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AT command set for S45 Siemens mobile phones and modems

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1 General information

This document constitutes the manual reference to the AT command set supported by S45 Siemens mobile phones.

1.3 Abbreviations and glossary

The following abbreviations and terms are used throughout this specification:

Abbreviation / Term	Meaning
FDN	Acronym for " Fixed dialing numbers "
PIN	Acronym for "Personal Identification Number"
PUK	Acronym for "PIN Unblocking Key "

1.4 Notational Conventions

The following notational conventions apply throughout this manual:

- Letters and digits in Courier New indicate parameter names and values
- Underlined digits indicate the default value of the parameter at hand
- Double quotes (") are used to indicate text strings
- Symbols (e. g. @) inside quotes are interpreted as text strings
- Strings which are not included in double quotes must be separarted by a comma
- Spaces inside strings not included in double quotes are ignored

1.5 Other conventions

The following other conventions apply throughout this manual:

- Leading zeroes in strings can be omitted
- If an optional parameter ([<value>]) is omitted in V.25ter commands, the value 0 is assumed
- Although the names of commands are not case-sensitive, cases should not be mixed. Either "AT" or "at" should be specified, but neither "aT" nor "At".

1.6 Related documentation

All documents listed in this section are related to the current document.

1.6.1 Related Siemens-internal documentation

No Siemens-internal documents are related to the current document.

1.6.2 Related Standardisation documentation

The following standardisation documents are related to the current document

[1] Digital cellular telecommunications system (Phase 2+);AT command set for GSM Mobile Equipment (ME) (GSM 07.07 version 6.4.0 Release 1997)

Reference No.: RTS/SMG-040707Q6R3

[2] 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) (GSM 07.05 version 6.0.0 Release 1997)
Reference No.: DTS/SMG-040705Q6

[3] ITU-T Draft new Recommendation V.25ter “Serial asynchronous automatic dialling and control”

[4] “Digital cellular telecommunication system (Phase 2+); Personalisation of GSM Mobile Equipment (ME) Mobile functionality specofocation” (GSM 02.22)

[5] “Digital cellular telecommunication system (Phase 2+); Specification of the Subscriber Identification Module – Mobile Equipment (SIM-ME) interface” (GSM 11.11)

[6] “Facsimile Digital Interfaces – Asynchronous Facsimile DCE Control Standard, Service Class 1(TIA/EIA-578-A), May 1995

[7] Standards Proposal No. 2388, Proposed New Standard “Asynchronous Facsimile DCE Control Standard” (if approved, to be published as EIA/TIA-592), October 1990

1.6.3 Change Requests related to the feature

The following new change requests are taken into account in this document: none

2 Software interface

2.1 Overview of the supported AT command set

This section provides overviews of the supported sets of AT commands, separate for each type of command set.

Table 2-1 lists all the supported GSM 07.07 AT commands in alphabetical order, and indicates the type of command as defined in the ETSI GSM 07.07 standard:

07.07 command	Function	Type of command	Page
AT+CACM	Accumulated call meter	Mobile equipment control	32
AT+CALM	Alert sound mode	Mobile equipment control	32
AT+CAMM	Accumulated call meter maximum	Mobile equipment control	32
AT+CAOC	Advice of charge	Network service	19
AT+CBC	Battery charge	Mobile equipment control	33
AT+CBST	Select bearer service type	Modem command	61
AT+CCFC	Call forwarding	Network service	20
AT+CCLK	Clock	Mobile equipment control	33
AT+CCWA	Call waiting	Network service	21
AT+CEER	Query the reason for disconnection of last call	Call control	17
AT+CGACT	PDP context activate or deactivate	GPRS	43
AT+CGANS	Manual response to a network request for PDP context activation	GPRS	43
AT+CGATT	GPRS attach or detach	GPRS	44
AT+CGAUTO	Auto response to a network request for PDP context activation	GPRS	44
AT+CGCLASS	GPRS mobile station class	GPRS	45
AT+CGDATA	Enter data state	GPRS	45
AT+CGDCONT	Define PDP Context	GPRS	46
AT+CGEREP	GPRS event reporting	GPRS	47
AT+CGMI	Issue manufacturer ID code	General	13
AT+CGMM	Issue model ID code	General	13
AT+CGMR	Output the GSM telephone version	General	15
AT+CGPADDR	Show PDP address	GPRS	50
AT+CGQMIN	Quality of Service Profile (Minimum acceptable)	GPRS	48
AT+CGQREQ	Quality of Service Profile (Requested)	GPRS	49
AT+CGREG	GPRS network registration status	GPRS	50
AT+CGSMS	Select service for MO SMS messages	GPRS	51
AT+CGSN	Output the serial number (IMEI)	General	15
AT+CHLD	Call hold and multiparty	Network service	22
AT+CHUP	Terminate call	Call control	17
AT+CIMI	Output of IMSI	General	15
AT+CKPD	Keypad control	General	15
AT+CLCC	List Current Calls	Network service	23
AT+CLCK	Switch locking on and off	Network service	24
AT+CLIP	Display telephone number of calling party	Network service	26
AT+CLIR	Select Incognito Mode (Call Line Identification	Call control	25

	Restriction)		
AT+CLVL	Loudspeaker volume level	Mobile equipment control	33
AT+CMEE	Expanded error messages according to GSM 07.07	Mobile equipment error	51
AT+CMUT	Mute control	Mobile equipment control	34
AT+COLP	Connected Line Identification Presentation	Call control	27
AT+COPN	Read operator names	Network service	27
AT+COPS	Commands concerning selection of network operator	Network service	28
AT+CPAS	Query the telephone status	Mobile equipment control	34
AT+CPBR	Read a telephone-book entry	Mobile equipment control	35
AT+CPBS	Select a telephone book	Mobile equipment control	36
AT+CPBW	Write a telephone-book entry	Mobile equipment control	37
AT+CPIN	Enter PIN and query lock	Mobile equipment control	38
AT+CPOL	Preferred operator list	Network service	29
AT+CPUC	Price per unit and currency table	Mobile equipment control	39
AT+CPWD	Change password to a lock	Network service	29
AT+CR	Service reporting control	General	18
AT+CRC	Cellular result codes	General	18
AT+CREG	Network registration	Network service	30
AT+CRLP	Select radio link protocol parameter for originating non-transparent data call	Modem command	62
AT+CRSL	Ringer sound level	Mobile equipment control	39
AT+CRSM	Restricted SIM access	Mobile equipment control	40
AT+CSCS	Select TE character set	General	16
AT+CSQ	Output signal quality	Mobile equipment control	41
AT+CSSN	Supplementary service notifications	Network service	31
AT+CVIB	Vibrator mode	Mobile equipment control	41
AT+GSN	Output the serial number (IMEI)	General	16
AT+VTS	Send a DTMF tone	TIA IS101	52
AT+VTD	Set duration of a DTMF tone	TIA IS101	52
AT+WS46	Select wireless network	General	16

Table 2-1: Supported GSM 07.07 commands

Table 2-2 lists all the supported GSM 07.05 AT commands in alphabetical order, and indicates the type of command as defined in the ETSI GSM 07.05 standard:

07.05 commands	Function	Type of command	Page
AT+CMGC	Send an SMS command	Message sending and writing	53
AT+CMGD	Delete an SMS in the SMS memory	Message sending and writing	53
AT+CMGF	SMS format	General configuration	53
AT+CMGL	List SMS	Message receiving and reading	54
AT+CMGR	Read in an SMS	Message receiving and reading	54
AT+CMGS	Send an SMS	Message sending and writing	55
AT+CMGW	Write an SMS to the SMS memory	Message sending and writing	55
AT+CMSS	Send an SMS from the SMS memory	Message sending and writing	56
AT+CNMA	Acknowledgment of a short message directly output	Message receiving and reading	56
AT+CNMI	Display new incoming SMS	Message receiving and reading	57
AT+CPMS	Selection of SMS memory	General configuration	59
AT+CSCA	Address of the SMS service center	Message configuration	59
AT+CSCB	Select cell broadcast messages	Message configuration	60
AT+CSMS	Selection of message service	General configuration	60

Table 2-2: Supported GSM 07.05 commands

Table 2-3 lists all the supported Siemens-specific AT commands in alphabetical oder:

Command	Function	Page
AT+GCAP	Request Capabilities List	74
AT+IPR	Fixed DTE rate	74

Table 2-3: Supported commands according to ITU-T Recommendation V.25 ter

Table 2-3 lists all the supported AT commands for FAX services in alphabetical oder:

Command	Function	Page
AT+ FBADLIN	Define or read number of bad lines	63
AT+ FBADMUL	Define, read or test number of bad lines	64
AT+ FBOR	Query the bit order for receive mode	64
AT+FCIG	Query or set the Local polling id	64
AT+FCLASS	Select, read or test FAX service class	65
AT+FCQ	Control Copy Quality	65
AT+ FCR	Capability to receive	65
AT+FDCC	Select service for MO SMS messages	67
AT+FDFFC	Data Compresssion Format Conversion	67
AT+FDIS	Query or set session parameters	68
AT+FDR	Begin or continue phase C data reception	69
AT+FDT	Data Transmission	69
AT+FET	End a page or document	70
AT+FK	Kill operation, orderly FAX abort	70
AT+FLID	Query or set session parameters	70
AT+FMDL	Identify Product Model	71
AT+FMFR	Request Manufacturer Identification	71
AT+FOPT	Set bit order independently	71
AT+FPHCTO	DTE Phase C Response Timeout	71
AT+FREV	Identify Product Revision	72
AT+FRH	Receive Data Using HDLC Framing	72
AT+FRM	Receive Data	72
AT+FRS	Receive Silence	73
AT+FTH	Transmit Data Using HDLC Framing	73
AT+FTM	Transmit Data	73
AT+FTS	Stop Transmission and Wait	73
AT+FVRFC	Vertical resolution format conversion	**Fehler! Textmarke nicht definiert.**

Table 2-4: Supported commands according to ITU-T Recommendation V.25 ter

Table 2-5 lists all the supported Siemens-specific AT commands in alphabetical oder:

Command	Function	Page
AT^SACM	Output ACM (accumulated call meter) and ACMmax	76
AT^SBNR	Binary Read	77
AT^SBNW	Binary Write	78
AT^SCID	Output card ID	79
AT^SCKS	Output SIM card status	80
AT^SCNI	Output call number information	80
AT^SDBR	Database Read	81
AT^SDLD	Delete the ”last number redial” memory	81
AT^SGAUTH	Select Type of Authentication for PPP connection	82
AT^SICO	Icon control	83

Table 2-5: Supported Siemens-specific commands

2.2 The AT command set

GSM mobile telephones and modems can be operated via Remote Control using a serial interface (data cable or infrared connection). Remote control is implemented by means of AT+C commands according to the ETSI GSM 07.07 [1] and GSM 07.05 [2] specifications, as well as several manufacturer-specific AT commands. These commands are described in more detail in section 2.2.2.

A command entered at the user port generally begins with an 'AT' command prefix. The remainder of the line is interpreted as a sequence of the commands described below. The commands are not case-sensitive. More than one command may be given on a single line, with the semicolon serving as the delimiter between commands.

The "ITU-T Draft new Recommendation V.25ter" specification [3] applies to the sequence of the interface commands. According to this guideline, commands should begin with the character string **"AT"** and end with **"<CR>" (= 0x0D).** The input of a command is acknowledged by the display of "OK" or "ERROR".

A command currently in process is interrupted by each additional character entered. This means that you should not enter the next command until you have received the acknowledgment; otherwise the current command is interrupted.

The commands supported are listed in the tables provided in sections 2.2.1, and 2.3.1 through 2.3.9.15.

2.2.1 Hayes Standard commands

The Hayes standard commands correspond to the commands of AT Hayes compatible modems.

All commands in Table 2-6 expect a numeric argument; if this argument is omitted, the default of `0` is assumed. The `ATD` command is a special command in that all characters specified in the same line (or up to a semicolon) are considered part of the number to dial.

Command	Function
A/	Repeat preceding command
AT...	Prefix for all other commands
ATA	Accept call (V.25*ter*, according to [3])
ATB[*n*]	This modem command is used to set the bearer service for data connections (cf. AT+CBST). <n> can take one of the following values: 7 2400bps, asynchronous, V.22bis 11 4800bps, asynchronous, V.32 13 9600bps, asynchronous, 32 15 14400bps, asynchronous, V.34 25 2400bps, asynchronous, V.110 ISDN 27 4800bps, asynchronous, V.110 ISDN 29 9600bps, asynchronous, V.110 ISDN 31 14400bps, asynchronous, V.110 ISDN
ATD<str>;	Dial the dialing string <str> with the voice utility Valid dial modifiers: "I" (restrict AT+CLIR) "i" (suppress AT+CLIR) for next call ”T” (tone dialing) ”P” (pulse dialing) is ignored The finishing character ”;” indicates to the phone that the call is to be set up with the voice utility. Otherwise, an attempt is made to set up a data call, which the phone immediately acknowledges with ”ERROR”. The dial command returns OK to the user immediately after starting a voice call. Other behavior like *# sequences in the dial command, and also data calls remain unchanged. See also section 2.8.3
ATD><n>;	Dial the telephone number from the current telephone book location number <n> The telephone book is selected using the AT+CPBS (or AT^SPBS) command.
ATD><mem><n>;	Dial the telephone number from the telephone book <mem> location number <n>
ATDx[;]	Dial phone number x. I ISDN: The phone call will be made as a UDI call. An ISDN connection to a V.110 terminal adapter will be established. The data transmission speed is the same as for an

Command	Function
	"analog" call (2400 / 4800 / 9600 / 14400 bps). PP Plus: same as + character.
ATDL	Dial last telephone number
ATE0	Deactivate command echo
ATE1	Activate command echo
ATH[0]	Release existing connection
ATI[n]	Modem command according to [3]: Display product code: 0 042 1 042 2 OK, (check firmware checksum) 8 Display supported operation modes (see ATB) 9 identification of modem and mobile phone
ATL[*n*]	Monitor speaker loudness (modem command according to [3])
ATM[*n*]	Monitor speaker mode (modem command according to [3])
ATO[*n*]	Switch back to transparent mode after +++ interruption (modem command according to [3])
ATQ0	Display acknowledgments (responses or messages)
ATQ1	Suppress acknowledgments (responses or messages)
ATSn=x	Write value x to S register n (modem command according to [3])
ATSn?	Display value of S register n (modem command according to [3]) ***Note**: This type of mobile phone does not allow the values of all S registers to be displayed with a single command*
ATV0	Display acknowledgments as numbers
ATV1	Display acknowledgments as text
ATX ATX1 ATX2 ATX3 ATX4	Report link with CONNECT only ignore busy signal Report link with CONNECT plus baud rate, ignore busy signal same as ATX1 same as ATX1, but report BUSY same as ATX1, but report BUSY
ATZ	Set to default configuration

AT&C[n]	Circuit 109 (Received line signal detector / DCD) behavior
AT&C0	DCD always ON
AT&C1	DCD ON if carrier detected
AT&D[n]	Circuit 108 (Data terminal ready / DTR) behavior **Note**: The AT&Dn commands, when entered, below take no effect since circuit 108 is not supported in this type of mobile phone. See section 2.7 for more information on the circuit assignments supported.
AT&D0	DTR ignored
AT&D1	On DTR ON to OFF: go to online command mode, don't disconnect
AT&D2	On DTR ON to OFF: disconnect go to command mode. Automatic answer is disabled while DTR OFF.
AT&F[0]	Resets all current parameters of the following AT commands to their factory profile: ATE, ATQ, ATV, ATX AT+CBST, AT+CRLP, AT+CRC, AT+CR, AT+CNMI, AT+CMEE, AT+CSMS, AT^SCKS, AT^SACM, AT+CREG, AT+CLIP • S parameters • AT&D; AT&C; AT&S Any existing connections will be terminated. No other commands are accepted on the same command line.
\N \N2 \N3 \N4 \N5 \N6	No action (\N2 - \N6)
\Q[n]	Local flow control selection (DTE ↔ DCE); can be customized
\Q0	Disable flow control
\Q1	XON-XOFF software flow control
\Q2	CTS only flow control
\Q3	RTS/CTS flow control
\V[n]	Modem command
0	No /REL or /RLP appendix with the CONNECT message
1	/REL or /RLP appendix with the CONNECT message
AT+GCAP	Display the capabilities list

Table 2-6: Commands supported according to Hayes standard

2.2.2 Command combinations to be avoided

It is possible to specify more than a single command in the command line at any one time; however, not all command combinations will have the expected result. To ensure that responses to commands will be displayed in the order expected, the following command combinations should be avoided:

- V25ter commands combined with FAX commands
- GSM 7.07 commands combined with Siemens-specific commands
- GSM 7.05 commands (SMS) specified stand-alone

2.3 AT commands and responses according to GSM 07.07 and GSM 07.05

According to GSM, it is possible to execute an AT command in various forms, as follows:

Test command	AT+CXXX**=?**	The mobile phone or modem responds by sending the list of parameters and value ranges; these can be set using the corresponding Write command or by means of internal processes.
Read command	AT+CXXX**?**	This command displays the current value setting of the parameter(s).
Write command	AT+CXXX**=<...>**	This command is used to set parameters that can be set.
Execute command	AT+CXXX	This command reads non-settable parameters which are influenced by internal processes in the mobile phone or modem.

