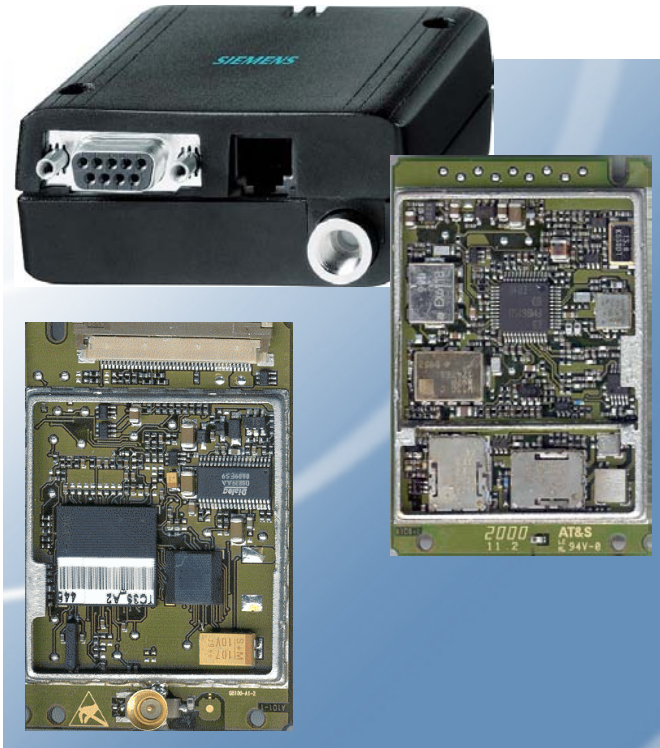
SIEMENS

AT Command Set

Siemens Cellular Engines



TC35 Module
TC37 Module
TC35 Terminal

Version: 03.00
DocID: TC3X-ATC-01-V03.00

Wireless Modules

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0 Version History

This chapter reports modifications and improvements over previous versions of the document.

"AT Command Set" Version **02.10 => 03.00:**

Chapter	Page	AT command	What is new
2.2	12	+++	Added: +++ not usable in Multiplex mode 3. a transmit inactivity of at least 1000 ms
2.14	22	ATI[value]	Additional Note added
2.32	29	ATZ	Instructions on how to manage user defined profile and default profile
2.35	30	AT&F	
2.38	32	AT&W	Additional information implemented for multiplexer mode
2.45	36	AT+IPR	Additional information in the Note to the swiching of the Baudrate.
3.23	49	AT+FRS	Correction of on-HOOK state
4.2	53	AT+CALA	Added: No charging functionality provided in Alarm mode. AT^SBC can only be used to query present current consumption, not the battery capacity.
4.18	67	AT+CLCK	Changing of class 7 to: 7 all classes except class 8 (default)
4.24	74	AT+CMUX	Note added how to get information to the multiplexer
4.41	95	AT+CSNS	Command available after PIN authentication
5.6	110	AT+CMGS	Note 6 implemented, the meaning of GSM character set
5.7	112	AT+CMGW	
5.9	115	AT+CNMA	Notes on Multiplex mode added
5.10	116	AT+CNMI	
6.5	129	AT^SBC	Added: no charging functionality provided in Alarm mode.
6.13	137	AT^SLCK	Changing of class 7 to: 7 all classes except class 8 (default)
6.29	148	AT^SPBS	Feature has been bugfixed. Indicates now physical memory locations of active phonebook.
7.2	166	AT+CSNS	Moved from PIN free to PIN requiring commands

"AT Command Set" Version **02.10 => 2.10a:**

Chapter	Page	AT command	What is new
1.4	11	AT command syntax described in a separate chapter, further details added	
2.5 - 2.10	14ff	Description of ATD commands revised	
2.45.1	37	AT+IPR	More detailed description of autobauding
4.2	53	AT+CALA	Alarm mode added
4.20	70	CLIR	CLIR described
4.24.1	76	AT+MUX	Description revised
4.30	82	AT+CPBW	Write command description modified
4.31	83	AT+CPIN	Further codes added Failed attempts to enter PIN (brief description)
4.32	85	AT+CPIN2	Description revised
4.41	95	AT+CSNS	Description added
4.43	97	AT+CSSN	Description of <code1> and <code2> added. New: <code2> = forwarded call
5	102ff	Length of SMS and CSCA added	
5.10	116	AT+CNMI	<mode> 2 added
6.5	129	AT^SBC	Charge-only mode added
6.9	134	AT^SCTM	Different URCs for module and battery, description added
6.22	142	Audio settings	Figure added
6.24	144	AT^SFNS	Note added that settings not retained after shutdown
6.28	147	AT^SPBG	Feature in current release only for reading, not for dialing. Description modified.
6.29	148	AT^SPBS	See AT^SPBG
6.35	153	AT^SSYNC	Behaviour of LED in Charge-only and Alarm modes
7.1.1	155	Error Codes	No. 48 added
7.1.3	159	URCs	Further URCs added, Examples added
7.2 / 7.3	166/168	Availability of AT commands with or without PIN authentication	
7.4	170	#31# and *31#	CLIR activation and deactivation added

1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for the following Siemens cellular engines:

TC35 Module
TC37 Module
TC35 Terminal

The AT commands detailed in this document are supported by all four products. Where differences occur, they are noted in the chapter that refers to the command. In the present version, the only exception is the AT^SSYNC command that offers various modes depending on the model (see Chapter 6.35).

1.2 Conventions

Throughout the document, the GSM engines are referred to as ME (Mobile Equipment), MS (Mobile Station), TA (Terminal Adapter), DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board).

To control your GSM engine you can simply send AT Commands via its serial interface. The controlling device at the other end of the serial line is referred to as TE (Terminal Equipment), DTE (Data Terminal Equipment) or plainly ´the application´ (probably running on an embedded system).

1.3 Supported character sets

The ME uses 2 character sets: GSM 03.38 (7 bit, see character tables in Chapter 7.5, pg. 172) and UCS2 (16 Bit, refer ISO/IEC 10646). Also refer to subclause „AT+CSCS Set TE character set", pg. 94.

With the intention of using an ASCII terminal to enter characters which are coded differently in ASCII and GSM (e.g. Ä, Ö, Ü), these characters have to be entered via escape sequences. Such a character is translated into the corresponding GSM character value and if output later, the GSM character value is issued. Any ASCII terminal then will have to show wrong responses.
For instance:

GSM 03.38 character	GSM character hex. value	Corresponding ASCII character	ASCII Esc sequence	Hex Esc sequence
Ö	5C	\	\5C	5C 35 43
"	22	“	\22	5C 32 32
ò	08	BSP	\08	5C 30 38
@	00 [1)]	NULL	\00	5C 30 30

[1)] Use of the GSM Null character may cause problems on application level when using a ´C´-function as „strlen()“ and should thus be represented by an escape sequence.

1.4 AT command syntax

The "AT" or "at" prefix must be set at the beginning of each command line. To terminate a command line enter <CR>.

Commands are usually followed by a response that includes “<CR><LF><response><CR><LF>”. Throughout this document, only the responses are presented, <CR><LF> are omitted intentionally.

Types of AT commands and responses:

Test command	AT+CXXX=?	The mobile equipment returns the list of parameters and value ranges set with the corresponding Write command or by internal processes.
Read command	AT+CXXX?	This command returns the currently set value of the parameter or parameters
Write command	AT+CXXX=<...>	This command sets user-definable parameter values.
Execution command	AT+CXXX	The execution command reads non-variable parameters affected by internal processes in the GSM engine.

1.4.1 Using parameters

- Default parameters are underlined throughout this document.
- Optional parameters are enclosed in square brackets. If optional parameters are omitted, the current settings are used until you change them.
- Optional parameters or subparamters can be omitted unless they are followed by other parameters. If you want to omit a parameter in the middle of a string it must be replaced by a comma. Example:
  AT+CPBW=,<number>,<type>,<text> writes a phonebook entry to the first free memory location.
  AT+CPBW=<index>,<number>,<type>,<text> writes a phonebook entry to the memory location specified by <index>.
- When the parameter is a character string, e.g. <text> or <number>, the string must be enclosed in quotation marks, e.g. "Charlie Brown" or "+49030xxxx". Symbols within quotation marks will be recognized as strings.
- All spaces will be ignored when using strings without quotaton marks.
- It is possible to omit the leading zeros of strings which represent numbers.
- In case of using V.25ter commands without giving an optional parameter, its value is assumed to be 0.

1.4.2 Combining AT commands on the same command line

You may enter several AT commands on the same line. This eliminates the need to type the "AT" or "at" prefix before each command. Instead, it is only needed once at the beginning of the command line. Use a semicolon as command delimiter.

The table below lists the AT commands you cannot enter together with other commands on the same line. Otherwise, the responses may not be in the expected order.

V.25ter commands	With	FAX commands, **Prefix AT+F**
GSM 07.07 commands	With	Siemens commands, **Prefix AT^S**
GSM 07.05 commands (SMS)		Used standalone
Commands starting with AT&		Used standalone

Note: Generally, appending the same or mixed AT commands should be avoided. If nevertheless you need to do enter several commands on the same line, note that the number of subsequent commands is limited.

2 Standard V.25ter AT Commands

These AT Commands are related to ITU-T (International Telecommunication Union, Telecommunication sector) V.25ter document.
The TC35 Module, the TC37 Module and the TC35 Terminal support the registers S0-S29. You can change S0,S3,S4,S5,S6,S7,S8,S10,S18 by using the appropriate ATSn commands. All the other registers are read-only and for internal usage only!

2.1 A/ Repeat previous command line

Execute command	Response
A/	Repeats previous command line. Line does not need to end with terminating character. Parameter
Reference V.25ter	Note • After beginning with the character „a“ or „A“, a second character „t“ „„T“ or „/“ has to follow. In case of using a wrong second character, it is necessary to start again with character „a“ or „A“. • If autobauding is active (see **+IPR**, pg. 35) A/ (and a/) cannot be used.

2.2 +++ Switch from data mode to command mode

Execute command	Response
+++	If TA receives the characters +++: TA cancels the data flow via the AT interface and switches to command mode. **OK** Note: This command is available in data mode only. The escape sequence consists of 1. a transmit inactivity of at least 1000 ms, 2. three escape characters (‘+’) in succession all within 1000 ms, 3. a transmit inactivity of at least 1000 ms
Reference V.25ter	Note: • The +++ command is only intended for data calls. • In Multiplex mode, the command is not effective. See Chapter 4.24, p. 74 for detail.

2.3 AT\Qn Flowcontrol

Execute command AT\Q<n>	Response **OK** Parameter **<n>** 0 AT\Q0 disables flow control 1 AT\Q1 XON/XOFF software flow control 2 AT\Q2 only CTS by DCE 3 AT\Q3 RTS/CTS
Reference	Note Line state refers to RS-232 levels.

2.4 ATA Answer a call

Execute command ATA	TA causes remote station to go off-hook (e.g. answer call). Note1: Any additional commands on the same command line are ignored. Note2: This command may be aborted generally by receiving a character during execution. It can´t be aborted in some connection setup states, such as handshaking. Response Response in case of data call, if successfully connected: **CONNECT<text>** TA switches to data mode. Note: **<text>** output only if +ATX parameter setting with value > 0. Response in case of voice call, if successfully connected: **OK** When TA returns to command mode after call release: **OK** Response if no connection: **NO CARRIER** Parameter
Reference V.25ter	Note See also AT+ATX and chapter 7.1.4 for **<text>**

2.5 ATD Mobile originated call to dial a number

Execute command ATD[<n>] [<mgsm][;]	This command can be used to set up outgoing *voice, data or fax calls*. It also serves to control *supplementary services*. Note: The command may be aborted generally when receiving an ATH command during execution. It can´t be aborted in some connection setup states, such as hand-shaking. Different behavior between voice and data call. Behaviour depends on parameter setting of AT^SM20. Voice call setup terminates immediately with OK. Data call setup terminates when call has been established. Response If no dialtone (parameter setting ATX2 or ATX4): **NO DIALTONE** If busy (parameter setting ATX3 or ATX4): **BUSY** If a connection cannot be set up: **NO CARRIER** If successfully connected and non-voice call: **CONNECT<text>** TA switches to data state. Note: **<text>** output only if +ATX parameter setting with value > 0. When TA returns to command mode after call release: **OK** If successfully connected and voice call: **OK** Parameter **<n>** String of dialling digits and optionally V.25ter modifiers (dialling digits): 0-9, * , #, +, A, B, C V.25ter modifiers: these are ignored: ,(comma), T, P, !, W, @ Emergency call: **<n>** = 112 worldwide number (no SIM needed) **<mgsm>** String of GSM modifiers: I Activates CLIR (disables presentation of own phone number to called party) i Deactivates CLIR (enables presentation of own phone number to called party) **<;>** Only required to set up voice calls. TA remains in command mode.
Reference V.25ter/GSM 07.07	Note • Parameter „I“ and „i“ only if no *#-code is within the dial string. • **<mgsm>** is not supported for data calls. • **<n>** is default for last number that can be dialled by ATDL. • See also +ATX and chapter 7.1.4 for <text>. • The *#-codes are available for voice calls (i.e. use ´; ´) only. • If ATD is used with a USSD command (e.g. ATD*100#;) an AT+CUSD=1 is executed implicitly. (see AT+CUSD, pg. 97).

2.6 ATD><mem><n> Originate call to phone number <n> in memory <mem>

This command allows you to dial a phone number from a specific phonebook. To initiate a call, enter a two letter abbreviation for the phonebook <**mem**>, followed by the memory location <**n**> of the desired entry. The location range of each phonebook can be queried by AT+CPBR (see Chapter 4.28).

