserved

<time>: 1...30 when "no reply" is enabled or queried, gives the time in seconds to wait before a call is forwarded. The default value is 20.

<status>:

0 not active

1 active

7.12 +CHLD CALL RELATED TO SSS

	Command	Response	+cme error
Execute	+CHLD=<n>		x
Test	+CHLD=?	+CHLD: (0,1,1x,2,2x,3,4)	

Optional. See ETSI GSM 07.07 /2/, section 7.12. Controls call hold, multiparty and explicit call transfer supplementary service operations as defined in GSM 02.30, section 4.5.5.1. A short description of <n> values: 0 = release waiting or incoming call (send ‘busy’ signal to network), or held calls; 1 = release active calls and accept another (waiting or held) call; 1x = release active call x; 2 = active calls on hold and accept another (waiting or held) call; 2x =

active multiparty call on hold except for call x; 3 = add a held call to a multiparty call; 4 = connect a held call to an active (or MO alerting) call (locally both calls are disconnected).

7.13 +CAOC ADVICE OF CHARGE

	Command	response	+cme error
execute	+CAOC[=<mode>]	[+CAOC: <ccm>]	x
read	[+CAOC?]	+CAOC: <mode>	
test	+CAOC=?	[+CAOC: (0-2)]	

Optional. See ETSI GSM 07.07 /2/, section 7.15. Returns the current call meter value (in home units) from the ME.

8. ME CONTROL AND STATUS COMMANDS (GSM 07.07)

8.1 +CPIN ENTER PIN

	Command	Response	+cme error
Set	+CPIN=<pin>,<newpin>		x
Read	+CPIN?	+CPIN: <code>	x
Test	+CPIN=?		

The +CPIN command sends a password to the Nokia 30 that is required for operating the Nokia 30 (SIM PIN, SIM PUK, PH-SIM PIN, etc.). Note that quotation marks must be used in this command (e.g. AT+CPIN="1234").

If the required PIN is SIM PUK or SIM PUK2, <newpin> is required. <newpin> replaces the old PIN of the SIM.

The read command returns an alphanumeric string that indicates whether a password is required.

Defined values

<pin>, <newpin> string type values

<code>:

READY	ME is not pending for any password
SIM PIN	ME is waiting for a SIM PIN
SIM PUK	ME is waiting for a SIM PUK
PH-SIM PIN	ME is waiting for a phone-to-SIM card password
PH-FSIM PIN password	ME is waiting for a phone-to-very-first SIM card
PH-FSIM PUK unblocking	ME is waiting for a phone-to-very-first SIM card password
SIM PIN2	ME is waiting for a SIM PIN2 (it is recommended that this <code> be returned only if the last executed command resulted in a PIN2 authentication failure (i.e. +CME ERROR: 17); if the PIN2 is not entered immediately after the failure, it is recommended that the ME should not block its operation)

SIM PUK2	ME is waiting for a SIM PUK2 (it is recommended that this <code> be returned only if the last executed command resulted in a PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and the new PIN2 are not entered immediately after the failure, it is recommended that the ME should not block its operation)
PH-NET PIN	ME is waiting for a network personalisation password
PH-NET PUK	ME is waiting for a network personalisation unblocking password
PH-NETSUB PIN	ME is waiting for a network subset personalisation password
PH-NETSUB PUK	ME is waiting for a network subset personalisation unblocking password
PH-SP PIN	ME is waiting for a service provider personalisation password
PH-SP PUK	ME is waiting for a service provider personalisation unblocking password
PH-CORP PIN	ME is waiting for a corporate personalisation password
PH-CORP PUK	ME is waiting for a corporate personalisation unblocking password

8.2 +CBC BATTERY CHARGE

	Command	Response	+cme error
Execute	+CBC	+CBC: <bcs>,<bcl>	x
Test	+CBC=?	+CBC: (0,1),(0-100)	

Optional. See ETSI GSM 07.07 /2/, section 8.4. Returns ME battery charging status and charge level.

Defined values

<bcs> battery charge state

1 battery is being charged

8.3 +CSQ SIGNAL QUALITY

	Command	Response	+cme error
Execute	+CSQ	+CSQ: <rssi>,99	X
Test	+CSQ=?	+CSQ: (0-31,99),(99)	

The +CSQ command returns the received signal strength indication <rssi>.

The test command returns the supported values.

Defined values

<rssi> indicates the quality of the network coverage:

0 No network coverage
6 Nokia 30 is connected to the network
12 Satisfactory coverage
18 Good coverage
24 Excellent coverage

8.4 +CPBS SELECT PHONEBOOK MEMORY STORAGE

	Command	Response	Default	+cme error
Set	+CPBS=<storage>		"SM"	
Read	+CPBS?	+CPBS: <storage>		X
Test	+CPBS=?	+CPBS: ("ME","SM","FD")		

The +CPBS command selects the phonebook memory storage <storage> that is used by the other phonebook commands.

The read command returns the currently selected memory, the number of used locations and the total number of locations in the memory.

The test command returns the supported storages.

Defined values

<storage>:

"FD" SIM fixed-dialling phonebook
"ME" ME phonebook
"SM" SIM phonebook

8.5 +CPBR READ PHONEBOOK ENTRIES

	Command	Response	+cme error
Execute	+CPBR=<index1>, <index2>	[+CPBR: <index1>,<number>,<type>,<text>[[...] <CR><LF>+CPBR: <index2>,<number>,<type>,<text>]]	x
Test	+CPBR=?	+CPBR: (<index>-list),[<nlength>],[<tlength>]	x

The +CPBR command returns phonebook entries in the location number range <index1> ... <index2> from the currently selected phonebook memory storage using the +CPBS. The entry fields returned are the location number <index*n*>, the phone number stored there <number> (of the format <type>) and text <text> associated with the number. If all the queried locations are empty (but available), no information text lines can be returned.

The test command returns the location range supported by the current storage as a compound value and the maximum lengths of the <number> and <text> fields. In the case of SIM storage, the lengths may not be available.

Defined values

<index1>, <index2>, <index> Integer type values in the range of the location numbers of the phonebook memory.

<number> string type phone number of the format <type>

<type> type of address octet in integer format (refer to GSM 04.08 10.5.4.7):

129 unknown/telephony
145 international/telephony

<text> string type field of the maximum length of <tlength>

<nlength> integer type value indicating the maximum length of the <number> field

<tlength> integer type value indicating the maximum length of the <text> field

8.6 +CPBF FIND PHONEBOOK ENTRIES

	Command	Response	+cme error
Execute	+CPBF=<findtext>	[+CPBF: <index1>,<number>,<type>,<text>[[...] <CR><LF>+CPBF: <index2>,<number>,<type>,<text>]]	x
Test	+CPBF=?	+CPBF: [<nlength>],[<tlength>]	x

The +CPBF command returns phonebook entries from the current phonebook memory storage selected using the +CPBS which has an alphanumeric field start with the <findtext> string. The entry fields returned are the location number <index*n*>, the phone number stored there <number> (of the format <type>) and the text <text> associated with the number. If the searched text is not found in the entries in the current memory, the response is empty.

The test command returns the maximum lengths of the <number> and <text> fields. In the case of SIM storage, the lengths may not be available.

Defined values

<index1>, <index2>integer type values in the range of location numbers of the phonebook memory

<number> string type phone number of the format <type>

<type> type of address octet in integer format (refer GSM 04.08 10.5.4.7):

129 unknown/telephony
145 international/telephony

<findtext>, <text> string type field of the maximum length of <tlength>

<nlength> integer type value indicating the maximum length of the <number> field

<tlength> integer type value indicating the maximum length of the <text> field

8.7 +CPBW WRITE PHONEBOOK ENTRY

	Command	Response	Default	+cme error
Execute	+CPBW=<index>,<number>, <type>,<text>		[,,129/145]	x
Test	+CPBW=?	+CPBW: (<index>-list),[<nlength>], (129,145),[<tlength>]		x

The +CPBW command writes a phonebook entry in the location number <index> in the current phonebook memory storage selected using the +CPBS. The entry fields written are the phone number <number> in the format <type> and text <text> associated with the number. If these fields are omitted, the phonebook entry is deleted.

The test command returns the location range supported by the current storage as a compound value, the maximum length of the <number> field, the supported number formats of the storage, and the maximum length of the <text> field. In the case of SIM storage, the lengths may not be available.

Defined values

<index> integer type values in the range of the location numbers of the phonebook memory

<number> string type phone number of the format <type>

<type> type of address octet in integer format (refer GSM 04.08 10.5.4.7). The default value is 145 when the dialling string includes the international access code character "+", otherwise it is 129:

129	unknown/telephony
145	international/telephony

<text> string type field of the maximum length of the <tlength>

<nlength> integer type value indicating the maximum length of the <number> field

<tlength> integer type value indicating the maximum length of the <text> field

9. ME ERROR COMMAND (GSM 07.07)

9.1 +CMEE REPORT MOBILE EQUIPMENT ERROR

	Command	Response	Default
Set	+CMEE=<n>		0
Read	+CMEE?	+CMEE: <n>	
Test	+CMEE=?	+CMEE: (0-1)	

The +CMEE command disables or enables the use of the result code +CME ERROR: <err> as an indication of an error relating to the functionality of the Nokia 30. When enabled, the ME-related errors return the +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when an error is related to the syntax or invalid parameters.

The test command returns the supported values.

Defined values

<n>:

0	disable +CME ERROR: <err> result code and use ERROR instead
1	enable +CME ERROR: <err> result code and use numeric <err> values

See also the result code +CME ERROR in Chapter 15.3.10.