2.3.1 General commands according to GSM 07.07

This section provides the descriptions of general GSM 07.07 commands.

2.3.1.1 ATO

ATO	Return to online data state
Execute command ATO	Response CONNECT/ NO CARRIER/ERROR

2.3.1.2 AT+CGMI

AT+CGMI	Issue manufacturer ID code
Test command AT+CGMI=?	Response OK
Execute command AT+CGMI	Response <manufacturer> Parameter <manufacturer> Name of manufacturer (SIEMENS)

2.3.1.3 AT+CGMM

AT+CGMM	Issue model ID code
Test command	Response

AT+CGMM=?	OK
Execute command AT+CGMM	Response <model> Parameter <model> Name of telephone (MOBILE)

2.3.1.4 AT+CGMR

AT+CGMR	Output the GSM telephone version
Test command AT+CGMR=?	Response OK
Execute command AT+CGMR	Response <revision> Parameter <revision> Version of the telephone software

2.3.1.5 AT+CGSN

AT+CGSN	Output the serial number (IMEI)
Test command AT+CGSN=?	Response OK
Execute command AT+CGSN	Response <sn> Parameter <sn> IMEI of the telephone

2.3.1.6 AT+CIMI

AT+CIMI	Output of IMSI
Test command AT+CIMI=?	Response OK
Execute command AT+CIMI	Response <imsi> Parameter <imsi> International Mobile Subscriber Identity (IMSI)

2.3.1.8 AT+CSCS

AT+CSCS	Select TE character set
Test command AT+CSCS=?	Response +CSCS: (list of supported <chset>s) OK
Read command AT+CSCS?	Response +CSCS: <chset> OK/ERROR/+CME ERROR Parameter <chset> String; determines which TE character set is used ("GSM"/"UCS2")
Write command AT+CSCS= [<chset>]	Response OK/ERROR/+CME ERROR

2.3.1.9 AT+GSN

AT+GSN	Output the serial number (IMEI)
Test command AT+GSN=?	Response OK
Execute command AT+GSN	Response +GSN: <sn> Parameter <sn> IMEI of the telephone

2.3.1.10 AT+WS46

AT+WS46	Select wireless network
Test command AT+WS46=?	Response (list of supported <n>s) OK
Read command AT+WS46?	Response <n> OK/ERROR/+CME ERROR Parameter <n> Integer; WDS side stack 12 GSM digital cellular
Write command AT+WS46=[<n>]	Response OK/ERROR/+CME ERROR

2.3.2 Call control commands

This section provides the descriptions of commands related to call control.

2.3.2.1 AT+CEER

AT+CEER	Query the reason for disconnection of last call
Test command AT+CEER=?	Response OK
Execute command AT+CEER	Response +CEER: <report> Parameter <report> Reason for disconnection, reported as numbers. For detailed information on GPRS values see section 3.3.

2.3.2.2 AT+CHUP

AT+CHUP	Terminate call
Test command AT+CHUP=?	Response OK
Execute command AT+CHUP	Response OK/ERROR
	Description: All active calls and all calls on hold are terminated.

2.3.2.3 AT+CR

AT+CR	Service reporting control
Test command AT+CR=?	Response +CR: (list of supported <mode>s) OK/ERROR/+CME ERROR
	Parameter <mode> 0 disables reporting 1 enables reportingOK/ERROR/+CME ERROR
Read command AT+CR?	Response +CR: <mode> OK/ERROR/+CME ERROR
	Parameter <mode> See Test command
Write command AT+CR=<mode>	Parameter <mode> See Test command Response OK/ERROR/+CME ERROR

2.3.2.4 AT+CRC

AT+CRC	Cellular result codes
Test command AT+CRC=?	Response +CRC: (list of supported <mode>s) OK/ERROR/+CME ERROR
	Parameter <mode> 0 disables reporting 1 enables reportingOK/ERROR/+CME ERROR
Read command AT+CRC?	Response +CRC: <mode> OK/ERROR/+CME ERROR
	Parameter <mode> See Test command
Write command AT+CRC=<mode>	Parameter <mode> See Test command Response OK/ERROR/+CME ERROR

2.3.3 Network service related commands

This section provides the descriptions of commands related to network service.

2.3.3.1 AT+CAOC

AT+CAOC	Advice of charge
Test command AT+CAOC=?	Response +CAOC: (list of supported <mode>s) Parameter <mode> 0 query CCM value
Read command AT+CAOC?	Response +CAOC: <mode> Parameter <mode> 0 See Test command
Write command AT+CAOC=<mode>	Response OK Parameter <mode> 0 See Test command
Execute command AT+CAOC	Response +CAOC: <ccm> OK/ERROR/+CME ERROR Parameter <ccm> Updated hexadecimal call meter, measured in home units; coding in analogy to ACMmax on the SIM

2.3.3.2 AT+CCFC

AT+CCFC	Call forwarding
Test command AT+CCFC=?	Response +CCFC: (list of supported <reas>s) OK/ERROR/+CME ERROR Parameter <reas> 0 Always 1 If busy 2 If no answer 3 If not available 4 All reasons (0-3) 5 All conditional reasons (1-3)
Write command AT+CCFC=<reas>, <mode>[, <num> [,<type>[,<class> [,,,<time>]]]]	Parameter <reas> See Test command <mode> 0 Deactivate 1 Activate 2 Query 3 Install 4 Delete <num> Telephone number <type> Type of telephone number <class> 1 Voice 2 Data 4 Fax 7 DEFAULT = Voice, Data and FAX 8 SMS 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access X X is a combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX <time> 1-30 Time, rounded to a multiple of five seconds Response If <mode>=2 and command is successful +CCFC: <status>, <class1>[, <num>, <type>[,,, <time>]][<CR><LF>+CCFC: ....] OK/ERROR/+CME ERROR Parameter <status> 0 Inactive 1 Active

2.3.3.3 AT+CCWA

AT+CCWA	Call waiting
Test command AT+CCWA=?	Response +CCWA: (list of supported <n>s) OK/ERROR/+CME ERROR Parameter <n> 0 disable 1 enable
Read command AT+CCWA? Write command AT+CCWA=[<n>, [<mode>[,<class>]]]	Response +CCWA: <n>, <m>,<class>,,<cli validity> OK/ERROR/+CME ERROR Parameter <n> See Test command <mode> 0 Disable 1 Enable 2 Query Status <class> 1 Voice 2 Data 4 Fax 7 Default =Voice, Data and Fax 8 SMS 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access X X is a combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX <CLI validity> 0 CLI valid 1 CLI has been withheld 2 CLI is not available Response If <mode>=2 and command is successful +CCWA: <status>, <class1><CR><LF>+CCWA: ....] OK/ERROR/+CME ERROR Parameter <status> 0 Inactive 1 Active
	Unsolicited message +CCWA:<num>,<type>,<class>,,<cli validity>

2.3.3.4 AT+CHLD

AT+CHLD	Call hold and multiparty
Test command AT+CHLD=?	Response +CHLD: (list of supported <n>s) OK/ERROR/+CME ERROR
Write command AT+CHLD= [<n>]	Parameter <n> 0 Terminates all held calls or sets UDUB (**U**ser **D**etermined **U**ser **B**usy) for a waiting call 1 Terminates all active calls (if there are any) and accepts the other call (waiting call or held call) 1X Terminates call number X (X= 1-7) 2 Puts all active calls on hold (if there are any) and accepts the other call (waiting call or held call) as active 2X Puts all active calls except call X (X= 1-7) on hold (split 3 Connects the call put on hold to the active call multiparty In conflict situations, the action is always applied to the waiting call. For terminating Terminating all calls except waiting calls is done with ”AT+CHUP” **Note:** Command scope depends on the SIM clearing and/or on the network support Response OK/ERROR/+CME ERROR

2.3.3.5 AT+CLCC

AT+CLCC	List Current Calls
Test command AT+CLCC=?	Response OK
Execute command AT+CLCC	Response [+CLCC: <id1>,<dir>,<stat>,<mode>,<empty>, <number>,<type>] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<empty>, <number>,<type> [...]]] OK/ERROR/+CME ERROR Parameter <idx>: integer type; call identification number as described in subclause 4.5.5.1 of the GSM 02.30 document [19]; this number can be used in AT+CHLD command operations <dir>: 0 mobile originated (MO) call 1 mobile terminated (MT) call <stat> (state of the call): 0 active 1 held 2 dialing (MO call) 3 alerting (MO call) 4 incoming (MT call) 5 waiting (MT call) <mode> (bearer/teleservice): 0 voice 1 data 2 fax 3 voice followed by data, voice mode 4 alternating voice/data, voice mode 5 alternating voice/fax, voice mode 6 voice followed by data, data mode 7 alternating voice/data, data mode 8 alternating voice/fax, fax mode 9 unknown <empty>: 0 call is not one of multiparty (conference) call parties 1 call is one of multiparty (conference) call parties <number>: string type phone number in format specified by <type> <type>: type of address octet in integer format

2.3.3.6 AT+CLCK

AT+CLCK	Switch locking on and off **Revision to GSM 07.07 according to CR TDOC ETSI/SMG4 187/96**
Test command AT+CLCK=?	Response +CLCK: (list of supported <fac>s) OK/ERROR/+CME ERROR Parameter <fac> ”CS” Keyboard lock ”PS” Phone locked to SIM (device code) ”SC” SIM card (PIN) ”FD” FDN lock "AO" BAOC (bar all outgoing calls) "OI" BOIC (bar outgoing international calls) "OX" BOIC-exHC (bar outgoing international calls except to home country) "AI" BAIC (bar all incoming calls) "IR" BIC-Roam (bar incoming calls when roaming outside the home country) "AB" All Barring services "AG" All outgoing barring services "AC" All incoming barring services
Write command AT+CLCK=<fac>, <mode>[, <passwd> [,<class>]]	Parameter <fac> See Test command <mode> 0 Cancels lock 1 Activates lock 2 Queries lock status <passwd> Password <class> 1 Voice 2 Data 4 Fax 7 DEFAULT = Voice, Data and FAX 8 SMS 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access X X is a combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX Response If <mode>=2 and command is successful +CLCK: <status>[,<class1>[<CR><LF> +CLCK: <status>, class2....]] Parameter <status> 0 Off 1 On OK/ERROR/+CME ERROR **Note:** If no device code (“PS”) has previously been entered, at+clck=ps,2 will return an error. It is possible to set a new device code or to delete it using the AT+CPWD command.

2.3.3.7 +CLIR

AT+CLIR	Select Incognito Mode (Call Line Identification Restriction)		
Test command AT+CLIR=?	Response +CLIR: (list of supported <n>s) OK/ERROR/+CME ERROR Parameter		
	<n>	0	Presentation indicator is used according to network
		1	CLIR invocation (incognito)
		2	CLIR suppression (not incognito)
Read command AT+CLIR?	Response +CLIR: <n>, <m> OK/ERROR/+CME ERROR Parameter		
	<n>		See Test command
	<m>	0	CLIR not provisioned (not incognito)
		1	CLIR provisioned in permanent mode (incognito)
		2	Unknown
		3	CLIR temporarly mode presentation restricted (next call incognito)
		4	CLIR temporarly mode presentation allowed (next call not incognito)
Write command AT+CLIR=[<n>]	Parameter <n>		See Read command
	Response OK/ERROR/+CME ERROR		

2.3.3.8 AT+CLIP

AT+CLIP	Display telephone number of calling party
Test command AT+CLIP=?	Response +CLIP: (list of supported <n>s) OK/ERROR/+CME ERROR Parameter <n> 0 Suppresses unsolicited messages 1 Displays unsolicited messages
Read command AT+CLIP?	Response +CLIP: <n>, <m>,<class>,,<cli validity> OK/ERROR/+CME ERROR Parameter <n> See Test command <m> 0 CLIP not booked 1 CLIP booked 2 Unknown <class> 1 Voice 2 Data 4 Fax 7 DEFAULT = Voice, Data and FAX 8 SMS 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access X X is a combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX <cli validity> 0 CLI valid 1 CLI withheld by originator 2 CLI not available due to network
Write command AT+CLIP=[<n>]	Parameter <n> See Read command Response OK/ERROR/+CME ERROR
	Unsolicited message +CLIP: <num>,<type>,,,,<CLI validity>

2.3.3.9 AT+COLP

AT+COLP	Connected Line Identification Presentation
Test command AT+COLP=?	Response +COLP: (list of supported <n>s) OK/ERROR/+CME ERROR Parameter <n> 0 Disable 1 Enable
Read command AT+COLP?	Response +COLP: <n>, <m> OK/ERROR/+CME ERROR Parameter <n> See Test command <m> 0 COLP not provisioned (no presentation) 1 COLP provisioned 2 Unknown
Write command AT+COLP=[<n>]	Parameter <n> See Read command Response OK/ERROR/+CME ERROR
	Unexpected message +COLP: <num>,<type>

2.3.3.10 AT+COPN

AT+COPN	Read operator names
Test command AT+COPN=?	Response OK
Execute command AT+COPN	Response +COPN:numeric <oper>,long alphanumeric <oper><CR><LF> +COPN:..... OK/ERROR/+CME ERROR Parameter <oper> Network operator in numeric and alphanumeric notation see AT^SPLM

2.3.3.11 AT+COPS

AT+COPS	Commands concerning selection of network operator
Test command AT+COPS=?	Response +COPS: [list of supported (<stat>,long alphanumeric <oper>,,numeric <oper>)s][,,(list of supported <mode>s),(list of supported <format>s)] OK/ERROR/+CME ERROR
	Parameter <stat> 0 Unknown 1 Useful network operator 2 Used network operator 3 Prohibited network operator <oper> Operator in the format according to <mode> <mode> 0 Automatic mode 1 Manual selection of network operator 3 Setting of format 4 Automatic, manual selected <format> 0 Long alphanumeric 2 Numeric <oper>
Read command AT+COPS?	Response +COPS: <mode>[,<format>,<oper] OK/ERROR/+CME ERROR Parameter <mode> See Test command <format> See Test command <oper> Network operator
Write command AT+COPS=<mode>[,<format>[,<oper>]]	Parameter <mode> See Test command <format> See Test command If <mode> = 1, <format> can only = 2 <oper> In numeric form only Response OK/ERROR/+CME ERROR

2.3.3.12 AT+CPOL

AT+CPOL	Preferred operator list
Test command AT+CPOL=?	Response +CPOL: (list of supported <index>s), (list of supported <format>s)
	Parameter <index> the order number of operator in the SIM preferred operator list <format> 2: numeric
Read command AT+CPOL?	Response +CPOL: <index>, <format>,<operator><CR><LF> +CPOL:..... OK/ERROR/+CME ERROR
	Parameter <index> See Test command <format> See Test command
Write command AT+CPOL=[<index>][,<format>[,<oper>]]	Parameter <index> See Test command <format> See Test command <oper> operator Response OK/ERROR/+CME ERROR

2.3.3.13 AT+CPWD

AT+CPWD	Change password to a lock
Test command AT+CPWD=?	Response +CPWD: list of supported (<fac>, <pwdlength>)s OK/ERROR/+CME ERROR
	Parameter <fac> "P2" PIN2 otherwise See Test command for AT+CLCK command, without "FD" <pwdlength> Password length
Write command AT+CPWD=<fac>, <oldpwd>, <newpwd>	Parameter <fac> See Test command for AT+CLCK command <oldpwd>, <newpwd> **Note:** "PS" Phone Code (device code) AT+CPWD="PS", ,<newpwd> when no password has previously been entered AT+CPWD="PS",<oldpwd> to delete password Response OK/ERROR/+CME ERROR

2.3.3.14 AT+CREG

AT+CREG	Network registration
Test command AT+CREG=?	Response +CREG: (list of supported <n>s) OK/ERROR/+CME ERROR
	Parameter <n> 0 Suppresses the unexpected network status messages 1 Displays the unexpected network status messages 2 ENABLE UNEXPECTED NETWORK REGISTRATION AND LOCATION INFORMATION MESSAGESOK/ERROR/+CME ERROR
Read command AT+CREG?	Response +CREG: <n>,<stat>[,<lac>,<ci>] OK/ERROR/+CME ERROR
	Parameter <n> See Test command <stat> 0 Not checked in, not seeking 1 Checked in 2 Not checked in, but seeking a network 3 Check-in denied by network 4 Unknown 5 Registered, roaming <lac> Hexadecimal 2-byte string type of location area code <ci> Hexadecimal 2-byte string type of cell ID
Write command AT+CREG=<n>	Parameter <n> See Test command Response OK/ERROR/+CME ERROR
	Unsolicited message +CREG: <stat>

2.3.3.15 AT+CSSN

AT+CSSN	Supplementary service notifications **Revision according to GSM 07.07 Version 5.0.0**
Test command AT+CSSN=?	Response +CSSN: (list of supported <n>s), (list of supported <m>s) Parameter <n> 0 Suppresses the +CSSI messages 1 Activates the +CSSI messages <m> 0 Suppresses the +CSSU messages 1 Activates the +CSSU messages For supported +CSSI/+CSSU messages, see 2.4.3 below.
Read command AT+CSSN?	Response +CSSN: <n>,<m> Parameter <n> See Test command <m> See Test command
Write command AT+CSSN=<n>[,<m>]	Parameter <n> See Read command <m> See Read command
	Unsolicited message +CSSI: <code1> +CSSU: <code2> Parameter <code1> Intermediate result code 3 Waiting call is pending <code2> Unsolicited result code 5 Held call was terminated

2.3.4 Commands related to mobile equipment control and status

This section provides the descriptions of commands related to network service.

