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AT command set for XX 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 <master> Siemens mobile phones.

1.2 Abbreviations and glossary

The following abbreviations and terms are used throughout this specification:

Abbreviation / Term	Meaning
ALS	Alternate Line Service
CSD	Circuit Switched Data
CTS	Clear to send
CUG	Closed User Gruop
DCE	Data Carrier Equipment
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
FDN	Fixed dialling numbers
GPP	Generation Partnership Project
IMEI	Internatonal Mobile Station Equipment Identity
IMSI	International Mobile Subscriber Identity
ME	Mobile Equipment
PDU	Protocol Data Unit
PIN	Personal Identification Number
PPP	Point-to-Point Protocol
PUK	PIN Unblocking Key
RLP	Radio Link Protocol
RTS	Ready to send
SIM	Subscriber Identity Module
SNDCP	Subnetwork Dependency Convergence Protocol
SWIM	Smart card that has both SIM and WIM applications
TA	Terminal Adapter
TE	Terminal Equipment
UDI	Unrestricted Digital Information
WIM	Wireless Identification Module

1.3 Notational Conventions

The following notational conventions apply throughout this manual:

Convention	Meaning
Case sensitivity	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”. Throughout this manual, “AT” is used
007	Leading zeroes in strings can be omitted
`Letters and digits`	Letters and digits in the `Courier New` font indicate parameter names and values
abc	Underlined parameter values indicate the recommended default setting of this

	parameter. In *parameter type* commands, this value should be used in factory settings which are configured by V.250 command `&F0`. In *action type* commands, this value should be used when parameter is not given
" … "	Double quotes (") are used to indicate text strings
@	Symbols (e. g. @) inside quotes are interpreted as text strings
Comma (,)	Commas are used as delimiters for strings which are not included in double quotes
Spaces	Spaces inside strings are ignored unless they are included in double quotes
<CR>	Carriage return character as specified with the S3 command
<LF>	Linefeed character as specified with the S4 command
< .. >	Angle brackets are used to denote a syntactical element. Angle brackets do not appear in the command line
[…]	Square brackets are used to indicate that a parameter of a command or part of TA information response is optional. Square brackets do not appear in the command line. If a parameter is omitted in a command that has parameters, the parameter retains its present value. In action type commands, action should be done on the basis of the recommended default setting of the parameter If an optional parameter ([`<value>`]) is omitted in V.250 commands, its assumed value is `0`

1.4 Related documentation

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

1.4.1 Related internal documentation

The following internal documents are related to the current document:

[1] Design Specification K1-Sat

[2] "(Unsolicited) result codes issued by Remote Control-related calls"

1.4.2 Related Standardisation documentation

The following standardisation documents are related to the current document:

[3] GSM 02.22: "Digital cellular telecommunication system (Phase 2+); Personalisation of GSM Mobile Equipment (ME) Mobile functionality specification".

[4] GSM 02.30: "Digital cellular telecommunication system (Phase 2+); Man-Machine Interface (MMI) of the Mobile Station (MS)".

[5] GSM 03.38: "Digital cellular telecommunication system (Phase 2+); Alphabet and language specific information".

[6] GSM 03.40: Digital cellular telecommunications system (Phase 2+);Technical realization of the Short Message Service (SMS) Point-to-Point (PP)

[7] GSM 03.41: "Digital cellular telecommunications system (Phase 2+); Technical realization of Short Message Service Cell Broadcast (SMSCB)".

[8] GSM 04.08: "Digital cellular telecommunication system (Phase 2+); Mobile radio interface layer 3 specification".

[9] GSM 04.11: "Digital cellular telecommunication system (Phase 2+); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[10]GSM 05.08: "Digital cellular telecommunication system (Phase 2+); Radio subsystem link control".

[11]GSM 11.11: Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME)

[12]

[13]3GPP TS 24.008: "3rd Generation Partnership Project; Mobile Radio Interface Layer 3 specification; Core Network Protocols-Stage 3".

[14]3GPP TS27.005: "Digital cellular telecommunication system (Phase 2+); Radio transmission and reception".

[15]3GPP S 27.007: "Digital cellular telecommunications system (Phase 2+);AT command set for GSM Mobile Equipment (ME)

[16]ITU-T Draft new Recommendation V.250 “Serial asynchronous automatic dialling and control”

[17]ITU-T Recommendation T.31: "Asynchronous facsimile DCE control, service class 1"

[18]ITU-T Recommendation T.32: "Asynchronous facsimile DCE control, service class 2"

[19]Hands-free Profile Adopted Version 1.0, 2003-04-29, by Bluetooth SIG Car Working Group; Doc no. CAR_x_SPEC/V1.0)

[20]TR29.2: Standards Proposal No. 2388, Proposed New Standard “Asynchronous Facsimile DCE Control Standard” (if approved, to be published as EIA/TIA-592), October 1990

[21]V29: 9600 bits per second modem standardized for use on point-to-point 4-wire leased telephone-type circuits

[22]ITU-T Draft new Recommendation V27ter: 4800/2400 bits per second modem standardized for use in the general switched telephone network

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 3GPP TS 27.007 AT commands in alphabetical order, and indicates the type of command as defined in the 3GPP TS 27.007 standard:

27.007 command	Function	Type of command	Page
AT+CACM	Accumulated call meter	Mobile equipment control	35
AT+CALM	Alert sound mode	Mobile equipment control	35
AT+CAMM	Accumulated call meter maximum	Mobile equipment control	35
AT+CAOC	Advice of charge	Network service	23
AT+CBC	Battery charge	Mobile equipment control	36
AT+CBST	Select bearer service type	Modem command	76
AT+CCFC	Call forwarding number and conditions	Network service	23
AT+CCLK	Clock	Mobile equipment control	36
AT+CCWA	Call waiting	Network service	24

		control	
AT+CPBR	Read a telephone-book entry	Mobile equipment control	42
AT+CPBS	Select a telephone book	Mobile equipment control	42
AT+CPBW	Write a telephone-book entry	Mobile equipment control	43
AT+CPIN	Enter PIN and query lock	Mobile equipment control	43
AT+CPOL	Preferred operator list	Network service	32
AT+CPUC	Price per unit and currency table	Mobile equipment control	44
AT+CPWD	Change password to a lock	Network service	32
AT+CR	Service reporting control	General	21
AT+CRC	Cellular result codes	General	22
AT+CREG	Network registration	Network service	33
AT+CRLP	Select radio link protocol parameter for originating non-transparent data call	Modem command	77
AT+CRMP	Ring Melody Playback	Mobile equipment control	45
AT+CRSL	Ringer sound level	Mobile equipment control	45
AT+CRSM	Restricted SIM access	Mobile equipment control	45
AT+CSCS	Select TE character set	General	20
AT+CSQ	Output signal quality	Mobile equipment control	46
AT+CSSN	Supplementary service notifications	Network service	34
AT+CTZR	Time Zone Reporting		47
AT+CTZU	Automatic Time Zone Update		47
AT+CVIB	Vibrator mode	Mobile equipment control	47
AT+GSN	Output the serial number (IMEI)	General	20
AT+VTD	Set duration of a DTMF tone	TIA IS101	67
AT+VTS	Send a DTMF tone	TIA IS101	68
AT+WS46	Select wireless network	General	20

Table 2-1: Supported 3GPP TS 27.007 commands [15]

Table 2-2 lists all the supported 3GPP TS 27.005 AT commands in alphabetical order, and indicates the type of command as defined in the 3GPP TS 27.005 standard:

27.005 commands	Function	Type of command	Page
AT+CMGC	Send an SMS command	Message sending and writing	68
AT+CMGD	Delete an SMS in the SMS memory	Message sending and writing	69
AT+CMGF	SMS format	General configuration	69
AT+CMGL	List SMS	Message receiving and reading	69
AT+CMGR	Read in an SMS	Message receiving and reading	70
AT+CMGS	Send an SMS	Message sending and writing	70
AT+CMGW	Write an SMS to the SMS memory	Message sending and writing	71

AT+CMMS	More (Short) Message to Send	Message sending and writing	71
AT+CMSS	Send an SMS from the SMS memory	Message sending and writing	72
AT+CNMA	Acknowledgment of a short message directly output	Message receiving and reading	72
AT+CNMI	New	Message receiving and reading	72
AT+CPMS	Preferred SMS message storage	General configuration	74
AT+CSCA	Address of the SMS service centre	Message configuration	75
AT+CSCB	Select cell broadcast messages	Message configuration	75
AT+CSMS	Selection of message service	General configuration	76

Table 2-2: Supported 3GPP TS 27.005 commands [14]

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

Command	Function	Page
AT+GCAP	Request Capabilities List	93
AT+IPR	Fixed DTE rate	93

Table 2-3: Supported commands according to ITU-T Recommendation V.250 [16]

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

Command	Function	Page
AT+FBADLIN	Define or read number of bad lines	78
AT+FBADMUL	Define, read or test number of bad lines	79
AT+FBOR	Query the bit order for receive mode	79
AT+FCIG	Query or set the Local polling id	80
AT+FCLASS	Select, read or test FAX service class	81
AT+FCQ	Control Copy Quality	80
AT+FCR	Capability to receive	81
AT+FDCC	Select service for MO SMS messages	81
AT+FDFFC	Data Compresssion Format Conversion	82
AT+FDIS	Query or set session parameters	83
AT+FDR	Begin or continue phase C data reception	85
AT+FDT	Data Transmission	85
AT+FET	End a page or document	86
AT+FK	Kill operation, orderly FAX abort	86
AT+FLID	Query or set session parameters	86
AT+FMDL	Identify Product Model	87
AT+FMFR	Request Manufacturer Identification	87
AT+FOPT	Set bit order independently	88
AT+FPHCTO	DTE Phase C Response Timeout	88
AT+FREV	Identify Product Revision	88
AT+FRH	Receive Data Using HDLC Framing	88
AT+FRM	Receive Data	89
AT+FRS	Receive Silence	89
AT+FTH	Transmit Data Using HDLC Framing	89
AT+FTM	Transmit Data	90
AT+FTS	Stop Transmission and Wait	90
AT+FVRFC	Vertical resolution format conversion	90

Table 2-4: Supported commands according to ITU-T Recommendation TR29.2 [20]

Table 2-5 lists all the supported Bluetooth-related AT commands in alphabetical order:

Command	Function	Page
AT+BINP	Phone number corresponding to the last voice tag recorded in the HF	91
AT+BLDN	Redial Last Number	91
AT+BRSF	Report Supported Features	92
AT+NREC	Noise Reduction and Echo Canceling	92
AT+VGS	Gain of the Speaker Volume	92
AT^SABD	Accessory for Bluetooth Data	93
AT^SPTT	Push To Talk	113

Table 2-5: Supported Bluetooth-related commands [19]

Table 2-6 lists all the supported Siemens-specific AT commands in alphabetical order:

Command	Function	Page
AT^SABD	Accessory for Bluetooth Data	93

AT^SACD	Accessory Data	94
AT^SACM	Output ACM (accumulated call meter) and ACMmax	95
AT^SADT	Application Data Transfer	95
AT^SBLK	Clear black list	95
AT^SBMH	Bookmark Handling	96
AT^SBNR	Binary Read	
AT^SBNW	Binary Write	97
AT^SCCM	CC Monitor	98
AT^SCID	Output card ID	100
AT^SCKA	Display SIM card status	100
AT^SCKS	Display SIM unsolicited card status	100
AT^SCNI	Output call number information	101
AT^SDBR	Database Read	101
AT^SDLD	Delete the ”last number redial” memory	102
AT^SDLY	Delay Command	102
AT^SGAUTH	Select Type of Authentication for PPP connection	102
AT^SGDCONT	Define PDP Context	102
AT^SGDV	GPRS data volume	103
AT^SICO	Icon control	104
AT^SIFS	Query InterFace Setting	104
AT^SKPD	Keypad control single key	104
AT^SLCK	Switch locks (including user-defined locks) on and off	105
AT^SLNG	Language settings	106
AT^SMGL	List SMS (without status change from *unread* to *read)*	106
AT^SMGO	SMS overflow indicator	107
AT^SMGR	Read SMS	107
AT^SMSO	Switch device off	108
AT^SNFS	Select NF hardware	108
AT^SNFV	Set the volume	108
AT^SOBX	Set OBEX Debug Level	109
AT^SPBA	Query active phonebook book	109
AT^SPBC	Seek the first entry in the sorted telephone book which begins with the selected (or next available) letter	109
AT^SPBG	Read entry from the sorted telephone book via the sorted index	110
AT^SPBS	Select a telephone book (including Siemens-specific books)	110
AT^SPIC	Output PIN counter	111
AT^SPLM	Read the PLMN	112
AT^SPLR	Read an entry from the preferred-operator	112
AT^SPLW	Write an entry to the preferred-operator	112
AT^SPST	Play Signal Tone	112
AT^SPTT	Push To Talk	113
AT^SPWD	Change password to a lock (including user-defined locks)	113
AT^SQWE	Switch Mode for External Interface	114
AT^SRMP	Ring Melody Playback	114
AT^SSET	Profile Settings Control (SET Melody and Picture settings in Mobile	115
AT^SSTK	SIM Toolkit	116
AT^STRC	Activate Universal Data Tracer	119
AT^SVMC	Voice Memo Control	116

Table 2-6: 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 3GPP TS 27.007 [15] and 3GPP TS 27.005 [14] specifications, as well as several manufacturer-specific AT commands. These commands are described in more detail in section 2.2.4.

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 "V.250" specification [16] 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".

2.2.1 Commands that can be executed without the PIN

The following commands can be executed without entering the PIN:

AT&C	AT^SMSO	AT+CGSN	AT+CTZR
AT&D	AT^SOBX	AT+CIND	AT+CVIB
AT&F	AT^SPIC	AT+CKPD	AT+GCAP
AT&V	AT^SPST	AT+CLCK	AT+GMI
AT^SACD	AT^SPWD	AT+CLVL	AT+GMM
AT^SADT	AT^SQWE	AT+CMEC	AT+GMR
AT^SAPO	AT^SRMP	AT+CMEE	AT+GSN
AT^SQWE	AT^STRC	AT+CEER	AT+IPR
AT^SCCM	AT^SVMC	AT+CMUT	AT+VTD
AT^SCKA			AT+WS46
AT^SCKS	AT^S_MI	AT+CPAS	ATA
AT^SDLY	AT^S_PM	AT+CPIN	ATD
AT^SFCB	AT+CALM	AT+CPWD	ATE
AT^SFLG	AT+CBC	AT+CREG	ATH
AT^SGAUTH	AT+CCLK	AT+CRMP	ATI
AT^SIFS	AT+CGMI	AT+CRSL	ATO
AT^SKPD	AT+CGMR	AT+CSCS	ATQ
AT^SLCK	AT+CGMM	AT+CSQ	
ATS0..7	ATX	AT\Q	
ATV	ATZ		

2.2.2 Commands that can be interrupted

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 following commands can be interrupted:

AT^SBNR	AT^SKPD	AT^SPLM	AT^SSTK
AT^SBNW	AT^SMGL	AT^SPLR	AT^SVMC
AT^SDBR	AT^SMGR	AT^SPLW	AT+CGACT

AT+CGATT	AT+CMGL	AT+COPS	ATA
AT+CGCMOD	AT+CMGR	AT+CPBR	ATD
AT+CHLD	AT+CMGS	AT+CPBS	
AT+CMGC	AT+CMGW	AT+CPBW	
AT+CMGD	AT+CMSS	AT+VTS	

2.2.3 Generic TA control commands according to ITU-T V.250

The generic TA control commands ("Hayes standard commands") correspond to the commands of AT Hayes compatible modems.

All commands in Table 2-7 expect a numeric argument; if this argument is omitted, the default of `0` is assumed.

Command	Function
AT...	Prefix for all commands
ATA	Accept call (V.250, according to [16])
ATB[*n*]	This modem command is used to set the bearer service for data connections (cf. AT+CBST). can take one of the following values: <n> 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 <dial_string>[;]	Dial command. For more detailed information see the ATD command section on page 16
ATE0	Deactivate command echo
ATE1	Activate command echo
ATH[0]	Release existing connection
ATI[n]	Modem command according to [16]: 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 [16])
ATM[*n*]	Monitor speaker mode (modem command according to [16])
ATO[*n*]	Switch back to transparent mode after +++ interruption (modem command according to [16])
ATQ0	Display acknowledgments (responses or messages)

Command	Function
ATQ1	Suppress acknowledgments (responses or messages)
ATSn=x	Write value x to S register n (modem command according to [16])
ATSn?	Display value of S register n (modem command according to [16]) ***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<n>	Report link with CONNECT only ignore busy signal <n> can take one of the following values: 1 Report link with CONNECT plus baud rate, ignore busy signal 2 same as ATX1 3 same as ATX, but report BUSY 4 same as ATX, t report BUSY
ATZ	Set to default configuration
AT&C<n>	Circuit 109 (Received line signal detector / DCD) behaviour <n> can take one of the following values: 0 DCD always ON 1 DCD ON if carrier detected
AT&D[n]	Circuit 108 (Data terminal ready / DTR) behaviour **Note**: The AT&D<n> commands described below take no effect since circuit 108 is not supported in this type of mobile phone. See section 3.3 for more information on which circuit assignments are supported. <n> can take one of the following values: 0 DTR ignored 1 On DTR ON to OFF: go to online command mode, do not disconnect 2 On DTR ON to OFF: disconnect go to command mode. Automatic answer is disabled while DTR OFF.