10. SMS COMMANDS (GSM 07.05)

10.1 +CSMS SELECT MESSAGE SERVICE

	Command	Response	Default
Set	+CSMS=<service>	+CSMS: 1,1,1	0
Read	+CSMS?	+CSMS: <service>,1,1,1	
Test	+CSMS=?	+CSMS: (0,1)	

The +CSMS command selects the messaging service <service>.

The read command returns the current service setting.

The test command returns a list of all the supported services.

Defined values

<service>:

0 GSM 03.40 and 03.41 (the syntax of the SMS AT commands is compatible with GSM 07.05 Phase 2, version 4.7.0; the phase 2+ features which do not require a new command syntax may be supported (e.g. correct routing of messages with new Phase 2+ data coding schemes)

1 GSM 03.40 and 03.41 (the syntax of the SMS AT commands is compatible with the GSM 07.05 Phase 2+ version; the requirement of the setting 1 is mentioned under the corresponding command descriptions)

10.2 +CPMS PREFERRED MESSAGE STORAGE

	Command	Response	Default	+cms error
Set	+CPMS=<mem1> ,<mem2> ,<mem3>	+CPMS: <used1>,<total1>,<used2>, <total2>,<used3>,<total3>	"SM","SM", "MT"	x
Read	+CPMS?	+CPMS: <mem1>,<used1>,<total1>,<mem2>, <used2>,<total2>,<mem3>,<used3>,<total3>		x
Test	+CPMS=?	+CPMS: ("ME","SM"),("ME","SM"),("MT")		

The +CPMS command selects the memory storage <mem1>, <mem2> and <mem3> to be used for reading, writing, etc.

The test command returns lists of the supported memory storage.

Defined values

<mem1> memory from which messages are read and deleted (the commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD)

<mem2> memory to which writing and sending operations are made (the commands Send Message from Storage +CMSS and Write Message to Memory +CMGW)

<mem3> memory to which received SMs are preferably to be stored (unless forwarded directly to the TE; refer to the command New Message Indications +CNMI); the received CBMs are always stored in the "BM" (or some manufacturer-specific storage) unless directly forwarded to the TE; the received status reports are always stored in the "SR" (or a manufacturer-specific storage) unless directly forwarded to the TE.

"ME" ME message storage

"SM" SIM message storage

<usedx> integer type; the number of messages currently in <memx>

<totalx> integer type; the total number of message locations in <memx>

10.3 +CMGF MESSAGE FORMAT

	Command	Response	Default
Set	+CMGF=<mode>		0
Read	+CMGF?	+CMGF: <mode>	
Test	+CMGF=?	+CMGF: (0,1)	

The +CMGF command tells the Nokia 30 the input and output format of messages to be used. <mode> indicates the format of the messages used with the send, list, read and write commands and the unsolicited result codes resulting from the received messages. The mode can either be the PDU mode (entire TP data units used) or the text mode (headers and body of the messages given as separate parameters). The text mode uses the character set specified by the command Select TE Character Set +CSCS to be used in the message body.

The test command returns the supported modes as a compound value.

Defined values

<mode>:

0 PDU mode
1 text mode

10.4 +CSCA SERVICE CENTRE ADDRESS

	Command	Response	Default
Set	+CSCA=<sca>,<tosca>		"",129
Read	+CSCA?	+CSCA: <sca>,<tosca>	
Test	+CSCA=?		

The +CSCA command updates the SMSC address through which mobile-originated SMs are transmitted. In text mode, the setting is used by the send and write commands. In the PDU mode, the setting is used by the same commands, but only when the length of the SMSC address coded into TPDU equals zero. The SMSC address may also change when the +CRES is taking action.

The read command returns the current SMSC address settings.

Defined values

<sca> GSM 04.11 RP SC address Address-Value field in string format

<tosca> GSM 04.11 RP SC address Type-of-Address octet in integer format:

129 unknown/telephony
145 international/telephony

10.5 +CSMP SET TEXT MODE PARAMETERS

	Command	Response	Default
Set	+CSMP=<fo>,<vp>,<pid>,<dcs>		17,167,0,0
Read	+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcs>	
Test	+CSMP=?		

The +CSMP command is used to select values for the additional parameters needed when the SM is sent to the network or placed in storage when the text format message mode is selected. It is possible to set the validity period starting from the moment when the SM is received by the SMSC (<vp> is in range 0... 255) or to define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>. The values of these parameters may also change when the +CRES is used.
NOTE: When storing an SMS-DELIVER from the TE to the preferred memory storage in the text mode (refer to command Write Message to Memory +CMGW), the <vp> field can be used for <scts>.

Defined values

<fo> first octet of GSM 03.40 SMS-DELIVER or SMS-SUBMIT in integer format

<vp> depending on the SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity Period either in integer format or in time-string format

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

<dcs> GSM 03.38 SMS Data Coding Scheme in integer format

10.6 +CSDH SHOW TEXT MODE PARAMETERS

	Command	Response	Default
Set	+CSDH=<show>		0
Read	+CSDH?	+CSDH: <show>	
Test	+CSDH=?	+CSDH: (0,1)	

The +CSDH command controls whether detailed header information is shown in the text mode result codes.

The test command returns the supported values as a compound value.

Defined values

<show>:

0	do not show header values defined in the commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in the +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in the +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>.
1	show the values in result codes

10.7 +CSCB SELECT CELL BROADCAST MESSAGE TYPES

	Command	Response	Default	+cms error
Set	+CSCB=<mode>,<mids>,<dcss>		0,"",""	x
Read	+CSCB?	+CSCB: <mode>,<mids>,<dccs>		
Test	+CSCB=?	+CSCB: (0,1)		

The +CSCB command defines the types of CBMs that are to be received.

The test command returns the supported modes as a compound value.

Defined values

<mode>:

0	message types specified in <mids> and <dcss> are accepted
1	message types specified in <mids> and <dcss> are not accepted

<mids> String type, all the possible combinations of GSM 03.41 CBM message identifiers, e.g. "0,1,5,320-478,922"

<dcss> String type, all the possible combinations of 03.38 CBM data coding schemes, e.g. "0-3,5”

10.8 +CSAS SAVE SETTINGS

	Command	Response	Default	+cms error
Execute	+CSAS=<profile>		[1]	x
Test	+CSAS=?	+CSAS: (1-1)		x

The +CSAS command saves active message service settings to a non-volatile memory. The settings specified in the commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB are saved. The SMSC address is not stored if +CSCA is not set/restored during the current session (i.e. +CSCA? returns +CSCA: "",129). The protocol ID (<pid>), data coding scheme (<dcs>) and validity period (<vp>) are not stored if the +CSMP parameter <fo> does not indicate SMS-SUBMIT (i.e. bits 1-0 are not '01'). In addition, the validity period is not stored if <fo> does not indicate the relative validity period format (i.e. bits 4-3 are not '10'). The destination address or alpha tag cannot be stored through an AT interface.

NOTE: The values that are not stored should remain intact.

The test command should display the supported profile numbers for the reading and writing of settings.

10.9 +CRES RESTORE SETTINGS

	Command	Response	Default	+cms error
Execute	+CRES=<profile>		[1]	x
Test	+CRES=?	+CRES: (1-1)		x

The +CRES command restores message service settings from non-volatile memory to the active memory. The settings specified in the commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB are restored. If the protocol ID, data coding scheme or validity period is restored, the +CSMP parameter <fo> is forced to be SMS-SUBMIT (i.e. bits 1-0 are set to '01'). In addition, if a validity period is restored, <fo> is forced to indicate the relative validity period format (i.e. bits 4-3 are set to '10'). The rest of the <fo> bits are set to zero.

The test command shall display the supported profile numbers.

10.10 +CNMI NEW MESSAGE INDICATIONS TO TE

	Command	Response	Default	+cms error
Set	+CNMI=<mode>,<mt>, <bm>,<ds>,<bfr>		0,0,0,0,0	X
Read	+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>		
Test	+CNMI=?	+CNMI: (0-2),(0-3),(0,2,3),(0-2),(0,1)		

The +CNMI command defines the procedure for indicating the receiving of new messages from the network to the TE when the TE is active; e.g. DTR signal is ON. If the TE is inactive (e.g. DTR signal is OFF), message receiving should be carried out as specified in GSM 03.38.

<mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1 or 2 is enabled.

The test command gives the supported setting values.

Defined values

<mode> The setting only affects unsolicited result codes specified within this command:

0 Buffer unsolicited result codes in the Nokia 30. If the Nokia 30 result code buffer is full, the oldest indications will be discarded and replaced with the newly received indications.

1 Discard indication and reject new received message unsolicited result codes when the control link is reserved (e.g. in online data mode). Otherwise, forward them directly to the TE.

2 Buffer unsolicited result codes in the Nokia 30 when the control link is reserved (e.g. in the online data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

NOTE: The result code buffer is in volatile memory, messages may get lost if the Nokia 30 is switched off before the codes are sent to TE.

<mt> The rules for storing received SMs depend on the data coding scheme (refer to GSM 03.38), preferred memory storage (+CPMS) setting and this value:

0 No SMS-DELIVER indications are routed to the TE.
If SMS-DELIVER is stored in the Nokia 30, an indication of the memory location is routed to the TE using an unsolicited result code: +CMTI: <mem>, <index>

0 SMS-DELIVERs (except for class 2 messages and messages in the message-waiting indication group [store message]) are routed directly to the TE using an unsolicited result code:

- +CMT: <length><CR><LF><pdu> (PDU mode enabled) or
- +CMT: <oa>,<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>, <length>]<CR><LF><data> (text mode enabled; about parameters in italics, refer to the command Show Text Mode Parameters +CSDH)

Class 2 messages and messages in the message waiting indication group (store message) result in an indication as defined in <mt>=1.