Execute command ATD><mem><n>[<mgsm>][;]	TA attempts to set up an outgoing call to the specified number. Note: This command may be aborted generally by receiving a character during execution. Abortion is not possible during some states of connection setup such as handshaking. Response If error is related to ME functionality: **+CME ERROR: <err>** If no dialtone (parameter setting ATX2 or ATX4): **NO DIALTONE** If busy (parameter setting ATX3 or ATX4): **BUSY** If connection cannot be set up: **NO CARRIER** If successfully connected and non-voice call: **CONNECT<text>** TA switches to data state. Note: **<text>** output only if +ATX parameter setting with value > 0. When TA returns to command mode after call release: **OK** If successfully connected and voice call: **OK**
	Parameter **<mem>** phonebook: "SM" SIM phonebook (storage depending on SIM card) "FD" SIM fixdialling phonebook (pos. 1-7) "LD" SIM last-dialling-phonebook (usually the last 10 numbers dialed are stored on the SIM card, no matter whether or not the calls were successfully set up) "MC" ME missed (unanswered received) calls list (up to 10 numbers) "RC" SIM received calls list "ME" ME Phonebook (up to 50 numbers) "ON" SIM (or ME) own numbers (MSISDNs) list Note: **<mem>** must be included in quotation marks (""), if parameter **<mgsm>** is used. If not, quotation marks are optional. **<n>** Integer type memory location in the range of locations available in the selected memory, i.e. the index number returned by AT+CPBR.

	<mgsm>	I	Activates CLIR (disables presentation of own phone number to called party)
		i	Deactivates CLIR (enables presentation of own phone number to called party)
	<;>	Only required to set up voice calls. TA remains in command mode.	
Reference V.25ter/GSM 07.07	Note • There is no <mem> for emergency call (“EN”). • Command is not supported for data call! • Parameter <mgsm> only if no *# code is within the dial string. • The *# codes are only available for voice calls (i.e use ´;´). • See also ATX and chapter 7.1.4 for <text>.		

Example	To query the location number of the phonebook entry:
	`AT+CPBR=1,xx`
	TA returns the entries available in the active phonebook.
	
	To dial a number from the SIM phonebook, for example the number stored to location 15:
	`ATD>SM15;`
	`OK`
	
	To dial a phone number stored in the last dial memory on the SIM card:
	`ATD>LD9;`
	`OK`		

2.7 ATD><n> Originate call to phone number selected from active memory

This command can be used to dial a phone number selected from the active memory. The active memory is the phonebook selected with AT+CPBS (see Chapter 4.29). To set up a call simply enter the memory location of the desired entry. The memory location range of each phonebook can be queried by AT+CPBR (see Chapter 4.28).

Execute command ATD><n>[<mgsm>][;]	TA attempts to set up an outgoing call to the stored number. Note: This command may be aborted generally by receiving a character during execution. It can´t be aborted in some connection setup states, such as handshaking. Response If error is related to ME functionality: **+CME ERROR: <err>** If no dialtone (parameter setting ATX2 or ATX4): **NO DIALTONE** If busy (parameter setting ATX3 or ATX4): **BUSY** If a connection cannot be set up: **NO CARRIER** If successfully connected and non-voice call: **CONNECT<text>** TA switches to data state. Note: **<text>** output only if +ATX parameter setting with value > 0. When TA returns to command mode after call release: **OK** If successfully connected and voice call: **OK** Parameter **<n>** integer type memory location should be in the range of locations available in the memory used, i.e. the index number returned by AT+CPBR. **<mgsm>** I Activates CLIR (disables presentation of own phone number to called party) i Deactivates CLIR (enables presentation of own phone number to called party) <;> Only required to set up voice calls. TA remains in command mode.
Reference V.25ter/GSM 07.07	Note • Parameter **<mgsm>** only if no *# code is within the dial string. • Command is not supported for data call! • The *# codes are only available for voice calls (i.e. use ´;´). • See also +ATX and chapter 7.1.4 for <text>.

2.8 ATD><str> Originate call to phone number in memory with corresponding field

This command searches the active phonebook for a given string <str> and dials the assigned phone number. The active phonebook is the one set with AT+CPBS.

Execute command ATD><str>[mgsm][;]	TA attempts to set up an outgoing call to stored number Note: This command may be aborted generally by receiving a character during execution. It can´t be aborted in some connection setup states, such as handshaking. Response If error is related to ME functionality: **+CME ERROR: <err>** If no dialtone (parameter setting ATX2 or ATX4): **NO DIALTONE** If busy (parameter setting ATX3 or ATX4): **BUSY** If a connection cannot be set up: **NO CARRIER** If successfully connected and non-voice call: **CONNECT<text>** TA switches to data state. Note: **<text>** output only if +ATX parameter setting with value > 0. When TA returns to command mode after call release: **OK** If successfully connected and voice call: **OK** Parameter **<str>** string type value (“x”), which should equal an alphanumeric field in at least one phonebook entry in the searched memories; used character set should be the one selected with Select TE Character Set +CSCS. **<str>** can contain escape sequences as described in chapter „Supported character sets“, pg. 10. **<str>** must be wrapped in quotation marks (""), if escape sequences or parameter **<mgsm>** are used or if the alphanumeric strings contains a blank. If not, quotation marks are optional. **<mgsm>** I Activates CLIR (disables presentation of own phone number to called party) i Deactivates CLIR (enables presentation of own phone number to called party) **<;>** Only required to set up voice calls. TA remains in command mode.
Reference V.25ter/GSM 07.07	Note Command is not supported for data calls! See also ATX and Chapter 7.1.4 for <text>

2.9 ATDI Mobile originated call to dialable ISDN number <n>

Execute command ATDI<n>[;]	TA attempts to set up an outgoing call to ISDN number. Note: This command may be aborted generally by receiving a character during execution. This command cannot be aborted in some connection setup states, such as handshaking. Response If no dialtone (parameter setting ATX2 or ATX4): **NO DIALTONE** If busy (parameter setting ATX3 or ATX4): **BUSY** If a connection cannot be set up: **NO CARRIER** If successful connected and non-voice call: **CONNECT<text>** TA switches to data state. Note: **<text>** output only if +ATX parameter setting with value > 0. When TA returns to command mode after call release: **OK** If successfully connected and voice call: **OK**
	Parameter **<n>** [+]<d> phone number string with maximum length of 20 characters + international dialling format **<d>** ISDN number string of digits: +,0-9, A, B, C **<;>** voice call
Reference V.25ter	

2.10 ATDL Redial last telephone number used

Execute command ATDL[;]	This command redials the last voice and data call number used in the ATD command. • To redial the last data call number simply enter ATD • To redial the last voice call number type ATD; Note: The command may be aborted generally by receiving a character during execution. This command cannot be aborted in some connection setup states, such as handshaking. Response If there is no last number or number is not valid: **+CME ERROR** If no dialtone (parameter setting ATX2 or ATX4): **NO DIALTONE** If busy (parameter setting ATX3 or ATX4): **BUSY** If a connection cannot be set up: **NO CARRIER** If successfully connected and non-voice call: **CONNECT<text>** TA switches to data state. Note: **<text>** output only if +ATX parameter setting with value > 0. When TA returns to command mode after call release: **OK** If successfully connected and voice call: **OK** Parameter <;> voice call
Reference V.25ter	Note In case of voice calls ";" is necessary.

2.11 ATE Enable command echo

Write command ATE[<value>]	This setting determines whether or not the TA echoes characters received from TE during command state. Response **OK** Parameter **<value>** 0 Echo mode off 1 Echo mode on
Reference V.25ter	Note 1. In case of using the command without parameter, **<value>** is set to 0. 2. Echo is disabled with the start of multiplex mode (see **AT+CMUX**, pg. 74). Therefore echo is not available on logical channels: **ATE0** responds with OK, **ATE1** responds with ERROR.

2.12 ATH Disconnect existing connection

Execute command ATH[n]	Response Disconnect existing call from command line by local TE and terminate call **OK** Note: OK is issued after circuit 109 (DCD) is turned off (RS-232 level), if it was previously on. Parameter **<n>** 0 disconnect from line and terminate call
Reference V.25ter	Note If multiplex mode (**AT+CMUX**) is used: • **ATH** terminates every data call, even if it is issued via logical channels 2 or 3. • This behavior is in accordance with ITU-T V.25 ter; (07/97, see „6.3.6 Hook control“: "ATH is terminating any call in progress.")

2.13 ATI Display product identification information

Execute command	Response
ATI	ME issues product information text **SIEMENS** **TC35** **REVISION x.yy** **OK** Explanation of „Revision“ parameter: Version x and variant yy of software release.
Reference V.25ter	Note

2.14 ATI[value] Display additional identification information

Execute command	Response
ATI[value]	**OK**
Reference V.25ter	Note All values behind Ati response with OK

2.15 ATL Set monitor speaker loudness

Execute command	Response
ATL[val]	**OK**
Reference	Note
V.25ter	• Commands ATL and ATM are implemented only for V.25ter compatibility reasons, no action takes place. • In multiplex mode the command is supported on logical channel 1 only.

2.16 ATM Set monitor speaker mode

Execute command	Response
ATM[val]	**OK**
Reference	Note
V.25ter	• Commands ATL and ATM are implemented only for V.25ter compatibility reasons, no action takes place. • In multiplex mode the command is supported on logical channel 1 only.

2.17 ATO Switch from command mode to data mode

Execute command	Response
ATO[n]	TA resumes the connection and switches back from command mode to data mode. If connection is not successfully resumed **NO CARRIER** or TA returns to data mode from command mode **CONNECT <text>** Note: **<text>** output only if +ATX parameter setting with value > 0. Parameter **<n>** 0 switch from command mode to data mode
Reference	Note
V.25ter	

2.18 ATQ Set result code presentation mode

Write command	Response
ATQ[<n>]	This parameter setting determines whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting. If <n>=0: **OK** If <n>=1: **(none)** Parameter **<n>** 0 DCE transmits result code 1 Result codes are suppressed and not transmitted
Reference V.25ter	Note

2.19 ATP Select pulse dialling

Execute command	Response
ATP	OK
Reference V.25ter	Note No effect for GSM

2.20 ATS0 Set number of rings before automatically answering the call

Read command ATS0?	Response **<n>** OK
Write command ATS0=<n>	This parameter setting determines the number of rings before automatic answering. Response **OK**
	Parameter **<n>** 000 automatic answering is disabled 001-255 enable automatic answering on the specified ring number
Reference V.25ter	Note • This command works only in data and fax mode.

2.21 ATS3 Write command line termination character

Read command ATS3?	Response **<n> OK**
Write command ATS3=<n>	This parameter setting determines the character recognized by TA to terminate an incoming command line. Response **OK**
	Parameter **<n>** 000-013-127 command line termination character Note: Using other value than 13 may cause problems when entering commands
Reference V.25ter	Note

2.22 ATS4 Set response formatting character

Read command ATS4?	Response **<n> OK**
Write command ATS4=<n>	This parameter setting determines the character generated by the TA for result code and information text. Response **OK**
	Parameter **<n>** 000-010-127 response formatting character.
Reference V.25ter	Note

2.23 ATS5 Write command line editing character

Read command ATS5?	Response **<n> OK**
Write command ATS5=<n>	This parameter setting determines the character recognized by TA as a request to delete the immediately preceding character from the command line. Response **OK**
	Parameter **<n>** 000-008-127 command line editing character
Reference V.25ter	Note

2.24 ATS6 Set pause before blind dialling

Read command ATS6?	Response **<n> OK**
Write command ATS6=<n>	No effect for GSM Response **OK**
	Parameter **<n>** 000-255 number of seconds to wait before blind dialling.
Reference V.25ter	Note

2.25 ATS7 Set number of seconds to wait for connection completion

Read command ATS7?	Response **<n> OK**
Write command ATS7=<n>	This parameter setting determines the amount of time to wait for the connection completion when answering or originating a call. Response **OK**
	Parameter **<n>** 000 – 060 no. of seconds to wait for connection completion.
Reference V.25ter	Note Values bigger than 60 cause no error, but **<n>** will be set down to maximum value of 60.

2.26 ATS8 Set number of seconds to wait for comma dial modifier

Read command ATS8?	Response **<n> OK**
Write command ATS8=<n>	No effect for GSM Response **OK**
	Parameter **<n>** 000 – 255 no. of seconds to wait for connection completion.
Reference V.25ter	Note

2.27 ATS10 Set disconnect delay after indicating the absence of data carrier

Read command ATS10?	Response <n> OK
Write command ATS10=<n>	This parameter setting determines the amount of time, that the TA remains connected in absence of a data carrier. If the data carrier is detected before disconnect, the TA remains connected. Response **OK**
	Parameter **<n>** 001-002-254 number of tenths of seconds of delay
Reference V.25ter	Note

2.28 ATS18 Extended error report

Test command ATS18?	Response **<n> OK**
Execute command ATS18=<n>	TA returns an extended report of the reason for the last call release and location. **<n>** 0 – 255, odd numbers set extended error report and even numbers disable this feature. Response **+CAUSE: <location ID>: <reason > OK** Parameter **<location ID>** Location ID as number code (see subclause 7.1.5). **<reason>** Reason for last call release as number code (see subclause 7.1.6).
Reference Siemens	Note This command works for data calls only. For voice calls please use AT+CEER.