Command	Function
AT&F[0]	Resets all current parameters of the following AT commands to their factory profile: ATE, ATQ, ATV, AT&\Q, AT&C, AT&D, AT&S , AT+VTS, ATX AT+CAOC, AT+CBST, AT+CCWA, AT+CEER, AT+CLIP, AT+CMEC, AT+CMEE, AT+CMER, AT+CNMI, AT+COLP, AT+COPS, AT+CPOL, AT+CPMS, AT+CPBS, AT+CR,, AT+CRC, AT+CREG, AT+CRLP, AT+CSCS, AT+CSMS, AT+CSSN, AT^SACM, AT^SCKS, AT^SMGO, S parameters If GPRS is supported then also the following GPRS commands are affected: AT+CGAUTO, AT+CR, AT+CGEREP, AT+CGREG Only for Master Document: AT^SACD, AT^SADT Any existing connections will be terminated. No other commands are accepted on the same command line.
AT&\N	No action (\N2 - \N6) \N2 \N3 \N4 \N5 \N6
AT&\Q<n	Local flow control selection (DTE ↔ DCE); can be customized <n> can take one of the following values: 0 Disable flow control 1 XON-XOFF software flow control 2 CTS only flow control 3 RTS/CTS flow control
AT\V[n]	Modem command 0 No /REL or /RLP appendix with the CONNECT message 1 /REL or /RLP appendix with the CONNECT message
AT+GMI	request TA manufacturer identification (see AT+CGMI)
AT+GMM	request TA model identification (see AT+CGMM)
AT+GMR	request TA revision identification (see AT+CGMR)
AT+GSN	request TA serial number identification (see AT+CGSN)

Table 2-7: Generic TA control commands supported according to ITU-T V.25

The ATD command

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. The ATD command can be used to create three types of calls:

- voice calls
- CSD data call / fax calls
- GPRS data calls

ATD for voice calls

To dial for a voice call the trailing semicolon (;) is required. The following syntax for a voice call is supported:

Command	Function
ATD<str>;	Dial the dialing string <str> with the voice utility Valid dial modifiers: g G The next call is treated as a closed user group call I restrict AT+CLIR i suppress AT+CLIR for next call T tone dialing P pulse dialing is ignored The trailing character ";" indicates that the call is to be set up with the voice utility. 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. A special form of the dial command is a GPRS data call. The syntax for setting up such a GPRS data call is: ATD*<99>[*[<called_address>] [*[<L2P>][*[<cid>]]]]# ATD*<98>[*<cid>]# See also section 4.3
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 "analog" call (2400 / 4800 / 9600 / 14400 bps). PP Plus: same as + character
ATDL	Dial last telephone number

ATD for CSD data call or FAX calls

To dial for a CSD data call or a FAX call the trailing semicolon (;) must not be used The following syntax for a CSD data/Fax call is supported:

ATD<type><number>	Dial command for modem and fax calls The selection if either a data or fax call is set up depends on the setting of the fax class. See the command AT+FCLASS for further details.	
<type>	T P	Tone or pulse dialling. Ignored as not useful for GSM calls
	I	ISDN The phone call will be made as a UDI (V.110) call. A connection to a V.110 terminal adapter will be established. The data transmission speed is the same as for an "analog" call (2400 / 4800 / 9600 / 14400 bps). See AT+CBST for further information. This parameter is ignored for fax calls. Example: AT+CBST=7 ATDI1234 and AT+CBST=71 ATD1234 will result in the same call setup parameters
	PP	PLUS: same as + character
ATDL	Dial last telephone number	

ATD for CSD data call or FAX calls

To dial for a GPRS data call the following syntax is supported:

`ATD*<GPRS_SC>[*[<called_address>] [*[<L2P>][*[<cid>[,<cid>[,…]]]]]]#`

Dial command for a GPRS data call.

<GPRS_SC>		GPRS service code
	99	request to use the Packet Domain service
<called_address>		A IP-address (IPv4, IPv6)
<L2P>		Layer 2 protocol
	PPP	The protocol used for connect the MT to external device.
<cid>	1-3	PDP context identifier

`ATD*<GPRS_SC_IP>[*<cid>[,<cid>[,…]]]#`

Dial command for a GPRS data call.

<GPRS_SC_IP>		GPRS service code
	98	request to use the GPRS with IP (PDP types IP and PPP)

	<cid>	1-3	PDP context identifier

Notes for GPRS calls:

1) The ATD command for GPRS always includes an attach if the mobile is currently detached. The attach may last for some time (up to 60 seconds). During attach the command is interruptible
2) If no <cid> is given in the ATD command a predefined PDP context without an Access Point Name is used for dialing. But maybe it is demanded by the network operator so the dial fails and issues an error message.
3) It is not possible to use a <cid> which is already active for the ATD command.

2.2.4 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:

- General commands according to ITU-T Recommendation V.250 combined with Fax commands
- General commands according to 3GPP TS 27.007 combined with Siemens defined commands
- General commands according to 3GPP TS 27.005 specified stand-alone

2.3 AT commands and responses according to 3GPP TS 27.007

According to 3GPP TS , it is possible to execute an AT command in any of the following forms:

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

Table 2-8: Conventions applying to the presentation of AT commands

2.3.1 General commands according to 3GPP TS 27.007

This section provides the descriptions of general 3GPP TS 27.007 commands [10].

ATO

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

AT+CGMI

AT+CGMI	Issue manufacturer ID code
Test command AT+CGMI=?	Response: OK
Execute command	Response

AT+CGMI	<manufacturer>
	Parameter: <manufacturer> Name of manufacturer (SIEMENS)

AT+CGMM

AT+CGMM	Issue model ID code
Test command AT+CGMM=?	Response: OK
Test command AT+CGMM	Response: <model>
	Parameter: <model> Name of telephone (MOBILE)

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

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

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)

AT+CKPD

AT+CKPD	Keypad control
Test command AT+CKPD=?	Response: OK/ERROR/+CME ERROR
Write command AT+CKPD=<keys>[,<time>[,<pause>]]	
	Response:

	OK/ERROR/+CME ERROR		
	Parameter:		
	<keys>	string of characters representing keys (see section 5.5 for a list of implemented keys)	
	<time>	0...255	time in tenths of seconds (0.1 seconds) that each key must be pressed
		3	Default: = 0.3 sec
	<pause>	0...255	length of pause in tenths of seconds (*0.1 seconds) that may elapse between two key presses
Note:	Keypad handling has to be enabled prior to executing this command by means of the AT+CMEC=2 command.		

AT+CSCS

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

AT+GSN

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

AT+WS46

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

Read command AT+WS46?	Response: <n> OK/ERROR/+CME ERROR
	Parameter: <n> See Test command
Write command AT+WS46=[<n>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <n> See Test command

2.3.2 Call control commands

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

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 see section 5.3.

AT+CHUP

AT+CHUP	Hangup call
Test command AT+CHUP=?	OK/ERROR/+CME ERROR
Execute command AT+CHUP	Response: OK/ERROR

For more detailed information see [2].

AT+CR

AT+CR	Service reporting control
Test command	Response:
AT+CR=?	+CR: (list of supported <mode>s) OK/ERROR/+CME ERROR Parameter: <mode> 0 disables reporting 1 enables reportingIf enabled, the intermediate result code +CR: <serv> is returned from the TA to the TE before the intermediate result code CONNECT is transmitted.
Read command AT+CR?	Response: +CR: <mode> OK/ERROR/+CME ERROR
	Parameter: <mode> See Test command
Write command	Response:

AT+CR=<mode>	OK/ERROR/+CME ERROR
	Parameter: <mode> See Test command
Unsolicited Result Code +CR: <serv>	
	Parameter: <serv> ASYNC For a detailed description refer to [15] SYNC REL ASYNC REL SYNC GPRS

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 reporting When enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal ring.
Read command AT+CRC?	Response: +CRC: <mode> OK/ERROR/+CME ERROR
	Parameter: <mode> See Test command
Write command AT+CRC=<mode>	
	Response OK/ERROR/+CME ERROR
	Parameter: <mode> See Test command
Unsolicited Result Code +CRING: <type>,<line> (line nur für master)	
	Parameter: <type> ASYNC For more detailed information refer to [15] SYNC REL ASYNC REL SYNC FAX VOICE VOICE DATA ALT VOICE DATA ALT DATA VOICE ALT VOICE FAX ALT FAX VOICE <line> 1 Default line 2 subscribed alternate line service (ALS); line 2

2.3.3 Network service related commands

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

AT+CAOC

AT+CAOC	Advice of charge
Test command AT+CAOC=?	Response: +CAOC: (list of supported <mode>s)
	Parameter: <mode> 0 query CCM value 1 deactivate the unsolicited reporting of CCM value 2 activate the unsolicited reporting of CCM value
Read command AT+CAOC?	Response +CAOC: <mode> Parameter: <mode> 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
Unsolicited result code +CCCM:<ccm>	

AT+CCFC

AT+CCFC	Call forwarding number and conditions
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>]]]]	
	Response: If <mode>=2 and command is successful +CCFC: <status>,<class1>[,<num>,<type>[,,,<time>]][<CR><LF> +CCFC:....] OK/ERROR/+CME ERROR
	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	Voice, Data and FAX (default)
		8	SMS
		16	data circuit sync
		32	data circuit async
		64	dedicated packet access
		128	dedicated PAD access
		X	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
	<status>	0	Inactive
		1	Active

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?	Response: +CCWA: <n> OK/ERROR/+CME ERROR		
	Parameter:		
	<n>	See Test command	
Write command AT+CCWA=[<n>,[<mode>[,<class>]]]			
	Response: If <mode>=2 and command is successful +CCWA: <status>, <class1><CR><LF>+CCWA: ....] OK/ERROR/+CME ERROR		
	Parameter:		
	<n>	See Test command	
	<mode>	0	Disable
		1	Enable
		2	Query Status
	<num>	Telephone number	
	<type>	Type of telephone number	
	<class>	1	Voice
		2	Data

		4	Fax
		7	Voice, Data and Fax (default)
		8	SMS
		16	data circuit sync
		32	data circuit async
		64	dedicated packet access
		128	dedicated PAD access
		X	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
	<status>	0	Inactive
		1	Active
Unsolicited result code: +CCWA: <num>,<type>,<class>,,<cli validity>,<alpha>,<line>			
	Parameter:		
	<alpha>	String type alphanumeric representation of <num>	
	Only for Master <line>	1	Default line
		2	subscribed alternate line service (ALS); line 2

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>]	Response: OK/ERROR/+CME ERROR		
	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)
		1<x>	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
		2<x>	Puts all active calls except call <x> (x= 1-7) on hold
		3	Connects the call put on hold to the active call multiparty
		4	Call transfer
In situations of conflict, the respective action is always applied to the waiting call. Terminating calls: Use the "AT+CHUP" command to terminate all calls except waiting calls			
Note: The scope of this command depends on the SIM clearing and/or on the network support			

AT+CLCC

AT+CLCC	List Current Calls

Test command AT+CLCC=?	Response: OK
Execute command AT+CLCC	Response: [+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>,<alpha>,<line>][<CR><LF> +CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>, <number>,<type>,<alpha>,<line> [...]]] OK/ERROR/+CME ERROR

Parameter:

<id>	Indicates the call identification number as described in subclause 4.5.5.1 of the GSM 02.30 document [4];	
	0 .. 65535	this number (integer) can be used in AT+CHLD command operations
<dir>	Specifies whether the call is mobile originated or mobile terminated	
	0	mobile originated (MO) call
	1	mobile terminated (MT) call
<stat>	Indicates the 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>	Indicates the 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
<mpty>	Specifies whether or not the call is of multiparty (conference) call parties	
	0	No (no multiparty (conference) call)
	1	Yes (multiparty (conference) call)
<number>	string type phone number in format specified by <type>	
<type>	type of address octet in integer format	
<alpha>	string type alphanumeric representation of <number>corresponding to the entry found in phonebook, character set according to the AT+CSCS command	
<line>		(Master copy only:)
	1	Default line
	2	subscribed alternate line service (ALS); line 2

AT+CLCK

AT+CLCK	Switch locking on and off **Revision to 3GPP TS 27.007 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>

AB	All barring services
AC	All incoming barring services
AG	All outgoing barring services
AI	BAIC (bar all incoming calls)
AO	BAOC (bar all outgoing calls)
CS	All incoming barring services
FD	FDN lock
IR	BIC-Roam (bar incoming calls when roaming outside the home country)
OI	BOIC (bar outgoing international calls)
OX	BOIC-exHC (bar outgoing international calls except to home country)
PC	Corporate personalization (GSM 02.22, [3])
PF	Phone locked to very first inserted SIM
PN	Network personalization (GSM 02.22, [3])
PP	Service provider personalization (GSM 02.22, [3])
PS	Phone locked to SIM (device code)
PU	Network subset personalization (GSM 02.22, [3])
SC	SIM card (PIN)

Write command
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]

Response:
If <mode>=2 and command is successful
+CLCK: <status>[,<class1>[<CR><LF>
+CLCK: <status>, class2....]]
OK/ERROR/+CME ERROR

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	Voice, Data and FAX (default)
	8	SMS
	16	data circuit sync
	32	data circuit async
	64	dedicated packet access
	128	dedicated PAD access
	X	combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX
<status>	0	Off
	1	On

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.

AT+CLIP

AT+CLIP	Calling Line Identification Presentation		
Test command AT+CLIP=?	Response: +CLIP: (list of supported <n>s) OK/ERROR/+CME ERROR		
	Parameter:		
	<n>	0	Suppresses Unsolicited result codes
		1	Displays Unsolicited result codes
Read command AT+CLIP?	Response: +CLIP: <n>,<m> OK/ERROR/+CME ERROR		
	Parameter		
	<n>	See Test command	
	<m>	0	CLIP not booked
		1	CLIP booked
		2	Unknown
Write command AT+CLIP=[<n>]			
	Response: OK/ERROR/+CME ERROR		
	Parameter:		
	<n>	See Read command	
Unsolicited result code +CLIP: <num>,<type>,,,<alpha>,<CLI validity>			
	Parameter:		
	<num>	Telephone number	
	<type>	1	Voice
		2	Data
		4	Fax
		7	Voice, Data and FAX (default)
		8	SMS
		16	data circuit sync
		32	data circuit async
		64	dedicated packet access
		128	dedicated PAD access
		X	combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX
	<alpha>	String type alphanumeric representation of <num>	
	<cli validity>	0	CLI valid
		1	CLI withheld by originator
		2	CLI not available due to network

AT+CLIR

AT+CLIR	Calling 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 mode presentation temporarily restricted (next call incognito)
		4	CLIR mode presentation temporarily allowed (next call not incognito)
Write command AT+CLIR=[<n>]			
	Response OK/ERROR/+CME ERROR		
	Parameter:		
	<n>	See Read command	

AT+CNUM

AT+CNUM	Read own numbers	
Test command AT+CNUM=?	Response: OK/ERROR/+CME ERROR	
Execute command AT+CNUM	Response: +CNUM: [<alpha1>],<number1>,<type1>[<CR><LF> +CNUM: [<alpha2>],<number2>,<type2> [...]] OK/ERROR/+CME ERROR	
	Parameter:	
	<alpha*x*>	optional alphanumeric string associated with <number*x*>; used character set should be the one selected with AT+CSCS command.
	<number*x*>	string type phone number of format specified by <type*x*>
	<type*x*>	type of address octet in integer format (see GSM 04.08 [8] subclause 10.5.4.7)

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>]		
	Response. OK/ERROR/+CME ERROR	
	Parameter: <n>	See Test command
Unsolicited message +COLP: <num>,<type>,,,<alpha>		
	Parameter	
	<num>	Telephone number
	<type>	Type of telephone number
	<alpha>	String type alphanumeric representation of <num><num><num><num><num><num><num><num><num>

AT+COPN

AT+COPN	Read operator names
Test command AT+COPN=?	Response: OK
Execute command AT+COPN	Response: +COPN: numeric <oper1>,long alphanumeric <oper1>[<CR><LF> +COPN: numeric <oper2>,long alphanumeric <oper2>][…] OK/ERROR/+CME ERROR
	Parameter: <operx> Network operator in numeric and alphanumeric notation see AT^SPLM command

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, selected manually
	<format>	0 Long alphanumeric
		2 Numeric <oper>
Note: Output of long alphanumeric <oper> is according to the settings defined using the AT+CSCS command, i. e. either in GSM or in UCS2 character set.		
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
Note: If <format> is set to long alphanumeric (0) output of <oper> is according to the settings defined using the AT+CSCS command, i. e. either in GSM or in UCS2 character set.	
Write command AT+COPS=<mode>[,<format>[,<oper>]]	Response: OK/ERROR/+CME ERROR Parameter: <mode> See Test command <format> See Test command If <mode> = 1, <format> can only be 2 <oper> In numeric form only

AT+CPOL

AT+CPOL	Preparation list
Test command AT+CPOL=?	Response: +CPOL: (list of supported <index>s), (list of supported <format>s) Parameter: <index> order number of operator in the preferred-operator list of the SIM <format> 2 Numeric
Read command AT+CPOL?	Response: +CPOL: <index1>, <format>,<oper1>[<CR><LF> +CPOL: <index2>, <format>,<oper2>][…] OK/ERROR/+CME ERROR Parameter: <indexx> See Test command <format> See Test command
Write command AT+CPOL=[<index>][, <format>[,<oper>]]	Response: OK/ERROR/+CME ERROR Parameter: <index> See Test command <format> See Test command <operx> Operator

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> AB All Barring services AC All incoming barring services

		AG	All outgoing barring services
		AI	BAIC (bar all incoming calls)
		AO	BAOC (bar all outgoing calls)
		IR	BIC-Roam (bar incoming calls when roaming outside the home country)
		OI	BOIC (bar outgoing international calls)
		OX	BOIC-exHC (bar outgoing international calls except to home country)
		PS	Phone locked to SIM (device code)
		P2	PIN2
		SC	SIM card (PIN)
	<pwdlength>	Password length	
Write command AT+CPWD=<fac>,<oldpwd>,<newpwd>			
	Response: OK/ERROR/+CME ERROR Parameter: <fac> See Test command <oldpwd> Existing password <newpwd> New password		
Note	PS Phone Code (device code) AT+CPWD="PS",,<newpwd> if no password has yet been entered AT+CPWD="PS",<oldpwd> to delete password		

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	Enables unexpected network registration and location information messages
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>	Response: OK/ERROR/+CME ERROR		
	Parameter <n>	See Test command	
Unsolicited result code			