3 Class 3 SMS-DELIVERs are routed directly to the TE using unsolicited result codes defined in <mt>=2. The messages of other data coding schemes result in an indication as defined in <mt>=1.

<bm> the rules for storing received CBMs depend on its data coding scheme (refer GSM 03.38), the setting of the Select CBM Types (+CSCB) and this value:

0 No CBM indications are routed to the TE.

2 New CBMs are routed directly to the TE using an unsolicited result code:

- +CBM: <length><CR><LF><pdu> (PDU mode enabled) or
- +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (textmode enabled)

3 Class 3 CBMs are routed directly to the TE using unsolicited result codes defined in <bm>=2. If the CBM storage is supported, the messages of other classes result in an indication as defined in <bm>=1.

<ds>:

0 No SMS-STATUS-REPORTs are routed to the TE.

1 SMS-STATUS-REPORTs are routed to the TE using an unsolicited result code:
+CDS: <length><CR><LF><pdu> (PDU mode enabled)
or
+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

2 If SMS-STATUS-REPORT is stored in the Nokia 30, an indication of the memory location is routed to the TE using an unsolicited result code: +CDSI: <mem>,<index>

<bfr>:

0 The Nokia 30 buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1-2 is entered (the OK response shall be given before flushing the codes).

1 The Nokia 30 buffer of unsolicited result codes defined within this command is cleared when <mode> 1-2 is entered.

10.11 +CMGL LIST MESSAGES

	Command	Response	Default	+cms error
Execute	+CMGL= <stat>	Text mode (+CMGF=1), SMS-DELIVER or SMS-SUBMIT: +CMGL: <index>,<stat>,<oa/da>,[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<oa/da>,[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]] text mode (+CMGF=1), SMS-STATUS-REPORT: +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]] text mode (+CMGF=1), SMS-COMMAND: +CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<ct>[...]] PDU mode (+CMGF=0): +CMGL: <index>,<stat>,<length><CR><LF><pdu>[<CR><LF>+CMGL: <index>, <stat>,<length> <CR><LF><pdu>[...]]	["REC UNREAD"/0]	x
Test	+CMGL=?	Text mode (+CMGF=1): +CMGL: ("REC UNREAD","REC READ","STO UNSENT", "STO SENT","ALL") PDU mode (+CMGF=0): +CMGL: (0,4)		

Text mode:

The +CMGL command returns the messages with the status value <stat> from a message storage to the TE. If the status of the message is 'received unread', the status in the storage changes to 'received read'.
NOTE: If the selected <mem1> can contain different types of SMs (e.g. SMS-DELIVERs, SMS-SUBMITs, SMS-STATUS-REPORTs and SMS-COMMANDs), the response may be a mix of the responses of the different SM types. The TE application can recognise the response format by examining the third response parameter.

The test command should give a list of all the supported status values.

PDU mode:

The +CMGL command returns messages with the status value <stat> from the preferred message storage <mem1> to the TE. Entire data units <pdu> are returned. If the status of the message is 'received unread', the status in the storage changes to 'received read'.

Defined values

<stat> Integer type in the PDU mode (default 0), or string type in the text mode indicates the status of the message in the memory:

0	"REC UNREAD" received unread message (i.e. new message)
1	"REC READ" received read message
2	"STO UNSENT" stored unsent message (only applicable to SMs)
3	"STO SENT" stored sent message (only applicable to SMs)
4	"ALL" all messages (only applicable to the +CMGL command)

<index> Integer type value in the range of location numbers

<oa/da> GSM 03.40 TP-Originating/Destination-Address Address-Value field in string format; type of address given by <tooda/toda>

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

<tooa/toda>/<tora> GSM 04.11 TP-Originating/Destination-Address Type-of-Address octet in integer format

129	unknown/telephony
145	internal/telephony

<length> Integer type value that indicates the length of the message body

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

<data> SMS: GSM 03.40 TP-User-Data in the text mode responses

<fo> First octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT, SMS-STATUS-REPORT, or SMS-COMMAND in integer format

<mr> GSM 03.40 TP-Message-Reference in integer format

<ra> GSM 03.40 TP-Recipient-Address Address-Value field in string format; the type of address is given by <tora>

<dt> GSM 03.40 TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”

<st> GSM 03.40 TP-Status in integer format

<ct> GSM 03.40 TP-Command-Type in integer format

<pdu> GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format

10.12 +CMGR READ MESSAGE

	Command	Response	+cms error
Execute	+CMGR= <index>	text mode (+CMGF=1), SMS-DELIVER: +CMGR: <stat>,<oa>,<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> text mode (+CMGF=1), SMS-SUBMIT: +CMGR: <stat>,<da>[,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> text mode (+CMGF=1), SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> text mode (+CMGF=1), SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>] PDU mode (+CMGF=0): +CMGR: <stat>,<length><CR><LF><pdu>	x
Test	+CMGR=?		

Text mode:

The +CMGR command returns a message with the location value <index> from the message storage. If the status of the message is 'received unread', the status in the storage changes to 'received read'.

PDU mode:

The +CMGR command returns a message with the location value <index> from the preferred message storage to the TE. The status of the message and the entire message data unit <pdu> is returned. If the status of the message is 'received unread', the status in the storage changes to 'received read'.

Defined values

<index> integer type; value in the range of the location numbers

<stat> integer type in the PDU mode (default 0), or string type in text mode; indicates the status of the message in the memory:

0	"REC UNREAD" received unread message (i.e. new message)
1	"REC READ" received read message
2	"STO UNSENT" stored unsent message (only applicable to SMs)
3	"STO SENT" stored sent message (only applicable to SMs)
4	"ALL" all messages (only applicable to the +CMGL command)

<oa>/<da> GSM 03.40 TP-Originating/Destination-Address Address-Value field in string format; the type of address is given by <tooda>/<toda>

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

<tooa>/<toda>/<tora> GSM 04.11 TP-Originating/Destination-Address Type-of-Address octet in integer format

129	unknown/telephony
145	internal/telephony

<fo> first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT, SMS-STATUS-REPORT, or SMS-COMMAND in integer format

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

<dcs> GSM 03.38 SMS Data Coding Scheme in integer format

<sca> GSM 04.11 RP SC address Address-Value field in string format, type of address given by <tosca>

<tosca> GSM 04.11 RP SC address Type-of-Address octet in integer format

129	unknown/telephony
145	internal/telephony

<length> integer type value that indicates the length of the message body

<data> in characters in the text mode (+CMGF=1); or that indicates the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) in the PDU mode (+CMGF=0).

<data> SMS: GSM 03.40 TP-User-Data in text mode responses

<vp> GSM 03.40 TP-Validity-Period either in integer format or in time-string format (refer <dt>)

<mr> GSM 03.40 TP-Message-Reference in integer format

<ra> GSM 03.40 TP-Recipient-Address Address-Value field in string format; type of address given by <tora>

<dt> GSM 03.40 TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”

<st> GSM 03.40 TP-Status in integer format

<ct> GSM 03.40 TP-Command-Type in integer format

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

<pdu> GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format

10.13 +CNMA NEW MESSAGE ACKNOWLEDGEMENT TO ME/TA

	Command	**Response**	**+cms error**
Execute	text mode (+CMGF=1): +CNMA PDU mode (+CMGF=0): +CNMA=<n>,<length><CR>PDU is given<ctrl-Z/ESC>		x
Test	+CNMA=?	PDU mode (+CMGF=0): +CNMA: (0-2)	

Text mode:

The +CNMA command confirms the correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE. This acknowledgement command (causing the Nokia 30 to send RP-ACK to the network) shall be used when the +CSMS parameter <service> equals 1. The Nokia 30 shall not send another +CMT or +CDS result code to the TE before the previous one is acknowledged.

If the Nokia 30 does not receive acknowledgement within the required time (network timeout), the Nokia 30 will send an RP-ERROR to the network. Routing to the TE will be automatically disabled by setting both <mt> and <ds> values of +CNMI to zero.

PDU mode:

The +CNMA command confirms the reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE. This acknowledgement command should be used when the +CSMS parameter <service> equals 1. In the PDU mode, it is possible to send either a positive (RP-ACK) or a negative (RP-ERROR) acknowledgement to the network. The parameter <n> defines which acknowledgement will be sent. Optionally (when <length> is greater than zero), an acknowledgement TPDU (SMS-DELIVER-REPORT for RP-ACK or RP-ERROR) may be sent to the network. The entering of the PDU is carried out similarly as specified in the command Send Message +CMGS, except that the format of <ackpdu> is used instead of <pdu> (i.e. SMSC address field is not present). The PDU should not be written inside double quotes. The TA should not send another +CMT or +CDS result code to the TE before the previous code has been acknowledged.

If the Nokia 30 does not receive acknowledgement within the required time (network timeout), the ME should send an RP-ERROR to the network. The Nokia 30 shall automatically disable routing to the TE by setting both <mt> and <ds> values of the +CNMI to zero.

The test command returns a list of supported <n> values. If the only value that is supported is 0, the device does not support the sending of TPDU.

Defined values

<n>:

0	command operates as defined for the text mode
1	send RP-ACK (or buffered result code received correctly)
2	send RP-ERROR (if PDU is not given, the Nokia 30 shall send an SMS-DELIVER-REPORT with a GSM 03.40 TP-FCS value set to ‘FF’ (unspecified error cause))

<length> the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

10.14 +CMGS SEND MESSAGE

	Command	Response	Default	+cms error
Execute	Text mode (+CMGF=1): +CMGS=<da>,<toda><CR> text is entered<ctrl-Z/ESC> PDU mode (+CMGF=0): +CMGS=<length><CR> PDU is given<ctrl-Z/ESC>	text mode (+CMGF=1) and sending ok: +CMGS: <mr>[,<scts>] PDU mode (+CMGF=0) and sending ok: +CMGS: <mr>[,<ackpdu>]	text mode: [,129/145]	x
Test	+CMGS=?			