2.29 ATT Select tone dialling

Execute command ATT	Response OK
Reference V.25ter	Note No effect for GSM

2.30 ATV Set result code format mode

Write command	Response
ATV[<value>]	This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses. When **<value>** =0 **0** When **<value>** =1 **OK** Parameter **<value>** 0 Information response: **<text><CR><LF>** Short result code format: **<numeric code><CR>** 1 Information response: **<CR><LF><text><CR><LF>** Long result code format: **<CR><LF><verbose code><CR><LF>**
Reference	Note
V.25ter	In case of using the command without parameter **<value>** will be set to 0. Information responses described in chapter 7 (verbose code and numeric code).

2.31 ATX Set CONNECT result code format and call monitoring

Write command	Response
ATX[<value>]	This parameter setting determines whether or not the TA detects the presence of dial tone and busy signal and whether or not TA transmits particular result codes. **OK** Parameter **<value>** 0 CONNECT result code only returned, dial tone and busy detection are both disabled 1 CONNECT<text> result code only returned, dial tone and busy detection are both disabled 2 CONNECT<text> result code returned, dial tone detection is enabled, busy detection is disabled 3 CONNECT<text> result code returned, dial tone detection is disabled, busy detection is enabled 4 CONNECT<text> result code returned, dial tone and busy detection are both enabled
Reference	Note
V.25ter	Related **<text>** see chapter 7.1.4.

2.32 ATZ Set all current parameters to user defined profile

Execute command ATZ[<value>]	Response TA sets all current parameters to the user profile stored with AT&W (see Chapter 2.38 on page 32). If a connection is in progess, it will be terminated. The user defined profile is stored to the non-volatile memory. Note: If invalid, the user profile will be reset to the factory default profile. Any additional commands on the same command line may be ignored. A delay of 300 ms is required before next command is sent, otherwise "OK" response may be corrupted. **OK**
	Parameter **<value>** 0 Reset to user profile
Reference V.25ter	Note The GSM engines referred to in this manual can be assigned two profiles: the factory profile (restored with AT&F) and the user profile (stored with AT&W).

2.33 AT&C Set circuit Data Carrier Detect (DCD) function mode

Write command AT&C[<value>]	Response This parameter determines how the state of circuit 109(DCD) relates to the detection of received line signal from the distant end. **OK**
	Parameter **<value>** 0 DCD line is always ON. 1 DCD line is ON in the presence of data carrier only.
Reference V.25ter	Note Line state refers to RS-232 levels.

2.34 AT&D Set circuit Data Terminal Ready (DTR) function mode

Write command AT&D[<value>]	Response This parameter determines how the TA responds when circuit 108/2 (DTR) is changed from ON to OFF during data mode. **OK**
	Parameter **<value>** 0 TA ignores status on DTR. 1 ON->OFF on DTR: Change to command mode while retaining the connected call. 2 ON->OFF on DTR: Disconnect call, change to command mode. During state DTR = OFF is auto-answer off.
Reference V.25ter	Note Line state refers to RS-232 levels.

2.35 AT&F Set all current parameters to manufacturer defaults

Execute command	Response
AT&F[value]	TA sets all current parameters to the manufacturer defined profile. Note: Any additional commands on the same command line are ignored. **OK** Parameter **<value>** 0 set all TA parameters to manufacturer default
Reference V.25ter	Note • List of parameters reset to manufacturer default (sorted by the associated AT commands): E, Q, V, X, +CBST, +CRLP, +CRC, +CR, +CNMI, +CMEE, +CSMS, ^SCKS, ^SACM, +CREG, +CLIP, the S Parameters, &D, &C, &S • In addition to the default profile, you can store an individual one with AT&W. To alternate between the two profiles enter either ATZ (loads user profile) or AT&F (restores factory profile). Refer to Chapter 2.38 for AT&W and Chapter 2.32 for ATZ.

2.36 AT&S Set circuit Data Set Ready (DSR) function mode

Write command	Response
AT&S<value>	This parameter determines how the TA sets circuit 107 (DSR) depending on the communication state of the TA interfacing TE. **OK**
	Parameter **<value>** 0 DSR always on. 1 TA in command mode: DSR is OFF. 1 TA in data mode: DSR is ON.
Reference V.25ter	Note Line state refers to RS-232 levels.

2.37 AT&V Display current configuration

Execute command	Response	
AT&V[<n>]	TA returns the current parameter setting. The following table shows four different kinds of responses depending on whether the PIN is entered or not, and whether channel 1 is used or communication is done via logical channels 2 or 3. This requires the multiplex mode to be enabled (see “AT+CMUX Enter multiplex mode”, pg. 74). Parameter **<n>** 0 profile number	
Channel 1 (with or without multiplex mode enabled)	PIN entered or not required (see AT+CPIN, pg. 82)	Required PIN not entered
	ACTIVE PROFILE: **E1 Q0 V1 X4 &C1 &D2 &S0 \Q0** **S0:000 S3:013 S4:010 S5:008 S6:000 S7:060 S8:000 S10:002 S18:000** **+CBST: 7,0,1** **+CRLP: 61,61,78,6** **+CR: 0** **+FCLASS: 0** **+CRC: 0** **+CMGF: 0** **+CNMI: 0,0,0,0,1** **+ILRR: 0** **+IPR: 0** **+CMEE: 2** **^SMGO: 0,0** **+CSMS: 0,1,1,1** **^SACM: 0,"000000","000000"** **^SCKS: 0,1** **+CREG: 0,1** **+CLIP: 0,2** **+CAOC: 0** **+COPS: 0,0,"operator"** **OK**	**ACTIVE PROFILE:** **E1 Q0 V1 X4 &C1 &D2 &S0 \Q0** **S0:000 S3:013 S4:010 S5:008 S6:000 S7:060 S8:000 S10:002 S18:000** **+CBST: 7,0,1** **+CRLP: 61,61,78,6** **+CR: 0** **+FCLASS: 0** **+ILRR: 0** **+IPR: 0** **+CMEE: 2** **^SCKS: 0,1** **OK**
Logical channels 2 and 3 (Multiplex mode enabled)	**+CRC: 0** **+CMGF: 0** **+CNMI: 0,0,0,0,1** **+ILRR: 0** **+IPR: 19200** **+CMEE: 2** **^SMGO: 0,0** **+CSMS: 0,1,1,1** **^SACM: 0,"000000","000000"** **^SCKS: 0,1** **+CREG: 0** **+CLIP: 0,2** **+CAOC: 0** **+COPS: 0,0,"operator"** **OK**	**+ILRR: 0** **+IPR: 19200** **+CMEE: 2** **^SCKS: 0,1** **OK**
Reference	Note: Parameter values and order are subject to change.	

2.38 AT&W Store current configuration to user defined profile

Execute command	Response
AT&W[<n>]	TA stores the currently set parameters to a user defined profile in the non-volatile memory. **OK** Parameter **<n>** 0 number of profile If error is related to ME functionality **ERROR/+CME ERROR: <err>**
Reference	Note
V.25ter	The user defined profile will be restored automatically after PowerUp. Use ATZ to restore user profile and AT&F to restore factory settings. Until the first use of AT&W, ATZ works as AT&F. See ATZ in Chapter 2.32 and AT&F in Chapter 2.35. List of settings stored to user defined profile: • ATE, ATQ, ATV, ATX, AT+CRC, AT+CMGF, AT+CSDH, AT+CNMI, AT+ILRR, AT+CMEE, AT^SMGO, AT+CSMS, AT^SACM, ^SCKS, AT+CREG, AT+CLIP, AT+COPS. AT&C, AT&D, AT&S, ATS0, ATS3, ATS4, ATS5, ATS6, ATS7, ATS8, ATS10, ATS18, AT+FCLASS, AT+CBST, AT+CRLP, AT+CR. The settings of the user profile is identical with the settings on multiplexer channel 1 User defined profiles in multiplex mode: • On each multiplexer channel you can save an individual profile. • List of settings stored to profile on multiplexer channel 1: ATE, ATQ, ATV, ATX, AT+CRC, AT+CMGF, AT+CSDH, AT+CNMI, AT+ILRR, AT+CMEE, AT^SMGO, AT+CSMS, AT^SACM, ^SCKS, AT+CREG, AT+CLIP, AT+COPS. AT&C, AT&D, AT&S, ATS0, ATS3, ATS4, ATS5, ATS6, ATS7, ATS8, ATS10, ATS18, AT+FCLASS, AT+CBST, AT+CRLP, AT+CR. • List of settings stored to profile on multiplexer channels 2 and 3: ATE, ATQ, ATV, ATX, AT+CRC, AT+CMGF, AT+CSDH, AT+CNMI, AT+ILRR, AT+CMEE, AT^SMGO, AT+CSMS, AT^SACM, ^SCKS, AT+CREG, AT+CLIP, AT+COPS. (Parameters for data call are not relevant on channels 2 and 3.) .

2.39 AT+GCAP Request complete TA capabilities list

Test command AT+GCAP=?	Response **OK** Parameter
Execute command AT+GCAP	Response TA reports a list of additional capabilities. **+GCAP: <name>** **OK** Parameter **<name>** e.g.: **+CGSM, +FCLASS**
Reference V.25ter	Note +CGSM: The response text shows which GSM commands of the ETSI standard are supported.

2.40 AT+GMI Request manufacturer identification

Test command AT+GMI=?	Response **OK**
Execute command AT+GMI	Response TA reports information to identify the manufacturer. **SIEMENS** **OK**
Reference V.25ter	Note See also ”AT+CGMI Request manufacturer identification”.

2.41 AT+GMM Request TA model identification

Test command AT+GMM=?	Response **OK**
Execute command AT+GMM	TA reports one or more lines of information text which permit the user to identify the specific model of device. **TC35** **OK**
Reference V.25ter	Note See also ”AT+CGMM Request model identification”.

2.42 AT+GMR Request TA revision identification of software status

Test command	Response
AT+GMR=?	OK
Execute command AT+GMR	Response TA returns product software version identification text. **<revision>** **OK** Parameter **<revision>** x.yy Explanation of „Revision“ parameter: Version x and variant yy of software release.
Reference V.25ter	Note See also ”AT+CGMR Request revision identification of software status”.

2.43 AT+GSN Request TA serial number identification(IMEI)

Test command	Response
AT+GSN=?	**OK**
Execute command AT+GSN	Response TA reports one or more lines of information text which permit the user to identify the individual device. **<sn>** **OK**
	Parameter **<sn>** IMEI of the telephone(International Mobile station Equipment Identity)
Reference V.25ter	Note The serial number (IMEI) varies for every individual ME device.

2.44 AT+ILRR Set TE-TA local rate reporting

Test command AT+ILRR=?	Response **+ILRR:** (list of supported **<value>s**) **OK** Parameter See write command
Read command AT+ILRR?	Response **+ILRR: <value> OK** Parameter See write command
Write command AT+ILRR= <value>	This parameter setting determines whether or not an intermediate result code of local rate is reported at connection setup. The rate is reported before the final result code of the connection is transmitted to the TE. Response **OK** Parameter **<value>** 0 Disables reporting of local port rate 1 Enables reporting of local port rate
	Intermediate result **+ILLR:<rate>** Note: Indicates port rate setting on connection. Parameter **<rate>** port rate setting on call connection in bit per second 0 (Autobauding, see Chapter 2.45.1) 300 600 1200 2400 4800 9600 14400 19200 28800 38400 57600 115200
Reference V.25ter	Note

2.45 AT+IPR Set fixed local rate

Test command AT+IPR=?	Response **+IPR:** (list of supported auto-detectable **<rate>s**), (list of supported fixed-only **<rate>s**) **OK** Parameter See write command
Read command AT+IPR?	Response **+IPR: <rate> OK** Parameter See write command
Write command AT+IPR=<rate>	This command determines the data rate of the TA on the serial interface. A selected bitrate takes effect following the issue of any result code associated with this command (e.g. **O.K.**). The selected bitrate is stored to the non-volatile memory and will be used again after next power-up. However, in case of autobaud mode (+IPR=0) the actually detected bitrate is not saved and must be re-synchronized when ME is powered up again (see Chapter 2.45.1). Response **OK** If error is related to ME functionality **ERROR/+CME ERROR: <err>** Parameter **<rate>** bit rate per second 0 (Autobauding, see Chapter 2.45.1) 300 600 1200 2400 4800 9600 14400 19200 28800 38400 57600 115200
Reference V.25ter	Note Factory setting of AT+IPR is autobauding enabled (AT+IPR=0). Your current setting of AT+IPR will be preserved • when you download new firmware (i.e. a firmware update does not restore the factory setting of AT+IPR=0); • in the event of power failure.

	AT+IPR=x can be combined with other command strings on the same line, but there are several constraints to be considered: • Avoid combinations with the AT commands listed in Chapter 1.4.2. • If you enter **AT+IPR=0** with other commands on the same line, autobauding will be activated after the response to the last command is received. But it could happened that during the swiching of the bit rate the last bytes of the response are send with the new bit rate. As a result of the switching the last bytes are not correctly transmitted. The following commands are transmitted correctly with the new bitrate. • When you enter **AT+IPR=x**, take into account that a delay of 100 ms is required between a response to the last command (e.g. **OK**) and the next command on the same line. •

2.45.1 Autobauding

The serial interface of the GSM engines supports autobauding in the range from **1200 to 115200** baud. Factory setting is autobaud mode enabled. To take advantage of autobaud mode specific attention must be paid to the following requirements:

Synchronization between DTE and DCE

Ensure that DTE and DCE are correctly synchronized and the bitrate used by the DTE is detected by the DCE (= ME). To allow the bitrate to be synchronized simply issue an "AT" or "at" string. This is necessary

- after you have activated autobauding
- when you start up the GSM engine while autobauding is enabled.