+CREG: <stat>

AT+CSSN

AT+CSSN	Supplementary service notifications **Revision according to 3GPP TS 27.007 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 result code
		1	Activates the +CSSI result code
	<m>	0	Suppresses the +CSSU result code
		1	Activates the +CSSU messages
	For supported +CSSI/+CSSU result codes see section 2.10 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 Test command
	<m>		See Test command
Unsolicited result code +CSSI: <code1>[,[<index>][,<number>]] +CSSU: <code2>[,[<index>][,<number>]]			
	<code1>		Intermediate result code
		0	unconditional call forwarding is active
		1	some of the conditional call forwardings active
		2	a MOC has been forwarded
		3	Waiting call is pending
		4	outgoing CUG call (also <index> present)
		5	outgoing calls are barred
		6	incoming calls are barred
		7	CLIR suppression rejected
	<code2>		Unsolicited result code
		0	forwarded MTC
		1	this is a CUG call (also <index> present)
		2	call is set on hold
		3	hold call is retrieved
		4	call is member of multiparty
		5	Held call was terminated
		7	call is being connected (alerting) with the remote party in alerting state in explicit call transfer
		8	call has been connected with the other remote party in explicit call transfer operation (also number may be present)
	<index>		Closed user group index (if available)
	<number>		ECT number (if available)
		0	unconditional call forwarding is active
		1	some of the conditional call forwardings active
		2	a MOC has been forwarded
		3	Waiting call is pending

2.3.4 Commands related to mobile equipment control and status

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

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; the coding is the same as ACMmax on the SIM
Write command AT+CACM=[<passwd>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <passwd> String type; usually PIN2

AT+CALM

AT+CALM	Alert sound mode
Test command AT+CALM=?	Response: +CALM: (list of supported <mode>s) OK/ERROR/+CME ERROR
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)

AT+CAMM

AT+CAMM	Accumulated call meter maximum
Test command AT+CAMM=?	Response: OK/ERROR/+CME ERROR
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 in analogy 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

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>

AT+CCLK

AT+CCLK	Clock
Test command AT+CCLK=?	Response: OK/ERROR/+CME ERROR
Read command AT+CCLK?	Response: +CCLK: <time> OK/ERROR/+CME ERROR
	Parameter: <time> string type value; format is "yy/MM/dd,hh:mm:ss+zz", where characters indicate the year (last two digits), month, day, hour, minutes, seconds and time zone; e.g. “04/05/06,22:10:00+08" stands for 6th of May 2004, 22:10:00 GMT +2 hours
Write command AT+CCLK=<time>	
	Response: OK/ERROR/+CME ERROR
	Parameter: <time> see Test command

AT+CIND

AT+CIND	Indicator Control
Test command AT+CIND=?	Response +CIND: ("battchg",(0-5)), ("signal",(0-5)), ("service",(0,1)), ("message",(0,1)), ("call",(0,1)), ("roam",(0,1)), ("smsfull",(0,1)) ("call status",(10x-

	20x,31x,33x,34x,51x,53x,54x)), ("GPRS coverage",(0,1)), ("callsetup",(0-3))		
	OK/ERROR/+CME ERROR		
	Parameter:		
	<battchg>	0 .. 5	battery charge level (0 = empty, 5 = full)
	<signal>	0 .. 5	quality of signal (0 = not detectable , 5 = good)
	<service>	0	Service not available
		1	Service available
	<message>	0	No unread message in memory storage
		1	At least one unread message in storage
	<call>	0	No call in progress or established
		1	call in progress or established
	<roam>	0	Home network, no roaming
		1	roaming
	<smsfull>	0	memory locations are available
		1	a short message memory storage in the MT has become full
	<call status>		
		0	There was no call since reporting was enabled
		10x	Call number x was released
		11x	A MOC with call number x has started dialing
		12x	A MOC with call number x is ringing at B-party
		13x	A MTC with call number x is ringing
		14x	Call number x was established
		15x	Call number x is waiting
		16x	Call(s) was/were swapped; x is call number of the call on hold. If no call is held, x = 0.
		170	A call is now in multiparty. No call number provided.
		180	A call was transfered. No call number provided.
		19x	Call number x was set on hold by B-party
		20x	Call number x was set to active by B-party
		21x	CCBS is available for this call
		Numbers 31-54 only for Master Doc. (K1)	
		31x	A Data-MOC call number x has been started
		33x	A Data-MTC with call number x is ringing
		34x	A Data call number x was established
		51x	A Data-MOC call number x has been started
		53x	A Data-MTC with call number x is ringing
		54x	A Data call number x was established
	<GPRS coverage>		
		0	No GPRS coverage available or coverage unknown
		1	GPRS coverage available
	<callsetup>	0	No call setup in progress
		1	MTC is waiting or ringing
		2	A MOC was initiated
		3	A MOC is ringing at B-party
Remark: The test command returns the supported values which are issued as unsolicited result code of each indicator. It does NOT return the supported values to set an indicator. Each indicator can be switched on (1) or off (0).			
Read command	Response:		

AT+CIND?	+CIND: <ind1>,<stat1>,... <ind10>,<stat10> OK/ERROR/+CME ERROR
	Parameter: <stat1> battery charge <stat2> signal quality <stat3> service <stat4> message <stat5> call <stat6> roam <stat7> smsfull <stat8> call status **Remark**: the last-issued/buffered call status is displayed <stat9> GPRS coverage <stat10> call setup
Remark: The read command does NOT return the current setting of the indicator. It issues the current value of the indicator, e.g.: +CIND: 2,3,1,0,0,0,0,0,1,0 which is : battery charge = 2, signal quality = 3, service = 1, call = 0 …….etc.	
Write command AT+CIND=[<ind>],[<ind>],[...],….	
	Response: OK/ERROR/+CME ERROR
	Parameter: <ind> 0 the indicator is switched off 1 the indicator is switched on
Remark: Use the AT+CMER=1,x,0,1 command to obtain information of any indicator values as an unsolicited result code.	

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

AT+CMEC

AT+CMEC	Mobile Termination control mode
Test command AT+CMEC=?	Response: +CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s) OK/ERROR/+CME ERROR
	Parameter: <keyp> 0 MT can be operated only through its keypad (execute command of AT+CKPD cannot be used)

		2	MT can be operated from both MT keypad and TE
	<disp>	0	only MT can write to its display
	<ind>	0	only MT can set the status of its indicators
Read command AT+CMEC?	Response: +CMEC: <keyp>,0,0 OK/ERROR/+CME ERROR		
	Parameter: <keyp>	See Test command	
Write command AT+CMEC=[<keyp>[,0[,0]]]	Response: OK/ERROR/+CME ERROR		
	Parameter: <keyp>	See Test command	

AT+CMER

AT+CMER	Mobile Termination control mode		
Test command AT+CMER=?	Response: +CMER: (list of supported <mode>s),(list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s) OK/ERROR/+CME ERROR		
	Parameter:		
	<mode>	0	buffer unsolicited result codes in the TA; if TA result code buffer is full, codes the oldest ones are discarded
		1	discard unsolicited result codes when TA-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 TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE
		3	same as "2". This input for the bluetooth carkit is acceptable but the behaviour is same as mode=2
	<keyp>	0	no keypad event reporting
		1	keypad event reporting using result code +CKEV: <key>,<press>, where <key> indicates the key (refer values defined in table for AT+CKPD) and <press> whether the key is pressed (1) or released (0). Only key pressings that are not caused by AT+CKPD are indicated by the TA to the TE
		2	keypad event reporting using result code +CKEV: <key>,<press>. All key pressings shall be directed from TA to TE
	<disp>	0	no display event reporting
	<ind>	0	no indicator event reporting
		1	indicator event reporting using result code +CIEV: <ind>,<value>. <ind> indicates the indicator order number (as specified for AT+CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by AT+CIND shall be indicated by the TA to the TE
		2	indicator event reporting using result code +CIEV:

			<ind>,<value>. All indicator events shall be directed from TA to TE
	<bfr>	0	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered
		1	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes)
Read command AT+CMER?	Response: +CMER: <mode>,<keyp>,0,<ind>,<bfr> OK/ERROR/+CME ERROR		
	Parameter:		
	<mode>	See Test command	
	<keyp>	See Test command	
	<ind>	See Test command	
	<bfr>	See Test command	
Write command AT+CMER=[<mode>],[<keyp>],[<disp>],[<ind>],[<bfr>]			
	Response: OK/ERROR/+CME ERROR		
	Parameter:		
	<mode>	See Test command	
	<keyp>	See Test command	
	<disp>	See Test command	
	<ind>	See Test command	
	<bfr>	See Test command	
Unsolicited result code: +CIEV: <ind>,<value> +CKEV: <key>,<press>			
	Parameter:		
	<ind>	The number of the indicator according to command AT+CIND=?	
	<value>	The new value of the indicator according to AT+CIND=? e.g. +CIEV: 8,101 -> call status indicator (8), new value 'call number one was released' (101).	
	<key>	Indicates the key the indication is for (refer values defined in table for AT+CKPD).	
	<press>	Status of <key> e.g.: +CKEV: "E",0 End key was released	
		0	<key> released
		1	<key> pressed

AT+CMUT

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

	<n> See Test command
Write command AT+CMUT=<n>	Response: OK/ERROR/+CME ERROR
	Parameter: <n> See Test command
Note:	Only applicable during an active/hold call

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

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>, <number>, <type>, <text >[[…]<CR><LF> +CPBR: <index2>, <number>, <type>, <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 <number> Telephone number <type> Type of number <text> Text corresponding to the telephone number <text> depends on AT+CSCS.
	Note: In the <text> field, special characters like the following may be displayed: `"` (0x22), `@` (0x00), `ò` (0x08), `Ö` (0x5c). See also section AT+CPBW and Appendix A: "How to use special characters in certain commands (e. g., AT+CPBW"). Empty entries do not produce any output.

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 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 section 3.1.2.
Read command AT+CPBS?	Response: +CPBS: <sto>,<used>,<total> OK/ERROR/+CME ERROR
	Parameter:

	<sto>	See Test command
	<used>	integer type value indicating the number of used locations in selected memory
	<total>	integer type value indicating the total number of locations in selected memory
Write command AT+CPBS=<sto>[,<passwd>]		
	Response: OK/ERROR/+CME ERROR	
	Parameter:	
	<sto>	See Test command
	<passwd>	PIN2 only for selecting the FD-phonebook

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>[,<type>[,<text>]]]	
	Response OK/ERROR/+CME ERROR
	Parameter: <index> Location number at which the entry is written <nummer> Telephone number <type> Type of number <text> Text corresponding to the telephone number The following characters in <text> must be entered via the Siemens-specific escape sequence (see also Appendix A: "How to use special characters in certain commands (e. g., AT+CPBW") <text> depends on AT+CSCS.

GSM Char	Hex char	ASCII	3 byte Esc Seq (hex)	Notes
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

AT+CPIN

AT+CPIN	Enter PIN and query lock
Test command	Response:

AT+CPIN=?	OK
Read command	Response:
AT+CPIN?	+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 PIN (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>[,<newpin>]	
	Response: OK/ERROR/+CME ERROR Parameter:

<pin>	Password for appropriate lock; if the lock is a PUK, a <newpin> is necessary.
<newpin>	New password for the lock

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. “EUR”)

		see AT+CSCS command
	<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

AT+CRMP

AT+CRMP	Ring Melody Playback	
Test command AT+CRMP=?	Response: +CRMP: (list of supported <call type>s),(list of supported <volume>s) OK	
Write command +CRMP=<call type>[,<volume>]		
	Response: +CRMP: <call type>[,<volume>] OK/ERROR/+CME ERROR	
	Parameter:	
	<call type>	integer type parameter corresponding to different ring melodies in mobile such as line1, line2, groups, Alarm, SMS, CBS and others
	<volume>	integer type parameter with manufacturer specific range
Note:	The Write command starts playing the ring melody.	
Execute command AT+CRMP	Response: OK/ERROR/+CME ERROR	
Note:	The Execute command stops the melody played. If an MTC is received during an active test ring, the test ring is switched off and the "normal" ring is switched on.	

AT+CRSL

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

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 5) <P1>, <P2>, <P3> integer — transferal parameter from ME to SIM, mandatory for every command except GET RESPONSE, STATUS (see 5) <data> Hexadec. string — information to be written to the SIM <sw1>, <sw2> integer — information from the SIM as to whether the command was executed at all, and if so, how <response> Hexadec. string — return value received from the SIM; not available for UPDATE commands

AT+CSQ

AT+CSQ	Output signal quality
Test command AT+CSQ=?	Response: +CSQ: (list of supported <rssi>s), list of supported <ber>s) 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 in Table GSM 05.08 [10] 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

AT+CTZR

AT+CTZR	Time Zone Reporting
Test command AT+CTZR=?	Response: +CTZR: (list of supported <n>s) OK/ERROR/+CME ERROR
	Parameter: <n> 0 Disable time zone change reporting 1 Enable time zone change reporting
Read command AT+CTZR?	Response: +CTZR: <n> OK/ERROR/+CME ERROR
Write command AT+CTZR=<n>	Parameter: <n> See Test command
Unsolicited result code +CTZV: <tz>	Parameter: <tz> Refer to AT+CCLK (e.g."+04" for time zone with 1 hour more than UTC)

AT+CTZU

AT+CTZU	Automatic Time Zone Update
Test command AT+CTZU=?	Response: +CTZU: (list of supported <n>s) OK/ERROR/+CME ERROR
	Parameter: <n> 0 Disable time zone change update 1 Enable time zone change update
Read command AT+CTZU?	Response +CTZU: <n> OK/ERROR/+CME ERROR
Write command AT+CTZU=<n>	Parameter: <n> See Test command

AT+CVIB

AT+CVIB	Vibrator mode
Test command AT+CVIB=?	Response: +CVIB: (list of supported <mode>s) OK
	Parameter: <mode> Vibrator mode 0 disable 1 enable 16 - 20 vibrate then ring
Execute command AT+CVIB	Response: +CVIB: <mode> OK/ERROR/+CME ERROR
Write command AT+CVIB=<mode>	Response: OK/ERROR/+CME ERROR Parameter: <mode> See Test command

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_IP> 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
ATO	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
ATS7	Wait for carrier after dialing (in seconds).

2.3.6 Commands for GPRS

This section provides the descriptions of commands related to GPRS.

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>[,…]]]]		
	Response: OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	See Read command
	<state>	See Test command

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>]]]		
	Response: CONNECT/ERROR/+CME ERROR	
	Parameter:	
	<response>	See Test command
	<L2P>	See Test command
	<cid>	numeric PDP Context Identifier

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>]		
	Response: OK/ERROR/+CME ERROR	
	Parameter:	
	<state>	See Test command

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>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <n> See Test command

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 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>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <class> See Test command

AT+CGCMOD

AT+CGCMOD	PDP context Modify
Test command AT+CGCMOD=?	Response: +CGCMOD: (list of <cid>s associated with active contexts) OK/ERROR/**+CME ERROR**
	Parameter: <cid> numeric PDP Context Identifier

Write command AT+CGCMOD=[<cid>[,<cid>[,…]]]	
	Response OK/ERROR/**+CME ERROR**
	Parameter: <cid> See Test command

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 Point-to-Point Protocol
Write command AT+CGDATA=[<L2P> ,[<cid> [,<cid> [,…]]]	
	Response: CONNECT/ERROR/+CME ERROR
	Parameter: <L2P> See Test command <cid> 1 .. x numeric PDP Context Identifier (maximum value x returned by command AT+CGDCONT=?)

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> 1 .. x numeric PDP Context Identifier <PDP_type> string parameter of Packet Data Protocol type PPP Type PPT IP Type IP <d_comp> numeric parameter that controls PDP data compression 0 off 1 on (manufacturer preferred compression) 2 V.42bis <h_comp> numeric parameter that controls PDP header compression 0 off 1 on (manufacturer preferred compression) which is RFC1144 if it is available 2 RFC1144 (applicable for SNDCP only) 3 RFC2507
Read command	Response:

AT+CGDCONT?	+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[<CR><LF> +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_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: Consists of dot-separated numeric (0-255) parameters on the form 'a1.a2.a3.a4', for IPv4 and 'a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16' for IPv6. <d_comp> See Test command <h_comp> See Test command
Write command AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr>[,<d_comp>[,<h_comp>]]]]]]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <cid> See Test command <PDP_type> See Test command <APN> See Read command <PDP_addr> See Read command <d_comp> See Test command <h_comp> See Test command

AT+CGDSCONT

AT+CGDSCONT	Define Secondary PDP Context		
Test command AT+CGDSCONT=?	Response: +CGDSCONT: (range of supported <cid>s), (list of <p_cid>s for active primary contexts), <PDP_type>,,, (list of supported <d_comp>s), (list of supported <h_comp>s) [<CR><LF> +CGDSCONT : (range of supported <cid>s), (list of <p_cid>s for active primary contexts), <PDP_type>,,, (list of supported <d_comp>s), (list of supported <h_comp>s) [...]] OK/ERROR/+CME ERROR		
	Parameter:		
	<cid>	1…x	numeric PDP Context Identifier
	<p_cid>	Primary PDP Context Identifier	
	<PDP_type>	string parameter of Packet Data Protocol type	
		PPP	Type PPT
		IP	Type IP
		IPV6	Type IP Version 6
	<d_comp>	numeric parameter that controls PDP data compression	
		0	off
		1	on (manufacturer preferred compression)
		2	V.42bis
	<h_comp>	numeric parameter that controls PDP header compression	
		0	off
		1	on (manufacturer preferred compression) which is RFC1144 if it is available

	2	RFC1144 (applicable for SNDCP only)
	3	RFC2507
Read command AT+CGDSCONT?	Response: +CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp> [<CR><LF>+CGDSCONT: <cid>, <p_cid, <d_comp>, <h_comp>[...]] OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	See Test command
	<p_cid>	See Test command
	<d_comp>	See Test command
	<h_comp>	See Test command
Write command		
AT+CGDSCONT=[<cid> [,<p_cid> ,[<d_comp>,],[<h_comp>]]]]		
	Response: OK/ERROR/**+CME ERROR**	
	Parameter:	
	<cid>	See Test command
	<p_cid>	See Test command
	<d_comp>	See Test command
	<h_comp>	See Test command

AT+CGEQMIN

AT+CGEQMIN	3G Quality of Service Profile (Minimum acceptable)	
Test command AT+CGEQMIN=?	Response: +CGEQMIN: <PDP_type>, (list of supported <Traffic_class>s) ,(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s)[<CR><LF> +CGEQMIN: <PDP_type>, (list of supported <Traffic_class>s) ,(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s)[…]] OK/ERROR/+CME ERROR	
	Parameter:	
	<PDP_type>	string parameter of Packet Data Protocol type
		PPP Type PPP
		IP Type IP
		IPV6 Type IP Version 6
	<Traffic_class>	numeric parameter for the traffic class
		0 conversational

		1 streaming 2 interactive 3 background
	<Maximum bitrate UL>	a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' 0 network subscribed value 1..8640 kbit/s
	<Maximum bitrate DL>	Same as Maximum bitrate UL but for down link 0 network subscribed value 1..8640 kbit/s
	<Guaranteed bitrate UL>	a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32 0 network subscribed value 1..8640 kbit/s
	<Guaranteed bitrate DL>	a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32 0 network subscribed value 1..8640 kbit/s
	<Delivery order>	a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not 0 No 1 Yes 2 network subscribed value
	<Maximum SDU size>	a numeric parameter (1,2,3,...) that indicates the maximum allowed SDU size in octets 0 network subscribed value 1..1520 octets
	<SDU error ratio>	a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. For example, a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as 5E3 0E0 network subscribed value 1E1-1E6 Range of supported values
	<Residual bit error ratio>	a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'.