2.3.4.1 AT+CACM

AT+CACM	Accumulated call meter
Test command AT+CACM=?	Response OK
Read command AT+CACM?	Response +CACM: <acm> OK/ERROR/+CME ERROR Parameter <acm> Accumulated call meter in hexadecimal format, measured in home units; coding analogous to ACMmax on the SIM
Write command AT+CACM=[<passwd>]	Response OK/ERROR/+CME ERROR Parameter <passwd> String type; usually PIN2

2.3.4.2 AT+CALM

AT+CALM	Alert sound mode
Test command AT+CALM=?	Response +CALM: (list of supported <mode>s) OK
Read command AT+CALM?	Response +CALM: <mode> OK/ERROR/+CME ERROR
Write command AT+CALM=<mode>	Response OK/ERROR/+CME ERROR Parameter <mode>: 0 normal mode 1 silent mode (all sounds are prevented) 2 beep (only a short beep indicates an incoming call)

2.3.4.3 AT+CAMM

AT+CAMM	Accumulated call meter maximum
Test command AT+CAMM=?	Response OK
Read command AT+CAMM?	Response +CAMM: <acmmax> OK/ERROR/+CME ERROR Parameter <acmmax>Accumulated call meter maximum in hexadecimal format, measured in home units; coding analogously to ACMmax on the SIM
Write command AT+CAMM=[<acmmax>[,<passwd>]]	Response OK/ERROR/+CME ERROR Parameter <acmmax> (see Read command) <passwd> String type; usually PIN2

2.3.4.4 AT+CBC

AT+CBC	Battery charge
Test command AT+CBC=?	Response +CBC: (list of supported <bcs>s),(list of supported <bcl>s) OK/ERROR/+CME ERROR Parameter <bcs> 0 ME is supplied from battery 1 ME has battery but is not supplied from there 2 ME has no battery connected 3 Error <bcl> 0 Battery is flat, no more actions are possible 1-100 charge in per cent
Execute command AT+CBC	Response +CBC: <bcs>,<bcl>

2.3.4.5 AT+CCLK

AT+CCLK	Clock
Test command AT+CCLK=?	Response OK
Read command AT+CCLK?	Response +CCLK: <time> OK/ERROR/+CME ERROR Parameter: <time>: string type value; format is "yy/MM/dd,hh:mm:ss", where characters indicate the year (last two digits), month, day, hour, minutes; e.g. 6th of May 1994, 22:10:00 hours is expressed as “94/05/06,22:10:00"
Write command AT+CCLK=<time>	Response OK/ERROR/+CME ERROR Parameter: <time> see Test command

2.3.4.6 AT+CLVL

AT+CLVL	Loudspeaker volume level
Test command AT+CLVL=?	Response +CLVL: (list of supported <level>s) OK
Read command AT+CLVL?	Response +CLVL: <level> OK/ERROR/+CME ERROR
Write command AT+CLVL=<level>	Response OK/ERROR/+CME ERROR Parameter <level>: Loudspeaker Volume Level

2.3.4.7 AT+CMUT

AT+CMUT	Mute control
Test command AT+CMUT=?	Response +CMUT: (list of supported <n>s) OK
Read command AT+CMUT?	Response +CMUT: <n> OK/ERROR/+CME ERROR
Write command AT+CMUT=<n>	Response OK/ERROR/+CME ERROR Parameter <n>: 0 mute off 1 mute on

2.3.4.8 AT+CPAS

AT+CPAS	Query the telephone status
Test command AT+CPAS=?	Response +CPAS: (list of supported <pas>s) OK/ERROR/+CME ERROR Parameter <pas> 0 Ready 3 Incoming call (phone is ringing) 4 Call is active
Execute command AT+CPAS	Response +CPAS: <pas> OK/ERROR/+CME ERROR Parameter <pas> See Test command OK/ERROR/+CME ERROR

2.3.4.9 AT+CPBR

AT+CPBR	Read a telephone-book entry
Test command AT+CPBR= ?	Response +CPBR: (list of supported <index>s), <nlength>, <tlength> OK/ERROR/+CME ERROR Parameter <index> Location number <nlength> Max. length of telephone number <tlength> Max. length of text corresponding to the number
Write command AT+CPBR= <index1> [,<index2>]	Response +CPBR: <index1>, <nummer>, <typ>, <text>[<CR><LF> +CPBR: ..... +CPBR: <index2>, <nummer>, <typ>, <text>] OK/ERROR/+CME ERROR Parameter <index1> Location number where the read of the entry starts <index2> Location number where the read of the entry ends <nummer> Telephone number <typ> Type of number <text> Text corresponding to the telephone number **NOTE:** In the <text> field, there may appear special characters like the following: **'"' (0x22), '@' (0x00), 'ò`(0x08), `Ö`(0x5c).** (See also AT+CPBW and Appendix A: "Using special characters in certain commands (e. g., +CPBR/+CPBW"). Empty entries do not produce any output in models succeeding the S25.

2.3.4.10 AT+CPBS

AT+CPBS	Select a telephone book
Test command AT+CPBS=?	Response +CPBS: (list of supported <sto>s) OK/ERROR/+CME ERROR Parameter <sto> "FD" SIM fix-dialing phonebook "SM" SIM phonebook "ME" ME phonebook "DC" ME Dialled Calls List "ON" SIM (or ME) own numbers (MSISDNs) list "LD" SIM last-dialling phonebook "MC" ME missed (unanswered received) calls list "RC" ME received calls list ***For a description of telephone-book features, see** Appendix A **Note:** "DC" and "LD" are never both available.
Read command AT+CPBS?	Response +CPBS: <sto> OK/ERROR/+CME ERROR Parameter <sto> See Test command
Write command AT+CPBS=<sto>	Parameter <sto> See Test command Response OK/ERROR/+CME ERROR

2.3.4.11 AT+CPBW

AT+CPBW	Write a telephone-book entry
Test command AT+CPBW=?	Response +CPBW: (list of supported <index>s), <nlength>,(list of supported <type>s), <tlength> OK/ERROR/+CME ERROR Parameter <index> Location number <nlength> Max. length of telephone number <tlength> Max. length of text corresponding to the number
Write command AT+CPBW= [<index>] [,<nummer> [,<typ>[,<text>]]]	Parameter <index> Location number at which the entry is written <nummer> Telephone number <typ> Type of number <text> Text corresponding to the telephone number Response OK/ERROR/+CME ERROR Note: The following characters in <text> must be entered via the Siemens-specific escape sequence (see also Appendix A: "Using special characters in certain commands (e. g., +CPBR/+CPBW") **GSM Char** / Hex char. / ASCII / 3 byte Esc Seq .(hex) / Note **Ö** / x5C / \ / x5C x35 x43 / Backslash **"** / x22 / " / x5C x32 x32 / String delim **ò** / x08 / BSP / x5C x30 x38 / Backspace @ / x00 / NULL / x5C x30 x30 / GSM Null GSM=0x00 may cause problems on application level when using the function strlen() and should thus be represented by an escape sequence

2.3.4.12 AT+CPIN

AT+CPIN	Enter PIN and query lock
Test command AT+CPIN=?	Response OK
Read command AT+CPIN?	Response +CPIN: <code> OK/ERROR/+CME ERROR Parameter <code> READY — No further input necessary SIM PIN — SIM PIN input necessary SIM PUK — SIM PUK input necessary PH-SIM PIN — Device code (theft protection) input necessary PH-SIM PUK — Device code PUK (theft protection) input necessary SIM PIN2 — PIN2, e.g. for editing the FDN book; only possible if previous command was acknowledged with +CME ERROR:17 SIM PUK2 — Only possible if previous command was acknowledged with error +CME ERROR:18 device specific codes (SIM LOCK): PH-FSIM PIN — There is no current PIN PH-FSIM PUK — Phone locked to very first inserted SIM PH-NET PIN — There is no current PIN PH-NET PUK — Network Personalization is actually a PUK PH-NETSUB PIN — There is no current PIN PH-NETSUB PUK — Network Subset Personalization is actually a PUK PH-SP PIN — There is no current PIN PH-SP PUK — Network Personalization is actually a PUK PH-CORP PIN — There is no current PIN PH-CORP PUK — Network Personalization is actually a PUK The required error message can (must) be provoked by an attempted Write command.
Write command AT+CPIN=<pin> [,<new pin>]	Parameter <pin> — Password for appropriate lock; if the lock is a PUK, then a <new pin> is necessary. <new pin> — New password for the lock Response OK/ERROR/+CME ERROR

2.3.4.13 AT+CPUC

AT+CPUC	Price per unit and currency table
Test command AT+CPUC=?	Response OK
Read command AT+CPUC?	Response +CPUC: <currency>,<ppu> OK/ERROR/+CME ERROR Parameter <currency>three-character currency code (e.g. “DEM”) <ppu> price per unit; dot is used as a decimal separator (e.g. “1.33”)
Write command AT+CPUC=<currency>,<ppu>[,<passwd>]	Response OK/ERROR/+CME ERROR Parameter <passwd> String type; usually PIN2

2.3.4.14 AT+CRSL

AT+CRSL	Ringer sound level
Test command AT+CRSL=?	Response +CRSL: (list of supported <level>s) OK
Read command AT+CRSL?	Response +CRSL: <level> OK/ERROR/+CME ERROR
Write command AT+CRSL=<level>	Response OK/ERROR/+CME ERROR Parameter <level>: Ringer Sound Level

2.3.4.15 AT+CRSM

AT+CRSM	Restricted SIM access
Test command AT+CRSM=?	Response OK
Write command +CRSM=<command> [,<file id> [,<P1>,<P2>,<P3> [,<data>]]]	Response +CRSM: <sw1>,<sw2>[,<response>] OK/ERROR/+CME ERROR Parameter <command>: 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS <file id>: Integer, identifier of the data file on the SIM, mandatory for every command except STATUS (see [4]) <P1>, <P2>, <P3>: Integer, transferal parameter from ME to SIM, mandatory for every command except GET RESPONSE, STATUS (see [4]) <data>: Hexadecimal string; information that is to be written to the SIM <sw1>, <sw2>: Integer; information from the SIM as to how/whether the command was executed <response>: Hexadecimal string; given when a command was successfully processed **Note**: The write access to CK boxes receives only limited support and differs from device to device.

2.3.4.16 AT+CSQ

AT+CSQ	Output signal quality
Test command AT+CSQ=?	Response +CSQ: (list of supported <rssi>s), list of supported <ber>) OK/ERROR/+CME ERROR Parameter <rssi> Reception level: 0 -113 dBm or less 1 -111 dBm 2-30 -109 to -53 dBm 31 -51 dBm or more 99 Unknown <ber> Bit error rate: 0-7 Like RXQUAL values from Table GSM 05.08 in Section 8.2.4 99 Unknown
Execute command AT+CSQ	Response +CSQ: <rssi>, <ber> OK/ERROR/+CME ERROR Parameter <rssi> See Test command <ber> See Test command

2.3.4.17 AT+CVIB

AT+CVIB	Vibrator mode
Test command AT+CVIB=?	Response +CVIB: (list of supported <mode>s) OK
Execute command AT+CVIB	Response +CVIB: <mode> OK/ERROR/+CME ERROR
Write command AT+CVIB=<mode>	Response OK/ERROR/+CME ERROR Parameter <mode>: Vibrator mode 0 disable 1 enable 16 vibrate then ring (not available in every model)

2.3.5 Extensions of Hayes Standard commands for GPRS

This chapter describes all the extensions of the Hayes Standard commands for GPRS.

Command	Function
ATD*<GPRS_SC>[*[<called_address>][*[<L2P>][*[<cid>]]]]#	Request GPRS service <GPRS_SC>: GPRS Service Code a digit string (value 99) <called_address> a string that identifies the called party in the address space <L2P>: a string which indicates the layer 2 protocol <cid>: a digit string which specifies a particular PDP context definition. The cid has to be defined by using the AT+CGDCONT command The dial command responds with CONNECT or ERROR
ATD*<GPRS_SC_IP>[*<cid>]#	Request GPRS **IP** service <GPRS_SC>: GPRS Service Code a digit string (value 98) <cid>: a digit string which specifies a particular PDP context definition. The cid has to be defined by using the AT+CGDCONT command The dial command responds with CONNECT or ERROR
AT0	Return to on-line data state
ATS0	Automatic answer. The command may be used to turn off (n=0) and on (n>0) the automatic response to a network request for a PDP context activation.
ATS3	Termination character
ATS4	Response formatting character
ATS5	Command line editing character

2.3.6 Commands for GPRS

This section provides the descriptions of commands related to GPRS.

2.3.6.1 AT+CGACT

AT+CGACT	PDP context activate or deactivate
Test command AT+CGACT=?	Response +CGACT: (list of supported <state>s) OK/ERROR/+CME ERROR Parameter <state> indicates the state of PDP context activation 0 - deactivated 1 - activated
Read command AT+CGACT?	Response +CGACT: <cid>, <state>[<CR><LF>+CGACT: <cid>, <state>...]] OK/ERROR/+CME ERROR Parameter <cid> numeric PDP Context Identifier <state> See Test command
Write command AT+CGACT=[<state>[,<cid>[,<cid>[,…]]]]	Parameter <state> See Test command <cid> See Read command Response OK/ERROR/+CME ERROR

2.3.6.2 AT+CGANS

AT+CGANS	Manual response to a network request for PDP context activation
Test command AT+CGANS=?	Response +CGANS(list of supported <response>s), (list of supported <L2P>s) OK/ERROR/+CME ERROR Parameter <response> 0 - the request is rejected 1 - the request is answered <L2P> layer 2 protocol to be used between the TE and MT PPP
Write command AT+CGANS=[<response>, [<L2P> ,[<cid>]]]	Parameter <response> See Test command <state> See Test command <cid> numeric PDP Context Identifier Response CONNECT/ERROR/+CME ERROR

2.3.6.3 AT+CGATT

AT+CGATT	GPRS attach or detach
Test command AT+CGATT=?	Response +CGATT: (list of supported <state>s) OK/ERROR/+CME ERROR Parameter <state> indicates the state of GPRS attachment 0 - detached 1 - attached
Read command AT+CGATT?	Response +CGATT: <state> OK/ERROR/+CME ERROR Parameter <state> See Test command
Write command AT+CGATT=[<state>]	Parameter <state> See Test command Response OK/ERROR/+CME ERROR

2.3.6.4 AT+CGAUTO

AT+CGAUTO	Auto response to a network request for PDP context activation
Test command AT+CGAUTO=?	Response +CGAUTO: (list of supported <n>s) OK/ERROR/+CME ERROR Parameter <n> indicates the state of PDP context activation 0 - turn off automatic response for GPRS only 1 – turn on automatic response for GPRS only 3 - modem compatibility mode, GPRS and circuit switched calls (default)
Read command AT+CGAUTO?	Response +CGAUTO: <n> OK/ERROR/+CME ERROR Parameter <n> See Test command
Write command AT+CGAUTO=[<n>]	Parameter <n> See Test command Response OK/ERROR/+CME ERROR

2.3.6.5 AT+CGCLASS

AT+CGCLASS	GPRS mobile station class
Test command AT+CGCLASS=?	Response +CGCLASS: (list of supported <class>s) OK/ERROR/+CME ERROR Parameter <class> string parameter for the GPRS mobile class B class B C class C in GPRS and circuit switched alternate mode CG class C in GPRS only mode CC class C in circuit switched only mode (lowest)
Read command AT+CGCLASS?	Response +CGCLASS: <class> OK/ERROR/+CME ERROR Parameter <n> See Test command
Write command AT+CGCLASS=[<class>]	Parameter <class> See Test command Response OK/ERROR/+CME ERROR

2.3.6.6 AT+CGDATA

AT+CGDATA	Enter data state
Test command AT+CGDATA=?	Response +CGDATA: (list of supported <L2P>s) OK/ERROR/+CME ERROR Parameter <L2P> layer 2 protocol to be used between the TE and MT PPP
Write command AT+CGDATA=[<L2P> ,[<cid> [,<cid> [,…]]]]	Parameter <L2P> See Test command <cid> numeric PDP Context Identifier Response CONNECT/ERROR/+CME ERROR

2.3.6.7 AT+CGDCONT

AT+CGDCONT	Define PDP Context
Test command AT+CGDCONT=?	Response +CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s) [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[...] OK/ERROR/+CME ERROR Parameter <cid> numeric PDP Context Identifier <PDP_type> string parameter of Packet Data Protocol type PPP IP <d_comp> numeric parameter that controls PDP data compression 0 off <h_comp> numeric parameter that controls PDP header compression 0 off
Read command AT+CGDCONT?	Response +CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp> [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[...]] OK/ERROR/+CME ERROR Parameter <cid> See Test command <PDP_type> See Test command <APN> string parameter for Access Point Name <PDP_addr> string parameter in IP V4 address notification <d_comp> See Test command <h_comp> See Test command
Write command AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr>]]]]	Parameter <cid> See Test command <PDP_type> See Test command <APN> See Read command <PDP_addr> See Read command Response OK/ERROR/+CME ERROR