If you want to use autobauding and autoanswer at the same time, you can easily enable the synchronization, when you activate autobauding first and then configure the autoanswer mode (ATS0=0).

Restrictions on autobauding operation

- The serial interface has to be operated at 8 data bits, no parity and 1 stop bit (factory setting).
- The A/ command (and a/) cannot be used.
- Only the strings „AT“ or „at“ can be detected (neither „aT“ nor „At“).
- The Unsolicited Result Code "^SYSSTART" is not indicated when you start up the ME while autobauding is enabled. This is due to the fact that the new bitrate is not detected unless DTE and DCE are correctly synchronized as described above.
- Any other Unsolicited Result Codes that may be issued before the ME detects the new bitrate (by receiving the first AT command string) will be sent at the previous bitrate.
- It is not recommended to switch to autobauding from a bitrate that cannot be detected by the autobaud mechnism (e.g. 300 baud). Responses to +IPR=0 and any commands on the same line might be corrupted.
- When entering several AT commands on the same line, consider the requirements described in the Notes of Chapter 2.45.
- See also AT+ILRR Set TE-TA local rate reporting , pg. 34

Autobauding and multiplex mode

If autobauding is active the multiplex mode (see +CMUX, pg. 74) cannot be activated (and if multiplex mode has been entered, **AT+IPR=<rate>** is not possible).

3 AT Commands for FAX

The following commands can be used for FAX transmission.
If the ME is acting as a Fax-Modem to a PC-based application (e.g. „WinFax“) it is necessary to select the proper Service Class (Fax Class) provided by the ME. The ME reports its Service Class capabilities, both the current setting and the range of services avaible. This is provided by the AT+FCLASS command (see pg. 40).

Currently defind Service Class values (see TIA/EIA-592-A)			
ME	+FCLASS parameter	Service Class	Reference, Standard
👍	0	data modem	e.g. TIA/EIA-602 or ITU V.25*ter*
👍	1	Service Class 1	EIA/TIA-578-A
	1.0	Service Class 1	ITU-T T.31
👍	2	manufacture specific	this document and EIA PN-2388 (draft)
	2.0	Service Class 2	TIA/EIA-592
	2.1	Service Class 2	TIA/EIA-592-A or ITU-T T.32
	8	Voice DCE	TIA IS-101
	Reserved		

Note: Be aware that there is a difference between Service Classes 2 and 2.0! Only the first is applicable to the ME.

3.1 AT+FBADLIN Bad Line Treshold

Read command AT+FBADLIN?	This command defines the “Copy-Quality-OK”-threshold. If <**badline**> consecutive lines have pixel count errors in normal resolution (98 dpi) mode, then the copy quality is unacceptable. If <**badline**> * 2 consecutive lines have pixel count errors in fine resolution (196 dpi) mode, then the copy quality is unacceptable. “Copy Quality Not OK” occurs if either the error percentage is too high or too many consecutive lines contain errors. A value of 0 implies that error checking is not present or disabled. Response **<badlin> OK** Parameter See write command
Write command AT+FBADLIN= <badlin>	Response **OK** If error is related to ME functionality: **ERROR** Parameter **<badlin>** 0 – 10 – 255 bad lines
Reference EIA PN-2388	Note Used for Fax class 2 only

3.2 AT+FBADMUL Error Threshold Multiplier

Read command AT+FBADMUL?	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. A value of 0 implies that error checking is not present or disabled. Response **<badmul> OK** Parameter See write command
Write command AT+FBADMUL=<n>	Response **OK** If error is related to ME functionality: **ERROR** Parameter **<n>** 0 – 20 – 255
Reference EIA PN-2388	Note Used for Faxclass 2 only

3.3 AT+FBOR Query data bit order

Test command AT+FBOR=?	Query the bit order for receive-mode. The mode is set by the ME dependent on the selected Service Class, see "AT+FCLASS Fax: Select, read or test service class", pg. 40. Response (list of supported bit order modes **<bor>s**) **OK** Parameter See write command
Read command AT+FBOR?	Response **<bor> OK** Parameter See write command
Write command AT+FBOR=<bor>	Response **OK** Parameter **<bor>** 0 direct bit order for both Phase C and for Phase B/D data. 1 Reversed bit order for Phase C data, direct Bit Order for Phase B/D data.
Reference EIA PN-2388	Note Used for Fax class 2 only

3.4 AT+FCIG Query or set the Local polling id

Test command AT+FCIG =?	Response (max. length of Local Polling ID string) (range of supported ASCII character values) **OK** Parameter See write command
Read command AT+FCIG?	Response **<id> OK** Parameter See write command
Write command AT+FCIG =<id>	Response **OK** Parameter **<id>** Local Polling ID string, max. length and possible content as reported by test command. Default value is empty string (“”).
Reference EIA PN-2388	Note See also “AT+FLID Query or set the Local Id setting capabilities”, pg. 46. Used for Faxclass 2 only

3.5 AT+FCLASS Fax: Select, read or test service class

Test command AT+FCLASS=?	See introduction to fax commands, pg. 38. Response (list of supported **<n>s)** **OK** Parameter See write command
Read command AT+FCLASS?	Response **<n> OK** Parameter See write command
Write command AT+FCLASS=<n>	The ME is set to a particular mode of operation (data, fax). This causes the MA to process information in a manner suitable for that type of information. Response **OK** Parameter **<n>** 0 data (e.g. EIA/TIA-602 or ITU V.25ter) 1 Fax class 1 (EIA/TIA-578-A, Service Class 1) 2 Fax class 2 (EIA/TIA SP-2388, an early draft version of EIA/TIA-592-A – Service class 2.1)
Reference EIA/TIA-592-A	Note Using Error Correcting Mode (ECM) when sending FAXes over GSM should be avoided.

3.6 AT+FCQ Copy Quality Checking

Test command AT+FCQ =?	This command controls Copy Quality checking when receiving a fax. Response (list of supported copy quality checking <cq>s) **OK** Parameter See write command
Read command AT+FCQ?	Response **<cq> OK** Parameter See write command
Write command AT+FCQ =<cq>	Response **OK** Parameter **<cq>** 0 No copy quality checking. The ME will generate Copy Quality OK (MCF) responses to complete pages. 1 ME can check 1-D phase data. The connected application must check copy quality for 2-D phase C data
Reference EIA PN-2388	Note Used for for Faxclass 2 only.

3.7 AT+FCR Capability to receive

Write command AT+FCR=<cr>	Response **OK** Parameter **<cr>** 0 ME will not receive message data. This 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.
Reference EIA PN-2388	Note Used for Faxclass 2 only

3.8 AT+FDCC Query or set capabilities

Test command AT+FDCC =?	This command allows the connected application to sense and constrain the capabilities of the facsimile DCE (=ME), from the choices defined in CCITT T.30 Table 2. Response (list of <**VR**>**s**), (list of <**BR**>**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**) **OK** 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, pg. 44
Read command AT+FDCC?	Response <**dcc**> **OK** Parameter See write command
Write command AT+FDCC=<VR>, ,<WD>,<LN>,<DF>,<EC>,<BF>,<ST>	Response **OK** 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, pg. 44
Reference EIA PN-2388	Note Used for Faxclass 2 only

3.9 AT+FDFFC Data Compression Format Conversion

Test command AT+FDFFC=?	This parameter determines the ME response to a mismatch between the data format negotiated for the facsimile session, reported by the +FDCS:DF subparameter, and the Phase C data desired by the controlling application, indicated by the optional +FDT:DF subparameter, or the +FDIS=DF subparameter for the +FDR operation. Response (list of supported **<df>**s) **OK** Parameter See write command
Read command AT+FDFFC?	Response **<df> OK** Parameter See write command
Write command AT+FDFFC =<df>	Response **OK** Parameter **<df>** 0 Mismatch checking is always disabled. The controlling application has to check the +FDCS: DF subparameter and transfer matching data.
Reference EIA PN-2388	Note Used for Fax Class 2 only

3.10 AT+FDIS Query or set session parameters

Test command

AT+FDIS =?

This command allows the controlling application to sense and constrain the capabilities used for the current session. It uses +FDIS to generate DIS or DTC messages directly, and uses +FDIS and received DIS messages to generate DCS messages.

Response

(list of <**VR**>s), (list of <**BR**>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

See write command

Read command

AT+FDIS?

Response

<**cdec**> **OK**

Parameter

See write command

Write command

AT+FDIS = <VR>,
,<WD>, <LN>,<DF>,<EC>, <BF>,<ST>

Response

OK

Parameter

Vertical Resolution	VR	0	normal, 98 lpi
		1	fine, 196 lpi
Bit Rate	BR	0	2400 bit/s, V.27ter
		1	4800 bit/s, V.27ter
		2	7200 bit/s, V.29
		3	9600 bit/s, V.29
Page Width	WD	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
Page Length	LN	0	A4, 297mm
		1	B4, 364mm
		2	unlimited length
Data Compression Format	DF	0 *)	1-D modified Huffman
		1	2-D modified read
		2	2-D uncompressed mode
Error correction (Annex A/T.30)	EC	0 *)	disable ECM
		1	enable ECM, 64 bytes/frame
		2	enable ECM, 256 bytes/frame
Binary File mode Transfer Mode	BF	0 *)	disable BFT
		1	enable BFT
Scan Time/Line	ST	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 really possible!

Reference

EIA PN-2388

Note

Used for Faxclass 2 only

3.11 AT+FDR Begin or continue phase C data reception

Execute command AT+FDR	The +FDR command initiates transition to Phase C data reception. Response **CONNECT** or **OK** If error is related to ME functionality: ERROR
Reference EIA PN-2388	Note Used for Faxclass 2 only

3.12 AT+FDT Data Transmission

Execute command AT+FDT	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, the +FDT command releases the ME to proceed with negotiation, and releases the DCS message to the remote station. In Phase C, the +FDT command resumes transmission after the end of a data stream transmited before. Response **CONNECT**
Write command AT+FDT =<dt>	Response **CONNECT** Parameter **<dt>** **DF,VR,WD,LN** comma separated parameter list Data Compression Format DF: 0 1-D modified Huffman; 1 2-D modified read; 2 2-D uncompressed mode Vertical Resolution VR: 0 normal, 98 lpi; 1 fine, 196 lpi Bit Rate BR: 0 2400 bit/s, V.27ter; 1 4800 bit/s, V.27ter; 2 7200 bit/s, V.29; 3 9600 bit/s, V.29 Page Width WD: 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 Page Length LN: 0 A4, 297mm; 1 B4, 364mm; 2 unlimited length
Reference EIA PN-2388	Note Used for Faxclass 2 only

3.13 AT+FET End a page or document

Write command AT+FET=<ppm>	This command indicates that the current page or partial page is complete. An ERROR response code results if this command is issued while the mode is on-hook. Response **OK** Parameter **<ppm>** Post Page Message Codes 1 another document next 2 no more pages or documents 4 another page, procedure interrupt 5 another document, procedure interrupt
Reference EIA PN-2388	Note Used for Faxclass 2 only

3.14 AT+FK Kill operation, orderly FAX abort

Execute command AT+FK	This command causes the TA to terminate the session in an orderly manner. Response **OK**
Reference	Note Used for Faxclass 2 only

3.15 AT+FLID Query or set the Local Id setting capabilities

Test command AT+FLID =?	Response (max. character length of Local ID string) (range of supported ASCII character values) OK Parameter See write command
Read command AT+FLID?	Response **< lid > OK** Parameter See write command
Write command AT+FLID =<lid>	Response **OK** Parameter **<lid>** Local ID string, max. length and possible content as reported by test command. Default value is empty string (“”).
Reference EIA PN-2388	Note See also “AT+FCIG Query or set the Local polling id ”, pg. 39. Used for Faxclass 2 only

3.16 AT+FMDL identify Product Model

Read command AT+FMDL?	Send the model identification to the TA Response **Gipsy Soft Protocolstack** **OK**
Reference Siemens	Note Used for Faxclass 2 only

3.17 AT+FMFR Request Manufacturer Identification

Read command AT+FMFR?	Send the manufacturer identification to the TA Response **SIEMENS** **OK**
Reference Siemens	Note Used for Fax class 2 only

3.18 AT+FOPT Set bit order independently

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>** 0 non-standard 1 standard
Reference Siemens	Note Used for Fax class 2 only

3.19 AT+FPHCTO DTE Phase C Response Timeout

Read command AT+FPHCTO?	The time-out value <**tout**> determines how long the DCE will wait for a command after reaching the end of data when transmitting in Phase C. When time-out is reached, the DCE assumes that there are no more pages or documents to send. Response **<tout> OK** Parameter See write command
Write command AT+FPHCTO=<tout>	Parameter **<tout>** 0 – 30 – 255 time-out value in 100ms units. Response **OK** If error is related to ME functionality: **ERROR**
Reference EIA PN-2388	Note Used for Fax class 2 only

3.20 AT+FREV Identify Product Revision

Test command AT+FREV?	Sends the revision identification to the TA Response **V2.550** **OK**
Reference Siemens	Note Used for Fax class 2 only

3.21 AT+FRH Receive Data Using HDLC Framing

Execute command AT+FRH=<mod>	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. Response **CONNECT** If error is related to ME functionality: **ERROR** Parameter **<mod>** modulation mode 3 V21 Ch2 300 bps 24 V.27ter 2400 bps 48 V.27ter 4800 bps 72 V.29 7200 bps 96 V.29 9600 bps
Reference TIA/EIA-578	Note Used for Fax class 1 only