		0E0	network subscribed value
		5E2-6E8	Range of supported values
	<Delivery of erroneous SDUs>		
		a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not	
		0	No
		1	Yes
		2	no detect
		3	network subscribed value
	<Transfer delay>	a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds	
		0	network subscribed value
		1..4000	milliseconds
	<Traffic handling priority>		
		a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers	
		0	network subscribed value
		1..3	Priority Level
Read command	Response:		
AT+CGEQMIN?	+CGEQMIN: <cid>, <Traffic_class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>[<CR><LF> +CGEQMIN: <cid>, <Traffic_class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority> OK/ERROR/+CME ERROR		
	Parameter:		
	<cid>		numeric PDP Context Identifier
	<Traffic_class>		See Test command
	<Maximum bitrate UL>		See Test command
	<Maximum bitrate DL>		See Test command
	<Guaranteed bitrate UL>		See Test command
	<Guaranteed bitrate DL>		See Test command
	<Delivery order>		See Test command
	<Maximum SDU size>		See Test command
	<SDU error ratio>		See Test command
	<Residual bit error ratio>		See Test command
	<Delivery of erroneous SDUs>		See Test command
	<Transfer delay>		See Test command
	<Traffic handling priority>		See Test command
Write command			

AT+CGEQMIN=[<cid> [,<Traffic_class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority>]]]]]]]]]]]]	
	Response: OK/ERROR/**+CME ERROR**
	Parameter:
<cid>	See Read command
<Traffic_class>	See Test command
<Maximum bitrate UL>	See Test command
<Maximum bitrate DL>	See Test command
<Guaranteed bitrate UL>	See Test command
<Guaranteed bitrate DL>	See Test command
< Delivery order>	See Test command
< Maximum SDU size>	See Test command
< SDU error ratio>	See Test command
< Residual bit error ratio>	See Test command
< Delivery of erroneous SDUs>	See Test command
< Transfer delay>	See Test command
<Traffic handling priority>	See Test command

AT+CGEQREQ

AT+CGEQREQ	3G Quality of Service Profile (Requested)
Test command AT+CGEQREQ=?	Response: +CGEQREQ: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s) [<CR><LF>+CGEQREQ: : <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Guaranteed bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s) […]] OK/ERROR/+CME ERROR
	Parameter:
<PDP_type>	string parameter of Packet Data Protocol type PPP — Type PPP IP — Type IP IPV6 — Type IP Version 6
<Traffic class>	numeric parameter for the traffic class

	0 conversational
	1 streaming
	2 interactive
	3 background
	4 network subscribed value
<Guaranteed bitrate UL>	
	numeric parameter for the traffic class
	1..8640 kbit/s
<Maximum bitrate UL>	
	a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as 32
	1..8640 kbit/s
<Maximum bitrate DL>	
	Same as Maximum bitrate UL but for down link
	1..8640 kbit/s
<Guaranteed bitrate UL>	
	a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as 32
	1..8640 kbit/s
<Guaranteed bitrate DL>	
	Same as Guaranteed bitrate DL but for down link
	1..8640 kbit/s
<Delivery order>	a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not
	0 No
	1 Yes
	2 network subscribed value
<Maximum SDU size>	
	a numeric parameter (1, 2, 3, …) that indicates the maximum allowed SDU size in octets
	1..1520 Octets
<SDU error ratio>	
	a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as 5E3
	0E0 network subscribed value
	1E1-1E6 Range of supported values
<Residual bit error ratio>	
	a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'.
	0E0 network subscribed value
	5E2-6E8 Range of supported values
<Delivery of erroneous SDUs>	

		a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not 0 No 1 Yes 2 no detect 3 network subscribed value
	<Transfer delay>	a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds 0 network subscribed value 1..4000 Milliseconds
	<Traffic handling priority>	a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers 0 network subscribed value 1..3 Priority Level
Read command AT+CGEQREQ?	Response +CGEQREQ: <cid>, (<Traffic class> , <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL> , <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority> [<CR><LF>+CGEQREQ: <cid>, (<Traffic class> , <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL> , <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority> […]] OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	numeric PDP Context Identifier
	<Traffic class>	See Test command
	<Guaranteed bitrate UL>	See Test command
	<Maximum bitrate DL>	See Test command
	<Guaranteed bitrate UL>	See Test command
	<Guaranteed bitrate DL>	See Test command
	<Delivery order>	See Test command
	<Maximum SDU size>	See Test command
	<SDU error ratio>	See Test command
	<Residual bit error ratio>	See Test command
	<Delivery of erroneous SDUs>	See Test command
	<Transfer delay>	See Test command
	<Traffic handling priority>	See Test command

Write command

AT+CGEQREQ=[<cid> [,<Traffic class> [,<Guaranteed bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority>]]]]]]]]]]]]	
	Response: OK/ERROR/+CME ERROR
	Parameter:
	<cid> — See Read command
	<Traffic class> — See Test command
	<Guaranteed bitrate UL> — See Test command
	<Maximum bitrate DL> — See Test command
	<Guaranteed bitrate UL> — See Test command
	<Guaranteed bitrate DL> — See Test command
	<Delivery order> — See Test command
	<Maximum SDU size> — See Test command
	<SDU error ratio> — See Test command
	<Residual bit error ratio> — See Test command
	<Delivery of erroneous SDUs> — See Test command
	<Transfer delay> — See Test command
	<Traffic handling priority> — See Test command

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 1 or 2 is entered for <mode> 1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when 1 or 2 is entered for <mode>
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>]]		
	Response OK/ERROR/+CME ERROR	
	Parameter:	
	<mode>	See Test command
	<bfr>	See Test command
Unsolicited result code:		
+CGEV: REJECT <PDP_type>, <PDP_addr>		context activation rejected
+CGEV: NW REACT <PDP_type>, <PDP_addr>		context activation by ME
+CGEV: NW DEACT <PDP_type>, <PDP_addr>		detached by network
+CGEV: ME DEACT <PDP_type>, <PDP_addr>		context activation by ME
+CGEV: NW DETACH		detached by network
+CGEV: ME DETACH		detached by ME
+CGEV: NW CLASS <class>		change of mobile class by network
+CGEV: ME CLASS <class>		change of mobile class by ME
	Parameter:	
	<PDP_type>	The PDP context type. Refer to AT+CGDCONT for details
	<PDP_addr>	The IP-address of the context

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	Type PPP
	IP	Type 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	Response:	

AT+CGQMIN?	+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>]]]]]]	
	Response: OK/ERROR/+CME ERROR
	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

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 Type PPP
	IP Type 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>]]]]]]		
	Response: OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	See Read command
	<precedence>	See Test command
	<delay>	See Test command
	<reliability>	See Test command
	<peak>	See Test command
	<mean>	See Test command

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=[<cid> ,[< cid> [,<cid> [,…]]]]		
	Response: +CGPADDR: <cid>,<PDP addr>[<CR><LF> +CGPADDR: <cid>,<PDP addr>[...]] OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	See Test command
	<PDP addr>	IP address of PDP

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
	1	Enable the unexpected network status messages
Unsolicited result code OK/ERROR/+CME ERROR		
Read command AT+CGREG?	Response: +CGREG: <n>,<stat> OK/ERROR/+CME ERROR Parameter:	
	<n>	See Test command
	<stat>	Status
	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

Write command AT+CGREG=[<n>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <n> See Test command
Unsolicited result code +CGREG: <stat>	

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: <service> 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: <service> See Test command
Write command AT+CGSMS=[<service>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <service> See Test command

AT+CGTFT

AT+CGTFT	Traffic Flow Template
Test command	Response:

AT+CGTFT=?	+CGTFT: <PDP_type>list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s) [<CR><LF> +CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s) […]] OK/ERROR/+CME ERROR
Parameter:	
<PDP_type>	string parameter of Packet Data Protocol type PPP Type PPP IP Type IP IPV6 Type IP Version 6
<packet filter identifier>	numeric parameter identifies the filter 1..8
<evaluation precedence index>	Numeric parameter 0..255
<source address and subnet mask>	Consists of dot-separated numeric (0-255) parameters on the form 'a1.a2.a3.a4.m1.m2.m3.m4', for IPv4 and 'a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16. m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16', for IPv6. Where 'ax' is the IP address and 'mx' is the mask.
<protocol number (ipv4) / next header (ipv6)>	Numeric parameter 0..255
<destination port range>	Consists of dot-separated parameters of the form 'f.t' (from …to). 0..65535
<source port range>	Same as destination port range but source port 0..65535
<ipsec security parameter index (spi)>	Hexadecimal parameter, value range from 00000000 to FFFFFFFF 0..FFFFFFFF
<type of service (tos) (ipv4) and mask / traffic class	

	(ipv6) and mask>	
		Dot-separated numeric (0-255) parameters on the form 't.m'.
		0..255
	<flow label (ipv6)>	
		Hexadecimal parameter, value range from 00000 to FFFFF. Valid for IPv6 only
		0 network subscribed value
Read command	Response:	
AT+CGTFT?	+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)> [<CR><LF>+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <flow label (ipv6)> […]] OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	numeric PDP Context Identifier
	<packet filter identifier>	See Test command
	<evaluation precedence index>	See Test command
	<source address and subnet mask>	See Test command
	<protocol number (ipv4) / next header (ipv6)>	See Test command
	<destination port range>	See Test command
	<source port range>	See Test command
	<ipsec security parameter index (spi)>	See Test command
	<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	See Test command
	<flow label (ipv6)>	See Test command
Write command		
AT+CGTFT=[<cid> [<packet filter identifier>, <evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)>]]]]]]]]		
	Response:	
	OK/ERROR/+CME ERROR	
	Parameter:	
	<cid>	See Read command
	<packet filter identifier>	See Test command
	<evaluation precedence index>	See Test command
	<source address and subnet mask>	See Test command
	<protocol number (ipv4) / next header (ipv6)>	See Test command

	<destination port range>	See Test command
	<source port range>	See Test command
	<ipsec security parameter index (spi)>	See Test command
	<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	See Test command
	<flow label (ipv6)>	See Test command

2.3.7 Commands related to mobile equipment errors

AT+CMEE

AT+CMEE	Expanded error messages according to 3GPP TS 27.007
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>	Response: OK/ERROR/+CME ERROR
	Parameter: <n>
	Description: For detailed information on the values possible for +CME ERROR see section 5.1. +CMS errors have been defined for SMS; for detailed information on the values possible for +CMS ERROR see section 5.2.

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

This section provides the descriptions of other AT commands.

AT+VTD

AT+VTD	Set duration of a DTMF tone
Test command AT+VTD=?	Response: <duration> OK/ERROR/+CME ERROR
	Parameter: <duration> Duration of tone (in tenths of seconds) 1 .. 255
Read command AT+VTD?	Response: <duration> OK/ERROR/+CME ERROR
Write command AT+VTD=<duration>	

	Response: OK/ERROR	
	Parameter:	
	<duration>	See Test command

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 of the list
	<duration>	1 .. 255 Duration of tone (in tenths of seconds)
Write command AT+VTS=<dtmf>[,<duration>] Or AT+VTS=<dtmf-string>		
	Response: OK/ERROR/+CME ERROR	
	Parameter:	
	<dtmf>	character from the list, see Test command
	<dtmf-string>	max. 29 characters in quotation marks ("...") (no duration cannot be specified)

2.4 General commands according to 3GPP TS 27.005

3GPP TS 27.005 commands are used for operating the SMS functions of the GSM mobile phone. GSM module mobiles support the SMS PDU mode.

AT+CMGC

AT+CMGC	Send an SMS command	
Test command AT+CMGC=?	Response: OK/ERROR/+CME ERROR	
Write command **If PDU mode (+CMGF=0)** AT+CMGC=<length><CR> ***PDU is given:*** <ctrl-Z/ESC>		
	Response: **If sending is successful:** +CMGC: <mr> **If sending is not successful:** +CMS ERROR	
	Parameter:	
	<length>	Length of PDU
	<pdu>	See AT+CMGL command
	<mr>	Message reference
	<ackpdu>	RP-ACK PDU according to [3]

AT+CMGD

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

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> See Test command
Write command AT+CMGF=[<mode>]	
	Response: OK/ERROR
	Parameter: <mode> See Test command

AT+CMGL

AT+CMGL	List SMS **Revision according to 3GPP TS 27.005**
Test command AT+CMGL=?	Response: +CMGL: (list of supported <stat>s)
	Parameter: <stat> 0 REC UNREAD i.e. received messages unread (default) 1 REC READ i.e. received messages read 2 STO UNSENT i.e. stored unsent messages 3 STO SENT i.e. stored sent messages 4 ALL i.e. all messages
Write command AT+CMGL[=<stat>]	
	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:	
	<index>	Index of message in selected memory <mem1>
	<stat>	See Test command
	<pdu>	The PDU begins with the service-center address (according to GSM 04.11, [9]), followed by the TPDU (according to GSM 03.40, [3]) in hexadecimal format otherwise: +CMS ERROR
	<alpha>	String type alphanumeric representation of <num>
	<length>	Length of PDU

AT+CMGR

AT+CMGR	Read in an SMS **Revision according to 3GPP TS 27.005**	
Test command AT+CMGR=?	Response: OK/ERROR/+CME ERROR	
Write command AT+CMGR=<index>		
	Response: **If PDU mode (+CMGF=0) and command is successful:** +CMGR: <stat>,,<length><CR><LF><pdu>	
	Parameter:	
	<index>	Index of message in selected memory <mem1>
	<pdu>	The PDU begins with the service-center address (according to GSM 04.11, [9]), followed by the TPDU (according to GSM 03.40, [3]) in hexadecimal format
	<stat>	
		0 REC UNREAD i.e. received messages unread (default)
		1 REC READ i.e. received messages read
		2 STO UNSENT i.e. stored unsent messages
		3 STO SENT i.e. stored sent messages
		4 ALL i.e. all messages
	<length>	Length of PDU otherwise: +CMS ERROR

AT+CMGS

AT+CMGS	Send an SMS	
Test command AT+CMGS=?	Response: OK/ERROR/+CME ERROR	
Write command **If PDU mode (+CMGF=0)** AT+CMGS=<length><CR> ***PDU is given:*** <ctrl-Z/ESC>		
	Response: **If sending is successful:**	

	+CMGS: <mr> **If sending is not successful:** +CMS ERROR	
	Parameter:	
	<length>	Length of PDU
	<pdu>	The PDU begins with the service-center address (according to GSM 04.11, [9]), followed by the TPDU (according to GSM 03.40, [6]) in hexadecimal format
	<mr>	Message reference
	<ackpdu>	RP-ACK PDU according to GSM 03.40 [6]

AT+CMGW

AT+CMGW	Write an SMS to the SMS memory	
Test command AT+CMGW=?	Response: OK/ERROR/+CME ERROR	
Write command **If PDU mode (+CMGF=0)** AT+CMGW=<length>[,<stat>]<CR> ***PDU is given:*** <ctrl-Z/ESC>		
	Response: +CMGW: <index> +CMS ERROR	
	Parameter:	
	<length>	Length of PDU
	<stat>	
		0 REC UNREAD i.e. received messages unread (default)
		1 REC READ i.e. received messages read
		2 STO UNSENT i.e. stored unsent messages
		3 STO SENT i.e. stored sent messages
		4 ALL i.e. all messages
	<pdu>	The PDU begins with the service-center address (according to GSM 04.11, [9]), followed by the TPDU (according to GSM 03.40, [6]) in hexadecimal format
	<index>	Index of message in selected memory <mem1>

AT+CMMS

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

AT+CMSS

AT+CMSS	Send an SMS from the SMS memory	
Test command AT+CMSS=?	Response OK	
Write command AT+CMSS=<index>[,<da>[,<toda>]]		
	Response: **If sending is successful:** +CMSS: <mr> **If sending is not successful:** +CMS ERROR	
	Parameter:	
	<index>	Index of message in selected memory <mem2>
	<da>	Destination address in string format
	<toda>	Format of destination address
	<mr>	Message reference
	<ackpdu>	RP-ACK PDU according to GSM 03.40 [6]

AT+CNMA

AT+CNMA	Acknowledgment of a short message directly output (without storing) *(**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>	0 Mode of functioning in analogy to GSM 27.005 text mode
Write command AT+CNMA[=<n>]	Response: OK/ERROR/+CMS ERROR	
	Parameter: <n>	See Test command