2.3.6.8 AT+CGEREP

AT+CGEREP	GPRS event reporting
Test command AT+CGEREP=?	Response +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK/ERROR/+CME ERROR Parameter <mode> numeric parameter 0 - buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE 1 - discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 - buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE <bfr> numeric parameter 0 - MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered 1 - MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered
Read command AT+CGEREP?	Response +CGEREP: <mode>,<bfr> OK/ERROR/+CME ERROR Parameter <mode> See Test command <bfr> See Test command
Write command AT+CGEREP=[<mode>[, <bfr>]]	Parameter <mode> See Test command <bfr> See Test command Response OK/ERROR/+CME ERROR
	Unsolicited message +CGEV: REJECT <PDP_type>, <PDP_addr> +CGEV: NW REACT <PDP_type>, <PDP_addr> +CGEV: NW DEACT <PDP_type>, <PDP_addr> +CGEV: ME DEACT <PDP_type>, <PDP_addr> +CGEV: NW DETACH +CGEV: ME DETACH +CGEV: NW CLASS <class> +CGEV: ME CLASS <class>

2.3.6.9 AT+CGQMIN

AT+CGQMIN	Quality of Service Profile (Minimum acceptable)
Test command AT+CGQMIN=?	Response +CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s)[…]] OK/ERROR/+CME ERROR Parameter <PDP_type> string parameter of Packet Data Protocol type PPP IP <precedence> numeric parameter for the precedence class 0 network subscribed value 1..3 <delay> numeric parameter for the delay class 0 network subscribed value 1..4 <reliability> numeric parameter for the reliability class 0 network subscribed value 1..5 <peak> numeric parameter for the peak throughput class 0 network subscribed value 1..7 <mean> numeric parameter for the mean throughput class 0 network subscribed value 1..12
Read command AT+CGQMIN?	Response +CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean>[<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean>[…]] OK/ERROR/+CME ERROR Parameter <cid> numeric PDP Context Identifier <PDP_type> See Test command <precedence> See Test command <delay> See Test command <reliability> See Test command <peak> See Test command <mean> See Test command
Write command AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	Parameter <cid> See Read command <PDP_type> See Test command <precedence> See Test command <delay> See Test command <reliability> See Test command <peak> See Test command <mean> See Test command Response OK/ERROR/+CME ERROR

2.3.6.10 AT+CGQREQ

AT+CGQREQ	Quality of Service Profile (Requested)
Test command AT+CGQREQ=?	Response +CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>>+CGQREQ: <PDP_type>, <precedence >, <delay>, <reliability>, <peak>, <mean>[…]] OK/ERROR/+CME ERROR
	Parameter <PDP_type> string parameter of Packet Data Protocol type PPP IP <precedence> numeric parameter for the precedence class 0 network subscribed value 1..3 <delay> numeric parameter for the delay class 0 network subscribed value 1..4 <reliability> numeric parameter for the reliability class 0 network subscribed value 1..5 <peak> numeric parameter for the peak throughput class 0 network subscribed value 1..7 <mean> numeric parameter for the mean throughput class 0 network subscribed value 1..12
Read command AT+CGQREQ?	Response +CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean>[<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean>[…]] OK/ERROR/+CME ERROR Parameter <cid> numeric PDP Context Identifier <PDP_type> See Test command <precedence> See Test command <delay> See Test command <reliability> See Test command <peak> See Test command <mean> See Test command
Write command AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	Parameter <cid> See Read command <PDP_type> See Test command <precedence> See Test command <delay> See Test command <reliability> See Test command <peak> See Test command <mean> See Test command Response OK/ERROR/+CME ERROR

2.3.6.11 AT+CGPADDR

AT+CGPADDR	Show PDP address
Test command AT+CGPADDR=?	Response +CGPADDR: (list of defined <cid>s) OK/ERROR/+CME ERROR Parameter <cid> numeric PDP Context Identifier
Write command AT+CGPADDR=[<L2P> ,[<cid> [,<cid> [,…]]]]	Parameter <L2P> layer 2 protocol to be used between the TE and MT PPP <cid> numeric PDP Context Identifier Response +CGPADDR:: <cid>,<PDP_addr> [<CR><LF>+CGPADDR: <cid>,<PDP_addr>[...]] OK/ERROR/+CME ERROR

2.3.6.12 AT+CGREG

AT+CGREG	GPRS network registration status
Test command AT+CGREG=?	Response +CGREG: (list of supported <n>s) OK/ERROR/+CME ERROR Parameter <n> 0 Suppresses the unexpected network-status messages Displays the unexpected network-status messages: OK/ERROR/CME ERROR
Read command AT+CGREG?	Response +CGREG: <n>,<stat>[,<lac>,<ci>] OK/ERROR/+CME ERROR Parameter <n> See Test command <stat> 0 Not registered, not currently searching 1 registered, home network 2 Not registered, but currently searching 3 registration denied by network 4 Unknown 5 Registered, roaming <lac> Hexadecimal 2-byte string type of location area code <ci> Hexadecimal 2-byte string type of cell ID
Write command AT+CGREG=[<n>]	Parameter <n> See Test command Response OK/ERROR/+CME ERROR
	Unsolicited message +CGREG: <stat>

2.3.6.13 AT+CGSMS

AT+CGSMS	Select service for MO SMS messages
Test command AT+CGSMS=?	Response +CGSMS: (list of currently available <service>s) OK/ERROR/+CME ERROR Parameter <class> numeric parameter for service or service preference 0 GPRS 1 circuit switched 2 GPRS preferred (use circuit switched if GPRS not available) 3 circuit switched preferred (use GPRS if circuit switched not available)
Read command AT+CGSMS?	Response +CGSMS: <service> OK/ERROR/+CME ERROR Parameter <n> See Test command
Write command AT+CGSMS=[< service >]	Parameter <service> See Test command Response OK/ERROR/+CME ERROR

2.3.7 Commands related to mobile equipment errors

2.3.7.1 AT+CMEE

AT+CMEE	Expanded error messages according to GSM 07.07
Test command AT+CMEE=?	Response +CMEE: (list of supported <n>s) Parameter <n> 0 Suppresses the expanded error format 1 Expanded error messages as number 2 Expanded error messages as text
Read command AT+CMEE?	Response +CMEE: <n> Parameter <n> See Read command
Write command AT+CMEE=<n>	Parameter <n> See Read command Response OK/ERROR/+CME ERROR
	Description: For detailed information on the values possible for +CME ERROR see section 3.1. +CMS errors have been defined for SMS; for detailed information on the values possible for +CMS ERROR see section 3.2.

2.3.8 TIA IS-101 commands ("Voice control interim standard for asynchronous DCE")

This section provides the descriptions of other AT commands.

2.3.8.1 AT+VTD

AT+VTD	Set duration of a DTMF tone
Test command AT+VTD=?	Response +VTD: (list of supported <duration>s) OK/ERROR/+CME ERROR Parameter <duration> 1-255 Duration of tone in (duration/10) seconds
Read command AT+VTD?	Response +VTD: <duration> OK/ERROR/+CME ERROR
Write command AT+VTD= <duration>	Parameter <duration> See Test command Response OK/ERROR

2.3.8.2 AT+VTS

AT+VTS	Send a DTMF tone
Test command AT+VTS=?	Response (list of supported <dtmf>s), (list of supported <duration>s) OK/ERROR/+CME ERROR Parameter <dtmf> 0-9,#,*,A-D, exactly one character <duration> Duration of tone in (duration/10) seconds
Write command AT+VTS= <dtmf> [,<duration>] or AT+VTS= <dtmf-string>	Parameter <dtmf> **One** character from the list, see Test command<duration> See Test command <dtmf-string> max. 29 characters in quotation marks ("..."), then a duration cannot be specified Response OK/ERROR/+CME ERROR

2.3.9 AT Cellular commands according to GSM 07.05 for SMS

GSM 07.05 commands are used for operating the SMS functions of the GSM mobile phone. The GSM module MOBILE supports the SMS PDU mode.

2.3.9.1 AT+CMGC

AT+CMGC	Send an SMS command
Test command AT+CMGC=?	Response OK
Write command **If PDU mode (+CMGF=0)** +CMGC=<length><CR> ***PDU is given:*** <ctrl-Z/ESC>	Parameter <length> Length of PDU <pdu> See "AT+CMGL" <mr> Message reference Response **If sending is successful:** +CMGC: <mr> **If sending is not successful:** +CMS ERROR: <err>

2.3.9.2 AT+CMGD

AT+CMGD	Delete an SMS in the SMS memory
Test command At+CMGD=?	Response OK
Write command AT+CMGD= <index>	Parameter <index> Index of message in the selected memory <mem1> Response OK/ERROR/+CMS ERROR

2.3.9.3 AT+CMGF

AT+CMGF	SMS format
Test command AT+CMGF=?	Response +CMGF: (list of supported <mode>s) Parameter <mode>:0 PDU mode
Read command AT+CMGF?	Response +CMGF: <mode> Parameter <mode>:0 PDU mode
Write command AT+CMGF=[<mode>]	Parameter <mode>:0 PDU mode Response OK/ERROR

2.3.9.4 AT+CMGL

AT+CMGL	List SMS **Revision according to GSM 07.05 Version 4.7.0**
Test command AT+CMGL=?	Response +CMGL: (list of supported <stat>s) Parameter <stat> 0 "REC UNREAD":received unread messages (default) 1 "REC READ": received read messages 2 "STO UNSENT":stored unsent messages 3 "STO SENT": stored sent messages 4 "ALL": all messages
Write command AT+CMGL [=<stat>]	Parameter <stat> See Test command Response If PDU mode (+CMGF=0) and command are successful: +CMGL:<index>,<stat>,[<alpha>],<length> <CR><LF><pdu>[<CR><LF> +CMGL: <index>,<stat>,[alpha],<length> <CR><LF><pdu><CR><LF> [...]] Parameter <pdu> The PDU begins with the service-center address (according to GSM04.11), followed by the TPDU according to GSM03.40 in hexadecimal format otherwise: +CMS ERROR

2.3.9.5 AT+CMGR

AT+CMGR	Read in an SMS **Revision according to GSM 07.05 Version 4.7.0**
Test command AT+CMGR=?	Response OK
Write command AT+CMGR= <index>	Parameter <index> Index of message in selected memory <mem1> Response **If PDU mode (+CMGF=0) and command are successful:** +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> Parameter <pdu> See AT+CMGL otherwise: +CMS ERROR

2.3.9.6 AT+CMGS

AT+CMGS	Send an SMS
Test command AT+CMGS=?	Response OK
Write command **If PDU mode (+CMGF=0)** AT+CMGS=<length><CR> ***PDU is given:*** <ctrl-Z/ESC>	Parameter <length> Length of PDU <pdu> See ”AT+CMGL” <mr> Message reference Response **If sending is successful:** +CMGS: <mr> **If sending is not successful:** +CMS ERROR

2.3.9.7 AT+CMGW

AT+CMGW	Write an SMS to the SMS memory
Test command AT+CMGW=?	Response OK
Write command **If PDU mode (+CMGF=0)** AT+CMGW=<length>[,<stat>]<CR> ***PDU is given:*** <ctrl-Z/ESC>	Parameter <length> Length of PDU <stat> See command AT+CMGL <pdu> See ”AT+CMGL” <index> Index of message in selected memory <mem1> Response +CMGW: <index> +CMS ERROR

2.3.9.8 AT+CMMS

AT+CMMS	More (Short) Message to Send
Test command AT+CMMS=?	Response +CMGF: (list of supported <mode>s) Parameter <mode>: 0 Disable 1Keep link enabled until time between last send messages command response and next send command exceeds 5 seconds then ME closesTA switches <n> to 0 2 keep link enabled until time between last send messages command response and next send command exceeds 5 seconds then ME closes link TA does NOT switch <n> to 0
Read command AT+CMMS?	Response +CMMS: <mode> Parameter <mode> See Test Command
Write command AT+CMMS=[<mode>]	Parameter <mode> See Test Command Response OK/ERROR

2.3.9.9 AT+CMSS

AT+CMSS	Send an SMS from the SMS memory
Test command AT+CMSS=?	Response OK
Write command AT+CMSS=<index>[,<da>[,<toda>]]	Parameter <index> Index of message in selected memory <mem1> <da> Destination address in string format <toda> Format of destination address <mr> Message reference
	Response **If sending is successful:** +CMSS: <mr> **If sending is not successful:** +CMS ERROR

2.3.9.10 AT+CNMA

AT+CNMA	Acknowledgment of a short message directly output (without storing on the chip card) ***(NOTE**: This command is only available if Phase 2+ compatibility has been activated by means of* AT+CSMS=*1*)
Test command AT+CNMA=?	Response +CNMA: (list of supported <n>s) Parameter <n> 0Mode of functioning analogously to GSM 07.05 text mode
Write command AT+CNMA[=<n>]	Parameter <n> See Test command Response OK/ERROR/+CMS ERROR

2.3.9.11 AT+CNMI

AT+CNMI	Display new incoming SMS
Test command AT+CNMI=?	Response +CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s) Parameter <mode> 0 Buffers unsolicited messages (but is equivalent to rejecting; see <bfr>) 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE. 2 Buffers unsolicited messages if serial interface is occupied <mt> 0 Suppresses unsolicited messages for incoming short messages 1 Unsolicited messages of a received short message (SMS-DELIVER) that is stored on a chip card are output in the form +CMTI: <mem>,<index> 2 Unsolicited messages of a received short message (SMS-DELIVER) (except class 2 and the message "Waiting Indication Group: store message") are output in the form +CMT: [<alpha>],<length><CR><LF><pdu> (<alpha> is not supported) Class 2 and the message "Waiting Indication Group: store message" are output as <mt>=1 3 Unsolicited messages of a received short message (SMS-DELIVER) class 3 are output as <mt>=2. Messages with other data coding schemes are output as <mt>=1. **NOTE:** <mt>=2 and <mt>=3 are not possible unless the Phase 2+ compatibility has been activated by means of +CSMS=1 <bm> 0 Suppresses unsolicited messages for incoming cell broadcast messages 2 Outputs unsolicited messages for cell broadcast messages in the form +CBM: <length><CR><LF><pdu>

	<ds>	0 Suppresses unsolicited messages for incoming SMS status reports 2 Outputs unsolicited messages for SMS status reports in the form +CDS: <length><CR><LF><pdu>
	<bfr>	1 Buffered unsolicited messages are rejected when switching from <mode> 0 to <mode> 2.
	<mem>	See AT+CPMS
	<index>	Index of the record on the chip card
	<alpha>	alphanumeric representation of the sender address
	<length>	Length of <pdu>
	<pdu>	See AT+CMGL
Read command AT+CNMI?	Response +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> Parameter	
	<mode>	See Test command
	<mt>	See Test command
	<bm>	See Test command
	<ds>	See Test command
	<bfr>	See Test command
Write command AT+CNMI= [<mode> [,<mt>[,<bm> [,<ds>[,<bfr>]]]]]	Parameter	
	<mode>	See Test command
	<mt>	See Test command
	<bm>	See Test command
	<ds>	See Test command
	<bfr>	See Test command
	Response OK/ERROR/+CMS ERROR	
	Unsolicited message +CMTI: <mem>,<index> +CMT: <length><CR><LF<>pdu> +CDS: <length><CR><LF><pdu> +CBM: <length><CR><LF><pdu>	

2.3.9.12 AT+CPMS

AT+CPMS	Selection of SMS memory **Revision according to GSM 07.05 Version 4.7.0**
Test command AT+CPMS=?	Response +CPMS: (list of supported <mem1>s),(list of supported <mem2>s) ,(list of supported <mem3>s) Parameter <mem1>Memory from which messages are read and deleted "SM" SIM-messages memory <mem2>Memory to which messages are written and sent "SM" SIM-messages memory <mem3>Memory in which received messages are stored, if forwarding to the PC is not set ("+CNMI") "SM" SIM-messages memory
Read command AT+CPMS?	Response +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2> ,<mem3>,<used3>,<total3> Parameter <memx>Memory from which messages are read and deleted <usedx>Number of messages currently in <memx> <totalx>Number of storable messages in <memx>
Write command AT+CPMS= <mem1> [,<mem2> [,<mem3>]]	Parameter <mem1> See Test command <mem2> See Test command <mem3> See Test command Response +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK/ERROR/+CMS ERROR

2.3.9.13 AT+CSCA

AT+CSCA	Address of the SMS service center
Test command AT+CSCA=?	Response OK
Read command AT+CSCA?	Response +CSCA: <sca>,<tosca> Parameter <sca> Service-center address in string format <tosca> Service-center address format
Write command AT+CSCA= <sca>[,<tosca>]	Parameter <sca> Service-center address in string format <tosca> Service-center address format Response OK/ERROR

2.3.9.14 AT+CSCB

AT+CSCB	Select cell broadcast messages
Test command AT+CSCB=?	Response +CSCB: (list of supported <mode>s) Parameter <mode> 0 Accepts messages that are defined in <mids> and <dcss> 1 Does not accept messages that are defined in <mids> and <dcss>
Read command AT+CSCB?	Response +CSCB: <mode>,<mids>,<dcss> Parameter <mode> See Test command <mids> String type; combinations of CBM message IDs <dcss> String type; combinations of CBM data coding schemes
Write command AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	

2.3.9.15 AT+CSMS

AT+CSMS	Selection of message service **Revision according to GSM 07.05 Version 5.0.0**
Test command AT+CSMS=?	Response +CSMS: (list of supported <service>s) Parameter <service> 0 GSM 3.40 and 3.41 1 GSM 3.40 and 3.41 and compatibility of the AT command syntax for phase 2+ **NOTE:** Deactivating phase 2+ compatibility is only possible if the direct output of short messages +CNMI=1,2 or +CNMI=1,3 is not activated. If necessary, the latter should be deactivated first.
Read command AT+CSMS?	Response +CSMS: <service>,<mt>,<mo>,<bm> Parameter <service> 0 GSM 3.40 and 3.41 <mt> Mobile terminated messages 1 Type supported <mo> Mobile originated messages 1 Type supported <bm> Broadcast type messages 1 Type not supported
Write command AT+CSMS=<service>	Parameter <service> 0 GSM 3.40 and 3.41 Response +CSMS: <mt>,<mo>,<bm> OK/ERROR/CMS ERROR

2.3.10 Modem commands

This section provides the descriptions of modem commands.