Text mode:

The +CMGS command sends a message to the network (SMS-SUBMIT). The message reference value <mr> is returned to the TE when a message has been delivered successfully. Optionally (when +CSMS <service> value is 1 and the network supports it), <scts> is returned. Values can be used to identify a message upon unsolicited delivery status report result code.

PDU mode:

The +CMGS command sends a message from a TE to the network (SMS-SUBMIT). The message reference value <mr> is returned to the TE when a message is successfully delivered. Optionally (when +CSMS <service> value is 1 and the network supports it), <ackpdu> is returned. Values can be used to identify a message upon an unsolicited delivery status report result code.

The text/PDU entering is as specified in 07.05. If the SMSC address is not set/restored during the current session (i.e. +CSCA? returns +CSCA: "",129), it must automatically be read from the SIM/ME (location 1). In PDU mode, all kinds of GSM 03.40 MO TPDUs can be sent with this command (operation equals +CMGC).

Defined values

<da> GSM 03.40 TP-Destination-Address Address-Value field in string format; the type of address is given by <toda>

<toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format

129 unknown/telephony
145 internal/telephony

<mr> GSM 03.40 TP-Message-Reference in integer format

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

<length> The length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<ackpdu> GSM 03.40 RP-User-Data element of RP-ACK PDU

10.15 +CMSS SEND MESSAGE FROM STORAGE

	Command	Response	Default	+cms error
Execute	+CMSS=<index>, <da>,<toda>	Text mode (+CMGF=1) and sending ok: +CMSS: <mr>[,<scts>] PDU mode (+CMGF=0) and sending ok: +CMSS: <mr>[,<ackpdu>]	[,"",129/145]	x
Test	+CMSS=?			

Text mode:

The +CMSS command sends a message with the location value <index> from a preferred message storage location <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If a new recipient address <da> is given for the SMS-SUBMIT, it should be used instead of the one stored with the message. The reference value <mr> is returned to the TE upon successful delivery of a message. Optionally (when +CSMS <service> value is 1 and network supports it), <scts> is returned. Values can be used to identify a message upon an unsolicited delivery status report result code.

PDU mode:

The +CMSS command sends a message with the location value <index> from a message storage location <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If the new recipient address <da> is given for the SMS-SUBMIT, it should be used instead of the one stored with the message. The reference value <mr> is returned to the TE when a message has been delivered successfully. Optionally (when +CSMS <service> value is 1 and network supports it), <ackpdu> is returned. Values can be used to identify a message upon an unsolicited delivery status report result code.

Defined values

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

<da> GSM 03.40 TP-Destination-Address Address-Value field in string format; type of address given by <toda>

<toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format

129 unknown/telephony
145 internal/telephony

<mr> GSM 03.40 TP-Message-Reference in integer format

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

<ackpdu> GSM 03.40 RP-User-Data element of RP-ACK PDU

10.16 +CMMS MORE MESSAGES TO SEND

	Command	Response	Default	+cms error
Set	+CMMS=[<n>]			
Read	+CMMS?	+CMMS: <n>		
Test	+CMMS=?	+CMMS: (list of supported <n>s)		

The set command controls the continuity of a SMS relay protocol link. When the feature is enabled (and supported by the network), multiple messages can be sent much faster as the link is kept open.

The test command returns the supported values as a compound value.

Defined Values

<n>:

0 disable

1 keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to the ME implementation); then the ME shall close the link and the TA automatically switch <n> back to 0

2 enable (if the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to the ME implementation), the ME shall close the link but the TA shall not automatically switch back to <n>=0)

10.17 +CMGW WRITE MESSAGE TO MEMORY

	Command	Response	Default	+cms error
Execute	Text mode (+CMGF=1): +CMGW=<oa/da>,<tooa/toda>,<stat> <CR>text is entered<ctrl-Z/ESC> PDU mode (+CMGF=0): +CMGW=<length>,<stat><CR> PDU is given<ctrl-Z/ESC>	storing successful: +CMGW: <index>	text mode: [,129/145, "STO UNSENT"] PDU mode: [,2]	x
Test	+CMGW=?			

Text mode:

The +CMGW command stores a message (either SMS-DELIVER or SMS-SUBMIT) in the memory storage <mem2>. A memory location <index> of the stored message is returned. By default, the message status will be set to 'stored unsent', but the parameter <stat> also allows other status values to be given. The entering of text is carried out similarly as specified in the command Send Message +CMGS.
NOTE: SMS-COMMANDs and SMS-STATUS-REPORTs cannot be stored in text mode.

PDU mode:

The +CMGW command stores a message to the memory storage <mem2>. A memory location <index> of the stored message is returned. By default, the message status will be set to 'stored unsent', but the <stat> parameter also allows other status values to be given.

Text/PDU entering is as specified in ETSI GSM 07.05 /3/. If the SMSC address is not set/restored during the current session (i.e. +CSCA? returns +CSCA: "",129) and the stored message is SMS-SUBMIT or SMS-COMMAND, the SMSC address must automatically be read from the SIM/ME (location 1).

Defined values

<oa>/<da> GSM 03.40 TP-Originating/Destination-Address Address-Value field in string format; the type of address is given by <tooda>/<toda>

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

<tooa>/<toda>/<tora> GSM 04.11 TP-Originating/Destination-Address Type-of-Address octet in integer format

129 unknown/telephony
145 internal/telephony

<stat> Integer type in the PDU mode (default 0), or string type in the text mode; indicates the status of a message in the memory:

0 "REC UNREAD" received unread message (i.e. new message)
1 "REC READ" received read message
2 "STO UNSENT" stored unsent message (only applicable to SMs)
3 "STO SENT" stored sent message (only applicable to SMs)
4 "ALL" all messages (only applicable to +CMGL command)

<index> Integer type; value in the range of the location numbers

<length> Integer type value that indicates the length of the message body

<data> In characters in text mode (+CMGF=1); or that indicates the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) in the PDU mode (+CMGF=0).

10.18 +CMGD DELETE MESSAGE

	Command	+cms error
Execute	+CMGD=<index>	X
Test	+CMGD=?	

The +CMGD command deletes a message from a preferred message storage location <index>.

10.19 +CMGC SEND COMMAND

	Command	Response	Default	+cms error
Execute	text mode (+CMGF=1): +CMGC=<fo>,<ct>,<pid>,<mn>,<da>,<toda><CR>text is entered <ctrl-Z/ESC> PDU mode (+CMGF=0): +CMGC=<length><CR> PDU is given<ctrl-Z/ESC>	text mode (+CMGF=1) and sending ok: +CMGC: <mr>[,<scts>] PDU mode (+CMGF=0) and sending ok: +CMGC: <mr>[,<ackpdu>]	text mode: [2,0,0, 0,"", 129/145]	x
Test	+CMGC=?			

Text mode:

The +CMGC command sends a command message from a TE to the network (SMS-COMMAND). The entering of text (GSM 03.40 TP-Command-Data) is carried out as specified in the command Send Message +CMGS, but the format is fixed as a sequence of two IRA character-long hexadecimal numbers which the Nokia 30 converts into 8-bit octets. The message reference value <mr> is returned to the TE when a message has been successfully delivered. Optionally (when +CSMS <service> value is 1 and network supports), <scts> is returned. Values can be used to identify a message upon an unsolicited delivery status report result code.

PDU mode:

The +CMGC command sends a command message from a TE to the network (SMS-COMMAND). The message reference value <mr> is returned to the TE upon the successful delivery of a message. Optionally (when +CSMS <service> value is 1 and the network supports it), <ackpdu> is returned. Values can be used to identify a message upon an unsolicited delivery status report result code.

Text/PDU entering is as specified in ETSI GSM 07.05. If the SMSC address is not set/restored during the current session (i.e. +CSCA? returns +CSCA: "",129) it must be automatically read from the SIM/ME (location 1). In PDU mode, all kinds of GSM 03.40 MO TPDUs can be sent with this command (operation equals +CMGS).

Defined values

<fo>	First octet of GSM 03.40 SMS-COMMAND in integer format
<ct>	GSM 03.40 TP-Command-Type in integer format
<pid>	GSM 03.40 TP-Protocol-Identifier in integer format
<mn>	GSM 03.40 TP-Message-Number in integer format
<da>	GSM 03.40 TP-Destination-Address Address-Value field in string format; the type of address is given by <tooda>/<toda>
<toda>	GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format 129 unknown/telephony 145 internal/telephony
<mr>	GSM 03.40 TP-Message-Reference in integer format
<scts>	GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format
<length>	In the PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<ackpdu> GSM 03.40 RP-User-Data element of RP-ACK PDU

11. VOICE COMMANDS

11.1 +FCLASS DCE MODE

	Command	Response	Default
Set	+FCLASS=<mode>		0
Read	+FCLASS?	<mode>	
Test	+FCLASS=?	0,1,2,2.0	

This command selects a DCE mode - data, facsimile.

Defined values

<mode>

0	Data
1	Fax class 1 (TIA-578-A)
1.0	Fax class 1 (ITU-T T.31 [11])
2	Fax (manufacturer specific)
2.0	Fax class 2 (ITU-T T.32 [12] and TIA-592)

11.2 +VTS DTMF GENERATION

	Command	Response
Execute	+VTS=<dtmf>,<dtmf>,... or +VTS={<dtmf>,<len>},…	
Test	+VTS=?	(),(),(0 - 3000)

The +VTS command sends Dual Tone Multiple Frequency (DTMF) voices during a call. The dialling command can also be used to send DTMFs (see the D command).

Defined values

<dtmf> DTMF digit: 0 - 9, *, #

<len> Length of the DTMF digit (0 – 3000 * 10 ms). Default length is 100 ms.