AT+CNMI

AT+CNMI	New Message Indication

Notes	TA selects the procedure how the receipt of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in GSM 03.38 (see [5]). 1) If the DTR signal is not available or the state of the signal is ignored (V.250 command &D0), reliable message transfer can be assured by using AT+CNMA acknowledgement procedure. 2) The rules <mt>=2 and <mt>=3 for storing received SM are possible only if phase 2+ compatibility is activated with AT+CSMS=1 3) The parameter <ds>=1 is only available in phase 2+
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 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE <mt> Rules for storing received SMS depend on the relevant data coding method (refer to GSM 03.38, (see [5])), preferred memory storage AT+CPMS) setting and this value **Note** If the AT command interface is acting as the only display device, the ME must support storage of class 0 messages and messages in the message waiting indication group (discard message) 0 No SMS-DELIVER indications are routed to the TE 1 If SMS-DELIVER is stored in ME/TA, indication of the memory location is routed to the TE using unsolicited result code +CMTI: <mem>,<index> 2 SMS-DELIVERs, except class 2 messages and messages in the message waiting indication group (store message), are routed directly to the TE using unsolicited result code: +CMT: <length><CR><LF><pdu> (PDU mode enabled) 3 Class 3 SMS-DELIVERs are routed directly to the TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.
	<bm> Rules for storing received CBMs depend on the relevant data coding method (refer to GSM 03.38 (see [5])), the setting of Select CBM Types AT+CSCB) and these values: 0 No CBM indications are routed to the TE. 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled) **Note** The settings of command AT+CNMI and AT+CSCB have to be done on the same Serial Interface. <ds> 0 No SMS-STATUS-REPORTs are routed to the TE 1 SMS-STATUS-REPORTs are routed to the TE using

			unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled)
		2	If SMS-STATUS-REPORT is routed into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem>,<index>
	<bfr>	1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.
	<mem>	See AT+CPMS command	
	<index>	Index of the record on the chip card	
	<length>	Length of <pdu>	
	<pdu>	See AT+CMGL command	
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>]]]]]			
	Response: OK/ERROR/+CMS ERROR		
	Parameter:		
	<mode>	See Test command	
	<mt>	See Test command	
	<bm>	See Test command	
	<ds>	See Test command	
	<bfr>	See Test command	
Unsolicited result code +CMTI: <mem>,<index> +CMT: <length><CR><LF><>pdu> +CDS: <length><CR><LF><pdu> +CDSI: <mem>,<index> +CBM: <length><CR><LF><pdu>			

AT+CPMS

AT+CPMS	Preferred SMS message storage **Revision according to 3GPP TS 27.005**		
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 message storage
		ME	Mobile Equipment message storage
		MT	combination of "ME" and "SM" storages
	<mem2>	Messages will be written and sent from this memory storage:	
		SM	SIM message storage
		ME	Mobile Equipment message storage

		MT	combination of "ME" and "SM" storages
	<mem3>	Memory in which received messages are preferred to be stored, if routing to TE is not set (see AT+CNMI command with parameter <mt>=2)	
		SM	SIM message storage
		ME	Mobile Equipment message storage
		MT	combination of "ME" and "SM" storages
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, x=1..3	
	<usedx>	Number of messages currently in <memx>	
	<totalx>	Total number of messages that can be stored in <memx>	
Write command AT+CPMS= <mem1>[,<mem2>[,<mem3>]]			
	Response: +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK/ERROR/+CMS ERROR		
	Parameter:		
	<mem1>	See Test command	
	<mem2>	See Test command	
	<mem3>	See Test command	
Note	Incoming short messages with message class 2 (see GSM 03.38, [5]) will be stored in the "SM" storage only. Therefore, the AT^SMGO:2 indication (see AT^SMGO command) can occur without a preceding AT^SMGO:1 indication.		

AT+CSCA

AT+CSCA	Address of the SMS service centre		
Test command AT+CSCA=?	Response: OK/ERROR/+CME ERROR		
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>]			
	Response: OK/ERROR		

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	Response:		

AT+CSCB?	+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>]]]	
	Parameter:
	<mode> See Test command
	<mids> String type; combinations of CBM message IDs
	<dcss> String type; combinations of CBM data coding schemes

AT+CSMS

AT+CSMS	Selection of message service **Revision according to 3GPP TS 27.005 Version 5.0.0**
Test command AT+CSMS=?	Response: +CSMS: (list of supported <service>s)
	Parameter: <service> 0 GSM 03.40 [6] and 03.41 [7] 1 GSM 03.40 [6] and 03.41 [7] 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 AT+CNMI=1,2 or AT+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> See Test Command <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>	
	Response: +CSMS: <mt>,<mo>,<bm> OK/ERROR/+CME ERROR
	Parameter: <service> See Test Command

2.5 Modem commands

This section provides the descriptions of modem commands.

AT+CBST

AT+CBST	Select bearer service type
Selects the bearer service <name> with data rate <speed> and the connection element <ce> to be used when data calls are originated.	
Test command	Response:

AT+CBST =?	+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/ERROR/+CME ERROR
Write command AT+CBST=<speed>[,0,1]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <speed> See Test command

AT+CRLP

AT+CRLP	Select radio link protocol parameter for originating non-transparent data call
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.	
Test command AT+CRLP=?	Response: +CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s)
	Parameter: <iws> Interworking window size (IWF to MS) 0-61 Default: 61 <mws> Mobile window size (MS to IWF) 0-61 Default: 61 <T1> Acknowledgement timer (T1 in 10 ms units) 48-255 Default: 78 <N2> Re-transmission attempts N2 1-255 Default: 6
Read command AT+CRLP?	Response The command returns current settings for the supported RLP version 0. +CRLP: <iws>,<mws>,<T1>,<N2> OK
	Parameter:

	<iws>	See Test command
	<mws>	See Test command
	<T1>	See Test command
	<N2>	See Test command
Write command AT+CRLP= [<iws>[,<mws>[,<T1>,<N2>]]]		
	Response: OK/ERROR/+CME ERROR	
	Parameter:	
	<iws>	See Test command
	<mws>	See Test command
	<T1>	See Test command
	<N2>	See Test command

2.6 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/-592-A [20], 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.250
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.

Note: all these commands are Fax Class 2 commands

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 2-9: List of dummy FAX commands (Fax Class 2)

AT+FBADLIN

AT+FBADLIN	Define or read number of bad lines

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			
Read command AT+FBADLIN?	Response: <badlin> OK		
	Parameter: <badlin>	See Write command	
Write command AT+FBADLIN=<badlin>			
	Parameter: <badlin>	0...255	0 indicates that error checking is not present or disabled (Default value: 10)

AT+FBADMUL

AT+FBADMUL	Define, read or test number of bad lines	
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.		
Read command AT+FBADMUL?	Response: OK/ERROR/+CME ERROR	
	Parameter: <n>	OK
Write command AT+FBADMUL =<n>		
	Parameter: <n>	0...255
		0 indicates that error checking is not present or disabled (Default value: 20)

AT+FBOR

AT+FBOR	Query the bit order for receive mode	
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.		
Test command AT+FBOR=?	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	Response:	

AT+FBOR?	OK/ERROR/+CME ERROR
	Parameter: <bor> OK
Write command AT+FBOR=<bor>	
	Response: OK/ERROR
	Parameter: <bor> OK

AT+FCIG

AT+FCIG	Query or set the Local polling id
Used for FAX class 2 only	
Test command AT+FCIG=?	Response: +FCIG: (max. length of Local Polling ID string) (range of supported ASCII character values) OK/ERROR/+CME ERROR
	Parameter: <id> Local Polling ID string, maximum length and possible content as reported by Test command. Default value is empty string (“”). Maximum length: 20 See also the “AT+FLID” command
Read command AT+FCIG?	Response: <id> OK
	Parameter: <id> See Test command
Write command AT+FCIG=<id>	Parameter: <id> See Test command

AT+FCQ

AT+FCQ	Control Copy Quality
Used for FAX class 2 only This command controls Copy Quality checking when receiving a fax	
Test command AT+FCQ=?	Response: +FCQ: (list of supported copy quality checking <cq>s) OK Parameter: <cq> 0 No checking of copy quality performed. 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: <cq> See Test command
Write command	Parameter:

AT+FCQ=<cq>	<cq>	See Test command

AT+FCLASS

AT+FCLASS	Select, read or test FAX service class	
Test command AT+FCLASS=?	Response: +FCLASS: (list of supported <n>s) OK/ERROR/+CME ERROR	
	Parameter: <n>	
	0	data (e.g. EIA/TIA-602 or ITU V.250)
	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 – asynchronous Facsimile DCE Control Standard - Service class 2)
Read command AT+FCLASS?	Response: <n> OK	
	Parameter: <n>	See Test command
Write command AT+FCLASS=<n>	Parameter: <n>	See Test command

AT+FCR

AT+FCR	Capability to receive	
Write command	Response:	
AT+FCR=<cr>	OK/ERROR/+CME ERROR 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**

AT+FDCC

AT+FDCC	Select service for MO SMS messages	
Used for Faxclass 2 only 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.		
Test command AT+FDCC=?	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 File transfer mode

	st	Scan Time / line
	Note:	For further information see AT+FDIS
Read command: AT+FDCC?	Response: <dcc> OK Parameter:	
	vr	See Test command
	br	See Test command
	wd	See Test command
	ln	See Test command
	df	See Test command
	ec	See Test command
	bf	See Test command
	st	See Test command
Write command AT+FDCC=<vr>, ,<wd>,<ln>,<df>,<ec>,<bf>,<st>		
	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	See Test command
	br	See Test command
	wd	See Test command
	ln	See Test command
	df	See Test command
	ec	See Test command
	bf	See Test command
	st	See Test command

AT+FDFFC

AT+FDFFC	Data Compresssion Format Conversion	
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.		
Test command AT+FDFFC=?	Response: +FDFFC: (list of supported <df>s) OK/ERROR/+CME ERROR 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: <df>	See Test Command
Write command AT+FDFFC=<df>	Response: +FDFFC: (list of supported <df>s) OK	
	Parameter:	

	<df>	See Test Command

AT+FDIS

AT+FDIS	Query or set session parameters	
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.		
Test command AT+FDIS=?	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: <cdis> OK
	Parameter: vr — See Test command br — See Test command wd — See Test command ln — See Test command df — See Test command ec — See Test command bf — See Test command st — See Test command
Write command AT+FDIS=<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	
	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 — See Test command br — See Test command wd — See Test command ln — See Test command df — See Test command ec — See Test command bf — See Test command st — See Test command

AT+FDR

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

AT+FDT

AT+FDT	Data Transmission
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.	
Execute command AT+FDT	Response CONNECT
	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
***) Note:**	Only the default value needs to be implemented. Use test command to check which parameter values are in fact possible!	

AT+FET

AT+FET	End a page or document	
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.		
Write command AT+FET=<ppm>	Response: OK/ERROR	
	Parameter:	
	<ppm>	Post Page Message Codes
		0 Another page next, same document
		1 another document next
		2 no more pages or documents
		4 another page, procedure interrupt
		5 another document, procedure interrupt

AT+FK

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

AT+FLID

AT+FLID	Query or set session parameters
Used for FAX class 2 only	
Test command	Response:
AT+FLID=?	+FLID: (max. character length of Local ID string) (range of supported ASCII character values) OK/ERROR/+CME ERROR

	Parameter: <lid> Local ID string, max. length and possible content as reported by test command. Default value is empty string (“”). Maximum length: 20 See also the “AT+FCIG” command
Read command AT+FLID?	Response: <lid> OK
	Parameter: <lid> See Test Command
Write command AT+FLID=<lid>	Response +FLID: (max. character length of Local ID string) (range of supported ASCII character values) OK
	Parameter <lid> See Test command

AT+FMDL

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

AT+FMFR

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

AT+FOPT

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

AT+FPHCTO

AT+FPHCTO	DTE Phase C Response Timeout
Used for FAX class 2 only 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	
Read command AT+FPHCTO?	Response: <tout> OK/ERROR
Write command AT+FPHCTO=<tout>	
	Response: <tout> OK/ERROR
	Parameter: <tout> 0...255 Time-out value in 100ms units. Default: 30
	Model-specific command to set bit order independently of the understanding which is "mirrored" and which is direct

AT+FREV

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

AT+FRH

AT+FRH	Receive Data Using HDLC Framing

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.	
Execute command AT+FRH=<mod>	Response: CONNECT/ERROR
	Parameter: <mod> modulation mode 3 V21 Ch2 300 bps

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			
	Response: (List of supported modulation modes <mod>s) OK/ERROR/+CME ERROR			
	Parameter: <mod>			
	96	V.29	9600 bps	See [21]
	72	V.29	7200 bps	See [21]
	48	V.27ter	4800 bps	See [22]
	24	V.27ter	2400 bps	See [22]
Write command AT+FRM=<mod>	Response: CONNECT			
	Parameter <mod> See Test command			

AT+FRS

AT+FRS	Receive Silence
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.	
Write command AT+FRS=<time>	Response: (List of supported modulation modes <mod>s) OK
	Parameter <time> 0 .. 255 number of 10 millisecond intervals

AT+FTH

AT+FTH	Transmit Data Using HDLC Framing
Read command	**Used for FAX class 1 only**

AT+FTH?	Parameter: <mod> 3 V.21 Ch2 300 bps
Write command	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.
AT+FTH=<mod>	Response: CONNECT
	Parameter <mod> See Read command

AT+FTM

AT+FTM	Transmit Data			
Test command	**Used for FAX class 1 only**			
AT+FTM=?	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	See [21]
	72	V.29	7200 bps	See [21]
	48	V.27ter	4800 bps	See [22]
	24	V.27ter	2400 bps	See [22]
Write command AT+FTM=<mod>	Response: CONNECT			
	Parameter <mod> See Test command			

AT+FTS

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

AT+FVRFC

AT+FVRFC	Vertical resolution format conversion
Test command	**Used for FAX class 2 only**

AT+FVRFC=?	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/ERROR/+CME ERROR
	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: <vrfc> See Test command
Write command AT+FVRFC=<vrfc>	Response: OK
	Parameter: <vrfc> See Test command

2.7 Bluetooth related commands

This section provides descriptions of commands related to Bluetooth applications. AT commands defined in this chapter are only to be used over a bluetooth connection between mobile and devices such as Headset or Carkit. These commands are currently specified in the Bluetooth Profile Description and not part of an ETSI specification [18].

AT+BINP

This command is part of the Handsfree (e.g. Carkit) Profile.

AT+BINP	Phone number corresponding to the last voice tag recorded in the HF
Test command AT+BINP=?	Response: OK/ERROR/+CME ERROR
Write command AT+BINP=1	Response: +BINP: <number>, <type> OK/ERROR/+CME ERROR
	Parameter: <number> Telephone number <type> Type of number

AT+BLDN

This command is part of the Handsfree (e.g. Carkit) Profile.

AT+BLDN	Redial Last Number
Execute command	Dial Last number! Similar to ATDL command but only for connection over Bluetooth
AT+BLDN;	Response: OK/ERROR/+CME ERROR

AT+BRSF

AT+BRSF	Report Supported Features
Test command AT+BRSF=?	Response: OK/ERROR/+CME ERROR
Write command AT+BRSF=<integer>	
	Response: +BRSF: <integer> OK
	Parameter: <integer> A 32 bit integer type parameter:

Bit	Feature
o	Three-way Calling
1	EC and/or NR function
2	Voice Recognition
3	In-band ringing Tone (AT+BSIR)
4	Attach a number to a voice Tag (AT+BINP)
5	Ability to reject a call
6…31	Unused

AT+NREC

This command is part of the Handsfree (e.g. Carkit) Profile.

AT+NREC	Noise Reduction and Echo Canceling
Test command AT+NREC=?	Response: OK/ERROR/+CME ERROR
Write command AT+NREC=<nrec>	Response: OK/ERROR/+CME ERROR Parameter: <nrec> 0 Disable Noise Reduction and Echo Cancellation 1 Enable Noise Reduction and Echo Cancellation

AT+VGS

This command is part of the Headset and Handsfree (e.g. Carkit) Profile.

AT+VGS	Gain of the Speaker Volume
Test command AT+VGS=?	Response: OK/ERROR/+CME ERROR
Write command AT+VGS=<gain>	Response: OK/ERROR/+CME ERROR
	Parameter: <gain> 0 .. Minimum Gain 15 Maximum Gain
Unsolicited result code +VGS: <gain>	

2.8 General commands according to ITU-T Recommendation V.250

This section provides the descriptions of general ITU-T Recommendation V.250 commands.

AT+GCAP

AT+GCAP	Request Capabilities List
Test command AT+GCAP=?	Response: OK/ERROR
Read command AT+GCAP?	Response: +GCAP: <mode>
	Parameter <mode> : e.g. "+GCAP: AT+CGSMS , AT+FCLASS"

AT+IPR

AT+IPR	Fixed DTE rate
Test command	Response:
AT+IPR=?	+IPR: (list of supported <rate> values) OK/ERROR/+CME ERROR
	Parameter: <rate> bits per second at which the DTE-DCE interface is to operate. The set of supported values can be retrieved by means of the Test command. 0 Auto-bauding
Read command AT+IPR?	Response: +IPR: <rate> OK/ERROR/+CME ERROR
	Parameter: <rate> See Test command
Write command: AT+IPR=<rate>	Response: +IPR: <rate> OK/ERROR/+CME ERROR
	Parameter: <rate> See Test command

2.9 Siemens defined commands

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 syntax prescribed in 3GPP TS recommendations, the command can be addressed using either command string.

AT^SABD

AT^SABD	Accessory for Bluetooth Data
Test command AT^SABD=?	Response : ^SABD: (list of supported <mode>s) OK
	Parameter: <mode> See Write command
Read command AT^SABD?	Response: ^SABD: <mode> OK
Write command AT^SABD=<mode>[,<data>]	
	Response: [^SABD: <data>] OK
	Parameter:

	<mode>	integer type parameter, indicating the status of the Accessory Data interface 0 disable Notifications and Accessory Data Transfer 1 enable Accessory Data Transfer Mode 2 Data Transfer mode **Note**: It can be used directly since x65 devices, no need to switch in mode 1 beforehand.
	<data>	String type, as input parameter only available in transfer mode (see <mode> = 2), Accessory specific data.
Unsolicited Result Code : ^SABD: <data> **Note**: Unsolicited Result Code, only available if write command with mode = 1 or 2 previously entered, that is to say if Data Transfer Mode enabled.		