3.22 AT+FRM Receive Data

Test command AT+FRM=?	Response (List of supported modulation modes <**mod**>s) **OK** Parameter See write command
Write command AT+FRM=<mod>	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 **CONNECT** If error is related to ME functionality: **ERROR** Parameter <**mod**> 96 V.29 9600 bps 72 V.29 7200 bps 48 V.27ter 4800 bps 24 V.27ter 2400 bps
Reference TIA/EIA-578	Note Used for Faxclass 1 only

3.23 AT+FRS Receive Silence

Write command AT+FRS=<time>	+FRS=n 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. Response **OK** If error is related to ME functionality: **ERROR** Parameter <**time**> 0 – 255 no. of 10 millisecond intervals
Reference TIA/EIA-578	Note Used for Faxclass 1 only

3.24 AT+FTH Transmit Data Using HDLC Framing

Write command AT+FTH=<mod>	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. Response **CONNECT** Parameter <**mod**> 3 V.21 Ch2 300 bps
Reference TIA/EIA-578	Note Used for Faxclass 1 only

3.25 AT+FTM Transmit Data

Test command AT+FTM=?	Response (List of supported modulation modes) **OK** Parameter See write command
Write command AT+FTM=<mod>	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. Response **CONNECT** If error is related to ME functionality: **ERROR** Parameter **<mod>** modulation mode 96 V.29 9600 bps 72 V.29 7200 bps 48 V.27ter 4800 bps 24 V.27ter 2400 bps
Reference TIA/EIA-578	Note Used for Fax class 1 only

3.26 AT+FTS Stop Transmission and Wait

Write command 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. Response An ERROR response code results if this command is issued while the modem is on-hook. Parameter **<time>** 0 – 85 no. of 10 millisecond intervals
Reference TIA/EIA-578	Note Used for Fax class 1 only

3.27 AT+FVRFC Vertical resolution format conversion

Test command 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. Response (List of supported mismatch checking modes) **OK** Parameter See write command
Read command AT+FVRFC?	Response **<vrfc> OK** Parameter See write command
Write command AT+FVRFC =<vrfc>	Response **OK** Parameter **<vrfc>** 0 disable mismatch checking. 2 enable mismatch checking, with resolution conversion of 1-D data in the DCE, and an implied AT+FK command executed on 2-D mismatch detection
Reference EIA PN-2388	Note Used for Fax class 2 only

The following AT commands are dummy commands. Invoking these commands will not cause ER-ROR result codes, but these commands have no functionality.

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

4 AT Commands originating from GSM 07.07

These AT Commands are according to ETSI (European Telecommunications Standards Institute) GSM 07.07 document.

4.1 AT+CACM Accumulated call meter (ACM) reset or query

Test command AT+CACM=?	Response **OK** Parameter
Read command AT+CACM?	Response TA returns the current ACM value. **+CACM: <acm> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<acm>** string type; three bytes of the current ACM value in hexadecimal format (e.g. “00001E” indicates decimal value 30) 000000 – FFFFFF
Write command AT+CACM= [<passwd>]	Parameter **<passwd>** string type: **SIM PIN2** Response TA resets the Advice of Charge related to the accumulated call meter (ACM) value in SIM file EF(ACM). ACM contains the total number of home units for both the current and preceding calls. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Reference GSM 07.07	

4.2 AT+CALA Set alarm time / activate Alarm mode

Test command AT+CALA=?	Test command returns supported array index values <**n**>, alarm types <**type**>, and maximum length of the text <**tlength**> to be output. Response **+CALA:** (list of supported <**n**>s), (list of supported <**type**>s), (range of supported <**tlength**>) **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Read command AT+CALA?	Read command returns the list of current active alarm settings in the ME. Response **+CALA: <time>[,<n>[,<type>[,<text>]]]** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+CALA=<time>[,<n>[,<type>[,<text>]]]	The write command sets an alarm time in the ME. When the alarm is timed out and executed the ME returns an Unsolicited Result Code (URC). The alarm call can adopt two functions, depending on whether or not you switch the GSM engine off after setting the alarm: Reminder call: You can use the alarm function as a wake-up or reminder call. For this purpose, set the alarm as described below and do not switch off or power down the ME. When executed the call comes as an Unsolicited Result Code. Alarm mode: You can use the alarm call to restart the ME when powered down. For this purpose, set the alarm as described below. Then power down the ME by entering the AT^SMSO command (pg. 139). When the alarm time is reached, the ME will wake up to Alarm mode. To prevent the ME from unintentionally logging into the GSM network, Alarm mode provides restricted operation. Upon wake-up, the ME indicates an Unsolicited Result Code which reads: ^SYSSTART ALARM MODE". A limited number of AT commands is available during Alarm mode: AT+CCLK, AT+CALA, AT^SBC, AT^SCTM, AT^SMSO. The ME remains deregistered from the GSM network. If you want the ME to return to full operation (normal operating mode) it is necessary to drive the ignition line (IGT pin of ZIF interface) to ground. If your application is battery powered note that charging cannot be started while ME is in Alarm mode. For details please refer to the "Hardware Interface Description" supplied with your GSM engine. Note: In the event of power outage the GSM engine retains the current alarm setting, but the RTC will be reset to <**time**> = “00/01/01,00:00:00” and must be restored after resume of power (see also +CCLK, pg. 59. It is only in Power Down mode, that the RTC is kept powered from a dedicated voltage regulator, thus saving the current date and time.

	Response **OK** If setting fails: **+CME ERROR: <err>** Refer Chapter 7.1.1, pg. 155, for <err> values. Parameter **<time>** string type value; format is "yy/MM/dd,hh:mm:ss", where characters indicate year (two last digits), month, day, hour, minutes. E.g. 6th of May 2001, 22:10:00 hours equals to "01/05/06,22:10:00" (see also +CCLK). Note: if **<time>** equals current date and time or is to an earlier date, TA returns **+CME ERROR: <21>.** **<n>** integer type value indicating the array index of the alarm. Index starts with 0. If only this value is returned by the test command, it is default and indicates that only one alarm time is possible; however, if a second alarm time is set, the previous alarm is deleted. **<type>** integer type value indicating the type of the alarm **0** Alarm indication: text message via serial interface **<text>** string type value indicating the text to be displayed when alarm time is reached; maximum length is **<tlength>**. After first connection to power supply **<text>** is undefined. Note: **<text>** will be stored to the non-volatile flash memory when the device enters the Power Down mode via AT^SMSO (pg. 139). Once saved, it will be available upon next power-up, until you overwrite it by typing another text. This eliminates the need to enter the full string when setting a fresh alarm and thus, saves memory due to the limited number of flash memory write cycles (e.g. 100.000). **<tlength>** integer type value indicating the maximum length of **<text>**. The maximum length is 16.
Unsolicited result code	Indicates reminder call: **+CALA: <text>** Indicates ME wake-up into Alarm mode: **^SSYSTART ALARM MODE** **+CALA: <text>** If autobauding is active (AT+IPR=0) the line ^SSYSTART ALARM MODE does not appear, but your individual **<text>** message will be displayed.
Reference GSM 07.07	Note • **<text>** should not contain characters which are coded differently in ASCII and GSM (e.g. Ä, Ö, Ü), see also „Supported character sets", pg. 10 and "Alphabet tables", pg. 172. • Please consider when using multiplex mode (**+CMUX**, pg. 74): - It is possible to use **+CALA** with every logical channel (1 – 3). - The total no. of possible alarm events is shared by all channels. If **<n>** = 0 is returned by the test command, this indicates that only one common alarm time is possible for all logical channels.

	- For every channel a different <text> parameter can be stored. - <text> will be output on the same logical channel the alarm was entered. If not in multiplex mode, <text> will be output independent of the related channel. - The read command returns all pending alarms, independent on which logical channel an alarm was entered. It´s up to the user to identify these alarms by specific <text>s.

Examples	Example 1:
	You may want to configure a reminder call for May 31, 2001, at 9.30h, including the message "Good Morning".
	Write command:
	`AT+CALA="01/05/31,09:30:00",0,0,"Good Morning"`
	`OK`
	Do not switch off the GSM engine. When the alarm is executed the ME returns the following URC:
	`+CALA: Good Morning`

	Example 2:
	To set a fresh alarm using the same message as in Example 1, simply enter date and time. <n>, <type>, <text>, <tlength> can be omitted:
	`AT+CALA="01/05/31,08:50:00"`
	`OK`
	When the alarm is executed the URC comes with the same message:
	`+CALA: Good Morning`

	Example 3:
	To configure the alarm mode, e.g. for May 20, 2001, at 8.30h, enter
	`AT+CALA="01/05/20,08:30:00"`
	`OK`
	Next, power down the ME:
	`AT^SMSO`
	`^SMSO: MS OFF`
	When the alarm is executed the ME wakes up to Alarm mode and displays a URC. If available, this line is followed by the individual <text> most recently saved. If no individual message was saved only the first line appears.
	`^SYSSTART ALARM MODE`
	`+CALA: Good Morning`

Table 1: Summary of AT commands available in Alarm mode

AT command	Use
AT+CALA	Set alarm time
AT+CCLK	Set date and time of RTC
AT^SBC	In Alarm mode, you can only query the present current consumption and check whether or not a charger is connected. The battery capacity is returned as 0, regardless of the actual voltage (since the values measured directly on the cell are not delivered to the module).
AT^SCTM	Query temperature of GSM engine
AT^SMSO	Power down GSM engine

4.3 AT+CAMM Accumulated call meter maximum (ACMmax) set or query

Test command AT+CAMM=?	Response OK Parameter
Read command AT+CAMM?	Response TA returns the current ACMmax value. **+CAMM: <acmmax> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+CAMM=[<acmax>[,<passwd>]]	Response TA sets the Advice of Charge related to the accumulated call meter maximum value in SIM file EF (ACMmax). ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<acmmax>** string type; three bytes of the max. ACM value in hexadecimal format (e.g. “00001E” indicates decimal value 30) 000000 disable ACMmax feature 000001-FFFFFF **<passwd>** string type SIM PIN2
Reference GSM 07.07	Note

4.4 AT+CAOC Advice of Charge information

Test command AT+CAOC=?	Response **+CAOC:** (list of supported **<mode>s**) **OK** Parameter See write command
Read command AT+CAOC?	Response **+CAOC: <mode> OK** Parameter See write command
Write command AT+CAOC=<mode>	Response TA sets the Advice of Charge supplementary service function mode. If error is related to ME functionality: **+CME ERROR: <err>** If **<mode>=0**, TA returns the current call meter value **OK** Parameter **<mode>** 0 query CCM value **<ccm>** string type; three bytes of the current CCM value in hexadecimal format (e.g. “00001E” indicates decimal value 30); bytes are similarly coded as ACMmax value in the SIM 000000-FFFFFF
Execute command AT+CAOC	Response TA returns the current call meter value If error is related to ME functionality: **+CME ERROR: <err>** If **<mode>=0**, TA returns the current call meter value **+CAOC: <ccm> OK** Parameter See write command
Reference GSM 07.07	Note

4.5 AT+CBST Select bearer service type

Test command AT+CBST=?	Response **+CBST:** (list of supported **<speed>s**),(list of supported **<name>s**),(list of supported **<ce>s**) **OK** Parameter See write command
Read command AT+CBST?	Response **+CBST: <speed>,<name>,<ce>** **OK** Parameter See write command
Write command AT+CBST=[<speed>[,<name>[,<ce>]]]	Response TA selects the bearer service **<name>**, the data rate **<speed>** and the connection element **<ce>** to be used when data calls are originated. The settings also apply to mobile terminated data calls, especially when single numbering scheme calls or calls from analog devices are received (see also Chapter 4.41). **OK** Parameter **<speed>** 0 auto bauding 4 2400 bps(V.22bis) 6 4800 bps(V.32) 7 9600 bps(V.32) 68 2400 bps (V.110) 70 4800 bps (V.110) 71 9600 bps (V.110) **<name>** 0 asynchronous modem **<ce>** 1 non-transparent Transparent mode is not supported.
Reference GSM 07.07	Note • GSM 02.02[1]: List of allowed combinations of subparameters. • The PLMN influences the second air interface (to the terminator), therefore another mode may be established by the network. • If multiplex mode is active, the bearer capability automatically switches to +CBST=7,0,1.

4.6 AT+CCFC Call forwarding number and conditions control

Test command AT+CCFC=?	Response **+CCFC: (list/range of supported <reas>s) OK** Parameter See execute command
Execute command AT+CCFC=<reas>, <mode>[,<number> [,<type>[,<class> [,<time>]]]]	Response TA controls the call forwarding supplementary service. Registration, erasure, activation, deactivation and status query are supported. When querying the status of a network service (**<mode>** = **2**), the response line for 'not active' (**<status>** = **0**) should be returned only if service is not active for any **<class>**. If **<mode>** **<>2** and command successful **OK** If **<mode>** = 2 and command successful (only in connection with **<reas>** **03**) **+CCFC: <status>, <class1>[, <number>, <type> [, <time>]]** **[<CR><LF>+CCFC: ....] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<reas>** 0 unconditional 1 mobile busy 2 no reply 3 not reachable 4 all call forwarding 5 all conditional call forwarding **<mode>** 0 disable 1 enable 2 query status 3 registration 4 erasure **<number>** string type phone number of forwarding address in format specified by <type> **<type>** type of address in integer format; default 145 when dialling string includes international access code character "+", otherwise 129 **<class>** 1 voice 2 data 4 fax 7 all classes 8 short message service **<time>** time to wait before call is forwarded, rounded to a multiple of 5 sec. Default is 20. 1...20..30 (only for <reas>=no reply) **<status>** 0 not active 1 active
Reference GSM 07.07	Note If status is "not active" parameter **<class>** can be ignored (0)

4.7 AT+CCLK Real Time Clock

Test command AT+CCLK=?	Response **OK**
Read command AT+CCLK?	Response **+CCLK: <time>** **OK/ERROR/+CME ERROR** Parameter: **<time>:** string type value; format is "yy/MM/dd,hh:mm:ss", where characters indicate year (two last digits), month, day, hour, minutes; e.g. 6th of May 2001, 22:10:00 hours equals to “01/05/06,22:10:00"
Write command AT+CCLK=<time>	Response **OK/ERROR/+CME ERROR** Parameter: **<time>** see read command
Reference GSM 07.07	Note • **<time>** is retained if the device enters the Power Down mode via AT^SMSO (pg. 140). • **<time>** is lost if power is totally disconnected and if no separate battery back-up for the clock is provided via the ZIF cable. In this case, the clock starts with <time> = “00/01/01,00:00:00” upon next power-up. • See AT+CALA, pg. 53.