12. MISCELLANEOUS COMMANDS

12.1 V.25TER

12.1.1 A/ Repeat last command line

As the first characters of a command line, A/ repeats the previous command line from the Nokia 30 terminal command line buffer. Lower case letters (a/) are also accepted.

13. GPRS COMMANDS (GSM 07.07)

13.1 SUPPORTED GPRS USER CONTEXT ID VALUES

GPRS-specific capabilities differ between different products and phone generations. A supported number of GPRS user contexts, for instance, is a configuration-specific choice.

The AT commands, which use user context ID values, <cid>, are listed below:

ATD

+CGDCONT (Chapter 13.2)

+CGQREQ (Chapter 13.3)

+CGQMIN (Chapter 13.4)

+CGACT (Chapter 13.6)

+CGDATA (Chapter 13.7)

Defined values

<cid> GPRS user cid value 1…2

13.2 +CGDCONT DEFINE PDP CONTEXT

	Command	Response	Default
Set	+CGDCONT=<cid>,<PDP_type>,<APN>, <PDP_addr>,<d_comp>,<h_comp>, <pd1>[,…[,<pdN>]]		1,"IP",,,0,0
Read	+CGDCONT?	+CGDCONT: <cid>,<PDP_type>, <APN>,<PDP_addr>,<data_comp>, <head_comp>,<pd1>[,…[,pdN]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>,<APN>,<PDP_addr>, <data_comp>,<head_comp>,<pd1> [,…[,pdN]] […]]	
Test	+CGDCONT=?	+CGDCONT: (1-2),"IP",,,(0,1), (0,1)	

Mandatory unless only a single subscribed context is supported. 07.60 section 10.2.1. Specifies PDP context parameter values for a PDP context. This command is used in conjunction with the +CGDATA command.

13.3 +CGQREQ QUALITY OF SERVICE PROFILE (REQUESTED)

	Command	Response
Set	+CGQREQ=<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>	
Read	+CGQREQ?	+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [<CR><LF>+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> […]]
Test	+CGQREQ=?	+CGQREQ: (1-2),(1-3),(1-4), (1-5), (1-9),(1-18,31)

Optional. 07.60 section 10.2.2. Used to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network. This command is used in conjunction with the +CGDATA command.

13.4 +CGQMIN QUALITY OF SERVICE PROFILE (MINIMUM ACCEPTABLE)

	Command	Response
Set	+CGQMIN=<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>	
Read	+CGQMIN?	+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [<CR><LF>+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> […]]
Test	+CGQMIN=?	+CGQMIN: (1-2),(1-3),(1-4),(1-5), (1-9),(1-18,31)

Optional. 07.60 section 10.2.3. Used to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message. This command is used in conjunction with the +CGDATA command.

13.5 +CGATT GPRS ATTACH OR DETACH

	Command	Response
Set	+CGATT= <state>	
Read	+CGATT?	+CGATT: <state>
Test	+CGATT=?	+CGATT: (0-1)

Optional. The execution command is used to attach the MT to, or detach it from, the GPRS service. Any active PDP contexts will automatically be deactivated when the attachment state changes to detached.

13.6 +CGACT PDP CONTEXT ACTIVATE OR DEACTIVATE

	Command	Response
Set	+CGACT= [<state> [,<cid>[,<cid>[,..]]]	
Read	+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]]
Test	+CGACT=?	+CGACT: (0-1)

Optional. The execution command is used to activate or deactivate the specified PDP context (s).

Defined values

<cid> a numerical parameter which specifies a particular PDP context definition.

13.7 +CGDATA ENTER DATA STATE

	Command	Response	Description
Execute	+CGDATA=<L2P>[,<cid>]	CONNECT NO CARRIER	Enter data state Data state cannot be entered
Test		+CGDATA: (“PPP”)	

Optional. 07.60 section 10.2.6. Causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more GPRS PDP type(s).

If the user, however, uses a non-existent <cid> value, even if it is within a valid range, DCE shall issue an ERROR result code in response to such an attempt. See +CGDCONT.

Defined values

<L2P> ”PPP”

<cid> 1…2

NOTE: GPRS Phase 1 does not support mobile-originated context modification.

14. FAX COMMANDS

The following standard facsimile (+F) command sets are supported by the Nokia 30 according to GSM 03.45 facsimile group 3 transparent. The command structures can be found in the standards referred to below:

- Class 1, TIA-578-A /4/
- Class 2, TIA SP-2388 /6/
- Class 2.0, TIA-592 and ITU-T T.32 /7/

In classes 2 and 2.0, the Nokia 30 Error supports the correction mode (ECM) with 16k send and receive buffers. The facsimile commands supported by the Nokia 30 are listed below.

14.1 TIA-578-A

+FCLASS	Select, read or test Service Class
+FMI	Report manufacturer identification
+FMM	Request model identification
+FMR	Request revision identification
+FTS	Transmit silence
+FRS	Receive silence
+FTM	Facsimile transmit
+FRM	Facsimile receive
+FTH	HDLC transmit
+FRH	HDLC receive
+FLO	Flow control select
+FPR	Serial port rate control
+FDD	Double Escape Character Replacement
D	Originate command
A	Answer command

14.2 TIA-592

+FCLASS	Select, read or test Service Class
+FMI	Report manufacturer identification
+FMM	Request model identification
+FMR	Request revision identification

D	Originate command
A	Answer command
+FDT	Data transmission
+FDR	Data reception
+FKS	Session termination
+FIP	Initialise facsimile parameters
+FCC	DCE capabilities parameters
+FIS	Current session parameters
+FCS	Current session results
+FLI	Local ID strings
+FPI	Local polling ID strings
+FNS	Non-standard frame FIF octet string
+FLP	Indicate document to poll
+FSP	Request to poll
+FCR	Capability to receive
+FBU	HDLC frame reporting
+FNR	Negotiation message reporting
+FIE	Procedure interrupt enable
+FPS	Page status
+FCQ	Copy quality checking
+FRQ	Receive quality thresholds
+FAA	Adaptive answer
+FCT	DTE phase C response timeout
+FHS	Call termination status
+FRY	ECM retry count
+FMS	Minimum phase C speed
+FLO	Flow control select
+FPR	Serial port rate control
+FPP	Packet protocol control
+FBO	Data bit order
+FEA	Phase C received EOL alignment
+FFC	Format conversion
+FBS	Buffer size

14.3 TIA SP-2388

+FCLASS	Select, read or test Service Class
+FMFR	Request manufacturer identification
+FMDL	Request model identification
+FREV	Request product revision identification
D	Originate a call
A	Answer a call
+FDT	Data transmission
+FET	Transmit page punctuation
+FDR	Begin or continue phase C receive data
+FDCC	Establish DCE capabilities
+FK	Session termination
+FDIS	Current session parameters
+FDCS	Current session results
+FLID	Local ID string
+FCIG	Local polling ID string
+FLPL	Indicate document to poll
+FSPL	Request to poll
+FCR	Capability to receive
+FBUG	Session message reporting
+FECM	Error correction mode control
+FPTS	Page transfer status
+FCQ	Copy quality checking
+FBADMUL	Error threshold multiplier
+FBADLIN	Bad line threshold
+FPHCTO	DTE phase C response timeout
+FAXERR	T.30 session error report
+FCTCRTY	ECM retry count
+FMINSP	Minimum phase C speed
+FTBC	Phase C transmit data block size
+FRBC	Phase C receive data block size
+FBOR	Data bit order
+FREL	Phase C received EOL alignment

+FVRFC	Vertical resolution format conversion
+FDFFC	Data compression format conversion
+FLNFC	Page length format conversion
+FWDFC	Page width format conversion
+FAA	Answer parameter
+FBUF	Buffer size

15. RESULT CODES

15.1 V.25TER

15.1.1 Basic syntax result codes

OK, ERROR, BUSY, CONNECT, CONNECT <rate>, NO ANSWER, NO CARRIER: See the ITU-T Recommendation V.25ter, section 5.7.1 and the X, D, A and O commands in this document. Note that OK can be a result of a successful remotely-initiated in-call modification from data to speech mode, and CONNECT[<rate>] can be a result of a successful remotely-initiated in-call modification from speech to data mode. NO CARRIER can also indicate the remote hang up of a speech call.

RING: See ETSI GSM 07.07 /2/, section 7.12. See the ITU-T Recommendation V.25ter, section 6.3.4 and the +CRC command in this document. The MT voice calls or alternating voice/data calls starting with voice shall not result in this indication. When the RING result code is enabled (+CRC=0), alternating MT voice/fax calls starting with voice shall automatically be switched into the fax mode by the Nokia 30 (if +CMOD=0). Note that the RING result code is not given for waiting calls.

15.1.2 +DR Data compression report

Format	Description
+DR: <type>	Given when +DR=1; informs about the presence of V.42bis data compression in the established connection

The +DR intermediate result code, if enabled, is issued after the Error Control Report (+ER) and before the final result code (e.g. CONNECT).

Defined values

<type>:

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

15.1.3 +ILRR DTE-DCE local rate report

Format	Description
+ILRR: <rate>	Given when +ILRR=1; informs about the local port rate after connection establishment

The +ILRR intermediate result code is given after the (possible) +DR result code.

15.2 DE FACTO

15.2.1 Call repeat restriction result codes

BLACKLISTED and DELAYED. Refer to the dialling command D and GSM 02.07, Annex A.

15.3 GSM 07.07

15.3.1 +CSSI Intermediate supplementary service notification

Format	Description
+CSSI: <code>	Given when +CSSN=1 and some supplementary service notification is given by network during MO call establishment

The +CSSI is the first intermediate result code after the dial command D. This result code is enabled and disabled with the +CSSN command.