AT^SACD

AT^SACD	Accessory Data
Test command	Response:
AT^SACD=?	^SACD: (list of supported <mode>s) OK/ERROR/+CME ERROR
	Parameter: <mode> See Write command
	The Test command returns the modes for the Accessory Notifications and Accessory Data Transfer
Read command: AT^SACD?	Response: ^SACD: (list of supported <mode>s) OK
	The Read command returns the mode currently selected
Write command AT^SACD==<mode>[,data]	Response: [^SACD: <data>] OK
	Parameter: <mode> integer type parameter, indicating the status of the Accessory Data interface 0 disable Notifications and Accessory Data Transfer 1 enable Accessory Data Transfer 2 Data Transfer mode Note: It can be used directly as of x65 devices, no need to switch in mode 1 beforehand. <data> String type, as input parameter only available in transfer mode (see <mode> = 2), Accessory specific data.
	The Write command enables the accessory notifications and accessory data transfer. If the mode is set to 'unsolicited Notifications' , all accessory notifications are issued with the unsolicited result code
Unsolicited Result Code for mode '2': ^SACD: <data>	

Note:
Unsolicited Result Code, only available if Data Transfer Mode enabled (i. e. <mode> = 1 or <mode>=2 previously entered in Write command

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 Write command <acm> Accumulated call meter <acm_max> Maximum accumulated call meter
Write command AT^SACM=<n>	Parameter: <n> Specifies whether the unsolicited redsult code is to be displayed 0 Suppresses the Unsolicited result code specified 1 Displays the Unsolicited result code specified
Unsolicited result code ^SACM: <m>	Parameter: <m> 1 ACM limit almost reached 2 ACM greater than ACMmax 3 ACM range overflow

AT^SADT

AT^SADT	Application Data Transfer
Test command AT^SADT=?	Response: ^SADT: (list of supported <application>s),(list of supported <bitrate>s) OK/ERROR
	Parameter: <application> integer parameter which identifies the applications 0 OMA (not supported) 1 CoC (Clip on Camera) application <bitrate> bits per second at which the DTE-DCE interface should operate.
Write command AT^SADT=<application>[,<bitrate>[,<filename>[,<filesize>]]]	
	Response: CONNECT/ERROR
	Parameter: <application> see Test command <bitrate> see Test command <filename> string containing the name of the file with extension (not supported) <filesize> string containing the size of the file in bytes (not supported)

AT^SBLK

AT^SBLK	Clear black list
Test command	Response:

AT^SBLK=?	OK/ERROR/+CME ERROR
Execute command AT^SBLK	Response: OK/ERROR/+CME ERROR

AT^SBMH

AT^SBMH	Bookmark Handling
Test command AT^SBMH=?	Response: ^SBMH: (list of supported <action>s),max. length of <folder>
	Parameter: <action> 1 overwrite existing bookmarks in root folder by imported bookmarks 2 append imported bookmarks to bookmarks in root folder 3 append imported bookmarks to existing bookmarks in folder specified by <folder>. Only for this <action> is the <folder> parameter required <folder> string type parameter which contains the folder name where the bookmarks have to be stored
Read command AT^SBMH?	Response: OK/ERROR/+CME ERROR
Note:	The read command causes the Browser to export the bookmarks to a file called bookmark.htm. This bookmark file is stored in data\misc folder of the file system.
Write command AT^SBMH=<action>[,<folder>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <action> See Test command <folder> See Test command
Note:	The file name of the import file has to be bookmark.htm and has to be stored in the data\misc folder of the file system.

AT^SBNR

AT^SBNR	Binary Read
Test command AT^SBNR=?	Response: ^SBNR: (list of supported <type>s, (list of supported <subtype>s)) OK/ERROR/+CME ERROR
	Parameter: <type> bmp Bitmap; Windows bitmap format compression; 2/16/256 colours <subtype> 0 shown permanently when registered in home network <subtype> 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 (and only) entry of type vcs
		<subtype> 1	entry of type vcs
	vcf	vcard format specification: http://www.imc.org/pdi	
		<subtype> 0	first (and only) entry of type vcf
		<subtype> 1	entry of type vcf
	t9d	Tegic database for t9 text recognition.	
		<subtype> 0	first (and only) entry of type t9d
<actNumber>	0	deletes entry of the current subtype	
	other	current packet number	
<maxNumber>	maximum number of packets		

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 Test command
<subtype>	see Test command
<data>	data in hexadecimal form (PDU)
<maxNumber>	see Test command See the “ Appendix B” for examples

AT^SBNW

AT^SBNW	Binary Write		
Test command AT^SBNW=?	Response: ^SBNW: (list of supported <type>s, list of supported <subtype>s) OK/ERROR/+CME ERROR		
	Parameter:		
	<type>	bmp	Bitmap; Windows bitmap format compression; 2/16/256 colours
			<subtype> 0 shown permanently when registered in home network
			<subtype> 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 (and only) entry of type vcs
			<subtype> 1 entry of type vcs
		vcf	vcard format specification: http://www.imc.org/pdi
			<subtype> 0 first (and only) entry of type vcf
			<subtype> 1 entry of type vcf
		t9d	Tegic database for t9 text recognition.

		<subtype> 0	first (and only) entry of type t9d
	<actNumber>	0	deletes entry of the current subtype
		other	current packet number
	<maxNumber>		maximum number of packets
Write command 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:	1) It is not possible to upload data when a call is active or in progress. 2) 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. 3) 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. 4) To get the extended +CME ERROR response, AT+CMEE=2 has to be sent first. Otherwise the mobile only returns an ERROR. (see 1) 5) If <actNumber> and <maxNumber> are omitted during the upload, the mobile aborts the whole input sequence for the current subtype. 6) If <actNumber> is 0 during the upload and <maxNumber> is omitted, the mobile deletes the current record with index <subtype> 7) Packets have to be uploaded in the right order!		
Restriction	The maximum PDU size is 508 bytes. See “ Appendix B” for examples.		

AT^SCCM

AT^SCCM	CC Monitor		
Test command AT^SCCM=?	Response: OK/ERROR/+CME ERROR		
Execute command AT^SCCM	Response: ^SCCM: <version>,<General>,<Setup>,<Network>,<Battery>,<Diagnosis> OK/ERROR/+CME ERROR		
	Parameters:		
	<version>	The version string of the CC Monitor	
	<General>	General: (9 Bit), specified as a 4-digit-hexadecimal-value	
		SimCard; (2) 00	no Card
		01	5V
		10	3V
		11	Reserved
		ClockStop; (1) 0	not supported

	HighSpeedSim; (1)	1	supported
		0	not active
		1	active
	Accessory; (3)	000	no Accessory
		001	DataCable
		010	Bluetooth
		011 .. 110	Reserved
		111	Unknown
	StatusRACH, (1)	0	not ok
		1	ok
	StatusSABM; (1)	0	not ok
		1	ok
<Setup>	Setup: (11 Bit)), specified as a 4-digit-hexadecimal-value		
	Irda; (1)	0	Off
		1	On
	CellBroadcast; (1)	0	Off
		1	On
	PowerSave; (1)	0	Off
		1	On
	Ringer; (1)	0	Off
		1	On
	Light; (1)	0	Off
		1	On
	Vibra; (1)	0	Off
		1	On
	AutoOff; (1)	0	Off
		1	On
	Filter; (1)	0	Off
		1	On
	Gprs; (1)	0	Off
		1	On
	Bluetooth; (1)	0	Off
		1	On
	AutoRoaming; (1)	0	Off
		1	On
<Network>	Network: (12 Bit), specified as a 4-digit-hexadecimal-value		
	MobileState; (2)	00	Idle
		01	Call
		10	Scan
		11	Reserved
	PerLocUpdate; (1)	0	Off
		1	On
	Neighbours; (4)	0 .. 15	
	RxLevel; (1)	0	> -95 dBm
		1	<= -95 dBm
	Multiframe; (3)	2 .. 9	
	PBCCHSupported; (1)	0	No
		1	Yes and active
<Battery>	Battery: (6 + 10 Bit), specified as a 4-digit-hexadecimal-value		
	AkkuType; (2)	00	NiH
		01	LiI
		10	LiP

			11	Reserve
		Battery; (4)		11 + 1 States
		ChargeCount (16)	4 special quantisation coding	
		ChargeBroken; (16)	3 special quantisation coding	
		ChargeFast; (16)	3 special quantisation coding	
	<Diagnosis>	Diagnosis (Lifetime 5 * 3 Bit = 15 Bit), specified as a 4-digit-hexadecimal-value		
			Turnoffs	
			Exits	
			Restarts	
			OpTime	
			TalkTime	

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

AT^SCKA

AT^SCKA	Display SIM card status
Test command AT^SCKA=?	Response: OK/ERROR/+CME ERROR
Read command AT^SCKA?	Response: ^SCKA: <n> OK/ERROR
	Parameter: <n> 0 No card 2 Card in card reader

AT^SCKS

AT^SCKS	Display SIM unsolicited card status
Test command AT^SCKS=?	Response: ^SCKS: (list of supported <n>s)
	Parameter: <n> 0 Suppresses the Unsolicited result codes 1 Displays the Unsolicited result codes
Read command AT^SCKS?	Response: ^SCKS: <n>, <m>
	Parameter: <m> 0 No card 1 Card in card reader
Write command	Response:

AT^SCKS=<n>	OK/ERROR
	Parameter <n> See Test command
Unsolicited result code ^SCKS: <m>	

AT^SCNI

AT^SCNI	Output call number information
Test command AT^SCNI=?	Response: OK/ERROR/+CME ERROR
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

AT^SDBR

AT^SDBR	Database Read
Test command	Response:
AT^SDBR=?	^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 type 0 phone number ‘HOME’ 1 phone number ‘OFFICE’ 2 phone number ‘MOBILE’ 3 phone number ‘FAX’ <number> Telephone number <typ> Type of number <text> Text corresponding to the telephone number <text> depends on AT+CSCS.

Note:	In the <text> field, special characters like the following may appear: `"` (0x22), `@` (0x00), `ò` (0x08), `Ö` (0x5c). (See also AT+CPBW and Appendix A: "How to use special characters in certain commands (e. g., AT+CPBW")

AT^SDLD

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

AT^SDLY

AT^SDLY	Delay Command
Test command AT^SDLY=?	Response: OK/ERROR/+CME ERROR
Write command AT^SDLY =<n>	Response: OK/ERROR/+CME ERROR
	Parameter: <n> Time (in tenth of second) until OK is returned e.g. <n>= 10 corresponds to 1 second
Remark:	This command implements a delay for the specified time.

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 type of supported authentication 0 none 1 PAP 2 CHAP 3 PAP and CHAP
Read command AT^SGAUTH?	Response: ^SGAUTH: <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

AT^SGDCONT

AT^SGDCONT	Define PDP Context
Test command	Response:

AT^SGDCONT=?	^SGDCONT: (range of supported <cid>s), <PDP_type>, , , (list of supported <d_comp>s), (list of supported <h_comp>s) [<CR><LF> ^SGDCONT: (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 0 .. 4 **Note:** The default context is not affected by the ATZ and AT&F commands <PDP_type> string parameter of Packet Data Protocol type PPP Type PPT IP Type 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^SGDCONT?	Response: ^SGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp> [<CR><LF> ^SGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_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^SGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr>]]]]	
	Response: OK/ERROR/+CME ERROR
	Parameter <cid> See Test command <PDP_type> See Test command <APN> See Read command <PDP_addr> See Read command

AT^SGDV

AT^SGDV	GPRS data volume
Test command AT^SGDV=?	Response: ^SGDV: (list of supported <n>s) OK/ERROR/+CME ERROR
	Parameter: <n> 0 Reset GPRS data volume statistics 1 Get total amount of data (mobile)
Read command AT^SGDV?	Response : ^SGDV: <cid>,<down>,<up>[<CR><LF>^SGDV: <cid>,<down>,<up>[..]] OK/ERROR/+CME ERROR
	Parameter

	<cid>	The context ID
	<down>	count of bytes of downlink
	<up>	count of bytes of uplink
Write command AT^SGDV=<n>	Response OK/ERROR/+CME ERROR	
	Parameter: <n>	See Test command

AT^SICO

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

AT^SIFS

AT^SIFS	Query InterFace Setting	
Test command AT^SIFS=?	Response: OK/ERROR	
Exec command AT^SIFS	Response: ^SIFS: <medium>	
	Parameter: <medium>	possible external interfaces. Wire IrDA BT

AT^SKPD

AT^SKPD	Keypad control single key
Test command AT^SKPD=?	Response: OK/ERROR/+CME ERROR
Write command	Response:

AT^SKPD =<key>	OK/ERROR/+CME ERROR
	Parameter: <key> The key in ASCII integer format (e.g. 48 for key '0') For a list of keys implemented for AT^SKPD see section 0

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> AB All barring services AC All incoming barring services AG All outgoing barring services AI BAIC (bar all incoming calls) AO BAOC (bar all outgoing calls) FD FDN lock IR BIC-Roam (bar incoming calls when roaming outside the home country) OI BOIC (bar outgoing international calls) OX BOIC-exHC (bar outgoing international calls except to home country) PC Corporate personalization (GSM 02.22, [3]) PF Phone locked to very first inserted SIM PN Network personalization (GSM 02.22, [3]) PP Service provider personalization (GSM 02.22, [3]) PS Phone locked to SIM (device code) PU Network subset personalization (GSM 02.22, [3]) SC SIM card (PIN)
Write command AT^SLCK = <fac>, <mode> [,<passwd>[,<class>]]	Response: **If <mode>=2 and command is successful** ^SLCK: <status>[,<class1>[<CR><LF> ^SLCK: <status>, class2....]] OK/ERROR/+CME ERROR
	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 Voice, Data and FAX (default) 8 SMS 16 data circuit sync 32 data circuit async 64 dedicated packet access

		128	dedicated PAD access
		X	combination of some of the above classes, e.g. 255 regroups all classes and 5 regroups Voice and FAX
	<status>	0	Off
		1	On

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 (see [5]) or mobile-specific language (>100)
Read command AT^SLNG?	Response: ^SLNG: <lng>
Write command AT^SLNG=<lng>	
	Response: OK/ERROR/+CME ERROR

AT^SMGL

AT^SMGL	List SMS (without status change from *unread* to *read*) **Revision according to 3GPP TS 27.005**
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>]	
	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: <stat> See Test command <pdu> The PDU begins with the service-center address (according to GSM 04.11, see [9]), followed by the TPDU according to GSM 03.40 (see [3]) in hexadecimal format otherwise: +CMS ERROR: <err>

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 storage full (The "SM" and "ME" storages are full, i. e. the "MT" storage is full. See AT+CPMS command.) 2 A message is queued in the (network-based) Message Service Centre (MSC) to be forwarded/delivered to the mobile phone (e.g., a Class 2 message is queued but the "SM" storage is full; or any kind of message is queued but every storage is full)
Write command AT^SMGO=<n>	Response OK/ERROR/+CMS ERROR
	Parameter: <n> See Test command <mode> See Test command
Unsolicited result code: ^SMGO: <mode>	
Notes	1) Indication during data transfer via break (100ms). 2) Incoming short messages with message class 2 (refer <dcs> GSM 03.38, see [5]) will be stored in "SM" storage only. Therefore, AT^SMGO: 2 indication can occur without a preceding AT^SMGO: 1 indication.

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>	
	Response: **If PDU mode (+CMGF=0) and command are successful:** AT^SMGR: <stat>,[<alpha>],<length><CR><LF><pdu>
	Parameter: <pdu> The PDU begins with the service-center address (according to GSM 04.11, see [9]), followed by the TPDU according to GSM 03.40 (see [3]) in hexadecimal format otherwise: +CMS ERROR: <err>
	<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
	<length>	See the AT+CMGL command otherwise: +CMS ERROR: <err>	
	<index>	Index of message in selected memory <mem1>	

AT^SMSO

AT^SMSO	Switch device off		
Test command AT^SMSO=?	Response: OK/ERROR/+CME ERROR		
Execute command AT^SMSO	Parameter: OK	Device switches off	
Write command AT^SMSO=<mode>			
	Parameter: <mode>	0	Response : ^SMSO: MS OFF OK
		1	Response: ^SMSO: MS RESET OK

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 set to "0" temporarily before NF hardware is changed (see AT^SNFV command).		
Write command AT^SNFS=<dev>			
	Response OK/ERROR		
	Parameter <dev>	See Test command	

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 volume

	1 2 3 4	max. volume (approx. 3 dB/level)
Read command AT^SNFV?	Response: ^SNFV: <vol>	
	Parameter: <vol>	See Test command
Write command AT^SNFV=<vol>		
	Response OK/ERROR	
	Parameter <vol>	See Test command

AT^SOBX

AT^SOBX	Set OBEX Debug Level	
Write command AT^SOBX=<level>		
	Response: OK/ERROR/+CME ERROR	
	Parameter: <level>	0 .. 127 enables a specific level of tracing for OBEX debug information.

AT^SPBA

AT^SPBA	Query active phonebook book	
Test command AT^SPBA=?	Response: ^SPBA: (list of supported <book>s) OK/ERROR/+CME ERROR	
	Parameter: <book>	Possible default books are: 0 Phonebook 1 Address book
Read command AT^SPBA?	Response ^SPBA: <book> OK	
	Parameter: <book>	See Test command
	The read option returns the actual setting for the default book.	

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>	
	Response: ^SPBC: <index> OK/ERROR/+CME ERROR
	Parameter: <char> A .. Z First letter of desired entry Value range: capital letters only (if <char> is not capital letter, the index of the first entry beginning with a special character is displayed) <index> Index in the sorted telephone book (access via AT^SPBG)

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>,<number>,<type>,<text>[<CR><CL> ^SPBG: <index2>,<number>,<type>,<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 <number> Telephone number <type> Type of number <text> Text corresponding to the telephone number

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> BD Barred dialing numbers BL Blacklist dialing numbers (barred numbers from remote) CD Callback dialing numbers (answered calls) CS Common sortable telephone book (sorted combination of "SM", "ME", "FD"; access only via ^SPBC, ^SPBG) DC ME Dialled Calls List FD SIM fix-dialing telephone book LD SIM last dialing number MB Mailbox dialing numbers (network-operator mailbox) MC ME Missed Calls List

	MD	Last number redial memory in telephone device
	ME	Telephone book in device
	MS	Missed dialing numbers (unanswered calls)
	ON	Own telephone numbers
	OW	Own numbers
	RC	ME Received Calls List
	RD	Red book (all entries in "CS" whose name portions have an exclamation mark ('!') as their final character)
	SD	Service dialing numbers
	For detailed information on the telephone-book features see " Appendix A"	
Read command AT^SPBS?	Response: ^SPBS: <sto>[,<used>,<total>] OK/ERROR/+CME ERROR	
	Parameter:	
	<sto>	See Test command
	<used>	integer type value indicating the number of used locations in selected memory
	<total>	integer type value indicating the total number of locations in selected memory
Write command AT^SPBS=<sto>	Response OK/ERROR/+CME ERROR	
	Parameter:	
	<sto>	See Test command

AT^SPIC

AT^SPIC	Output PIN counter	
Test command AT^SPIC=?	Response ^SPIC:(<fac1>,<pin_attempts>,<puk_attempts>)[,(<fac2>,<pin_attempts>,<puk_attempts>)][,...] OK/ERROR/+CME ERROR	
	Parameter:	
	<fac>	Facility as described in AT+CLCK command
	<pin_attempts>	Number of attempts left to enter the PIN password via AT+CLCK (or AT+CPIN).
	<puk_attempts>	Number of attempts still available to enter the PUK password
Write command AT^SPIC=<fac>	Response: ^SPIC: <pin_attempts>,<puk_attempts> OK/ERROR/+CME ERROR	
Read command	Response:	
AT^SPIC?	^SPIC: (<fac1>,<pin_attempts>,<puk_attempts>),...,(<facX>,<pin_attempts>,<puk_attempts>) OK/ERROR/+CME ERROR	
Execute command AT^SPIC	Response: ^SPIC: <n> OK/ERROR/+CME ERROR	
	Parameter:	
	<n>	Number of attempts still available to enter the <passwd>. Use the AT+CPIN? command to check which password is being required.