4.8 AT+CEER Extended error report

Test command AT+CEER=?	Response **OK**
Execute command AT+CEER	TA returns an extended error report of the reason for the last call release and location. Response **+CEER: <location ID>, <reason > , <ss_release>OK** Parameter **<location ID>** Location ID as number code (see subclause 7.1.5) **<reason>** Reason for last call release as number code (see subclause 7.1.6) **<ss_release>** Release cause for last Supplementary Service Call (see subclause 7.1.7)
Reference GSM 07.07	Note • AT+CEER is not avalable for data calls, please use ATS18=1. • Default output in the case of a no-error-situation is **+CEER: 0,0,0**.

4.9 AT+CFUN Set phone functionality

Test command AT+CFUN=?	Response The write command selects the level of functionality <**fun**> in the ME. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. +**CFUN:** (list of supported <**fun**>s), (list of supported <**rst**>s) If error is related to ME functionality: +**CME ERROR:** <**err**> Parameter See below
Read command AT+CFUN?	Response +**CFUN:** <**fun**> If error is related to ME functionality: +**CME ERROR:** <**err**> Parameter See below
Execute command AT+CFUN=[<fun>[,<rst>]]	Response **OK** If error is related to ME functionality: +**CME ERROR:** <**err**>
	Parameter <**fun**> 0 Minimum functionality (SLEEP mode) Note: If command AT+CFUN=0 is input, **do not send** further characters until the device has entered SLEEP mode. Otherwise these characters remain in the input buffer and will delay output of an URC (see pg. 159, e.g. "**RING**"). Note: Any established connection will be terminated. 1 Full functionality (only used as placeholder for **+CFUN=1,1**). <**rst**> 0 Do not reset the ME before setting it to **<fun>** power level. (only used as placeholder for **+CFUN=0,0**). 1 ME resets and restarts in full functionality mode. If <**rst**> = 1 the first parameter <**fun**> has no effect.
Reference GSM 07.07	Note 1. To check the current operation mode see „AT^SSYNC Configure SYNC Pin", pg. 153. 2. To check that ME has entered SLEEP mode it is necessary to measure the supply current. SLEEP mode actually starts after remaining network activities were terminated. 3. After restart it is necessary to use AT+CPIN again. 4. GSM module wakes up by incoming call, Real Time Clock alarm, falling edge of RTS (RS-232 levels) and upon receipt of an unsolicited result code (URC, see chapter 7.1.3).

4.10 AT+CGMI Request manufacturer identification

Test command AT+CGMI=?	Response **OK**
Execute command AT+CGMI	Response TA returns manufacturer identification text. **SIEMENS** **OK**
Reference GSM 07.07	Note See also ”AT+GMI Request manufacturer identification”.

4.11 AT+CGMM Request model identification

Test command AT+CGMM=?	Response **OK**
Execute command AT+CGMM	Response TA returns product model identification text. **TC35** **OK**
Reference GSM 07.07	Note See also ”AT+GMM Request TA model identification”.

4.12 AT+CGMR Request revision identification of software status

Test command AT+CGMR=?	Response OK
Execute command AT+CGMR	Response TA returns product firmware version identification text. **<revision>** **OK** Parameter **<revision>** x.yy Explanation of „Revision“ parameter: Version x and variant yy of software release.
Reference GSM 07.07	Note See also ”AT+GMR Request TA revision identification of software status”.

4.13 AT+CGSN Request product serial number identification (IMEI) identical to GSN

Test command AT+CGSN=?	Response **OK**
Execute command AT+CGSN	Response TA returns identification text for determination of the individual ME. **<sn> OK** Parameter **<sn>** IMEI of the telephone (International Mobile station Equipment Identity)
Reference GSM 07.07	Note See also ”AT+GSN Request TA serial number identification”.

4.14 AT+CHLD Call hold and multiparty

Test command AT+CHLD=?	Response **+CHLD:** (list of supported **<n>s**) **OK**
Execute command AT+CHLD=[<n>]	Response TA controls the supplementary services Call Hold, MultiParty and Explicit Call Transfer. Calls can be put on hold, recovered, released, added to conversation and transferred. Note: Supplementary services are only applicable to teleservice 11 (Speech telephony). **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<n>** 0 Terminate all held calls; or set UDUB (User Determined User Busy) for a waiting call, i.e. reject the waiting call. 1 Terminate all active calls (if any) and accept the other call (waiting call or held call) 1X Terminate the active call X (X= 1-7) 2 Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call 2X Place all active calls except call X (X= 1-7) on hold 3 Add the held call to the active calls
Reference GSM 07.07	Note In conflicting situations, e.g. when a waiting call comes while there are already held calls, the above procedures apply to the waiting call only. For example, **<n>=0** rejects the waiting call, but does not affect the held calls.

4.15 AT+CHUP Hang up call

Test command AT+CHUP=?	Response **OK**
Execute command AT+CHUP	Cancels all active and held calls. Response **OK/ERROR**
Reference GSM 07.07	Note

4.16 AT+CIMI Request international mobile subscriber identity

Test command AT+CIMI=?	Response **OK**
Execute command AT+CIMI	Response TA returns < IMSI> for identifying the individual SIM which is attached to ME. **<IMSI> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<IMSI>** International Mobile Subscriber Identity (string without quotes)
Reference GSM 07.07	Note

4.17 AT+CLCC List current calls of ME

Test command AT+CLCC=?	Response **OK** Parameters
Execute command AT+CLCC	Response TA returns a list of current calls of ME. If command successful, but no calls are available, no information response is sent to TE. **[+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>,** **[<number>,<type>,[<alpha>]]]** **[<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>,** **[<number>,<type>,[<alpha>]]]** **[...]]] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameters **<idx>** Integer type; call identification number as described in GSM 02.30[19] subclause 4.5.5.1; this number can be used in +CHLD command operations **<dir>** 0 mobile originated (MO) call 1 mobile terminated (MT) call **<stat>** state of the call: 0 active 1 held 2 dialing (MO call) 3 alerting (MO call) 4 incoming (MT call) 5 waiting (MT call) **<mode>** bearer/teleservice: 0 voice 1 data 2 fax 9 unknown **<mpty>** 0 call is not one of multiparty (conference) call parties 1 call is one of multiparty (conference) call parties **<number>** string type phone number in format specified by <type> **<type>** type of address octet in integer format; 145 when dialling string includes international access code character “+”, otherwise 129 **<alpha>** string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS
Reference GSM 07.07	Note

4.18 AT+CLCK Facility lock

Test command AT+CLCK=?	Response **+CLCK: (list of supported <fac>s) OK** Parameter See execute command
Execute command AT+CLCK=<fac>, <mode> [,<passwd> [,<class>]]	This command is used to lock, unlock or interrogate a ME or a network facility **<fac>**. When querying the status of a network service (**<mode>=2**) the response line for a 'not active' case (**<status>=0**) should be returned only if service is not active for any **<class>**. It should be possible to abort the command when network facilities are set or interrogated. Response If **<mode>** <> **2** and command is successful **OK** If **<mode>** = **2** and command is successful **+CLCK: <status>[,<class1>[<CR><LF>** **+CLCK: <status>, class2....]] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<fac>** "CS" Keypad lock (not supported since keypad cannot be connected) "PS" Phone locked to SIM card (phone code). ME requests password when other than current SIM card inserted; ME may remember certain number of previously used cards thus not requiring password when they are inserted. "SC" SIM (lock SIM cards). SIM requests password upon ME power-up and when this lock command is issued. "FD" SIM fixed dialling memory feature (if PIN2 authentication has not been performed during the current session, PIN2 is required as <passwd>) "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 (applicable only for <mode>=0) "AG" All outGoing barring services (applicable only for <mode>=0) "AC" All inComing barring services (applicable only for <mode>=0) The following parameters depend on the factory settings: "PF" lock Phone to the very First SIM card "PN" Network Personalisation "PU" Network subset Personalisation "PP" Service Provider Personalisation "PC" Corporate Personalisation

	<mode> 0 unlock 1 lock 2 query status **<passwd>** password **<class>** 1 voice 2 data 4 fax 7 all classes except class 8 (default) 8 short message service **<status>** 0 off 1 on
Reference GSM 07.07	Note A password is needed before the first use of **<fac>"PS"** and therefore has to be given via **AT+CPWD**.

4.19 AT+CLIP Calling line identification presentation

Test command AT+CLIP=?	This command refers to the GSM supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. Response + **CLIP:** (list of supported <**n**>s) **OK** Parameter See write command
Read command AT+CLIP?	Response **+CLIP: <n>, <m> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+CLIP=<n>	Set command enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network. Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter <**n**> 0 suppress unsolicited result codes 1 display unsolicited result codes <**m**> 0 CLIP not provisioned 1 CLIP provisioned 2 unknown
Unsolicited result code	When CLIP is enabled at the TE (and is permitted by the calling subscriber), an unsolicited result code is returned after every RING (or +CRING: <type>) at a mobile terminating call. Voice call response format: **+CLIP: <number>, <type>,,,,<CLI validity>** Data/FAX call response format: **+CLIP: <number>, <type>** Parameter <**number**> string type phone number of calling address in format specified by <**type**> <**type**> type of address octet in integer format; **145** when dialling string includes international access code character "+", otherwise **129**. <**CLI validity**> 0 CLI valid 1 CLI has been withheld by the originator. 3 CLI is not available due to interworking problems or limitations of originating network. <**number**> shall be an empty string ("") and <**type**> value will not be significant.
Reference GSM 07.07	Note

4.20 AT+CLIR Calling line identification restriction (by *# sequence)

The AT+CLIR command is not supported. Instead, you can handle CLIR on a call-by-call basis using the ATD command and a *# sequence.

Read command ATD*#31#	Run the Read command to query status: Response **+CLIR: <n>,<m>** Defined values **<n>** (parameter shows the settings for outgoing calls): 0 presentation indicator is used according to the subscription of the CLIR service 1 CLIR invocation 2 CLIR suppression **<m>** (parameter shows the subscriber CLIR service status in the network): 0 CLIR not provisioned 1 CLIR provisioned in permanent mode 2 unknown (e.g. no network, etc.) 3 CLIR temporary mode presentation restricted 4 CLIR temporary mode presentation allowed
Execute commands ATD*31#<Phonenumber>[;] ATD#31#<Phonenumber>[;]	The Execute commands allow you to enable or disable the presentation of your phone number to the called party when you set up a call: Deactivate CLIR = enable presentation of own phone number to called party Activate CLIR = suppress presentation of own phone number to called party
	Note: <Phonenumber> = phone number of called party

4.21 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 (0-4)
Reference GSM 07.07	Note • The volume level cannot be modified in audio mode 1. • The changed volume level will not be saved with AT^SNFW, instead it will be saved after AT^SMSO only.

4.22 AT+CMEE Report mobile equipment error

Test command AT+CMEE=?	Response **+CMEE:** (list of supported **<n>s) OK** Parameter See write command
Read command AT+CMEE?	Response **+CMEE: <n> OK** Parameter See write command
Write command AT+CMEE=<n>	This command controls the presentation of the result **code +CME ERROR: <err>** that indicates errors relating to ME functionality. The setting is not stored upon Power Down, i.e. after restart, only the default level 0 will be restored. The levels 1 or 2 need to be selected once again after reboot. Response **OK** Parameter **<n>** 0 disable result code (only 'ERROR' will be displayed) 1 enable result code and use numeric values 2 enable result code and use verbose values
Example	To obtain enhanced error messages it is recommended to choose <n>=2. AT+CMEE=2 OK
Reference GSM 07.07	Note • The possible error result codes are listed in chapter 7 • In multiplex mode (see “AT+CMUX Enter multiplex mode”, pg. 74) the setting applies only to the logical channel where selected. The setting on the other channels may differ.