Defined values

<code>:

0	unconditional call forwarding is active
1	some of the conditional call forwards are active
2	call has been forwarded
3	call is waiting
5	outgoing calls are barred
6	incoming calls are barred
7	CLIR suppression rejected

15.3.2 +COLP Connected line identification report

Format	Description
+COLP: <number>, <type>	Given when +COLP=1 and a number is received from the network when MO call established

The +COLP intermediate result code is given after the possible +CSSI result code. This result code is enabled and disabled with the +COLP command.

Defined values

<number> string type phone number of the format specified by <type>

<type> type of address octet in integer format (refer GSM 04.08 subclause 10.5.4.7):

129 unknown/telephony
145 international/telephony

15.3.3 +CR Data service report

Format	Description
+CR: REL ASYNC	Given when +CR=1 and a data call is established; informs about the type of data call being established

The +CR intermediate result code is given after a possible +COLP result code during an MO data call setup. During an MT data call setup, this is the first intermediate result code. Note that this result code should replace the CARRIER result code (when X5 is set). This result code is enabled and disabled with the +CR command.

15.3.4 +CRING Distinctive ring

Format	Description
+CRING: <type>	Given when +CRC=1 and incoming MT call (no active or held calls in ME)

This result code is enabled and disabled with the +CRC command.
NOTE: +CRING replaces the V.25ter RING result code.

Defined values

<type>:

FAX	Facsimile (TS 62)
VOICE	Normal voice (TS 11)
REL ASYNC	Normal data
ASYNC	Normal data
VOICE/REL ASYNC	Voice followed by data (BS 81)
ALT VOICE/REL ASYNC	Alternating voice/data, voice first (BS 61)
ALT REL ASYNC/VOICE	Alternating voice/data, data first (BS 61)
ALT VOICE/FAX	Alternating voice/fax, voice first (TS 61)
ALT FAX/VOICE	Alternating voice/fax, fax first (TS 61)

15.3.5 +CLIP Calling line identification report

Format	Description
+CLIP: <number>, <type>	Given when +CLIP=1 and a number is received from the network when an MT call is received (no active or held calls in ME)

The +CLIP result code is sent to the TE after every RING (or +CRING) result code. This result code is enabled and disabled with the +CLIP command.

Defined values

<number> string type phone number of a format specified by <type>

<type> type of address octet in integer format (refer GSM 04.08 subclause 10.5.4.7):

129	unknown/telephony
145	international/telephony

15.3.6 +CSSU Unsolicited supplementary service notification

Format	Description
+CSSU: <code> [,<index>[,<number>, <type>]]	Given when +CSSN=,1 and some supplementary service notification is given by the network during an MT call setup or during a voice call; note that the remote release of a held call is also indicated with this result code

In the MT call setup case, the +CSSU result code is sent to the TE after every possible +CLIP result code. In the case of a waiting call, this is given after the +CCWA result code but

discarded if the Nokia 30 is in the online data state. This result code is enabled and disabled with the +CSSN command.

Defined values

<index> Please refer to chapter Closed user group +CCUG"

<code>:

0	This is a forwarded call (MT call setup)
1	This is a CUG call (also <index> present) (MT call setup)
2	Call has been put on hold (during a voice call)
3	Call has been retrieved (during a voice call)
4	Multiparty call entered (during a voice call)
5	Call on hold has been released (this is not an SS notification) (during a voice call)
6	–
7	Call is being connected (alerting) with the remote party in the alerting state in an explicit call transfer operation (during a voice call)
8	Call has been connected with the other remote party in an explicit call transfer operation (number and sub-address parameters may also be present) (during a voice call or a MT call setup)

<number> String type phone number of a format specified by <type>

<type> Type of address octet in integer format (refer to GSM 04.08, subclause 10.5.4.7):

129	Unknown/telephony
145	International/telephony

15.3.7 +CCWA Call waiting

Format	Description
+CCWA: <number>,<type>, <class>	Given when +CCWA=1 and an incoming MT call is received when there are active or held calls in the ME; discarded if in the online data state

This command allows the controlling of the Call Waiting supplementary service. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2), the response line for ‘not active’ case (<status>=0) should be returned only if the service is not active for any <class>. The parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA: <number>, <type>, <class>[,<alpha>] to the TE when a call waiting service is enabled. The command should be abortable when the network is interrogated.

The interaction of this command with other commands based on other GSM supplementary services is described in the GSM standard.

The test command returns the values supported by the TA as a compound value.

Defined values

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

0	Disable
1	Enable

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

0	Disable
1	Enable
3	Query status

<class*x*> A sum of integers each representing a class of information (default 7 equals all classes):

1	Voice (telephony)
2	Data (usually refer to all bearer services; with <mode>=2 this may refer only to some bearer service)
4	Fax (facsimile services)

Also all other values below 128 are reserved by this ETS

<status>:

0	Not active
1	Active

<number>: String type phone number of a calling address in the format specified by <type>

<type>: Type of address octet in integer format (refer to GSM 04.08 [8] subclause 10.5.4.7)

<alpha>: Optional string type alphanumeric representation of <number> corresponding to the entry found in the phonebook; the used character set should be the one selected with the command Select TE Character Set +CSCS

15.3.8 +CREG Network registration

Format	Description
+CREG: <stat>[,<lac>,<cid>]	When +CREG=1: given when <stat> value changes; given after NO CARRIER if network lost when online When +CREG=2: given when <stat> value changes and when network cell (<lac> and <cid>) of the ME changes; given after NO CARRIER if network lost when online

The +CREG result code is enabled and disabled with the +CREG command.

Defined values

<stat>:

0 Not registered, the ME is not currently searching for a new operator to register with
1 Registered, home network
2 Not registered, but ME is currently searching a new operator to register with
3 Registration denied
4 Unknown
5 Registered, roaming

<lac> string type, two-byte location area code in hexadecimal format (e.g. "00C3" equals 193 in decimal)

<ci> string type, two-byte cell ID in hexadecimal format

15.3.9 +CUSD Network-initiated unstructured supplementary service data

Format	Description
+CUSD: <m>,<str>,<dcs>	Given when +CUSD=1 and network-initiated ‘notify’ or ‘request’ USSD message received; discarded if in the online data state

This result code is enabled and disabled with the +CUSD command.
NOTE: only the first ‘request’ message during a network-initiated USSD session yields to the +CUSD unsolicited result code. The rest are information responses to the +CUSD command.

Defined values

<m>:

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

1 Further user action required (network-initiated USSD-Request, or further information needed after mobile-initiated operation)

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

- If <dcs> indicates that GSM 03.38 default alphabet is used
- If the TE character set is other than "HEX" (refer to the Select TE command)
- Character Set +CSCS): the Nokia 30 converts the GSM alphabet into the current TE character set according to the rules of GSM 07.05, Annex A
- If the TE character set is "HEX": the Nokia 30 converts each 7-bit character of the GSM alphabet into two IRA character long hexadecimal numbers (e.g. character Π (GSM 23) is presented as 17 (IRA 49 and 55))
- If <dcs> indicates that an 8-bit data coding scheme is used: the Nokia 30 converts each 8-bit octet into two IRA character-long hexadecimal numbers (e.g. octet with integer value 42 is presented to the TE as two characters 2A (IRA 50 and 65))
- GSM 03.38 Cell Broadcast Data Coding Scheme in the integer format (default 0)

<dcs>

15.3.10 +CME ERROR Mobile equipment error

Format	Description
+CME ERROR: <err>	Given instead of ERROR when +CMEE=1 or =2 and the error is related to the ME or network operation

Defined values

<err> See Error values section

15.3.11 +CHSR HSCSD parameters report

Format	Description
+CHSR: <rx>, <tx>, <aiur>, <coding>	Given when +CHSR=1. Result code transmission is done after possible service (+CR), error control (+ER), and/or compression (+DR) reporting but before possible TE-TA rate (+ILRR) reporting and before the intermediate result code CONNECT is transmitted.

07.07 section 6.16.

15.4 GSM 07.05

15.4.1 +CMTI New SMS-DELIVER indication

Format	Description
+CMTI: <mem>,<index>	When +CNMI=0: indications are buffered into the Nokia 30 When +CNMI=1: in the online data state, indications are discarded; in the command mode they are forwarded directly to the TE When +CNMI=2: in the online data state, indications are buffered into the Nokia 30; in the command mode they are forwarded directly to the TE

See also the +CNMA command.

Defined values

<mem> memory to which the received SMs are preferably stored:

"SM" SIM message storage

<index> integer type, the location of the message in the defined memory

15.4.2 +CMT New SMS-DELIVER

Format	Description
text mode: +CMT: <oa>,<scts>[,<tooa>,<fo>, <pid>,<dcs>,<sca>, <tosca>,<length>]<CR><LF><data> PDU mode: +CMT: <length><CR><LF><pdu>	When +CNMI=0: routed messages are buffered into the Nokia 30 (if the buffer is full, 'memory capacity exceeded' is sent to the network) When +CNMI=1: in the online data state, the routed messages are rejected (e.g. 'memory capacity exceeded' is sent to the network and when the command mode is entered, 'memory available' is sent to the network); in the command mode they are forwarded directly to the TE When +CNMI=2: in the online data state, routed messages are buffered into the Nokia 30 (if the buffer is full, 'memory capacity exceeded' is sent to the network and, when the command mode is entered, 'memory available' is be sent to the network); in the command mode they are forwarded directly to the TE

See also +CNMA command.