2.3.10.1 AT+CBST

AT+CBST	Select bearer service type		
Test command AT+ CBST =?	Selects the bearer service <name> with data rate <speed> and the connection element <ce> to be used when data calls are originated. Response +CBST: (list of supported <speed>s), (list of supported <name>s), (list of supported <ce>s) OK Parameter		
	<speed>	0	auto bauding
		4	2400 bps (V.22bis)
		6	4800 bps (V.32)
		7	9600 bps (V.32)
		14	14400 bps (V.34)
		68	2400 bps (V.110)
		70	4800 bps (V.110)
		71	9600 bps (V.110)
		75	14400 bps (V.110)
	<name>	0	asynchronous modem
	<ce>	1	non-transparent
Read command AT+ CBST?	Response +CBST: <speed>,<name>,<ce> OK		
Write command AT+ CBST=<speed>[,0,1]	Parameter See Test command Response OK		

2.3.10.2 AT+CRLP

AT+CRLP	Select radio link protocol parameter for originating non-transparent data call
Test command AT+ CRLP =?	Response This modem command sets radio link protocol (RLP) parameters used when non-transparent data calls are initiated. This command returns supported values as a compound value. +CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s)<verx> Parameter **<iws>** 0-61 Interworking window size (IWF to MS) Default: 61 **<mws>** 0-61 Mobile window size (MS to IWF) Default: 61 **<T1>** 48-255 Acknowledgement timer (T1 in 10 ms units) Default: 78 <N2> 1-255 Re-transmission attempts N2 Default: 6 <verx> RLP version supported: 0 single-link basic version
Read command AT+ CRLP?	Response The command returns current settings for the supported RLP version 0. +CRLP: <iws>,<mws>,<T1>,<N2>[,<verx>] OK Parameter See Write command
Write command AT+CRLP= [<iws>[,<mws>[,<T1> [,<N2>[,<verx>]]]]]	Parameter See Test command Response

2.3.11 Fax commands

The following commands can be used for FAX transmission. If the ME is acting as a FAX modem to a PC-based application, it is necessary to select the appropriate service class (FAX class) provided by the ME. The ME reports its FAX service class capabilities, both the current setting and the range of services available, via the AT+FCLASS command.

Note: According to EIA/TIA-592-A, the Error Correcting Mode (ECM) should not be used when sending FAXes over GSM.

+FCLASS parameter	Service Class	Reference, Standard
0		e.g. TIA/EIA-602 or ITU V.25*ter*
1	Service Class 1	EIA/TIA-578-A
2	Vendor-specific	this document and EIA PN-2388 (draft)

The following FAX commands are dummy commands. Invoking these commands will not cause ERROR result codes, but these commands have no functionality either:

Command	Meaning
AT+FAA	Auto Answer mode
AT+FECM	Error Correction Mode control
AT+FLNFC	Page Length format conversion
AT+FLPL	Indicate document available for polling
AT+FMINSP	Minimum Phase C speed
AT+FRBC	Phase C data receive byte count
AT+FREL	Phase C received EOL alignment
AT+FSPL	Enable polling
AT+FTBC	Phase C data transmit byte count
AT+FWDFC	Page width format conversion

Table 2-7: List of dummy FAX commands

2.3.11.1 AT+FBADLIN

AT+ FBADLIN	Define or read number of bad lines
Read command AT+ FBADLIN?	Response <badlin> OK Parameter See Write command
Write command AT+FBADLIN=<badlin>	Used for FAX class 2 only This command defines the “Copy Quality OK” threshold. If pixel count errors were detected in normal resolution (98 dpi) mode in as many consecutive lines as defined in **<badlin>**, the copy quality is unacceptable. If pixel count errors were detected in fine resolution (196 dpi) mode in twice as many consecutive lines as defined in **<badlin>**, the copy quality is unacceptable. “Copy Quality Not OK” occurs if either the error percentage is too high or if too many consecutive lines contain errors Parameter

	<badlin>	0...255	0 implies that error checking is not present or disabled.
		10	default value

2.3.11.2 AT+FBADMUL

AT+ FBADMUL	Define, read or test number of bad lines
Read command AT+ FBADMUL?	Response Parameter <n> OK
Write command AT+ FBADMUL =<n>	Used for FAX class 2 only This command defines the "Copy-Quality-OK" multiplier. The number of lines received with a bad pixel count is multiplied by this number. If the result exceeds the total number of lines on the page the error rate is considered too high. A threshold multiplier value of 20 corresponds to a 5% error rate. Parameter <n> 0...255 0 implies that error checking is not present or disabled. 20 default value

2.3.11.3 AT+FBOR

AT+ FBOR	Query the bit order for receive mode
Test command AT+FBOR=?	Used for FAX class 2 only Query the bit order for receive-mode. The mode is set by the ME dependent on the selected Service Class. Response +FBOR: (list of supported bit order modes <bor>s) OK Parameter <bor> 0 direct bit order for both Phase C and Phase B/D data 1 Reversed bit order for Phase C data, direct bit order for Phase B/D data
Read command AT+FBOR?	Response Parameter <bor> OK

2.3.11.4 AT+FCIG

AT+FCIG	Query or set the Local polling id
Test command AT+FCIG=?	Response +FCIG: (max. length of Local Polling ID string) (range of supported ASCII character values) OK Used for FAX class 2 only Parameter <id> Local Polling ID string, max. length and possible content as reported by test command. Default value is empty string (""). See also "AT+FLID" command
Read command	Response

AT+FCIG?	<id> OK Parameter
Write command AT+FCIG=<id>	See Test command

2.3.11.5 AT+FCIG

AT+FCQ	Control Copy Quality
Test command AT+FCQ=?	Response +FCQ: (list of supported copy quality checking <cq>s) OK This command controls Copy Quality checking when receiving a fax Used for FAX class 2 only Parameter <cq> 0 No copy quality checking. The ME will generate Copy Quality OK (MCF) responses to complete pages. 1 ME can check 1-D phase data. The connected application must check copy quality for 2-D phase C data
Read command AT+FCQ?	Response <cq> OK Parameter
Write command AT+FCQ=<id>	See Test command

2.3.11.6 AT+FCLASS

AT+FCLASS	Select, read or test FAX service class
Test command AT+FCLASS=?	Response +FCLASS: (list of supported <n>s) OK Parameter <n> 0 data (e.g. EIA/TIA-602 or ITU V.25ter) 1 Fax class 1 (EIA/TIA-578-A, Service Class 1) 2 Vendor-specific (Fax class 2 (EIA/TIA SP-2388, an early draft version of EIA/TIA-592-A – Service class 2.1))
Read command AT+FCLASS?	Response Parameter
Write command AT+FCLASS=<n>	See Test command

2.3.11.7 AT+FCR

AT+ FCR	Capability to receive
Read command AT+ FCR?	Response Parameter <n> OK
Write command AT+FCR=<cr>	Response OK Parameter <cr> 0 ME cannot receive message data.

	This value can be used when the application has insufficient storage. The ME can send and can be polled for a file. 1 ME can receive message data. Used for FAX class 2 only

2.3.11.8 AT+FDCC

AT+FDCC	Select service for MO SMS messages
Test command AT+FDCC=?	This command allows the connected application to sense and constrain the capabilities of the facsimile DCE (=ME), from the choices defined in ITU T.30 Table 2. Used for Faxclass 2 only Response +FDCC: (list of <VR>s), (list of s), (list of <WD>s), (list of <LN>s), (list of <DF>s), (list of <EC>s), (list of <BF>s), (list of <ST>s) Parameter VR Vertical Resolution BR Bit rate WD Page Width LN Page length DF Data compression Format EC Error Correction mode BF Binary Fole transfer mode ST Scan Time / line ***Note:*** For further information see AT+FDIS
Read command AT+FDCC?	Response <dcc> OK Parameter See Test command
Write command AT+FDCC=<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	Parameter See Test command Response See Test command

2.3.11.9 AT+FDFFC

AT+FDFFC	Data Compresssion Format Conversion
Test command AT+FDFFC=?	Used for FAX class 2 only This parameter determines whether there is a mismatch in the ME response between the data format negotiated for the facsimile session (reported by the +FDCS:DF subparameter) and the Phase C data desired by the controlling application, indicated by the optional +FDT:DF subparameter, or the +FDIS=DF subparameter for the +FDR operation. Response +FDFFC: (list of supported <df>s) OK Parameter <df> 0 mismatch checking is always disabled. The controlling application has to check the +FDCS: DF subparameter and transfer matching data.
Read command AT+FDFFC?	Response <df> OK Parameter See Test Command
Write command	Parameter

AT+FDFFC=<df>	See Test command Response See Test command

2.3.11.10 AT+FDIS

AT+FDIS	Query or set session parameters
Test command AT+FDIS=?	Used for FAX class 2 only This command allows the controlling application to set and constrain the capabilities used for the current session. +FDIS is used to generate DIS or DTC messages directly. +FDIS (and received DIS messages) is also used to generate DCS messages. Response +FDIS: (list of <VR>s), (list of s), (list of <WD>s), (list of <LN>s), (list of <DF>s), (list of <EC>s), (list of <BF>s), (list of <ST>s) Parameter

VR	Vertical Resolution	
	0	normal, 98 lpi
	1	fine, 196 lpi
BR	Bit rate	
	0	2400 bit/s, V.27ter
	1	4800 bit/s, V.27ter
	2	7200 bit/s, V.29
	3	9600 bit/s, V.29
WD	Page Width	
	0*)	1728 pixels in 215mm
	1	2048 pixels in 255 mm
	2	2432 pixels in 303 mm
	3	1216 pixels in 151 mm
	4	864 pixels in 107 mm
LN	Page length	
	0	A4, 297mm
	1	B4, 364mm
	2	unlimited length
DF	Data compression Format	
	0*)	1-D modified Huffman
	1	2-D modified read
	2	2-D uncompressed mode
EC	Error Correction mode	
	0*)	disable ECM
	1	enable ECM, 64 bytes/frame
	2	enable ECM, 256 bytes/frame
BF	Binary Fole transfer mode	
	0*)	disable BFT
	1	enable BFT
ST	Scan Time / line	
	0*)	0 ms (at VR= normal)
	1	5 ms
	2	10 ms
	3	10 ms
	4	20 ms
	5	20 ms

	6 40 ms 7 40 ms ***) Note:** Only the default value needs to be implemented. Use test command to check which parameter values are in fact possible!
Read command AT+FDIS?	Response <cdec> OK Parameter See Test Command
Write command AT+FDIS=<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	Parameter See Test command Response See Test command

2.3.11.11 AT+FDR

AT+FDR	Begin or continue phase C data reception
Execute command AT+FDR	Used for FAX class 2 only This command initiates transition to Phase C data reception. Response CONNECT/OK/ERROR

2.3.11.12 AT+FDT

AT+FDT	Data Transmission
Execute command AT+FDT	Used for FAX class 2 only This command requests the ME to transmit a Phase C page. When the ME is ready to accept Phase C data, it issues the negotiation responses and the CONNECT result code to the application. In Phase B, this command releases the ME to proceed with negotiation, and releases the DCS message to the remote station. In Phase C, this command resumes transmission after the end of a data stream transmitted before.
	Parameter **<dt>** (list of <DF>s, <VR>s, <WD>s, <LN>s) DF Data compression Format 0*) 1-D modified Huffman 1 2-D modified read 2 2-D uncompressed mode VR Vertical Resolution 0 normal, 98 lpi 1 fine, 196 lpi WD Page Width 0*) 1728 pixels in 215mm 1 2048 pixels in 255 mm 2 2432 pixels in 303 mm 3 1216 pixels in 151 mm 4 864 pixels in 107 mm LN Page length 0 A4, 297mm 1 B4, 364mm

	2 unlimited length Response CONNECT
Write command AT+FDIS=<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	Parameter See Test command Response See Test command

2.3.11.13 AT+FET

AT+FET	End a page or document
Write command AT+FET=<ppm>	Used for FAX class 2 only This command indicates that the current page or part thereof is complete. An ERROR response code results if this command is issued while the mode is on-hook. Parameter: <ppm> Post Page Message Codes 1 another document next 2 no more pages or documents 4 another page, procedure interrupt 5 another document, procedure interrupt Response OK/ERROR

2.3.11.14 AT+FK

AT+FK	Kill operation, orderly FAX abort
Execute command AT+FK	Used for FAX class 2 only This command causes the TA to terminate the session in an orderly manner. Response OK/ERROR

2.3.11.15 AT+FLID

AT+FLID	Query or set session parameters
Test command AT+FLID=?	Used for FAX class 2 only Parameter <lid> Local ID string, max. length and possible content as reported by test command. Default value is empty string (“”). See also “AT+FCIG” command Response +FLID: (max. character length of Local ID string) (range of supported ASCII character values) OK
Read command AT+FLID?	Response <lid> OK Parameter See Test Command
Write command AT+FLID=<lid>	Parameter See Test command

	Response See Test command

2.3.11.16 AT+FMDL

AT+FMDL	Identify Product Model
Read command AT+FMDL?	Used for FAX class 2 only Send the model identification to the TA. Response OK/ERROR

2.3.11.17 AT+FMFR

AT+FMFR	Request Manufacturer Identification
Read command AT+FMFR?	Used for FAX class 2 only Send the model identification to the TA. Response Siemens OK

2.3.11.18 AT+FOPT

AT+FOPT	Set bit order independently
Write command AT+FOPT=<opt>	Used for FAX class 2 only Model-specific command to set bit order independently of the understanding which is "mirrored" and which is direct. Parameter: <opt> 0 non-standard 1 standard Response OK

2.3.11.19 AT+FPHCTO

AT+FPHCTO	DTE Phase C Response Timeout
Read command AT+FPHCTO?	Used for FAX class 2 only Send the model identification to the TA. Response <tout> OK/ERROR
Write command AT+FPHCTO=<tout>	Used for FAX class 2 only Model-specific command to set bit order independently of the understanding which is "mirrored" and which is direct. Parameter: <tout> determines how long the DCE will wait for a command after reaching the end of data when transmitting in Phase C. When time-out is reached, the DCE assumes that there are no more pages or documents to send. 0...255 time-out value in 100ms units. 30 default

	Response <tout> OK/ERROR

2.3.11.20 AT+FREV

AT+FREV	Identify Product Revision
Test command AT+FREV=?	Used for FAX class 2 only This command sends the revision identification to the TA. Response V2.550 OK

2.3.11.21 AT+FRH

AT+FRH	Receive Data Using HDLC Framing
Execute command AT+FRH=<mod>	Used for FAX class 1 only This command causes the TA to receive frames using the HDLC protocol and the modulation defined below. An ERROR response code results if this command is issued while the modem is on-hook. Parameter <mod> modulation mode 3 V21 Ch2 300 bps 24 V.27ter 2400 bps 48 V.27ter 4800 bps 72 V.29 7200 bps 96 V.29 9600 bps Response CONNECT/ERROR

2.3.11.22 AT+FRM

AT+FRM	Receive Data
Test command AT+FRM=?	Used for FAX class 1 only This command causes the TA to enter the receiver-mode using the modulation defined below. An ERROR response code results if this command is issued while the modem is on-hook Parameter <mod> 96 V.29 9600 bps 72 V.29 7200 bps 48 V.27ter 4800 bps 24 V.27ter 2400 bps Response (List of supported modulation modes <mod>s) OK
Write command AT+FRM=<mod>	Response CONNECT Parameter

2.3.11.23 AT+FRS

AT+FRS	Receive Silence
Write command AT+FRS=<time>	Used for FAX class 1 only This command causes the TA to report an OK result code to the TE after <time> 10 millisecond intervals of silence have been detected on the line. This command is aborted if any character is received by the DTE. The modem discards the aborting character and issues an OK result code. An ERROR response code results if this command is issued while the mode is on-hook. Parameter **<time>** 0 – 255 number of 10 millisecond intervals Response (List of supported modulation modes **<mod>**s) OK

2.3.11.24 AT+FTH

AT+FTH	Transmit Data Using HDLC Framing
Write command AT+FTH=<mod>	Used for FAX class 1 only This command causes the TA to transmit data using HDLC protocol and the modulation mode defined below. An ERROR response code results if this command is issued while the modem is on-hook. Parameter **<mod>** 3 V.21 Ch2 300 bps Response CONNECT

2.3.11.25 AT+FTM

AT+FTM	Transmit Data
Test command AT+FTM=?	Used for FAX class 1 only This command causes the TA to transmit data using the modulation mode defined below. An ERROR response code results if this command is issued while the modem is on-hook. Parameter **<mod>** modulation mode 96 V.29 9600 bps 72 V.29 7200 bps 48 V.27ter 4800 bps 24 V.27ter 2400 bps
Write command AT+FTM=<mod>	Parameter **<mod>** 3 V.21 Ch2 300 bps Response CONNECT

2.3.11.26 AT+FTS

AT+FTS	Stop Transmission and Wait
Write command AT+FTS=<time>	Used for FAX class 1 only

	This command causes the TA to terminate a transmission and wait for <time> 10 millisecond intervals before responding with the OK result code to the DTE. An ERROR response code results if this command is issued while the modem is on-hook Parameter <time> 0 – 85 number of 10 millisecond intervals

2.3.11.27 AT+FVRF

AT+FVRFC	Vertical resolution format conversion
Test command AT+FVRFC=?	Used for FAX class 2 only This command determines the DCE response to a mismatch between the vertical resolution negotiated for the facsimile session and the Phase C data desired by the DTE. An ERROR response code results if this command is issued while the modem is on-hook Response (List of supported mismatch checking modes) OK Parameter <vrfc> 0 disable mismatch checking. 2 enable mismatch checking, with resolution conversion of 1-D data in the DCE, and an implied AT+FK command executed on 2-D mismatch detection
Read command AT+FVRFC?	Response <vrfc> OK Parameter See Test command
Write command AT+FVRFC=<vrfc>	Response OK Parameter See Test command

2.4 General commands according to ITU-T Recommendation V.25 ter

This section provides the descriptions of general ITU-T Recommendation V.25ter commands.