AT^SPLM

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

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

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 at which the entry is written
Write command AT^SPLW=<index>[, <oper>]	
	Response: OK/ERROR/+CME ERROR
	Parameter: <index> See Test command <oper> Network operator in numeric form

AT^SPST

AT^SPST	Play Signal Tone
Test command	Response:

AT^SPST =?	^SPST: (list of supported <n>s) OK/ERROR/+CME ERROR
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

AT^SPTT

AT^SPTT	Push To Talk (for BT Headset)
Test command AT^SPTT =?	Response: OK/ERROR/+CME ERROR
Write command AT^SPTT =<n>	Response OK/ERROR/+CME ERROR
	Parameter: <n> Key Press 0 Short key pressed 1 Long key pressed

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 PS Phone locked to SIM (device code) SC SIM card (PIN) 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, [3]) PC Corporate personalization (GSM 02.22, [3] PU Network subset personalization (GSM 02.22, [3]

		PP	Service provider personalization (GSM 02.22, [3])
		PF	Phone locked to very first inserted SIM
	<pwdlength>	Length of password	
Write command AT^SPWD = <fac>,<oldpwd>, <newpwd>			
	Response: OK/ERROR/+CME ERROR		
	Parameter		
	<fac>	See Test command	
	<oldpwd>	Old password	
	<newpwd>	New password	

AT^SQWE

AT^SQWE	Switch Mode for External Interface		
Test command AT^SQWE=?	Response: ^SQWE: (list of supported <mode>s) OK/ERROR/+CME ERROR		
	Parameter:		
	<mode>	0	RCCP AT command mode without CSD
		1	BFC Siemens specific data transfer mode
		2	GIPSY Default mode, AT command mode with CSD
		3	OBEX OBEX data transfer mode
Read command AT^SQWE=?	Response: ^SQWE: <mode> OK The Read command returns the actual setting for the <mode> parameter.		
Write command AT^SQWE=<mode>			
	Response: OK/ERROR The Write command sets the mode for this interface (e.g. BT, IrDA, Wire)		

AT^SRMP

AT^SRMP	Ring Melody Playback	
Test command AT^SRMP=?	Response ^SRMP: (list of supported <call type>s),(list of supported <volume>s) OK	
Read command AT^SRMP?	Response ^SRMP: (<call type1>,<volume1>s)[…] [^SRMP: (<call typex>,<volumex>s)] OK	
	The Read command returns the volume set for each ring melody index.	
Write command ^SRMP=<call type>[,<volume>]		
	Response: ^SRMP: <call type>[,<volume>] OK/ERROR/+CME ERROR	
	Parameter:	
	<call type>	integer type parameter corresponding to different ring melodies in mobile such as line1, line2, groups, Alarm, SMS, CBS and others
	<volume>	integer type parameter with manufacturer specific range

	The Write command starts playing the ring melody.
Execute command AT^SRMP	Response: OK/ERROR/+CME ERROR
	The Execute command stops the melody played. If an MTC is received during an active test ring, the test ring is switched off and the ”normal” ring is switched on.

AT^SSET

AT^SSET	Profile Settings Control (SET Melody and Picture settings in Mobile)
Test command AT^ SSET =?	Response ^SSET:((list of <action>s), <applicationX>,(list of <key>s)),…, ((list of <action>s),<applicationY>,(list of <key>s)) OK
	Parameter: <action> integer type value that lets you set, get or delete settings; the following values are defined: 0 Delete 1 Set 2 Get <application> integer type value; the following values are defined: 1 MMI Settings (Melody and Picture Settings) <key> integer type value indicating the feature related, e.g. incoming SMS ringer melody, background picture.
Write command ^SSET=<action>[,<application>[,<key>[,<fullname>]]]	
	Response to Write and Delete Action OK/ERROR/+CME ERROR: <err>
	Response to Read Action with application and key parameters [^SSET: <applicationX>,<keyY>,<fullname><CR><LF>] OK/ERROR/+CME ERROR: <err> Response to Read Action with application parameter but without key parameter [[^SSET: <applicationX>,<key1>,<fullname><CR><LF>][…] [^SSET: <applicationX>,<keyN>,<fullname><CR><LF>]] OK/ERROR/+CME ERROR: <err>
	Response to Read Action without application and key parameters [[^SSET: <applicationX>,<key1>,<fullname><CR><LF>][…] [^SSET: <applicationX>,<keyN>,<fullname><CR><LF>][…] [^SSET: <applicationY>,<key1>,<fullname><CR><LF>][…] [^SSET: <applicationY>,<keyM>,<fullname><CR><LF>]] OK/ERROR/+CME ERROR: <err>
	Parameter: <action> see Test command <application> see Test command <key> see Test command <fullname> String type parameter which contains the name of the file with extension
Description:	The Test command returns a list of possible applications with its available actions and keys.
	The Write command is used to set, get or delete settings of the mobile.

	Delete Action	If no parameters are provided, every setting will be deleted. If no <key> parameter is entered then all settings of this application are deleted Otherwise just the setting corresponding to the key will be deleted.
	Set Action	All parameters are mandatory.
	Get Action	Optional application and <key> parameters If no <key> parameter is entered then all settings of this application are retrieved, otherwise just the setting corresponding to the <key> will be retrieved.
Example Note:	The <fullname> parameter should be specified according to the character setting defined in the AT+CSCS command. Example: "A:\Sounds\jump.mid" In GSM character set, this string is different to ANSI character set (standard) and thus the Backslash character must be passed as two characters: the extension table character and a slash. The extension table character has value 1B and the following character "/" has value 2F. In UCS2 character set, there is no problem since "\" is defined as value 005C. **Note**: String case insensitive (Upper or Lower case)	

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, with a maximum PDU length of 255 bytes
	<mode>	0 Single command 1 Sequence of commands
	<pdu>	SIM Toolkit commands, see GSM 11.14
Unsolicited result code ^SSTK: <data>		

AT^SVMC

AT^SVMC	Voice Memo Control
Test command AT^SVMC =?	Response: ^SVMC: (list of <action>s),<number>,<time>,<nlength> OK/ERROR/+CME ERROR

Parameter:

<action>	integer type value; the following values are defined: 0 stop recording and save the Voice Memo, or stop playback of Voice Memo 1 cancel recording without saving current file 2 start recording; no index is needed - if an index is specified, an error is issued. If a name is specified, it will be associated with the current Voice Memo; otherwise, <date_time> is used as name. <nlength> gives the max. length for the name of a Voice Memo. Examples: AT^SVMC=2 start record, Voice Memo is named with default name "date_time" AT^SVMC=2,,"My-Memo" start record named 'My-Memo' 3 start playback of voice memo selected with <index>, from start of file if no time is given. If a time (<start>) is given then the playback starts a position <start> in seconds from the beginning of the file. This could also be used to have a fast forward or rewind. The parameter <name> is not needed and if it is available an error is issued 4 query information for voice memo with <index>, if no index is given then an error is issued 5 delete voice memo with <index>, if no index is given then all voice memos are being deleted
<number>	integer type value indicating the number of available Voice Memos, if no Voice Memo is available this value is '0'
<time>	string of format "hh:mm:ss", indicating hour (hh), minutes (mm) and seconds (ss)
<nlength>	integer type value indicating the maximum length of field <name>
The Test command returns a list of possible actions, a list of available indexes of Voice Memos, the remaining recording time and the maximum length for the name of a Voice Memo (see also section 4.4)	

Write command

^SVMC=<action>[,<index>[,[<name>][,<start>]]]

Response:

^SVMC: <action>,<index>,<name>,<date_time>

OK/ERROR/+CME ERROR

Parameter:

<action>	see Test command	
<index>	0 .. 254	integer type value; which represents a certain voice memo sorted in a chronological order (starting with '0', max. '254')
<name>	string representing the name of the file; used character set should be the one selected with Select TE Character Set AT+CSCS	
<start>	integer indicating the time in seconds from the beginning of a voice memo (not supported at the moment)	

	<date_time>	string of format yy-MM-dd,hh:mm:ss[±zz] indicating year, month, day, hour, minutes, seconds and, optionally, time zone (indicates the difference between the local time and GMT, expressed in quarters of an hour, range -47...+48) E.g. "04-05-06,22:10:00+08" stands for 6th of May 2004, 22:10:00 GMT+2 hours
	The Write command is used to control the Voice Memo functionality of the mobile. The action parameter lets you start, stop, pause, or cancel a Voice Memo playback. Also, this command can be used to start, stop, cancel and pause the recording of a Voice Memo (see also section 4.4).	
Read command ^SVMC?	Response: ^SVMC: <type>,<time> OK/ERROR/+CME ERROR>	
	Parameter: <type>	integer indicating the type of action being performed for a voiced memo; the following values are defined 0 Idle 1 recording of voice memo 2 playback of voice memo
	<time>	see Test command
	The Read command indicates whether a playback or recording is running (type), the remaining time (recording time or playback time) and the name (if available) of the current Voice Memo.	
Execute command ^SVMC	Response: ^SVMC: <type>,<time> OK/ERROR/+CME ERROR	
	The Execute command controls the pausing of playback and recording. Each time this command is executed there is a change between playback/record and pause (see also section 4.4).	
Unsolicited result code: ^SVMC: <event>		
	Parameter: <event>	0 Normal Stop 1 Memory failure (e.g. MMC removed) 2 Memory full 3 Incoming call 4 Warning: 5 seconds remaining for recording 5 – 254 not yet defined (reserved for later use) 255 Unknown event

AT^STRC

AT^STRC	Activate Universal Data Tracer
Test command AT^STRC=?	Response: OK/ERROR/+CME ERROR
Write command AT^STRC=<traceid> [,<serial>]	
	Response: OK/ERROR
	Parameter: <traceid> enables a specific level of tracing e.g. RLP, PPP. 0 tracer disabled 1 2 3 4 5 6 7 <serial> specifies the serial interface which should be used for debug output. 0 1 This command can only be used if the RESI-SAP is activated in the mobile device.

2.10 List of all Unsolicited result codes

Unsolicited result codes indicate that processing of actions currently running is aborted due to an unforeseen event. Table 2-10 lists all unsolicited result codes defined, together with their meaning:

Message	Meaning
+CBM: <length><CR><LF><pdu>	Direct output of the broadcast message. For an explanation of parameters see the AT+CNMI command
+CCCM:<ccm>	Indication that the <ccm> value has changed but no more than every 10 seconds
+CCWA: <num>,<type>,<class>,,<cli validity>,<alpha>,<line>	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
+CDSI: <mem>,<index>	Displays the status report index and memory For an explanation of parameters see the AT+CNMI command
+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
+CIEV: <ind>,<value>	Indicator event reporting For an explanation of parameters see AT+CMER
+CKEV: <key>,<press>	For an explanation of parameters see AT+CMER
+CLIP: <num>,<type>,,,<alpha>,<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>,,,<alpha>	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>[,[<index>][,<number>]]	Supplementary service

+CSSU: <code2>[,[<index>][,<number>]]	intermediate/unsolicited result code For an explanation of parameters see AT+CSSN
+CTZV: <tz>	Time Zone Changed indication For an explanation of parameters see AT+CTZR
^SABD: <data>	For an explanation of parameters see AT^SABD
^SACD: <data>	For an explanation of parameters see AT^SACD
^SACM: <m>	Message indicating if ACM has reached the maximum value ACMmax For an explanation of parameters see AT^SACM
^SCBI: <stat>,<cn>	Message indicating that the CCBS feature is available
^SCBI: <stat>,<cn>,<number>,<type>	Message indicating that a CCBS recall is incoming
^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
+VGS: <gain>	Speaker Volume indication used in Headset and Handsfree(Carkit) Bluetooth Profile For an explanation of parameters see AT+VGS
^SVMC: <int>	For an explanation of parameters see AT^SVMC

Table 2-10: List of unexpected messages

3 Appendix A

3.1.1 Factory settings made by AT&F

```
Reset pending locks (Phone Pin/Puk, Pin2/Puk2 ...)
which are given as answer to AT+CPIN?
ATS0=0
ATS3=13
ATS4=10
ATS5=8
ATS7=60
ATV1
ATE1
ATQ0
AT\Q3
AT&C1
AT&D2
ATX0
AT+VTD=1

AT+CSCS="GSM"
AT+CMEE=0
AT+CLIP=0
AT+COLP=0
AT+CPBS=SM (if available)
AT^SCKS=0
AT^SACM=0

AT+CRC=0
AT+CAOC=0
AT^SACM=0
AT+CCWA=0
AT+CSSN=0,0
AT+CPOL=,2
AT+CMER=0,0,0,0,0
AT+CREG=0
AT+CMEC=0,0,0
AT+CRC=0
AT+COPS=0,0
The extended error report (AT+CEER) will be reset (0,0).

AT+CNMI=0,0,0,0,1
AT+CMPS=SM,SM,SM
AT^SMGO=0
AT+CSMS=0
AT+CSCB=0 (Toni bitte prüfen!!!)

If GPRS is supported, the following GPRS commands are affected as well:
AT+CGAUTO=0
AT+CR=0
AT+CGEREP=0,0
AT+CGREG=0
```

AT^SABD=0

Only for Master Document:
AT^SACD=0
AT^SADT=0

3.1.2 Features of the Telephone book memory

Table 3-1 lists the features supported by the telephone book memory.

Name	Description	Category	Access	Write allowed ?	How to delete completely
FD	Fix-dialing number (SIM fix-dialing telephone book)	3GPP TS 27.007	AT+CPBS or AT^SPBS	PIN2 required	
SM	Abbreviate dialing number (SIM telephone book)	3GPP TS 27.007	AT+CPBS or AT^SPBS	device code required if FDN replacement is active	
DC (MD)	Mobile last dialing number (last number redial memory; only if "LD" is not available)	3GPP TS 27.007	AT+CPBS or AT^SPBS	-	AT^SDLD
ON (OW)	Own Numbers (SIM own telephone numbers)	3GPP TS 27.007 (Siemens)	AT+CPBS (historical)	x	
LD	SIM last dialing number (last number redial memory on SIM)	3GPP TS 27.007	AT+CPBS or AT^SPBS	-	AT^SDLD
ME	Mobile-equipment telephone book (ME dialing numbers)	3GPP TS 27.007	AT+CPBS or AT^SPBS	device code required if FDN replacement is active	
BD	Barred dialing numbers (blocked numbers)	Siemens	AT^SPBS	-	
SD	Service dialing numbers (Service numbers)	Siemens	AT^SPBS	-	
MC (MS)	Missed dialing numbers (unanswered calls)	3GPP TS 27.007 (Siemens)	AT+CPBS, AT^SPBS	-	
RC (CD)	Callback dialing numbers (answered calls)	3GPP TS 27.007 (Siemens)	AT+CPBS, AT^SPBS	-	
BL	Blacklist of dialing numbers (numbers that are blocked for a certain time in order to prevent continuous accesses from remote control)	Siemens	AT^SPBS	-	
MB	Mailbox dialing numbers (network-operator mailbox)	Siemens	AT^SPBS	-	
CS	Common sortable numbers (sorted combination of SM, ME,	Siemens	AT^SPBS, AT^SPBC,	-	

	FD)		AT^SPBG		
RD	Red book numbers (CS entries with ! at the end of the name portion)	Siemens	AT^SPBS, AT^SPBC, AT^SPBG	-	

Table 3-1: Features of the telephone book memory

3.1.3 Writing to the FDN Phonebook / FDN Replacement

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

AT Command	Comment
AT+CMEE=2 OK	Activate expanded error message
AT+CPBS=? +CPBS: (“FD”,”SM”,”LD”) OK	Listing of available telephone books
AT+CPBS=”FD” OK	Selection of the FDN telephone book
AT+CPBW=5,"1234",,”test” +CME ERROR: SIM PIN2 REQUIRED AT+CPIN? +CPIN: SIM PIN2 AT+CPIN="12345678" OK	A Write to record 5 is attempted PIN2 is required for this purpose Query of the PIN status PIN2 is to be entered Input of PIN2
AT+CPBW=5,"1234",,”test” OK	A Write to record 5 is attempted... PIN2 remains active as long as you use the commands AT+CPIN, AT+CPBS, AT+CPBR, AT+CPBW, AT+CACM, AT+CAMM, AT+CPUC or AT^SPIC, AT^SPBS, AT^SPBC, AT^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” OK	A Write to record 6 is attempted...

As of Rel. 99 there is an alternative way to insert PIN2 for FDN writing:

AT Command	Comment
AT+CMEE=2 OK	Activate expanded error message
AT+CPBS=? +CPBS: (“FD”,”SM”,”LD”) OK	Listing of available telephone books
AT+CPBS=”FD”,”12345678” OK	Selection of the FDN telephone book and provide PIN2 with the same command.
AT+CPBW=6,”5678”,,”new test” OK	Record 6 is written...

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.

3.1.4 How to use special characters in certain commands (e. g., AT+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 omitted:

- 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 3-2 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 3-2: Using escape characters in commands

Examples of using escape characters in GSM commands are listed in Table 3-3:

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 3-3: 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).