Defined values

<oa> GSM 03.40 TP-Originating -Address Address-Value field in string format; the type of address is given by <tooa>

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

<tooa> GSM 04.11 TP-Originating -Address Type-of-Address octet in integer format

129 Unknown/telephony
145 Internal/telephony

<fo> First octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT, SMS-STATUS-REPORT, or SMS-COMMAND in integer format

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

<dcs> GSM 03.38 SMS Data Coding Scheme in integer format

<sca> GSM 04.11 RP SC address Address-Value field in string format, type of address given by <tosca>

<tosca> GSM 04.11 RP SC address Type-of-Address octet in integer format

129 Unknown/telephony
145 Internal/telephony

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

<data> SMS: GSM 03.40 TP-User-Data in the text mode responses

<pdu> GSM 04.11 SC address followed by GSM 03.40 TPDU in the hexadecimal format

15.4.3 +CBM New CBM

Format	Description
Text mode: +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> PDU mode: +CBM: <length><CR><LF><pdu>	When +CNMI=0: messages are discarded When +CNMI=1-2: messages are forwarded directly to the TE (CBMs cannot be received during a call)

Defined values

<sn> GSM 03.41 CBM Serial Number in integer format

<mid> GSM 03.41 CBM Message Identifier in integer format

<dcs> GSM 03.38 Cell Broadcast Data Coding Scheme in integer format

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

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

<data> GSM 03.41 CBM Content of Message in text mode responses; format:

- If <dcs> indicates that GSM 03.38 default alphabet is used:
- If the TE character set is other than "HEX" (refer command +CSCS in GSM 07.07): the Nokia 30 converts the GSM alphabet into the current TE character set according to the rules of Annex A
- If the TE character set is "HEX": the Nokia 30 converts each 7-bit character of the GSM alphabet into two IRA character-long hexadecimal numbers
- If <dcs> indicates that an 8-bit or a UCS2 data coding scheme is used: the Nokia 30 converts each 8-bit octet into two IRA character-long hexadecimal numbers

<length> The length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<pdu> GSM 03.41 TPDU in hexadecimal format

15.4.4 +CDSI New SMS-STATUS-REPORT indication

Format	Description
+CDSI: <mem>,<index>	When +CNMI=0: indications are buffered into the Nokia 30 When +CNMI=1: in the online data state, indications are discarded; in command mode they are forwarded directly to the TE When +CNMI=2: in the online data state, indications are buffered into the Nokia 30; in the command mode forwarded directly to the TE

Defined values

<mem> memory to which the received SMs are preferred to be stored:

"SM" SIM message storage

<index> integer type, the location of the message in the defined memory

15.4.5 +CDS New SMS-STATUS-REPORT

Format	Description
Text mode: +CDS: <fo>,<mr>,[<ra>],[<tora>], <scts>,<dt>,<st> PDU mode: +CDS: <length><CR><LF><pdu>	When +CNMI=0: routed messages are buffered into the Nokia 30 (if buffer is full, 'memory capacity exceeded' is sent to the network) When +CNMI=1: in the online data state, the routed messages are rejected (e.g. 'memory capacity exceeded' is sent to the network and when the command mode is entered, 'memory available' is sent to network); in the command mode they are forwarded directly to the TE When +CNMI=2: in the online data state routed, messages are buffered into the Nokia 30 (if the buffer is full, 'memory capacity exceeded' is sent to the network and when the command mode is entered, 'memory available' is sent to network); in the command mode, they are forwarded directly to the TE

See also the +CNMA command.

Defined values

<fo> First octet of GSM 03.40 SMS-STATUS-REPORT in integer format

<mr> GSM 03.40 TP-Message-Reference in integer format

<ra> GSM 03.40 TP-Recipient-Address Address-Value field in string format; type of address given by <tora>

<tora> GSM 04.11 TP- Recipient-Address Type-of-Address octet in integer format:

129 Unknown/telephony
145 Internal/telephony

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

<dt> GSM 03.40 TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss±zz"

<st> GSM 03.40 TP-Status in integer format

<length> The length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<pdu> GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format

15.4.6 +CMS ERROR Message service failure

Format	Description
+CMS ERROR: <err>	Given instead of ERROR when error is related to ME or network operation

Defined values

<err> See the Error values section

15.5 PN-3131

15.5.1 In-band events from DCE to DTE

The following <dle> shielded codes (refer PN-3131 sections 5.2 and 7.3) can be sent by DCE when in class 8 mode (+FCLASS=8). At least some of these events are required if binary voice data is transferred through AT command interface. Other events of PN-3131 are not applicable to GSM. See also +VLS command.

event	code	description	state
3	R	ring	command
5	o	receive buffer overrun	receive
6	c	facsmile calling	command
7	e	data calling	command
9	s	presumed hang-up	receive
10	q	presumed end of message	receive
18	r	ringback	command
19	b	busy	command
23	u	playback buffer underrun	transmit
-	<DLE>	single <DLE> in data	receive
-	<SUB>	<DLE><DLE> in data	receive
-	<ETX>	end data state	receive

16. ERROR VALUES

16.1 +CME ERROR VALUES

The columns in the following table indicate which AT commands can return the numerical <err> value given in the top row. The numbers in the cells indicate what kind of error can generate the <err>. Keys to the numbers are given below the table.

An example of the +CNUM command:

Numeric error values: 1, 5, 10 - 12, 23.

The corresponding errors are: ‘external ME is not connected to TA’, ‘phone security code required to execute the AT command’, ‘ME does not have a SIM connected to it’, 'SIM PIN required to execute the AT command’, 'SIM PUK required to execute the AT command’.

Table 5. +CME error values

	3	4	5	10	11	12	16	17	18	21	22	23	24	26	27	30	31	100
+CGMM																		
+CGMR																		
+CGSN																		
D><str>	9		1	2	3	4					7	8						
D>*mem*<n>	9		1	2	3	4				5, 6		8						
+CNUM			1	2	3	4						8						
+CREG?																		
+COPS=	10		1	2	3	4												
+COPS?			1	2	3	4												
+COPS=?			1	2	3	4												
+CLCK=		15	1	2	3	4	11		12			8				13	23	14
+CPWD=			1	2	3	4	11		12			8				13	23	14
+CCWA=			1	2	3	4										13	23	14
+CUSD=			1	2	3	4										13	23	14
+CFUN=																		
+CFUN?																		
+CPIN=			1	2	3	4	11					8						
+CPIN?				2														
+CSQ																		
+CPBS?			1	2	3	4						8						
+CPBR=			1	2	3	4				5		8		18				
+CPBR=?			1	2	3	4						8						

Table 5. +CME error values																		
	3	**4**	**5**	**10**	**11**	**12**	**16**	**17**	**18**	**21**	**22**	**23**	**24**	**26**	**27**	**30**	**31**	**100**
+CPBF=			1	2	3	4						8						
+CPBF=?			1	2	3	4						8						
+CPBW=	24	15	1	2	3	4		16	12	5		8	17	18	19			
+CPBW=?			1	2	3	4						8						

1. Phone security code required to execute the AT command
2. ME does not have a SIM connected to it
3. SIM PIN required to execute the AT command
4. SIM PUK required to execute the AT command
5. Memory location does not exist
6. Phonebook memory location is empty
7. Match in searched string is not found in any of the memory locations
8. General memory error; e.g. problems in SIM database communication
9. Call hold/retrieve/swap/build/split/transfer/deflection failed or cannot be carried out
10. Manual network selection is not possible because unavailable or forbidden network name was given, or call is active
11. Invalid password was given
12. SIM PUK2 required to execute the AT command
13. There is no network service to complete the request
14. Supplementary service command failed due to an unknown error; i.e. an error that is not covered by other <err> values
15. AT interpreter does not support the operation
16. SIM PIN2 required to execute the AT command
17. Alpha entry to be stored is too long
18. Number to be read/stored is too long
19. Number to be stored contains characters that are not available in that memory
20. SIM interface control is not reserved or the maximum number of applications has reserved the SIM control
21. –
22. External ME UI cannot be accessed
23. Network timeout
24. Entries cannot be stored in the currently selected phonebook memory (e.g. on missed calls list)
25. There is no active voice call

16.2 +CMS ERROR VALUES

The columns in the following table indicate the SMS AT commands that can return the <err> value given in the top row. The numbers in the cells indicate the error that can generate the <err> value. A key to the numbers is given under the table. For details on how to read the table, see the example in the previous section.

Table 6. +CMS error values

	0-127	128-255	301	302	304	305	310	311	312	316	320	321	322	330	331
+CPMS=			5				2	3	1	4	6				
+CPMS?			5				2	3	1	4	6				
+CSCB=			5								6				
+CSAS=			5				2	3	1	4	6	8			
+CSAS=?			5				2	3	1	4	6				
+CRES=			5				2	3	1	4	6	8			
+CRES=?			5				2	3	1	4	6				
+CNMI=			5				2				6				
+CMGL=			5				2	3	1	4	6				
+CMGR=			5				2	3	1	4	6	8			
+CNMA=					11										
+CMGS=	9	10	5		11	12	2	3	1	4				7	16
+CMSS=	9	10	5	14	11	12	2	3	1	4	6	8		7	16
+CMGW=			5		11	12	2	3	1	4	6		13		
+CMGD=			5				2	3	1	4	6	8			
+CMGC=	9	10	5		11	12	2	3	1	4				7	16

1. Phone security code required to execute the AT command
2. ME does not have a SIM connected to it
3. SIM PIN required to execute the AT command
4. SIM PUK required to execute the AT command
5. SMS interface is reserved by some other application
6. General memory error; e.g. problems in the SIM database communication
7. Message to be sent to the network does not contain the SMSC address and the SMSC address cannot be found from the Nokia 30
8. Memory location does not exist
9. RP layer cause value from the network
10. TP layer cause value from the network
11. PDU mode is enabled: the length of the given PDU is not equivalent to the given <length>, or the ME/TA detects that the PDU is of invalid format

12. Text mode is enabled: sending/storing of too long a message is attempted, or the +CSMP does not contain a valid SMS-SUBMIT (in the case of +CMGS=), or the ME/TA detects that the PDU is of invalid format
13. SMS memory is full
14. <index> given in the +CMSS does not contain SMS-SUBMIT or SMS-COMMAND, or <index> given in the +CMSS contains SMS-COMMAND and the <da> is given

16. No network service

17. EXAMPLE PROCEDURES ON SOME AT-COMMANDS

How to create a data call or send an SMS in text or PDU mode (and how to check the PIN code or signal quality).