2.4.1.1 AT+GCAP

AT+GCAP	Request Capabilities List
Test command AT+GCAP=?	Response OK/ERROR
Read command AT+GCAP?	Response +GCAP: <mode> Parameter

2.4.1.2 AT+IPR

AT+IPR	Fixed DTE rate
Test command AT+IPR=?	Response +IPR:(list of fixed-only <rate> values) OK/ERROR/+CME ERROR

	Parameter: <rate> bits per second at which the DTE-DCE interface should operate
Read command AT+IPR?	Response +IPR: <rate> OK/ERROR/+CME ERROR Parameter <rate> See Test command
Write command AT+IPR=<rate>	Response OK/ERROR/+CME ERROR Parameter <rate> See Test command

2.4.2 User-defined commands for controlling the GSM mobile phone

Since user-defined commands cannot be implemented according to official syntax, the character string ”+C” is replaced by ”^S” (”^” = 0x5E). In future, if a user-defined command is accepted in the same syntax in GSM recommendations, the command can be addressed using both command strings.

2.4.2.1 AT^SACM

AT^SACM	Output ACM (accumulated call meter) and ACMmax
Test command AT^SACM=?	Response ^SACM: (list of supported <n>s)
Execute command AT^SACM	Response ^SACM: <n>,<acm>,<acm_max> OK/ERROR/+CME ERROR Parameter <n> See Test command <acm> Accumulated call meter <acm_max> Maximum accumulated call meter
Write command AT^SACM=<n>	Parameter <n> 0 Suppresses the unsolicited message 1 Displays the unsolicited message
	Unsolicited message ^SACM: <m>; <m> 1 ACM LIMIT ALMOST REACHED 2 ACM GREATER THAN ACMmax 3 ACM RANGE OVERFLOW

2.4.2.2 AT^SBNR

AT^SBNR	Binary Read
Test command AT^SBNR=?	Response ^SBNR: (list of supported <types>s, (list of supported <subtype>s)) OK/ERROR/+CME ERROR Parameter: <type> see AT^SBNWcommand <subtype> see AT^SBNWcommand
Write command AT^SBNR=<type>,<subtype>	Response ^SBNR: <type>,<subtype>,1,<maxNumber> <CR><LF><data><CR><LF> ^SBNR: <type>,<subtype>,2,<maxNumber> <CR><LF><data><CR><LF>[...] OK/ERROR/+CME ERROR Parameter: <type> see AT^SBNW command <subtype> see AT^SBNW command <data> data in hexadecimal form (PDU) <maxNumber> see AT^SBNW command See “Appendix B” for examples.

2.4.2.3 AT^SBNW

AT^SBNW	Binary Write
Test command AT^SBNW=?	Response ^SBNW: (list of supported <types>s, list of supported <subtype>s) OK/ERROR/+CME ERROR: Parameter: <type> „bmp“ bitmap Windows bitmap format without compression; 2/16/256 colours, at least 97x26 pixels <subtype> 0 shown permanently when registered in home network 1 shown temporarily, deleted by more important display contents „mid“ ring tones in standard MIDI format 0, without polyphony specification: http://www.midi.org <subtype> 0 first (and only) entry of type “mid” „vcs“ vcal format specification: http://www.imc.org/pdi <subtype> 0 first entry of type “vcs” 1 entry of type “vcs” ... <actNumber> 0 deletes entry of the current subtype other current packet number <maxNumber> maximum number of packets
(cont. ...)	

Write command (cont. ...) AT^SBNW=<type>,<subtype>, [<actNumber>[, <maxNumber>]]<CR> ***PDU is given:*** <ctrl-Z/ESC>	Response OK/ERROR/+CME ERROR Parameter: `<type>` see Test command `<subtype>` see Test command `<actNumber>` see Test command `<maxNumber>` see Test command **Notes**: - It is not possible to upload data when a call is active or in progress. If a call is active the mobile responds with ++CME ERROR: PHONE BUSY, the current upload sequence is aborted and all data packets are discarded. - If uploaded data is not useable (e.g. wrong data format) the mobile responds with ++CME ERROR: INV CHAR IN TEXT after the last packet is uploaded. - To get the extended +CME ERROR response, `AT+CMEE=2` has to be sent first. Otherwise the mobile only returns an ERROR. (see 1) - If `<actNumber>` and `<maxNumber>` are omitted during the upload, the mobile aborts the whole input sequence for the current subtype. - If `<actNumber>` is 0 during the upload and <maxNumber> is omitted, the mobile deletes the current record with index `<subtype>` - Packets have to be uploaded in the right order! -**Limitation**:The maximum pdu size is 176 bytes (or 352 characters) See “Appendix B” for examples.

2.4.2.4 AT^SCID

AT^SCID	Output card ID
Test command AT^SCID=?	Response OK/ERROR/+CME ERROR
Execute command AT^SCID	Response `^SCID: <cid>` OK/ERROR/+CME ERROR Parameter `<cid>` Number of SIM card

2.4.2.5 AT^SCKS

AT^SCKS	Output SIM card status
Test command AT^SCKS=?	Response ^SCKS: (list of supported <n>s) Parameter <n> 0 Suppresses the unsolicited messages 1 Outputs the unsolicited messages
Read command AT^SCKS?	Response ^SCKS: <n>, <m> Parameter <m> 0 No card 1 Card in card reader
Write command AT^SCKS=<n>	Parameter <n> See Test command Response OK/ERROR
	Unsolicited message ^SCKS: <m>

2.4.2.6 AT^SCNI

AT^SCNI	Output call number information
Test command AT^SCNI=?	Response OK
Execute command AT^SCNI	Response ^SCNI: 1[,<cs>[,<number>,<type>]]<CR><LF> ^SCNI: 2[,<cs>[,<number>,<type>]]<CR><LF> ^SCNI: 3[,<cs>[,<number>,<type>]]<CR><LF> ^SCNI: 4[,<cs>[,<number>,<type>]]<CR><LF> ^SCNI: 5[,<cs>[,<number>,<type>]]<CR><LF> ^SCNI: 6[,<cs>[,<number>,<type>]]<CR><LF> ^SCNI: 7[,<cs>[,<number>,<type>]] OK/ERROR/+CME ERROR
	Parameter <cs> Call status of affiliated call number (first parameter) 0 Call on hold 1 Active call 2 Waiting call <number> Telephone number <type> Type of number

2.4.2.7 AT^SDBR

AT^SDBR	Database Read
Test command AT^SDBR=?	Response ^SDBR: (list of supported <index>s) OK/ERROR/+CME ERROR Parameter: <index> Location number stored in the alphabetically-sorted addressbook
Write command AT^SDBR=<index1>[,<number typ]>	Response [^SDBR: <number typ>, <number>, <typ>, <text>[[...] <CR><LF>^SDBR: <number typ>, <number>, <typ>, <text>]] OK/ERROR/+CME ERROR Parameter <number typ> Number typ: 0: phone number 'HOME' 1: phone number 'OFFICE' 2: phone number 'MOBILE' 3: phone number 'FAX' <nummer> Telephone number <typ> Type of number <text> Text corresponding to the telephone number **NOTE:** In the <text> field, there may appear special characters like the following: **'"' (0x22), '@' (0x00), 'ò` (0x08), `Ö` (0x5c).** (See also AT+CPBW and Appendix A: "Using special characters in certain commands (e. g., +CPBR/+CPBW")

2.4.2.8 AT^SDLD

AT^SDLD	Delete the "last number redial" memory
Test command AT^SDLD=?	Response OK
Execute command AT^SDLD	Response OK/ERROR/+CME ERROR

2.4.2.9 AT^SGAUTH

AT^SGAUTH	Select Type of Authentication for PPP connection
Test command AT^SGAUTH=?	Response ^SGAUTH: (list of supported <auth>s) OK/ERROR/+CME ERROR Parameter <auth> indicates typ of supported authentication: 0 – none 1 – PAP 2 – CHAP 3 – PAP and CHAP
Read command AT^SGAUTH?	Response +CGACT: <auth> OK/ERROR/+CME ERROR Parameter <auth> See Test command
Write command AT^SGAUTH =<auth>	Response OK/ERROR/+CME ERROR Parameter <auth> See Test command

2.4.2.10 AT^SICO

AT^SICO	Icon control
Test command AT^SICO =?	Response ^SICO: (list of supported <n>s),(list of supported <m>s) OK
Write command AT^SICO =<n>,<m>	Response for <m> = 0 and 1 OK/ERROR/+CME ERROR Response for <m> = 2 ^SICO: <s> OK Parameter <n>: Type of icon 0 GPS icon <m>: Mode 0 hide icon 1 show icon 2 query icon status <s>: Status 0 icon hidden 1 icon shown

2.4.2.11 AT^SLCK

AT^SLCK	Switch locks (including user-defined locks) on and off
Test command AT^SLCK=?	Response ^SLCK: (list of supported <fac>s) OK/ERROR/+CME ERROR Parameter <fac> "PS" Phone locked to SIM (device code) "SC" SIM card (PIN) "FD" FDN lock "AO" BAOC (bar all outgoing calls) "OI" BOIC (bar outgoing international calls) "OX" BOIC-exHC (bar outgoing international calls except to home country) "AI" BAIC (bar all incoming calls) "IR" BIC-Roam (bar incoming calls when roaming outside the home country) "AB" All barring services "AG" All outgoing barring services "AC" All incoming barring services "PN" Network personalization (GSM 02.22, [4]) "PC" Corporate personalization (GSM 02.22, [4]) "PU" Network subset personalization (GSM 02.22, [4]) "PP" Service provider personalization (GSM 02.22, [4]) "PF" Phone locked to very first inserted SIM
Write command AT^SLCK = <fac>, <mode> [,<passwd> [,<class>]]	Parameter <fac> See Test command <mode> 0 Cancels lock 1 Activates lock 2 Queries lock status <passwd> Password <class> 1 Voice 2 Data 4 Fax 7 DEFAULT = Voice, Data and FAX 8 SMS 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access X X is a combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX Response **If <mode>=2 and command is successful** ^SLCK: <status>[,<class1>[<CR><LF> ^SLCK: <status>, class2....]] Parameter <status> 0 Off 1 On OK/ERROR/+CME ERROR

2.4.2.12 AT^SLNG

AT^SLNG	Language settings
Test command AT^SLNG=?	Response ^SLNG: (list of supported languages <lng>s) Parameter: <lng>: Integer; language coded according to GSM 03.38 or mobile-specific language (>100)
Read command AT^SLNG?	Response ^SLNG: <lng>
Write command AT^SLNG=<lng>	Response OK/ERROR/+CME ERROR

2.4.2.13 AT^SMGL

AT^SMGL	List SMS (without status change from *unread* to *read*) **Revision according to GSM 07.05 Version 4.7.0**
Test command AT^SMGL=?	Response ^SMGL: (list of supported <stat>s) Parameter <stat> 0 "REC UNREAD": received unread messages (default) 1 "REC READ": received read messages 2 "STO UNSENT": stored unsent messages 3 "STO SENT": stored sent messages 4 "ALL": all messages
Write command AT^SMGL [=<stat>]	Parameter <stat> See Test command Response **If PDU mode (+CMGF=0) and command is successful:** ^SMGL: <index>,<stat>,[<alpha>],<length> <CR><LF><pdu> [<CR><LF>^SMGL: <index>,<stat>,[alpha],<length> <CR><LF><pdu> [...]]
	Parameter <pdu> The PDU begins with the service-center address (according to GSM04.11), followed by the TPDU according to GSM03.40 in hexadecimal format otherwise: +CMS ERROR: <err>

2.4.2.14 AT^SMGO

AT^SMGO	SMS overflow indicator
Test command AT^SMGO=?	Response ^SMGO: (list of supported <n>s) OK/ERROR/+CMS ERROR Parameter <n> 0 Disable 1 Enable
Read command AT^SMGO?	Response ^SMGO: <n>,<mode> OK/ERROR/+CMS ERROR
	Parameter <n> See Test command <mode> 0 Space still available 1 SMS buffer is full (chip card) 2 Buffer is full and new message that should be sent to the telephone is present in the SC
Write command AT^SMGO=<n>	Parameter <n> See Test command Response OK/ERROR/+CMS ERROR
	Unsolicited message ^SMGO: <mode>

2.4.2.15 AT^SMGR

AT^SMGR	Read SMS (without status change from *unread* to *read)* **Syntax identical with** AT+CMGR
Test command AT^SMGR=?	Response OK
Write command AT^SMGR= <index>	Parameter <index> Index of message in selected memory <mem1> Response **If PDU mode (+CMGF=0) and command are successful:** ^SMGR: <stat>,[<alpha>],<length><CR><LF><pdu> Parameter <pdu> See "AT+CMGL" otherwise: +CMS ERROR: <err>

2.4.2.16 AT^SMSO

AT^SMSO	Switch device off
Test command AT^SMSO=?	Response OK
Execute command AT^SMSO	Response OK Device switches off

2.4.2.17 AT^SNFS

AT^SNFS	Select NF hardware
Test command AT^SNFS=?	Response ^SNFS: (list of supported <dev>s) Parameter <dev> 0 Cell phone mode 1 Handsfree
Read command AT^SNFS?	Response ^SNFS: <dev> Parameter <dev> See Test command **Note:** Volume should be temporarily set to "0" before NF hardware is changed.
Write command AT^SNFS=<dev>	Parameter <dev> See Test command Response OK/ERROR

2.4.2.18 AT^SNFV

AT^SNFV	Set the volume
Test command AT^SNFV=?	Response ^SNFV: (list of supported <vol>s) Parameter <vol> Value range of volume (0 to 4) 0 low, ..., 4 max. volume (approx. 3 dB/level)
Read command AT^SNFV?	Response ^SNFV: <vol> Parameter <vol> See Test command
Write command AT^SNFV=<vol>	Parameter <vol> See Test command Response OK/ERROR

2.4.2.19 AT^SPBC

AT^SPBC	Seek the first entry in the sorted telephone book which begins with the selected (or next available) letter
Test command AT^SPBC=?	Response ^SPBC: (list of sorted telephone books supported <mem>s) See AT+CPBS / AT^SPBS OK/ERROR/+CME ERROR
Write command AT^SPBC=<char>	Parameter <char> First letter of desired entry "A" to "Z" (with any other character, the index of the first entry that begins with a special character is sent back) <index> Index in the sorted telephone book (access via AT^SPBG) Response ^SPBC: <index> OK/ERROR/+CME ERROR

2.4.2.20 AT^SPBG

AT^SPBG	Read entry from the sorted telephone book via the sorted index
Test command AT^SPBG=?	Response ^SPBG: (list of supported <index>s), <nlength>, <tlength> OK/ERROR/+CME ERROR: Parameter <index> Location number <nlength> Max. length of telephone number <tlength> Max. length of the text corresponding to the number
Write command AT^SPBG= <index1> [, <index2>]	Response ^SPBG: <index1>, <nummer>, <typ>, <text>[<CR><CL> ^SPBG: ..... ^SPBG: <index2>, <nummer>, <typ>, <text>] OK/ERROR/+CME ERROR Parameter <index1> Location number where the read of the entry starts <index2> Location number where the read of the entry ends <nummer> Telephone number <typ> Type of number <text> Text corresponding to the telephone number

2.4.2.21 AT^SPBS

AT^SPBS	Select a telephone book (including Siemens-specific books)
Test command AT^SPBS=?	Response ^SPBS: (list of supported <sto>s) OK/ERROR/+CME ERROR Parameter <sto> ”FD” SIM fix-dialing telephone book ”SM” SIM telephone book ”ME” Telephone book in device ”DC” ME Dialled Calls List ”ON” Own telephone numbers ”LD” SIM last dialing number "MC" ME Missed Calls List "RC" ME Received Calls List ”MD” Last number redial memory in telephone device ”OW” Own numbers ”BD” Barred dialing numbers ”SD” Service dialing numbers ”MS” Missed dialing numbers (unanswered calls) ”CD” Callback dialing numbers (answered calls) ”BL” Blacklist dialing numbers (barred numbers from remote) ”MB” Mailbox dialing numbers (network-operator mailbox) ”CS” Common sortable telephone book (sorted combination of ”SM”, ”ME”, ”FD”; access only via ^SPBC, ^SPBG) ”RD” Red book (all entries in ”CS” whose name portions have an exclamation mark (‘!’) as their final character) *For a description of the telephone-book features, see “Appendix A”
Read command AT^SPBS?	Response ^SPBS: <sto> OK/ERROR/+CME ERROR Parameter <sto> See Test command
Write command AT^SPBS= <sto>	Parameter <sto> See Test command Response OK/ERROR/+CME ERROR

2.4.2.22 AT^SPIC

AT^SPIC	Output PIN counter
Test command AT^SPIC=?	Response OK/ERROR/+CME ERROR
Execute command AT^SPIC	Response ^SPIC: <counter> OK/ERROR/+CME ERROR Parameter <counter> Number of attempts still available to enter the <passwd>. The command ”AT+CPIN?” must be used to check which password is currently needed.