4.23 AT+CMUT Mute control

Test command AT+CMUT=?	Response **+CMUT**: (list of supported **<n>s**) **OK**
Read command AT+CMUT?	Response **+CMUT: <n>** **OK/ERROR/+CME ERROR**
Write command AT+CMUT=<n>	Response **OK/ERROR/+CME ERROR** Parameter **<n>:** 0 mute off 1 mute on
Reference GSM 07.07	Note

4.24 AT+CMUX Enter multiplex mode

Test command AT+CMUX=?	This command is used to start the multiplexing protocol control channel, as described in detail in ETSI standard GSM 07.10 (See download area at „www.etsi.org“. The document can be obtained for free, however, a registration procedure may be necessary.) Supplied by Siemens AG additional customer information regarding the implementation of multiplex mode is available, see document „Multiplexer Protocol GSM 07.10 for GSM-Engines“. The GSM 07.10 multiplexer protocol operates between the MS and a TE and allows a number of simultaneous sessions over one normal serial asynchronous interface. Each session consists of a stream of bytes transferring various kinds of data; for instance, voice, fax, data, SMS, phonebook maintenance, battery status etc. This permits, for example, SMS to be transferred to a TE when a voice call is in progress. Many other combinations are possible. The multiplexer allows a complete system to be partitioned in a flexible way between a MS and TE. Response **+CMUX:** (list of supported **<mode>**s) **OK**
Read command AT+CMUX?	Response **+CMUX: <mode> OK** If error is related to ME functionality: **+CME ERROR: <err>**
Write command AT+CMUX=<mode>	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<mode>** multiplexer transparency mechanism 0 basic option Subparameters defined in GSM07.07 are adjusted for control and logical channels as follows: **<subset>** 0 UIH frames used only (control channel)
Reference GSM 07.07	Note 1. This command is used to enter the multiplex mode. The setup of any logical channel has to be initiated by the TE, thus it acts always as the initiator. Therefore the TE has to ensure that logical channels are established before any further actions on the channels can be started. 2. There is a timeout of five seconds, if the multiplexer protocol is enabled and no multiplexer control channel is established. The GSM engine returns to AT command mode. 3. '+++' is not available in multiplex mode.

	4. There are different possibilities to switch from data mode to command mode: a) Circuit 108/2 (DTR) changes from ON to OFF, reaction depends on command at&d (caution: at&d0: TA ignores status on DTR). b) The message Modem Status Command (MSC) for control channel is defined by the multiplexer protocol GSM07.10. MSC conveys V.24 signals. Bit 3 of Control Signal Octet is DTR, reaction depends on command at&d (caution: at&d0: TA ignores status on DTR). 5. The parameter maximum frame size (N1) of at+cmux in GSM07.07 is fixed to 97, the parameter is not changeable. All other parameters are not available. 6. Echo is disabled with the start of multiplex mode (see **ATE**, pg. 21). Therefore echo is not available on logical channels: **ATE0** responds with OK, **ATE1** responds with ERROR. 7. Multiplex mode cannot be activated if autobauding is enabled (+IPR=0, see “AT+IPR Set fixed local rate”, pg. 35). 8. In multiplex mode, **AT+IPR=<rate>** cannot be used. 9. Multiplex mode can be terminated by **AT^SMSO** (,AT^SMSO Switch off mobile station" pg. 139). It has to be reestablished after power-on.

Note: For further information of tools to the multiplexer please contact you local distributor.

4.24.1 Restrictions on Multiplex mode

When the serial interface is in multiplex mode, data calls can only be set up on logical channel 1. Due to this restriction, AT commands have a different behaviour on channels 2+3 compared to channel 1. Several commands are not available, others return different responses. These commands are listed in the table below:

Command	Behaviour on channel 1	Differences on channel 2+3
AT+CBST	as described	not usable
AT+CR	as described	not usable
AT+CRLP	as described	not usable
AT+F.... (Fax commands)	as described	not usable
+++	not usable	not usable
AT&C	as described	not usable
AT&D	as described	not usable
AT&F	as described	Data Call parameters not changed
AT&S	as described	not usable
AT&V	as described	Data Call parameters not displayed
ATA	as described	no Data Calls
ATD	as described	no Data Calls
ATDI<n>	as described	not usable
ATO	as described	not usable
ATL	Dummy	not usable
ATM	Dummy	not usable
ATS0 [1])	as described	not usable
ATS3 [1])	as described	not usable
ATS4 [1])	as described	not usable
ATS5 [1])	as described	not usable
ATS6 [1])	as described	not usable
ATS7 [1])	as described	not usable
ATS8 [1])	as described	not usable
ATS10 [1])	as described	not usable
ATS18 [1])	as described	not usable
AT\Q	as described	not usable
ATZ	as described	Data Call parameters not changed
+CMEE	ERROR	+CME ERROR: <value>

[1]) Siemens GSM engines support the registers S0 - S29. You can change S0,S3,S4,S5,S6,S7,S8,S10 and S18 using the related ATSn commands (see starting from pg. 24). The other registers are read-only and for internal use only!

4.25 AT+COPN Read operator names

Test command AT+COPN=?	Response **OK**
Execute command AT+COPN	TA returns the list of operator names from the ME. Each operator code <numericn> that has an alphanumeric equivalent <alphan> in the ME memory is returned. Response +COPN: numeric <**numeric1**>,long alphanumeric <**alpha1**><**CR**><**LF**> +**COPN:.....OK** If error is related to ME functionality: +**CME ERROR:** <**err**> Parameter <**numericn**> string type; operator in numeric form; GSM location area identification number <**alphan**> string type; operator in long alphanumeric format; can contain up to 16 characters
Reference GSM 07.07	Note See also AT^SPLM, pg. 149

4.26 AT+COPS Operator selection

Test command AT+COPS=?	Response TA returns a list of quadruplets, each representing an operator present in the network. Any of the formats may be unavailable and will then be an empty field (,,). The list of operators comes in the following order: Home network, networks referenced in SIM, and other networks. **+COPS:** (list of supported**<stat>**, long alphanumeric **<oper>**,, numeric **<oper>**s) [,(list of supported **<mode>**s), (list of supported **<format>**s)] **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Read command AT+COPS?	Response TA returns the current mode and the currently selected operator. If no operator is selected, **<format>** and **<oper>** are omitted. **+COPS: <mode>[, <format>[, <oper>]] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+COPS= <mode> [,<format>[,<oper>]]	Response TA forces an attempt to select and register the GSM network operator. If the selected operator is not available, no other operator shall be selected (except **<mode>=4**). The selected operator name format shall apply to further read commands (+COPS?), too. Parameters used **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<stat>** 0 unknown 1 operator available 2 operator current 3 operator forbidden **<oper>** operator in format as in per **<format>** **<mode>** 0 automatic mode; <oper> field is ignored 1 manual operator selection; <oper> field shall be present **<format>** can only be = 2) 2 manual deregister from network and remain unregistered until mode 0,1,4 is selected 3 set only **<format>** (for read command +COPS?) 4 automatic, manual selected; if manual selection fails, automatic mode (**<mode>=0**) is entered (**<oper>** field shall be present) **<format>** 0 long format alphanumeric **<oper>**; up to 16 characters 2 numeric **<oper>**; GSM Location Area Identification number
Reference GSM 07.07	Note

4.27 AT+CPAS Mobile equipment activity status

Test command AT+CPAS=?	Response **+CPAS:** (list of supported **<pas>**s) **OK** Parameter See execute command
Execute command AT+CPAS	Response TA returns the activity status of ME. **+CPAS: <pas> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<pas>** 0 ready 3 incoming call (ringing) 4 call in progress or call hold
Reference GSM 07.07	Note

4.28 AT+CPBR Read current phonebook entries

Test command AT+CPBR=?	Response TA returns location range supported by the current storage as a compound value and the maximum length of <**number**> and <**text**> fields. Note: If SIM storage is selected, the length may not be available. If storage does not offer format information, the format list should be empty parentheses. **+CPBR:** (list of supported <**index**>s), <**nlength**>, <**tlength**> **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<index>** location number **<nlength>** max. length of phone number, normally 20, for a small number of locations 40 **<tlength>** max. length of text for number
Execute command AT+CPBR=<index1>[,<index2>]	Response TA returns phonebook entries in location number range <**index1**> **...** <**index2**> from the current phonebook memory storage selected with +CPBS. If <**index2**> is left out, only location <**index1**> is returned. **+CPBR: <index1>, <number>, <type>, <text>[<CR><LF>+CPBR: .....+CPBR: <index2>, <number>, <type>, <text>] OK** If error is related to ME functionality: **+CME ERROR** Parameter **<index1>** location number where reading starts **<index2>** location number where reading ends **<number>** phone number **<type>** type of address octet in integer format; **145** when dialling string includes international access code character "+", otherwise **129**. **<text>** string type field of maximum length <**tlength**>; character set as specified with +CSCS
Reference GSM 07.07	Note

4.29 AT+CPBS Select phonebook memory storage

Test command AT+CPBS=?	Response **+CPBS:** (list of supported **<storage>**s) **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Read command AT+CPBS?	Response TA returns currently selected memory: **+CPBS: <storage>,<used>,<total> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+CPBS=<storage>	Response TA selects current phonebook memory storage, which is used by other phonebook commands. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameter **<storage>** "SM" SIM phonebook (storage depends on SIM Card) "FD" SIM fixdialling phonebook (FD Phonebook storage pos.1-7) "LD" SIM last-dialling-phonebook (LD Phonebook storage pos.1-10) (+CPBW not be applicable to this storage) "MC" ME missed (unanswered received) calls) (MC Phonebook storage pos.1-10) list (+CPBW not applicable to this storage "RC" ME received calls list (+CPBW not applicable for this storage) (RC Phonebook storage pos.1-10) "ON" SIM (or ME) own numbers (MSISDNs) list "ME" ME Phonebook ME Phonebook storage pos.1-50 **<used>** Integer type value indicating the number of used locations in selected memory **<total>** Integer type value indicating the maximum number of locations allowed in the selected memory
Reference GSM 07.07	Note This command can be used right after power-on to get selected **<storage>**. Since data need to be loaded from the SIM, values of **<used>** and **<total>** might not be available for the first 20 seconds.

4.30 AT+CPBW Write phonebook entry

Test command AT+CPBW=?	Response TA returns location range supported by the current storage, the maximum length of <**number**> field, supported number formats of the storage and the maximum length of <**text**> field. Note: The length may not be available while SIM storage is selected. If storage does not offer format information, the format list should be empty parentheses. **+CPBW:** (list of supported <**index**>**s**), <**nlength**>, (list of supported <**type**>**s**), <**tlength**> **OK** If error is related to ME functionality: **+CME ERROR:** <**err**> Parameter See write command.
Write command AT+CPBW= [<index>] [,<number> [[,<type>] [,<text>]]]	This command writes a phonebook entry to the memory location <**index**> of the active memory. The memory location number <**index**> is followed by the phone number <**number**> (in the format <**type**>) and the associated <**text**>. If writing fails, an ME error +CME ERROR: <**err**> is returned. Parameter <**index**> Location number within phonebook memory, range is given in test command response <**number**> Phone number, range is given as <**nlength**> in test command response <**type**> Type of phone number (address octet in integer format); **145** when dialling string includes international access code character "+", otherwise **129** (refer GSM 04.08 subclause 10.5.4.7) <**text**> Text assigned to the phone number, range is given in test command response <**tlength**>, character set as specified with +CSCS. See note below. <**nlength**> Max. length of phone number, normally 20, for a small number of locations 40 <**tlength**> Max. length of text corresponding to the telephone number Response **OK/ERROR/+CME ERROR** To delete a phonebook entry simply enter the location number: AT+CPBW=<**index**> To write a phonebook entry to the first free location number: AT+CPBW=,<**number**>,<**type**>,<**text**>
Reference GSM 07.07	Note If <**text**> contains characters which are coded differently in ASCII and GSM (e.g. Ä, Ö, Ü), these characters have to be entered via escape sequences as described in chapter „Supported character sets", pg. 10.

4.31 AT+CPIN Enter PIN

Test command AT+CPIN=?	Response **OK**
Read command AT+CPIN?	Response TA returns an alphanumeric string indicating whether some password is required or not. **+CPIN: <code> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<code>**

READY	no further entry needed
SIM PIN	ME is waiting for SIM PIN
SIM PUK	ME is waiting for SIM PUK
PH-SIM PIN	ME is waiting for phone-to-SIM card password (antitheft)
PH-SIM PUK	ME is waiting for SIM PUK (antitheft)
SIM PIN2	PIN2, e.g. for editing the FD phonebook, only if preceding command was acknowledged with +CME ERROR:17
SIM PUK2	only if preceding command was acknowledged with error +CME ERROR:18.
PH-FSIM PIN	ME is locked to very first SIM card and waiting for phone-to-very-first-SIM card password (factory personalisation)
PH-FSIM PUK	ME is waiting for phone-to-very-first-SIM card unblocking password to be given
PH-NET PIN	ME is waiting for network personalisation password
PH-NET PUK	ME is waiting for network personalisation unblocking password
PH-NS PIN	ME is waiting for network subset personalisation password
PH-NS PUK	ME is waiting for network subset unblocking password
PH-SP PIN	ME is waiting for service provider personalisation password
PH-SP PUK	ME is waiting for service provider personalisation unblocking password
PH-C PIN	ME is waiting for coporate personalisation password
PH-C PUK	ME is waiting for coprorate personalisation unblocking password

Write command AT+CPIN=<pin> [, <new pin>]	Response TA stores a password, which is necessary before it can be operated on (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken and an error message, +CME ERROR, is returned to TE. If the PIN required is SIM PUK or SIM PUK2, the second PIN must be entered. This second pin, <**newpin**>, is used to replace the old PIN in the SIM. **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<pin>** password (string type) E.g.: AT+CPIN=9515<CR> **<new pin>** if the PIN required is SIM PUK or SIM PUK2: new password
Reference GSM 07.07	Note • Caution: After entering a password with AT+CPIN all other commands that need access to the data on the SIM card may be blocked for up to 20 seconds! • Wait 10 seconds after PIN input before using SMS related commands. • <pin> and <new pin> can also be entered in quotes (e.g. ”1234”). • See also Chapter 7.2 „Summary of PIN requiring AT Commands“. • Caution: After three failures to enter the PIN, the SIM card is blocked. To unblock the card +CMEE Error: 18 will prompt you to enter the PUK (PIN unblocking key). After ten failed attempts to enter the PUK the SIM card is invalidated, and ME returns +CMEE Error: 48, i.e. ME is waiting for the Master Phone Code. This is a 10-digit code based on the IMEI number of the module which can only by obtained from the manufacturer or provider. Therefore contact Siemens AG and request the Master Phone Code of the specific module. This behavior applies to all "PIN" Commands and also for +CPWD and ^SPWD

4.32 AT+CPIN2 Enter PIN2

Test command AT+CPIN2=?	Response **OK**
Read command AT+CPIN2?	Response TA returns an alphanumeric string indicating whether some password is required or not. **+CPIN2: <code> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<code>** READY: ME is not pending for any password SIM PIN2: ME is waiting SIM PIN2 to be given (this **<code>** is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR:17)). SIM PUK2: ME is waiting SIM PUK2 to be given (this **<code>** is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR:18)).
Write command AT+CPIN2=<pin >[, <new pin>]	Response TA stores a password, which is necessary before it can be operated (SIM PIN2, SIM PUK2, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken and an error message, +CME ERROR, is returned to TE. If the PIN required is SIM PUK2, the second pin is required. This second pin, **<newpin>**, is used to replace the old pin2 in the SIM. **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<pin>** password (string type) should be entered in quotes. E.g.: AT+CPIN2=”9515” **<new pin>** if the PIN required is SIM PUK2: new password
Reference	Note Functions accessible only after PIN2 authentication: AT+CACM: Accumulated call meter (ACM) reset or query AT+CAMM: Accumulated call meter maximum (ACMmax) set or query AT+CLCK: Facility lock to "FD" (Fixed dialling phonebook) AT^SLCK: Facility lock to "FD" (Fixed dialling phonebook) AT+CPWD: Change "P2"password AT^SPWD: Change "P2"password AT+CPUC: Price per unit and currency table AT+CPIN: If PIN2 or PUK2 is requested by ME (e.g. when you attempt to edit "FD" phonebook and ME returns +CMEE Error 17 or +CPIN: SIM PIN2.