17.1 INPUTTING PIN CODE

The password (PIN, security code, etc.) status can be queried with the +CPIN? command. If the response is READY, no password is required. If the response is SIM PIN, the Nokia 30 is waiting for a PIN code. It is possible that more than one password is needed. The following example indicates how the PIN code is given to the Nokia 30.

How to input PIN code:

Command from the DCE	**Response from the Nokia 30**	**Explanation**
AT+CPIN?<CR>	-	Query about password status
	+CPIN: SIM PIN	PIN code required
	OK	Previous command was successful
AT+CPIN="1234"<CR>	-	Give PIN code 1234 to the Nokia 30
	OK	Previous command was successful
AT+CPIN?<CR>	-	Query about the password status
	+CPIN: READY	No password required
	OK	Previous command was successful

How to check network registration (signal quality):

AT+CSQ<CR>	-	Query signal strength.
	+CSQ:31, 99	Response +CSQ<rssi>, 99 (*)

(*) Values for <rssi>

0 No network coverage (Check PIN code)

1-31 Signal strength

17.2 INITIALISING THE NOKIA 30

Command from the DCE	Response from the Nokia 30	Explanation
AT&F<CR>	-	Set to factory-defined configuration.
	OK	Previous command was successful
AT+IFC=1,1<CR>	-	Set the flow control to SW flow control; the default is HW flow control (2,2)
	OK	Previous command was successful
AT&D0<CR>	-	Ignore DTR changes
	OK	Previous command was successful

17.3 MAKING A DATA CALL WITH NOKIA 30:

ATD+358705966200<CR>	-	Start connection by dialling the preferred number
	CARRIER	The Nokia 30 has a data connection to the GSM infrastructure
	CONNECT	The connection to the preferred number is established and the application can start sending data

17.4 SENDING AN SMS FROM A TERMINAL OR OTHER SIMILAR APPLICATION

There are two different modes – text mode and PDU (Protocol Data Unit) mode – for handling short messages. The default mode of the Nokia 30 is the PDU mode (+CMGF=0). Text mode is easier to understand than the PDU mode.

AT+CMGF=0<CR>	-	Set the Nokia 30 to GSM 07.05 SMS PDU mode (default).
AT+CMGS=29<CR> >0011000C91535850818142000 0A71154747A0E4Acf41f4f29C9E769F4121	-	Send the message to the defined phone number. The service number is not a mandatory field in the PDU structure. This example does not have the SMSC number.

17.5 SENDING A SAMPLE SMS IN TEXT MODE

Command from the DCE	Response from the Nokia 30	Explanation
AT+CMGF=1<CR>	-	Set the Nokia 30 to GSM 07.05 SMS Text mode. The default value is the PDU mode (0).
	OK	Previous command was successful.
AT+CSCA="+358508771010",145	-	Set the SMS Service Centre number to be used with an outgoing SMS.
	OK	Previous command was successful.
AT+CMGS="+358705966200",145<CR>My SMS<CTRL-Z>		Send the "My SMS" message to defined phone number. 145 specifies the phone number type.
	+CMGS: 60	Nokia 30 responses to successful sending with Message reference number
	OK	Previous command was successful.

17.6 HSCSD COMMAND EXAMPLES

	Connection Type
Required air interface user rate	**31.1 kHz**
9600	AT+CBST=0,0,1;+CHSN=1,0,0,0
14400	AT+CBST=0,0,1;+CHSN=2,0,0,0
19200	AT+CBST=0,0,1;+CHSN=3,0,0,0
28800	AT+CBST=0,0,1;+CHSN=4,0,0,0
43200	AT+CBST=0,0,1;+CHSN=6,0,0,0

	Connection Type
Required air interface user rate	**v.110**
9600	AT+CBST=81,0,1;+CHSN=1,0,0,0
14400	AT+CBST=81,0,1;+CHSN=2,0,0,0
19200	AT+CBST=81,0,1;+CHSN=3,0,0,0
28800	AT+CBST=81,0,1;+CHSN=4,0,0,0
43200	AT+CBST=81,0,1;+CHSN=6,0,0,0

	Connection Type
Required air interface user rate	**v.120**
9600	AT+CBST=51,0,1;+CHSN=1,0,0,0
14400	AT+CBST=51,0,1;+CHSN=2,0,0,0
19200	AT+CBST=51,0,1;+CHSN=3,0,0,0
28800	AT+CBST=51,0,1;+CHSN=4,0,0,0
43200	AT+CBST=51,0,1;+CHSN=6,0,0,0

18. CHANGE HISTORY

Issue 1.0 Initial version

Issue 1.1 Minor corrections

Issue 2.0 Corrections in the following chapters:

	Chapter #	Chapter heading	Notes
1.	2	Data connections	References to transparent data removed
2.	4.1.10	+IPR Fixed DTE rate	Rates 1200, 2400 and 4800 added.
3.	4.1.11	+ICF DTE-DCE character framing	0 added as default value for Set, 0-6 added for <format> value Test response
4.	5.1.8	+GCAP Request complete capabilities list	+W added as response for Execute
5.	5.3.5	+CSCS Select TE character set	"PCCP437" added as default value for Execute
6.	6.3.4	+CBST Select bearer service type	References to transparent data removed
7.	6.3.12	+CHSN HSCSD Parameter command syntax	HSCSD marking added
8.	6.3.13	+CHSC HSCSD Current call parameters	HSCSD marking added, comment on parameter values added when no call in progress
9.	7.3	+CLCK Facility lock	Values for <fac> added
10.	7.4	+CPWD Change password	Values added for Test response
11.	8.4	+CPBS Select phonebook memory storage	Values “FD”, ME”, “SM” for <storage> added
12.	9.1	+CMEE Report mobile equipment error	1 added for <n> for Test response
13.	10.2	+CPMS Preferred message storage	MT added as default for Set and Test response
14.	10.8	+CSAS Save settings	(1,1) corrected to (1-1) for Test response
15.	10.9	+CRES Restore settings	(1,1) corrected to (1-1) for Test response
16.	10.11	+CMGL List messages	Values of <stat> added for Test response
17.	11.2	+VTS DTMF generation	Defined value <len> added
18.	12.1.2	S47 Force fax class 2/2.0 error correction mode	Chapter of issue 1.1 removed
19.	12.1.3	S48 Force fax 14.4kB	Chapter of issue 1.1 removed
20.	15.1.2	+ER Error control report	Chapter of issue 1.1 removed
21.	15.5.1	+VCID Calling line identification report	Chapter of issue 1.1 removed

19. REFERENCES

/1/ ITU-T Recommendation V.25ter: Serial asynchronous automatic dialling and control; Aug 1995.

/2/ GSM 07.07: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME); version 5.4.0; Nov 1997.

/3/ GSM 07.05: Digital cellular telecommunications system (Phase 2+); Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS); version 5.4.0; Nov 1997.

/4/ TIA-578-A Facsimile Digital Interfaces - Asynchronous Facsimile DCE Control Standard, Service Class 1; May 1995.

/5/ TIA-592 Facsimile Digital Interfaces - Asynchronous Facsimile DCE Control Standard, Service Class 2; May 1995.

/6/ TIA SP-2388: Proposed new standard - Asynchronous Facsimile DCE Control Standard; Aug 1990.

/7/ TIA PN-3131: Project to complete IS-101 Facsimile Digital Interfaces - Voice Control Interim Standard for Asynchronous DCE; Feb 1995.

/9/ ITU-T Recommendation G.711: Pulse code modulation (PCM) of voice frequencies; 1993.

/10/ GSM 03.40: Digital cellular telecommunications system (Phase 2+); Technical realisation of the Short Message Service (SMS); Point-to-Point (PP).

/11/ GSM 03.38: Digital cellular telecommunications system (Phase 2+); alphabets and language-specific information.

/12/ GSM 03.41: Digital cellular telecommunications system (Phase 2+); Technical realisation of the Short Message Service Cell Broadcast (SMSCB).

/13/ ETS 300 342-1: Radio Equipment and Systems (RES); Electro-Magnetic Compatibility (EMC) for European digital cellular telecommunications system (GSM 900 MHz and DCS 1 800 MHz).

QUESTIONS AND ANSWERS

Q. Can the application or terminal I am using directly receive an incoming SMS?

A. The received SMS messages are stored in the SIM card memory "SM" by default. The messages can be read from the SIM card using AT commands, e.g., the +CMGR command.

The +CNMI command (e.g. AT+CNMI=1,2,2,1,0<CR>) allows the application to receive the incoming SMS directly in all environments.

The following ETSI specifications can be used as a reference when the GSM 07.05 Text- and PDU modes are used: GSM 07.05, GSM 03.03, GSM 03.38, GSM 03.40, GSM 03.41, GSM 04.11.

Q. What standards does the Nokia 30 support?

A. There are several standards that have influenced the design of the Nokia 30. From the application's point of view, the most important standards are those that specify the AT-command interface: ITU-T V.25ter, ETS GSM 07.07, ETS GSM 07.05, TIA-578-A, TIA-592 and TIA SP-2388. These standards can be obtained from national standards organisations or at www.etsi.fr, www.tiaonline.org and www.itu.ch.