2.4.2.23 AT^SPLM

AT^SPLM	Read the PLMN list
Test command AT^SPLM=?	Response OK
Execute command AT^SPLM	Response ^SPLM: numeric <oper>,long alphanumeric <oper><CR><LF> ^SPLM:..... OK/ERROR/+CME ERROR Parameter <oper> Network operator in numeric and alphanumeric notation

2.4.2.24 AT^SPLR

AT^SPLR	Read an entry from the preferred-operator list
Test command AT^SPLR=?	Response ^SPLR: (list of supported <index>s) OK/ERROR/+CME ERROR Parameter <index> Location numbers
Write command AT^SPLR=<index1> [, <index2>]	Response ^SPLR: <index1>, numeric <oper> ^SPLR: ..... ^SPLR: <index2>, numeric <oper> OK/ERROR/+CME ERROR Parameter <index1> Location number where the read of the entry starts <index2> Location number where the read of the entry ends <oper> Network operator in numeric form

2.4.2.25 AT^SPLW

AT^SPLW	Write an entry to the preferred-operator list
Test command AT^SPLW=?	Response ^SPLW: (list of supported <index>s) OK/ERROR/+CME ERROR Parameter <index> Location number
Write command AT^SPLW=<index>[, <oper>]	Parameter <index> Location number at which the entry is written <oper> Network operator in numeric form Response OK/ERROR/+CME ERROR

2.4.2.26 AT^SPST

AT^SPST	Play Signal Tone
Test command AT^SPST =?	Response ^SPST: (list of supported <n>s) OK
Write command AT^SPST =<n>,<m>	Response OK/ERROR/+CME ERROR Parameter <n>: Type of Signal Tone (st = self terminating) 0 Carkit PTT (st) 1 Carkit PTT long (st) 2 Carkit Crash (st) 3 Carkit Error (st) 4 Carkit Call Setup (st) <m>: Mode 0 Stop tone (not necessary for self terminating tones) 1 Play tone

2.4.2.27 AT^SPWD

AT^SPWD	Change password to a lock (including user-defined locks)
Test command AT^SPWD=?	Response ^SPWD: list of supported (<fac>, <pwdlength>)s OK/ERROR/+CME ERROR Parameter <fac> "P2" PIN2 otherwise See Test command for the command AT^SLCK, without "FD" <pwdlength> Length of password
Write command AT^SPWD = <fac>,<oldpwd>, <newpwd>	Parameter <fac> See Test command for the command AT^SLCK <oldpwd>, <newpwd> Old and new password Response OK/ERROR/+CME ERROR

2.4.2.28 AT^SRTC

AT^SRTC	Set the ringing tone
Test command AT^SRTC=?	Response ^SRTC: (list of supported <type>s), (list of supported <vol>s) Parameter <type> 1-X Number of ringing tone 0 Mutes the ringing tone; when MTC is set, the phone does not ring and the volume is ignored <vol> 1-Y Volume of ringing tone
Read command AT^SRTC?	Response ^SRTC: <type>, <vol>, <ringing> Parameter <type> See Test command <vol> See Test command <ringing> 0 Test-ring is switched off 1 Test-ring is switched on
Write command AT^SRTC=[<type>][,<vol>]	Parameter <type> See Test command <vol> See Test command Response OK/ERROR
Execute command AT^SRTC	Response The ringing tone sounds on the current NF device; it is selected using ”AT^SNFS” until AT^SRTC is called up again OK/ERROR/+CME ERROR **Note:** If an MTC arrives while the test-ring is active, the latter is switched off and the ”normal” ring is switched on.

2.4.2.29 AT^SSTK

AT^SSTK	SIM Toolkit
Test command AT^SSTK=?	Response ^SSTK: <profile> Parameter: <profile> ME profile according to GSM 11.14
Write command AT^SSTK=<length>[,<mode>]<CR> ***PDU is given:*** <ctrl-Z/ESC>	Response: OK/ERROR/+CME ERROR: Parameter: <length>: Length of PDU in bytes <mode>: 0: Single command 1: Sequence of commands <pdu>: SIM Toolkit commands, see GSM 11.14 **Limitation**: The maximum PDU length is 176 bytes. Unsolicited message ^SSTK:<data>

2.4.3 Summary of all unsolicited messages

Table 2-8 lists all unsolicited messages defined, together with their meaning:

Message	Meaning
+CBM: <length><CR><LF><pdu>	Direct output of the broadcast message. For an explanation of parameters see AT+CNMI
+CCWA:<num>,<type>,<class>,,<cli validity>	Call waiting indication For an explanation of parameters see AT+CCWA
+CDS: <length><CR><LF><pdu>	Direct output of the status report For an explanation of parameters see AT+CNMI
+CGEV: ME CLASS <class>	The mobile equipment has forced a change of MS class For an explanation of parameters see AT+CGEREP
+CGEV: ME DEACT <PDP_type>, <PDP_addr>	The mobile equipment has forced a context deactivation For an explanation of parameters see AT+CGEREP
+CGEV: ME DETACH	The mobile equipment has forced a GPRS detach For an explanation of parameters see AT+CGEREP
+CGEV: NW CLASS <class>	The network has forced a change of MS class For an explanation of parameters see AT+CGEREP
+CGEV: NW DEACT <PDP_type>, <PDP_addr>	The network has forced context deactivation For an explanation of parameters see AT+CGEREP
+CGEV: NW DETACH	The network has forced a GPRS detach For an explanation of parameters see AT+CGEREP
+CGEV: NW REACT <PDP_type>, <PDP_addr>	The network has requested a context reactivation For an explanation of parameters see AT+CGEREP
+CGEV: REJECT <PDP_type>, <PDP_addr>	A network request for PDP context activation occurred when the MT was unable to report it and was automatically rejected For an explanation of parameters see AT+CGEREP
+CGREG: <stat>	GPRS Network registration For an explanation of parameters see AT+CGREG
+CLIP: <num>,<type>,,,,<CLI validity>	Telephone number of caller For an explanation of parameters see AT+CLIP
+CMT: <length><CR><LF<>pdu>	Direct output of the short message For an explanation of parameters see AT+CNMI
+CMTI: <mem>,<index>	Indication that a new message has arrived For an explanation of parameters see AT+CNMI
+COLP: <num>,<type>	Telephone number of called line For an explanation of parameters see AT+COLP
+CREG: <stat>	Network registration For an explanation of parameters see AT+CREG
+CSSI: <code1> +CSSU: <code2>	Supplementary service intermediate/unsolicited result code For an explanation of parameters see AT+CSSN
^SACM: <m>	Message indicating if ACM has reached the maximum value ACMmax For an explanation of parameters see AT^SACM
^SCKS: <m>	Message indicating whether card has been removed or inserted For an explanation of parameters see AT^SCKS
^SMGO: <mode>	SMS overflow indicator For an explanation of parameters see AT^SMGO
^SSTK:<data>	The user has selected a menu entry from a menu created by means of AT^SSTK

Table 2-8: List of unexpected commands

2.5 Appendix A

2.5.1 Factory settings made by AT&F

```
ATE1 (only in case of RCCP mode)
ATQ0
ATV1

AT+CCWA=0
AT+CREG=0
AT+CLIP=0
AT+COLP=0
AT+CRC=0
AT+CAOC=0
AT+CMEE=0
AT+CPBS=SM (if available)
AT+COPS=0
AT+VTS=1
AT+CSCS="GSM"
AT+CSSN=0,0
AT^SCKS=0
Reset pending locks (Phone Pin/Puk, Pin2/Puk2 ...)
which are given as answer to AT+CPIN?

AT+CSMS=0
AT+CNMI=0,0,0,0,1
AT^SMGO=0
AT+CSCB=0
```

2.5.2 Features of the Telephone book memory

Table 2-9 lists the features supported by the telephone book memory.

Name	Description	Category / Access	Write	Delete completely
FD	Fix-dialing number (SIM fix-dialing telephone book)	GSM 07.07 / AT+CPBS or AT^SPBS	Allowed (PIN2 required)	
SM	Abbreviate dialing number (SIM telephone book)	GSM 07.07 / AT+CPBS or AT^SPBS	Allowed (device code required if FDN replacement is active)	
DC (MD)	Mobile last dialing number (last number redial memory; only if ”LD” is not available)	GSM 07.07 / AT+CPBS or AT^SPBS	Not allowed	By means of AT^SDLD
ON (OW)	Own Numbers (SIM own telephone numbers)	GSM 07.07 (Siemens) / AT+CPBS (historical)	Allowed	
LD	SIM last dialing number (last number redial memory on SIM)	GSM 07.07 / AT+CPBS or AT^SPBS	Not allowed	By means of AT^SDLD
ME	Mobile-equipment telephone book (ME dialing numbers)	GSM 07.07 / AT+CPBS or AT^SPBS	Allowed (device code required if FDN replacement is active)	
BD	Barred dialing numbers (blocked numbers)	Siemens / AT^SPBS	Not allowed	
SD	Service dialing numbers (Service numbers)	Siemens / AT^SPBS	Not allowed	
MC (MS)	Missed dialing numbers (unanswered calls)	GSM 07.07 (Siemens) / AT+CPBS, AT^SPBS	Not allowed	
RC (CD)	Callback dialing numbers (answered calls)	GSM 07.07 (Siemens) / AT+CPBS, AT^SPBS	Not allowed	
BL	Blacklist dialing numbers (numbers that are blocked for a certain time in order to prevent continuous accesses from remote control)	Siemens / AT^SPBS	Not allowed	
MB	Mailbox dialing numbers (network-operator mailbox)	Siemens / AT^SPBS	Not allowed	
CS	Common sortable numbers (sorted combination of ”SM”, ”ME”, ”FD”)	Siemens / AT^SPBS / AT^SPBC / AT^SPBG	Not allowed	

RD	Red book numbers ("CS" entries with '!' at the end of the name portion)	Siemens / AT^SPBS / AT^SPBC / AT^SPBG	Not allowed	

Table 2-9: Features of the telephone book memory

2.5.3 Writing to the FDN Phonebook / FDN Replacement

Writing to the fixed-dialing number phonebook is protected by PIN2. A Write sequence (to e.g. record 5) is provided below:

```
AT+CMEE=2//Activate expanded error message
OK

AT+CPBS=?                          // Listing of available telephone books
+CPBS: ("FD","SM","LD")
OK

AT+CPBS="FD"                       // Selection of the FDN telephone book
OK

AT+CPBW=5,"1234",,"test"           //  A Write to record 5 is attempted...
++CME ERROR: SIM PIN2 REQUIRED     //  ... PIN2 is required for this purpose

AT+CPIN?                           //  Query of the PIN status...
+CPIN: SIM PIN2//  ... PIN2 is to be entered

AT+CPIN="12345678"                 //   Input of PIN2
OK

AT+CPBW=5,"1234",,"test"           // A Write to record 5 is attempted...
OK                                 // PIN2 remains active as long as you use the commands
                                   // +CPIN, +CPBS, +CPBR, +CPBW, +CACM, +CAMM,
                                   // +CPUC or ^SPIC, ^SPBS, ^SPBC, ^SPBG,:
                                   //  If you use other commands or if none of the
                                   //  above commands are executed within five
                                   //  minutes, PIN2 is no longer valid.

AT+CPBW=6,"5678",,"new test"       //  A Write to record 6 is attempted...
OK
...
```

In addition, if there is no FDN phonebook available on the SIM, it is possible to activate a feature which activates an FDN-like behavior for the "SM" and "ME" phonebooks (FDN replacement). (Currently this feature can only be activated via the MMI lock/device lock/excluding telephone book.)
In this case, the Write to the "SM" and "ME" phonebooks is ensured by the device code (PH-SIM PIN and PH-SIM PUK, respectively).
The sequence for entering the device code is analogous to the above example.

2.5.4 Using special characters in certain commands (e. g., +CPBR/+CPBW)

String parameters like <text> in certain commands (like, for instance, AT+CPBW) should be entered using quotation marks ‘"‘ (Ascii=Windows=GSM=0x22), since the following problems may occur if the quotation marks are left out:

- SPACEs (Space, Blank, Ascii=Windows=GSM=0x20) are skipped.
  E.g. at+cpbw=1,"123",,K. H. results in "K.H." ☹
  at+cpbw=1,"123",,"K. H." spaces are retained ☺

- Commas (‘**,**‘) (Ascii=Windows=GSM=0x2C) and semicolons (‘**;**‘)(Ascii=Windows=GSM=0x3B) are prohibited and must not be used in <text>, because they are used as separators between parameters and commands.
  E.g. at+cpbw=1,"123",,Kurz,Helmut results in ERROR ☹
  at+cpbw=1,"123",,"Kurz,Helmut" ☺

To be able, however, to enter quotation marks (and some other special characters) in string parameters you will have to use the Escape character (hex value 0x5c). While “0x5c” denotes the backslash (`\`) in the ASCII character set (Ascii=Windows=0x5C), in the GSM character set “0x5C” denotes the `Ö` character.

The escape sequence thus has the following structure:

- The sequence begins with the escape character 0x5C (ASCII=Windows=`\', GSM=`Ö`)
- The special character follows and is entered as a 2 Byte representation of the GSM chacter set value . e.g. the 2 Byte representation of the `@` (GSM=0x**00**) is **`00`**

Table 2-10 lists the special characters that should be entered using the escape sequence:

GSM Char	GSM hex value	ASCII char.	3 byte esc. seq.(hex)	Note
Ö	0x5C	\	0x5C 0x35 0x43	Backslash
"	0x22	“	0x5C 0x32 0x32	String delimiter
ò	0x08	BSP	0x5C 0x30 0x38	Backspace
@	0x00	NULL	0x5C 0x30 0x30	GSM NULL

Table 2-10: Using escape characters in commands

Examples of using escape characters in GSM commands are listed in Table 2-11:

Desired phonebook entry	<text> in AT+CPBW command (hex)
Ölhändler	0x22 0x5C 0x35 0x43 0x6C 0x68 0x7B 0x6E 0x64 0x6C 0x65 0x72 0x22
“Eddi" Kurz	0x22 0x5C 0x32 0x32 0x45 0x64 0x64 0x69 0x5C 0x32 0x32 0x20 0x4B 0x75 0x72 0x7A 0x22
Oòo	0x22 0x4F 0x5C 0x30 0x38 0x6F 0x22
@Adr.	0x22 0x5C 0x30 0x30 0x41 0x64 0x72 0x2E 0x22 [no problems with strlen()]
	22 00 41 64 72 2E 22 (may cause problems with strlen() in application)

Table 2-11: Using escape characters in GSM commands

Note:
When reading phonebook records, there is NO replacement. Every character will appear in normal GSM character set notation (like the left column in the example above).

2.6 S Registers

This section provides the meanings of S registers used in the modem:

S Register	Function (default values in bold type)				
S 0	The number of rings before the call is answered default: 0 (i. e. does not answer)				
S 3	Command termination character and first character of response trailer (**CR**)				
S 4	Second character of response trailer (**LF**)				
S 5	Editing character; erases the previous character (**BS**)				
S 6	Escape character				
S 7	Wait for carrier after dialing (in seconds). default: 60				
S 8 + S 9	No action				
S 10	Delay between Lost Carrier and Hang up in 0.1 sec. (Default 2 = 200ms)				
S 11 .. S17	No action				
S 18	Bit				
	0	0	**no GSM exit cause**	1	with GSM exit cause
	1	0	no SMS Indication '+C...'	1	**with incoming SMS Indication '+C..'**
S 19 ... S99	No action				

Table 2-12: S-Registers

Only the following S registers can be modified by means of the corresponding ATSn=x command (where n denotes the number of the register): S0, S3, S5, S6, S7, S8, S10; S18.
All the other S registers are used internally and thus read-only.
The contents of a single S register can be displayed via the ATSn? command (where n denotes the number of the register). It is not possible to have the contents of multiple registers displayed at the same time.