3.2 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
	Bit 1		
		0	No SMS indication “+C”
		1	With incoming SMS indication “+C”
S 19 ... S99	No action		

Table 3-4: 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.

3.3 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

4 Appendix B

4.1 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 0D0A445453544152543A313939393132313354313
30303030300D0A4445534352495054494F4E3A572E20766F6E205369656D656E730D0A454E443A56455645
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 0D0A445453544152543A313939393132313354313030303030 0D0A4
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-byte 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 0D0A445453544152543A31393939313231335431
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: ("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`.

4.2 Examples and hints for using GPRS commands

Defining and using a Context Definition Id (CID):
Whenever a CID is used as a parameter for a GPRS command the CID has to be defined first via the AT+CGDCONT or, for secondary contexts, AT+CGDSCONT command.
To retrieve the parameter of a CID the AT+CGDCONT/AT+CGDSCONT read option must be used.
If the response of AT+CGDCONT/AT+CGDSCONT? 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, CID 2 and CID 3 by using the AT+CGDCONT and the AT+CGDSCONT command.
All three CIDs could be defined as a primary or a secondary context.
Furthermore the CIDs are global within the mobile. That means that it is possible to define and activate a context using the cable and to deactivate and reset this context using another interface (e.g the IrDa).

e.g. for primary context definition and activation

```
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,IPV6, "APN", 111.222.123.234. 111.222.123.234.111.222.123.234.111.222.123.234
OK                          // defines CID 2 and sets PDP type IP version 6 , APN and IP addr

AT+CGDCONT=2,IP, "internet.t-d1.gprs", 111.222.123.234,1,1
OK                          // defines and overwrites CID 2 and sets PDP type, APN and IP addr and
                            manufacturer preferred compression for header and data
```

A subsequent read command will return

```
AT+CGDCONT?
+CGDCONT: 1,"IP","","",0,0
+CGDCONT:2,”IP”,"internet.t-d1.gprs",”111.222.123.234”,1,1
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”,1,1
OK
```

For secondary context definition and activation

```
// precondition: define and activate a primary context first
AT+CGDCONT=1,IP, "internet.t-d1.gprs", 111.222.123.234
OK                          // defines CID 1 as primary
AT+CGACT=1,1                // activate primary context
OK

AT+CGDSCONT=2,1,0,0// define CID 2 as a secondary context of CID 1
OK                          // without header and without data compression

AT+CGACT=1,2                // activates the CID 2 (secondary)
OK
```

The activation of a secondary context depends on network support.

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
```

The commands AT+CGEQMIN and AT+CGEQREQ (Minimum and Requested 3G Quality of Service Profile) have to used in the same manner and have the same behaviour. The 3G-QoS consists of the following parameter:

- `Traffic class`
- `Maximum bitrate UL`
- `Maximum bitrate DL`
- `Guaranteed bitrate UL`
- `Guaranteed bitrate DL`
- `Delivery order`
- `Maximum SDU size`
- `SDU error ratio`
- `Residual bit error ratio`
- `Delivery of erroneous SDUs`
- `Transfer delay`
- `Traffic handling priority`

It is possible to define a 3G-QoS in addition to an already defined QoS (older release).

```
AT+CGEQREQ=1,4,8640,0,63,576,2,1520,”2E1”,”5E7”,3,4000
OK                      // defines a 3G-QoS using all parameters
```

After defining a CID and its QoS 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+CGACT command.

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.
Example to define a TFT for a CID
The handling and behaviour of a TFT is similar to the QoS, the only difference is that the CID has to be defined before the TFT:

Here are some examples to define a TFT:

```
AT+CGDCONT=1,IP, "internet.t-d1.gprs"
OK                         // define the context first

AT+CGTFT=1    // reset all TFT packet filter of CID 1
OK

AT+CGTFT=1,2,1          // set TFT filter 2 with eval. precedence index 2 for CID 1
OK

// set TFT filter 3 with all parameter of an IPv4 CID 1
AT+CGTFT=1,3,1,”123.124.125.126.233.234.235.236”,1,”2.655”,”0.65534”,”ABCDEF”,”0.255”
OK
```

Remark: It is possible to change the QoS and TFT parameter while a context is active or online. The new values are temporary stored in the ME and take effect if the context is activated next time or using the AT+CGCMOD command.

4.3 The GPRS dial command ATD

For more detailed information see [2].

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

4.4 The AT^SVMC command

In this section examples for the use of the AT^SVMC command are provided:

Test command

The Test command returns a list of possible actions, a list of available indexes of Voice Memos, the remaining recording time and maximum length for the name of a Voice Memo.

Sample input plus output:

```
AT^SVMC=?
^SVMC: (0-5),14,132,"00:04:15"
```

Meaning:
- All actions (0-5) are possible,
- Currently there are 14 voice memos
- The maximum length for a voice memo name in this example is 132 bytes
- The remaining recording time is 4 minutes and 15 seconds

Write-command

The Write command is used to control the Voice Memo functionality of the mobile. The action parameter lets you start, stop, pause, or cancel the playback of a voice memo. Also, this command can be used to start, stop, cancel and pause the recording of a voice memo.

Sample input and resulting output:

```
AT^SVMC=0
```

```
^SVMC: OK
```

Meaning:

The recording of a voice memo has been stopped, saving the file, or the playing of the voice memo has been stopped. No error occurred.

```
AT^SVMC=2
^SVMC: OK
```

Meaning:

The recording of a voice memo has been started, the time and date of the recording is taken as voice memo name

```
AT^SVMC=2,,"my_memo"
^SVMC: OK
```

Meaning:

The recording of a voice memo has been started, the voice memo name is “my_memo”.

```
AT^SVMC=2,14,"my_memo"
^SVMC: ERROR
```

Meaning:

An attempt was made to start recording a voice memo by the name of “my_memo”, specifying the index at which the voice memo is to be stored. Since the index of a voice memo cannot be set (only queried or played back), an error is returned.

```
AT^SVMC=3,14
^SVMC: OK
```

Meaning:

A voice memo with the index 14 is to be played back.

AT^SVMC=4,2
^SVMC: 2,"02-02-22,22:22:22",”My_Memo”,“00:01:00“ OK

Meaning:

A query was started for a voice memo defined by index 2, and the query result is returned, including the index specified, date and time information ("02-02-22,22:22:22") the name by which it is stored and the length of the voice memo.

AT^SVMC=5

Meaning:

All voice memos stored are to be deleted.

AT^SVMC=5,2

Meaning:

The voice memo stored with the index 2 is to be deleted.

Read command

The Read command indicates whether a playback or recording is running (type), the remaining time (recording time or playback time) and the name (if available) of the current Voice Memo.

Sample input and resulting output:

```
AT^SVMC?
^SVMC: 0
```

Meaning:

Currently no action is performed for a voice memo, the value of <type> is “Idle”.

```
AT^SVMC?
^SVMC: 1,”00:10:00”
```

Meaning:

A voice memo is being recorded, with 10 minutes’ record time remaining

```
AT^SVMC?
^SVMC: 2,”00:00:30”
```

Meaning:

A voice memo is being played back, with 30 seconds remaining

Execute command

The Execute command controls the pausing of playback and recording. Each time this command is executed there is a change between playback/record and pause.

Pause a recording or playback depending on the current running action. The following table shows the possible response for the execution command:

State of VM-AL	Command Response	Meaning	Next State
Recording	^SVMC: 0,”00:00:30” OK	30s are recorded	‘Pause Recording’
Pause Recording	OK	recording continued	‘Recording’
Playing	^SVMC: 1,”00:00:40” OK	40s are played	‘Pause Playing’
Pause Playing	OK	playback continued	‘Playing’
Other states	ERROR (+CME ERROR: operation temporarily not allowed)		

5 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.

5.1 Summary of CME ERRORS (+CME ERROR) related to 3GPP TS 27.007

Table 5-1 lists the numbers and meaning of CME errors (+CMS ERROR: <err>) related to 3GPP TS 27.007 [15].

***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

103	Illegal MS (#3) (Values in parentheses are GSM 04.08 cause codes, see [8].)
106	Illegal ME (#6)
107	GPRS services not allowed (#7)
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)
132	service option not supported (#32)
133	requested service option not subscribed (#33)
134	service option temporarily out of order (#34)
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
256	Operation temporarily not allowed
257	call barred
258	phone is busy
259	user abort
260	invalid dail string
261	Supplementary service not executed
262	SIM blocked
263	Supplementary service rejected

Table 5-1: CME ERRORS related to 3GPP TS 27.007

5.2 Summary of CMS ERRORS (+CMS ERROR) related to 3GPP TS 27.005

Table 5-2 lists the numbers and meaning of CMS errors related to 3GPP TS 27.005 [14].

<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 executed
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 5-2: CMS ERRORS related to 3GPP TS 27.005

5.3 GSM return values issued by AT+CEER

Table 5-7 lists the GSM 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 5-7 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 5-8 through Table 5-13:

Value	Meaning
2	GSM values for Radio Resource (see section 5.3.1)
4	GSM values for Mobility Manager (see section 5.3.2)
8	GSM values for Call Control (see section 5.3.3)

Table 5-3 GSM return values issued by AT+CEER

5.3.1 Return values issued by AT+CEER for Radio Resource

Value	Meaning
0	NORMAL EVENT
1	ABNORMAL RELEASE, UNSPECIFIED
2	ABNORMAL RELEASE, CHANNEL UNACCEPTABLE
3	ABNORMAL RELEASE, TIMER EXPIRED
4	ABNORMAL RELEASE, NO ACTIVITY ON RADIO PATH
5	PREEMPTIVE RELEASE
6	PREEMPTIVE RELEASE
8	HANDOVER IMPOSSIBLE, TA OUT OF RANGE
9	CHANNEL MODE UNACCEPTABLE
10	FREQUENCY NOT IMPLEMENTED
12	LOWER LAYER FAILURE
65	CALL ALREADY CLEARED
95	SEMANTICALLY INCORRECT MESSAGE
96	INVALID MANDATORY INFORMATION
97	MESSAGE TYPE NOT IMPLEMENTED
98	MESSAGE NOT COMP W. STATE
99	IE NOT IMPLMENTED
100	CONDITIONAL IE ERROR
101	NO CELL ALLOCATION AVAILABLE
111	PROTOCOL ERROR UNSPECIFIED

Table 5-4: Radio Resource return values issued by AT+CEER

5.3.2 Return values issued by AT+CEER for Mobility Manager

Value	Meaning
2	IMSI UNKNOWN IN HLR
3	ILLEGAL MS
4	IMSI UNKNOWN IN VLR
5	IMEI NOT ACCEPTED
6	ILLEGAL ME
11	PLMN NOT ALLOWED
12	LA NOT ALLOWED
13	ROAMING N. ALL. in this LA

15	NO SUITABLE CELLS in this LA
17	NETWORK FAILURE
20	MAC FAILURE (sent to network)
21	SYNCH FAILURE (sent to network)
22	CONGESTION
23	GSM auth. Unaccept. (sent to network, UMTS only)
32	SERVICE OPT. NOT SUPPORTED
33	REQ. SERVICE NOT SUBSCRIBED
34	SERV. TEMPOR. OUT OF ORDER
38	CALL CANNOT BE IDENTIFIED
95	SEMANTICALLY INCORRECT MESSAGE
96	INVALID MANDATORY INFORMATION

Table 5-5: Mobility Manager return values issued by AT+CEER

5.3.3 Return values issued by AT+CEER for Call Control

Value	Meaning
1	UNASSIGNED NUMBER
3	NO ROUTE TO DESTINATION
6	CHANNEL UNACCEPTABLE
8	OPERATOR DETERMINED BARRING
16	NORMAL CLEARING
17	USER BUSY
18	NO USER RESPONDING
19	USER ALERTING, NO ANSWER
21	CALL REJECTED
22	NUMBER CHANGED
25	PRE-EMPTION (sent to network)
26	NON SELECTED USER CLEARING
27	DESTINATION OUT OF ORDER
28	INCOMPLETE NUMBER
29	FACILITY REJECTED
30	RESPONSE TO STATUS ENQUIRY
31	NORMAL, UNSPECIFIED
34	NO CIRCUIT/CHANNEL AVAILABLE
38	NETWORK OUT OF ORDER
41	TEMPORARY FAILURE
42	SWITCHING EQUIPMENT CONGESTION
43	ACCESS INFORMATION DISCARDED
44	REQUESTED CHANNEL NOT AVAIL.
47	RESOURCES UNAVAILABLE, UNSPEC
49	QUALITY OF SERVICE UNAVAILABLE
50	REQ. FACILITY NOT SUBSCRIBED
55	INCOMING CALLS BARRED IN CUG
57	BEARER CAPABILITY NOT AUTH.
58	BEARER CAP. NOT PRES.AVAIL.
63	SERVICE OR OPTION NOT AVAIL.
65	BEARER SERVICE NOT IMPLEM.
68	ACM EQUAL OR GREATER ACM-MAX
69	REQ. FACILITY NOT IMPLEMENTED

70	ONLY RESTRICTED DIGITAL INFORMATION BEARER CAP. AVAIL.
79	SERVICE OR OPTION NOT IMPL.
81	INVALID TI
87	USER NOT MEMBER OF CUG
88	INCOMPATIBLE DESTINATION
91	INVALID TRANSIT NETWORK SELECTION
95	SEMANTICALLY INCORRECT MESSAGE
96	INVALID MANDATORY INFORMATION
97	MESSAGE TYPE NOT IMPLEMENTED
98	MESSAGE NOT COMP W. CC STATE
99	IE NOT IMPLMENTED
100	CONDITIONAL IE ERROR
101	MESSAGE NOT COMP W. CC STATE
102	RECOVERY ON TIMER EXPIRY
111	PROTOCOL ERROR, UNSPECIFIED
127	INTERWORKING, UNSPECIFIED

Table 5-6: Call control return values issued by AT+CEER

5.4 GPRS return values issued by AT+CEER

Table 5-7 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 5-7 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 5-8 through Table 5-13:

Value	Meaning
48	GPRS Layer 3 Mobility Management (see section 5.4.1)
50	GSM values of Session Manager (see section 5.4.2)
51	Internal values of Session Manager (see section 5.4.3)
241	Internal values of GAPI (see section 5.4.4)
242	Internal values of Link Manager (see section 5.4.5)
243	Internal values of IP stack (see section 5.4.6)

Table 5-7 GPRS return values

5.4.1 Return values issued by AT+CEER for GPRS Layer 3 Mobility Management

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 5-8: Return values issued by AT+CEER for GPRS Layer 3 Mobility Management

5.4.2 GSM return values issued by AT+CEER for Session Manager

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 5-9: GMM return values issued by AT+CEER

5.4.3 Internal values of Session Manager issued by AT+CEER

Value	Meaning
3	T3380 timer expired
4	DeactAct
5	DeactActReject

6	DeactActStaticPDPaddressCollision
7	Unspecified protocol error

Table 5-10: Internal values of Session Manager issued by AT+CEER

5.4.4 Internal values GAPI issued by AT+CEER

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 5-11: GAPI values issued by AT+CEER

5.4.5 Internal values of Link Manager issued by AT+CEER

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 5-12: LMAN return values issued by AT+CEER

5.4.6 Internal values of IP stack issued by AT+CEER (ENIP_LOC_OWN)

Value	Meaning
0	Regular call deactivation
1	LCP stopped
255	Undefined

Table 5-13: ENIP return values issued by AT+CEER

5.5 List of keys implemented for AT+CKPD / AT^SKPD

The following keys are implemented for the AT+CKPD and AT^SKPD commands:

Character (AT+CKPD)	**key value (dec)** (AT^SKPD)	**Comment**
#	35	Hash (number sign)
%	37	Percent sign
*	42	asterisk
0..9	48 .. 57	number keys
:		Colon; escape character for manufacturer specific keys
<	61	Left arrow
>	62	Right arrow
C/c	10	clear display (C/CLR)
E/e	12	connection end (END)
F/f	26	Navi centre
S/s	11	connection start (SEND)
V/v	14	Down arrow
W/w		pause character
Y/y	9	delete last character (C)
[	1	soft key 1
]	4	soft key 2
^	59	Up arrow
Siemens specific keys		
+		left side key up
-		left side key down
M		right side key
O/o		short key
X/x		Hexanumeric string of all Siemens Keys

5.6 Use of Siemens specific Key O/o

":" following the CKPD command indicates the use of manufacturer specific keys. The new Siemens key O/o is defined to use the short key which is sometimes used in R65 e.g. the key under the navi in the S65 model.

A command could look like.

- AT+CKPD=:O <cr>
- AT+CKPD=":O"<cr>
- AT+CKPD=:o <cr>
- AT+CKPD=":o"<cr>

The short key will normaly call the browser menue by default but this behavior can be changed by the user

5.7 Use of Siemens specific Key X/x

":" following the CKPD command indicates the use of manufacturer specific keys. The subsequent X states a that a string may be appended, which can include all Siemens keys in hexadecimal format. Otherwise an error will be indicated.

A command could look like.

- AT+CKPD=:X4142434445 <cr>
- AT+CKPD=":X4142434445"<cr>
- AT+CKPD=:x4142434445 <cr>
- AT+CKPD=":x4142434445"<cr>

Both will result in sending the keys 41 , 42 , 43 , 44 and 45 to the mobil, which will generate different keys depending on the language settings of the mobile. In case of an English version this would be a,b,c,d and e.

The application must handle the state of the mobile, because not all keys behave the same way in different states. So no characters result an effect, when neo is not in crossed mode for example. This will not be indicated in by an error.

Keys not useable in the current mode are just ignored. Some modes can be set by keys, as for example crossing mode by 0x17 and 0x18. For detailed key information see keypad.h All Siemens key stated there can be used , too.

5.8 List of Commands related to CSCS / UCS2

The following commands relate to the AT+CSCS command and UCS2:

- AT+CNUM
- AT+CPBR
- AT+CPBW
- AT+CPUC
- AT^SDBR
- AT^SSET
- AT^SVMC

5.9 Result codes

Table 5-14 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 5-14: Result codes

For detailed information on uncolicited result codes issued ba Remote Control-related calls see [2].

5.10 List of *# codes

The commands listed in Table 5-15 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 5-15: List of *# codes

The abbreviations used in Table 5-15 have the following meaning:

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

6 Index