2.7 Circuit assignments

The following circuits are assigned at the mobile connector to support the exchange of data:

Name:	Direction	Function	ITU V24 Circuit
SG		Signal Ground	102
TxD	DTE to DCE	Transmitted Data	103
RxD	DCE to DTE	Received Data	104
CTS	DCE to DTE	Clear To Send	106
DCD	DCE to DTE	Data Carrier Detect	109

2.8 Appendix B

2.8.1 Example for creating / retrieving an organizer entry

-vcs object which has to be uploaded:

BEGIN:VCALENDAR
VERSION:1.0
BEGIN:VEVENT
CATEGORIES:ANNIVERSARY
DTSTART:19991213T100000
DESCRIPTION:W. von Siemens
END:VEVENT
END:VCALENDAR

-hexadecimal representation of this object:
424547494E3A5643414C454E4441520D0A56455253494F4E3A312E300D0A424547494E3A564556454E540
D0A43415445474F524945533A414E4E4956455253415259 0D0A445453544152543A31393939313231335431
30303030300D0A4455534352495054494F4E3A572E20766F6E205369656D656E730D0A454E443A56455645
4E540D0A454E443A5643414C454E4441520D0A

-upload of an entry on record 20

at^sbnw="vcs",20,1,3<CR>
<CR><LF> > <Space>
424547494E3A5643414C454E4441520D0A56455253494F4E3A312E300D0A424547494E3A564556454E540
D0A43415445474F<Ctrl-Z>
<CR><LF>OK<CR><LF>

at^sbnw="vcs",20,2,3<CR>
<CR><LF> > <Space>
524945533A414E4E4956455253415259 0D0A445453544152543A313939393132313354313030303030300D0A4
4455343524950<Ctrl-Z>
<CR><LF>OK<CR><LF>

at^sbnw="vcs",20,3,3<CR>
<CR><LF> > <Space>
54494F4E3A572E20766F6E205369656D656E730D0A454E443A564556454E540D0A454E443A5643414C454
E4441520D0A<Ctrl-Z>
<CR><LF>OK<CR><LF>

All characters are answered with an echo. Echoing can be switched off via „ATE0“.
In this example the organizer entry is uploaded in 50 bytes packets (100 input characters in every PDU).
Characters in blue characterize the responses of the mobile.

-interrogation of the current <type>,<subtype>,<actNumber>,<maxNumber>

at^sbnw?<CR>
<CR><LF>^SBNW: "vcs",20,2,3<CR><LF>
<CR><LF>OK<CR><LF>

description: The current object which is uploaded is an VCS object.
It has to be stored on record 20.
2 of 3 packets have already been uploaded.

-deleting of record 20

at^sbnw="vcs",20,0<CR>
<CR><LF>OK<CR><LF>

-download entry from record 20

at^sbnr="vcs",20<CR>
<CR><LF>^SBNR:<space>"vcs",20,1,1<CR><LF>
424547494E3A5643414C454E4441520D0A56455253494F4E3A312E300D0A424547494E3A564556454E540
D0A43415445474F524945533A414E4E4956455253415259 0D0A445453544152543A313939393132313354313
30303030300D0A4445534352495054494F4E3A572E20766F6E205369656D656E730D0A454E443A56455645
4E540D0A454E443A5643414C454E4441520D0A<CR><LF>
<CR><LF>OK<CR><LF>

The mobile divides the record entry into packets of 176 byte (=176*2 characters).

-Download of an empty record 20

at^sbnr="vcs",20<CR>
<CR><LF>OK<CR><LF>

-Test command of AT^SBNW

at^sbnw=?<CR>
<CR><LF>^SBNW:<space>("bmp",(0)),(„mid“,(0)),(„vcs“,(1-30)) <CR><LF>
<CR><LF>OK<CR><LF>

description: The mobile supports bitmaps of subtype `0`, midi obects of subtype 0 and vcs objects of the subtypes `1` to `30`.

2.8.2 Examples and hints for using GPRS commands

2.8.2.1 Defining and using a Context Definition Id (CID):

Every time a CID is used as a parameter for a GPRS command the CID has to be defined first via the AT+CGDCONT command.
To retrieve the parameter of a CID the AT+CGDCONT read option must be used.
If the response of AT+CGDCONT? is OK only, no CID is defined.

```
AT+CGDCONT?
OK                          // no CID defined
```

All parameters of the CID are initiated by NULL or non-existing values, and the CID itself is set to undefined.
To define a CID use the AT+CGDCONT command with at least one CID parameter.
The present version of the mobile software supports CID 1 and CID 2 by using the AT+CGDCONT command.
e.g.

```
AT+CGDCONT=1,IP
OK                          // defines CID 1 and sets the PDP type to IP
                            // access point name and IP address aren't set

AT+CGDCONT=2,IP, "internet.t-d1.gprs", 111.222.123.234
OK                          // defines CID 2 and sets PDP type, APN and IP addr
```

A subsequent read command will return

```
AT+CGDCONT?
+CGDCONT:1,IP
+CGDCONT:2,IP," internet.t-d1.gprs",111.222.123.234
OK

AT+CGDCONT=1
OK                      // sets the CID 1 to be undefined
```

A subsequent read command will return

```
AT+CGDCONT?
+CGDCONT:2,IP, "internet.t-d1.gprs",111.222.123.234
OK
```

2.8.2.2 Defining Quality of service for a CID

Quality of Service (QoS) is a special parameter of a CID which again consists of several parameters.
The QoS consists of

- the precedence class
- the delay class
- the reliability class
- the peak throughput class
- the mean throughput class

and is subdivided into "requested QoS" and "minimum acceptable QoS".

All parameters of the QoS are initiated by default to the "network subscribed value (= 0)", but the QoS itself is set to undefined. Use the AT+CGQREQ or AT+CGQMIN command to define a QoS.
e.g.:

```
AT+CGQREQ=1,2
OK              // overwrites the precedence class of QoS of CID 1 and sets
                // the QoS of CID 1 to be present
```

A following read command will response

```
AT+CGQREQ?
+CGQREQ: 1,2,0,0,0,0
OK                  // all QoS values of CID 1 are set to network subscribed
                    // except precedence class which is set to 2

AT+CGQREQ=1
OK                  // set the QoS of CID 1 to not present
```

After defining a CID it could be activated. To activate a CID use

```
AT+CGACT=1,2
OK                  // activate CID 2
```

If the CID is already active, the mobile immediately returns OK.

If no CID is given, all CIDs defined will be activated by means of

```
AT+CGACT=   // NO CID and NO STATE given
OK                  // all defined CIDs will be activated
```

If no CID is defined the mobile returns ++CME ERROR: invalid index
Remark: If the mobile is NOT attached via AT+CGATT=1 before activating, the attach is automatically done by means of the AT+CGACTcommand.

After a CID has been defined and activated, it can be used using AT commands as in the following example:

```
AT+CGDATA=PPP,1
CONNECT                 // the mobile is connected using the parameters of CID 1

AT+CDATA=
CONNECT                 // the mobile is connected using default parameter
```

The mobile supports Layer 2 Protocol (L2P) PPP only.
Remark: If the mobile is NOT attached by means of AT+CGATT=1 and if the CID is NOT activated before connecting, the attach and activate is automatically done by means of the AT+CGDATA command.

2.8.3 The GPRS dial command ATD

As an alternative to using the GPRS-AT commands it is possible to connect to a GPRS network by using the dial command "atD".

There are two GPRS Service Codes for the ATD command. Values 98 and 99.
e. g.:

```
ATD*99#
CONNECT          // establish a connection via service code 99


ATD*99*123.124.125.126*PPP*1#
CONNECT          // establish a connection via service code 99, IP address 123…
                 //and L2P = PPP and using CID 1.
                 // The CID has to be defined by means of AT+CGDCONT


ATD*99**PPP#
CONNECT          // establish a connection via service code 99 and L2P = PPP


ATD*99***1#
CONNECT          // establish a connection via service code 99 and using CID 1


ATD*99*PPP*1#
CONNECT          // establish a connection via service code 99 and L2P = PPP and
                 // using CID 1. The CID has to be defined by means of AT+CGDCONT


ATD*98#
CONNECT          // establish an IP connection via service code 98

ATD*98*1#
CONNECT          // establish an IP connection via service code 98 using CID 1
                 // The CID has to be defined by means of AT+CGDCONT
```

3 Errors and Messages

This section provides information on the final result code of a command execution (+CMS ERROR: <err>) and indicates an error related to mobile equipment or network.

3.1 Summary of CME ERRORS related to GSM 07.07

Table 3-1 lists the numbers and meaning of CME errors related to GSM 07.07.
***Note**: Values smaller than 256 are reserved.*

Code of <err>	Meaning
0	phone failure
1	no connection to phone
2	phone-adapter link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	invalid index
22	not found
23	Memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	Network timeout
32	Network not allowed emergency calls only
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
100	Unknown
256	Operation temporarily not allowed
257	call barred
258	phone is busy
259	user abort
260	invalid dail string
261	ss not executed
262	SIM blocked

Table 3-1: CME ERRORS related to GSM 07.07

3.2 Summary of CMS ERRORS related to GSM 07.05

Table 3-2 lists the numbers and meaning of CMS errors related to GSM 07.05:

<err> code	Meaning
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be actioned
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure

301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error
512	User abort

Table 3-2: CMS ERRORS related to GSM 07.05

3.3 GPRS return values issued by AT+CEER

Table 3-3 lists the GPRS return values issued by the AT+CEER command in the form <x>.<y>, where x indicates the type of the value returned and y denotes the reason why the call was terminated. Table 3-3 provides the values for the applications handled by AT+CEER (x values). For more detailed information on meaning of the y values see tables Table 3-4 through Table 3-9:

Value	Meaning
48	GMM_LOC_GSM (see section 3.3.1)
50	SM_LOC_GSM (see section 3.3.2)
51	SM_LOC_OWN (see section 3.3.3)
241	GAPI_LOC_OWN (see section 3.3.4)
242	LMAN_LOC_OWN (see section 3.3.5)
243	ENIP_LOC_OWN (see section 3.3.6)

Table 3-3 GPRS return values

3.3.1 GMM-GSM return values issued by AT+CEER (GMM_LOC_GSM)

Value	Meaning
2	IMSI is unknown in HLR
3	MS is illegal
6	ME is illegal
7	GPRS services not allowed
8	GPRS services not allowed in combination with non-GPRS services
9	MS cannot be identified
10	Implicit detachment
11	PLMN not allowed
12	Location area not allowed
13	Roaming not allowed in current location area
14	GPRS services not allowed in current PLMN
16	MSC temporarily unreachable
17	Network failure
22	Congestion
48 – 63	Retry upon entry into new cell low – high
95	Message semantically incorrect
96	Mandatory information invalid
97	Message type does not exist or is not implemented
98	Message type incompatible with protocol state
99	Information element does not exist or is not implemented
100	Conditional error
101	Message incompatible with protocol state
111	Unspecified protocol error

Table 3-4: GMM return values issued by AT+CEER

3.3.2 SM-GSM return values issued by AT+CEER (SM_LOC_GSM)

Value	Meaning
25	LLC or SNDCP failure
26	Insufficient resources
27	Missing or unknown APN
28	PDP address or type unknown
29	User authentication failed
30	Activation rejected by GGSN
31	Activation rejected for unspecified reason
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
35	NSAPI already used
36	Regular deactivation
37	QoS not accepted
38	Network failure
39	Reactivation required
81	Invalid transaction identifier value
95	Message semantically incorrect
96	Mandatory information invalid
97	Message type does not exist or is not implemented
98	Message type incompatible with protocol state
99	Information element does not exist or is not implemented
100	Conditional IE error
101	Message incompatible with protocol state
111	Unspecified protocol error

Table 3-5: GMM return values issued by AT+CEER

3.3.3 SM_OWN return values issued by AT+CEER (SM_LOC_OWN)

Value	Meaning
3	T3380 timer expired
4	DeactAct
5	DeactActReject
6	DeactActStaticPDPaddressCollision
7	Unspecified protocol error

Table 3-6: GAPI return values issued by AT+CEER

3.3.4 GAPI return values issued by AT+CEER (GAPI_LOC_OWN)

Value	Meaning
0	Regular deactivation of the call
1	Action temporarily not allowed
2	Wrong connection type
3	Specified data service profile invalid
4	PDP type or address is unknown
255	Undefined

Table 3-7: GAPI return values issued by AT+CEER

3.3.5 LMAN return values issued by AT+CEER (LMAN_LOC_OWN)

Value	Meaning
0	Regular call deactivation
1	Action temporarily not allowed
2	Bearer invalid
3	Specified data service profile invalid
4	GPRS profile invalid
5	CSD profile invalid
17	Modem in use
18	Modem not responding
19	Modem error
20	Timeout while waiting for modem
21	Modem nocarrier
22	Modem no dialtone
23	Modem busy
24	Modem dial timeout
25	Modem call lost
255	Undefined

Table 3-8: LMAN return values issued by AT+CEER

3.3.6 ENIP return values issued by AT+CEER (ENIP_LOC_OWN)

Value	Meaning
0	Regular call deactivation
1	LCP stopped
255	Undefined

Table 3-9: ENIP return values issued by AT+CEER

3.4 Result codes

Table 3-10 lists the numbers of result codes and provides their meaning:

Indication	Numeric	Meaning
OK	0	Command executed, no errors, Wake up after reset
CONNECT	1	Link established
RING	2	Ring detected
NO CARRIER	3	Link not established or disconnected
ERROR	4	Invalid command or command line too long
NO DIALTONE	6	No dial tone, dialling impossible, wrong mode
BUSY	7	Remote station busy
CONNECT 2400	10	Link with 2400 bps
CONNECT 4800	30	Link with 4800 bps
CONNECT 9600	32	Link with 9600 bps
CONNECT 14400	33	Link with 14400 bps
CONNECT 2400/RLP	47	Link with 2400 bps and Radio Link Protocol
CONNECT 4800/RLP	48	Link with 4800 bps and Radio Link Protocol
CONNECT 9600/RLP	49	Link with 9600 bps and Radio Link Protocol
CONNECT 14400/RLP	50	Link with 14400 bps and Radio Link Protocol

Table 3-10: Result codes

3.5 List of *# codes

The commands listed in Table 3-11 can be used with ATD (only for voice calls):

*# code	Functionality	Possible response(s)
*#06#	Query IMEI:	<IMEI> / OK
**04[2]*oldPin*newPin[2]*newPin[2]#	Change SIM pwd:	+CME ERROR/ OK
**05[2]*unblKey*newPin[2]*newPin[2]#	Change/Unblocking SIM pwd:	
[*]03[ZZ]*oldPw*newPw*newPw#	Registration of network password:	
*#30#	Interrogation CLIP	AT+CLIP / OK
*#31#	Interrogation CLIR	AT+CLIR : <n>,<m> OK
*#76#	Interrogation COLP	AT+COLP : 0,<m> OK
*#77#	Interrogation COLR (Connection line interpretation restriction)	+COLR : 0,<m> OK
(choice of *,#,*#,**,##)21*DN*BS#	Act/deact/int/reg/eras CFU	AT+CCFC
(choice of *,#,*#,**,##)67*DN*BS#	Act/deact/int/reg/eras CF busy	
(choice of *,#,*#,**,##)61*DN*BS*T#	Act/deact/int/reg/eras CF no reply	
(choice of *,#,*#,**,##)62*DN*BS#	Act/deact/int/reg/eras CF no reach	
(choice of *,#,*#,**,##)002*DN*BS*T#	Act/deact/int/reg/eras CF all	
(choice of *,#,*#,**,##)004*DN*BS*T#	Act/deact/int/reg/eras CF all cond.	
(choice of *,#,*#)43*BS#	Activation/deactivation/int WAIT	AT+CCWA
(choice of *,#,*#)33*Pw*BS#	Act/deact/int BAOC	AT+CLCK
(choice of *,#,*#)331*Pw*BS#	Act/deact/int BAOIC	
(choice of *,#,*#)332*Pw*BS#	Act/deact/int BAOIC exc.home	
(choice of *,#,*#)35*Pw*BS#	Act/deact/int. BAIC	
(choice of *,#,*#)351*Pw*BS#	Act/deact/int BAIC roaming	
#330*Pw*BS#	Deact. All Barring Services	
#333*Pw*BS#	Deact. All Outg.Barring Services	
#353*Pw*BS#	Deactivation. All Inc.Barring Services	

Table 3-11: List of *# codes

The abbreviations used in Table 3-11 have the following meaning:

ZZ	type of supplementary services	Barring services	330
ZZ		All services	----
DN	dialling number	string of digits	0-9
BS	basic service:Voice	Voice	11
		Sms	16
		Fax	13
		Sms+fax	12
		Voice+fax	19
		Voice+sms+fax	10
		Data circuit asyncron	25
		Data circuit syncron	24
		PAD	27
		packet	26
		data circuit async.+PAD	21
		data circuit sync.+packet	22
		data circ.Async+sync.+PAD+ packet	20
		all services	----
T	time in seconds		
Pw	network password		

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