	Explanation: • With the AT+CPIN command, PIN2 can only be set if expected (+CPIN: SIM PIN2). • To edit the "FD" Phonebook, PIN2 has to be entered before.
Examples In these examples PIN2 is supposed to be 8888	To change PIN2: `AT+CPWD=P2,0000,8888` (where 0000 = old PIN2 and 8888 = new PIN2)

	To write to "FD" phonebook:
	`AT+CBPS="FD"`
	`OK`
	
	`AT+CPBW=2,"+493012345678",145,"Charly"`
	`+CMEE Error 17` (access denied due to missing PIN2 authentication)
	
	`AT+CPIN2=8888`
	`OK`
	
	`AT+CPBW=2,"+493012345678",145,"Charly"`
	`OK`

	To change price per unit: `AT+CPUC="dm","5",8888`

4.33 AT+CPUC Price per unit and currency table

Test command AT+CPUC=?	Response **OK**
Read command AT+CPUC?	Response Read command returns the current parameters of PUC. **+CPUC: <currency>, <ppu> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+CPUC=<currency>,<ppu>[,<passwd>]	Response Write command sets the parameters of Advice of Charge related price per unit and currency table. SIM PIN2 is usually required to set the parameters. If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<currency>** string type; three-character currency code (e.g. “GBP”, “DEM”); character set as specified with AT+CSCS. If the currency name is longer than three characters, all characters will be cut off after the third position. Before they are written to the SIM Card, these characters are converted to the standard GSM alphabet. **<ppu>** string type; price per unit; dot is used as a decimal separator (e.g. “2.66”). The length is limited to 20 characters. If the string length is exceeded, the command is terminated with an error. This string may only contain digits and a dot. Leading zeros are removed from the string. The minimum and maximum value are determined by the structure of the SIM-PUCT file. The maximum price per unit value is 999 999 999.00. When successfully entered, this value is rounded to maximum accuracy. Note: Due to storage in mantisse (range 0-4095) and exponent (-7 to 7) it is possible that rounding errors occur. **<passwd>** string type; SIM PIN2. String parameter which can contain any combination of characters. The maximum string length is limited to 8 characters. If this value is exceeded, the command terminates with an error message. If the PIN2 is incorrect, a CME error **(+CME ERROR: incorrect password)** is output.
Reference GSM 07.07	Note

4.34 AT+CPWD Change password

Test command	Response
AT+CPWD=?	TA returns a list of pairs which represent the available facilities and the maximum length of their password. **+CPWD:** (list of supported **(<fac>, <pwdlength>)s**) **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<fac>** see execute command **<pwdlength>** integer max. length of password
Execute command	Response
AT+CPWD = <fac>, [<oldpwd>], <newpwd>	TA sets a new password for the facility lock function. **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<fac>** "SC" SIM (lock SIM card) (SIM asks password in ME power-up and when this lock command issued) "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 (applicable only for <mode> = 0) "AG" All outGoing barring services (applicable only for <mode> = 0) "AC" All inComing barring services (applicable only for <mode> = 0) "P2" SIM PIN2 "PS" Phone locked to SIM (device code) "PF" lock Phone to the very first SIM card "PN" Network Personalisation "PU" Network-subset Personalisation "PP" Service-Provider Personalisation "PC" Corporate Personalisation **<oldpwd>** password specified for the facility. If an old password has not yet been set, <oldpwd> has not to be entered. Note: A password may have already been set, depending on the provider. Please check with your provider. **<newpwd>** new password
Reference	Note
GSM 07.07	If you only want to delete a password, use the following syntax: **at+cpwd=<fac>,<oldpwd>** +CPWD can only used by cusomer for the <fac> "SC", "P2" and "PS" the other locks are depend by factory. See also ^SPWG on pg. 152

4.35 AT+CR Service reporting control

Test command AT+CR=?	Response +**CR**: (list of supported <**mode**>s) **OK** Parameter See write command
Read command AT+CR?	Response +**CR: <mode> OK** Parameter See write command
Write command AT+CR=<mode>	Response TA controls whether or not intermediate result code +**CR: <serv>** is returned from the TA to the TE at call setup. **OK** Parameter <**mode**> 0 disable 1 enable
	Intermediate result code When enabled, an intermediate result code is transmitted at the point during connect negotiation when the TA has determined the speed and quality of service to be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted. +**CR:<serv>** Parameter <**serv**> REL ASYNC asynchronous non-transparent
Reference GSM 07.07	Note The PLMN influences the second air interface (to the terminator), therefore another mode may be established from the network

4.36 AT+CRC Set Cellular Result Codes for incoming call indication

Test command AT+CRC=?	Response **+CRC:** (list of supported **<mode>**s) **OK** Parameter See write command
Read command AT+CRC?	Response **+CRC: <mode> OK** Parameter See write command
Write command AT+CRC= [<mode>]	Response TA controls whether or not the extended format of incoming call indication is used. **OK** Parameters **<mode>** 0 disable extended format 1 enable extended format
	Unsolicited result code When enabled, an incoming call is indicated to the TE with unsolicited result code **+CRING: <type>** instead of the normal RING. Parameter **<type>** REL ASYNC asynchronous non-transparent FAX facsimile VOICE voice
Reference GSM 07.07	Note

4.37 AT+CREG Network registration

Test command AT+CREG=?	Response **+CREG:** (list of supported **<n>**s) **OK** Parameter See write command
Read command AT+CREG?	Response TA returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the ME. Location information elements <lac> and <ci> are returned only when <n>=2 and ME is registered in the network. **+CREG: <n>,<stat>[,<lac>,<ci>] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT+CREG=[<n>]	Response **OK** TA controls the presentation of an unsolicited result code **+CREG: <stat>** when **<n>=1** and there is a change in the ME network registration status, or code **+CREG: <stat>[,<lac>,<ci>]** when **<n>=2** and there is a change of the network cell. Parameter **<n>** 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code **+CREG:<stat>** 2 Enable network registration and location information unsolicited result code **+CREG:<stat>[,<lac>,<ci>]** Note: Optional parameters will not be displayed during call **<stat>** 0 not registered, ME is not currently searching for a new operator at which to register 1 registered, home network 2 not registered, but ME is currently searching for a new operator at which to register 3 registration denied 4 unknown 5 registered, roaming **<lac>** string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 193 in decimal) **<ci>** string type; two byte cell ID in hexadecimal format
	Unsolicited result code When **<n>=1** and there is a change in the ME network registration status: **+CREG: <stat>** When **<n>=2** and there is a change in the ME network registration status or a change of the network cell: **+CREG: <stat>[,<lac>,<ci>]**
Reference GSM 07.07	Note Optional parameters will not be displayed during a call.

4.38 AT+CRLP Select radio link protocol param. for orig. non-transparent data call

Test command AT+CRLP=?	Response TA returns values supported by the TA as a compound value. **+CRLP:** (list of supported **<iws>s**), (list of supported **<mws>s**), (list of supported **<T1>s**), (list of supported **<N2>s**) **OK** Parameter See write command
Read command AT+CRLP?	Response TA returns current settings for the supported RLP version 0. **+CRLP: <iws>,<mws>,<T1>,<N2>[,<verx>]** **OK** Parameter See write command
Write command AT+CRLP= [<iws> [,<mws> [,<T1> [,<N2 >]]]]	Response TA sets radio link protocol (RLP) parameters used when non-transparent data calls are originated. **OK** Parameter **<iws>** 0-61 Interworking window size (IWF to MS) **<mws>** 0-61 Mobile window size (MS to IWF) **<T1>** 48-78-255 Acknowledgement timer (T1 in 10 ms units) **<N2>** 1-6-255 Re-transmission attempts N2 **<verx>** 0 RLP version number in integer format; when version indication is not present it shall equal 0.
Reference GSM 07.07	Note • RLP version 0: single-link basic version; • RLP version 1: single-link extended version (e.g. extended by data compression); • RLP version 2: multi-link version. • Compression and multi-link are not supported.

4.39 AT+CRSM Restricted SIM access

Test command AT+CRSM=?	Response **OK**
Write command AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]	Response By using this command instead of generic SIM Access TE application has easier but more limited access to the SIM database. As response to the command, ME sends the actual SIM information parameters and response data. **+CRSM: <sw1>, <sw2> [,<response>] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<command>** 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS all other values are reserved **<fileid>** integer type; this is the identifier for an elementary data file on SIM. Mandatory for every command except STATUS **<P1>,<P2>,<P3>** integer type; parameters passed on by the ME to the SIM **<data>** information which shall be written to the SIM (hexadecimal character format) **<sw1>, <sw2>** integer type; information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command **<response>** response of a successful completion of the command previously issued (hexadecimal character format)
Reference GSM 07.07	Note

4.40 AT+CSCS Set TE character set

Test command AT+CSCS=?	Response **+CSCS**: (list of supported <**chset**>s) **OK**
Read command AT+CSCS?	Response **+CSCS: <chset>** **OK**
Write command AT+CSCS=[<chset>]	Response Write command informs TA which character set <**chset**> is used by the TE. TA is then able to convert character strings correctly between TE and ME character sets. **OK**
	Parameters **<chset>:** **"GSM"** GSM default alphabet (GSM 03.38 subclause 6.2.1); Note: This setting may cause software flow control problems due to values of XON/XOFF characters. **"UCS2"** 16-bit universal multiple-octet coded character set (ISO/IEC10646 [32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99, $(AT R97)$
Reference GSM 07.07	Note • Also see chapter „Supported character sets“, pg. 10. • When TA-TE interface is set to 8-bit operation and used TE alphabet is 7-bit, the highest bit will be set to zero.

4.41 AT+CSNS Single Numbering Scheme

The AT+CSNS command enables the ME to accept incoming calls when no bearer capability information is provided with the call, e.g. single numbering scheme calls or calls originitating from analog devices.

The command must be set before the call comes. By default, when you do not modify the settings, all calls received without bearer element are assumed to be voice.

Please note that you can use the command if PIN authentication has been done during current session. The setting will be automatically saved when you power down the GSM engine with AT^SMSO.

Test command AT+CSNS=?	Response **+CSNS: (list of supported <mode>s)** **OK**
Read command AT+CSNS?	Response **+CSNS: <mode>** **OK**
Write command AT+CSNS=[<mode>]	Response Write command **OK** Parameters **<mode>:** 0 Voice — Each call received without bearer element is assumed to be speech. 2 Fax — Each call received without bearer element is assumed to be an incoming fax. 4 Data — Each call received without bearer element is assumed to be a data call. Please take into account that the bearer service parameters set with AT+CBST apply to all data calls including those received without bearer capability. To avoid conflicts see Chapter 4.5.
Reference GSM 07.07	Note

4.42 AT+CSQ Signal quality

Test command AT+CSQ=?	Response **+CSQ:** (list of supported <**rssi**>s), (list of supported <**ber**>) **OK** Parameter See execute command
Execute command AT+CSQ	Response TA returns received signal strength indication <**rssi**> and channel bit error rate <**ber**> from the ME. **+CSQ: <rssi>, <ber> OK** Parameter **<rssi>** Receive level: 0 -113 dBm or less 1 -111 dBm 2...30 -109... -53 dBm 31 -51 dBm or greater 99 not known **<ber>** Bit error rate: 0...7 as RXQUAL values in the table in GSM 05.08 section 8.2.4 not known
Reference GSM 07.07	Note

4.43 AT+CSSN Supplementary service notifications

Test command AT+CSSN=?	Response **+CSSN**: (list of supported **<n>**s), (list of supported **<m>**s)**OK** Parameter **<n>** 0 Suppresses the +CSSI messages 1 Activates the +CSSI messages **<m>** 0 Suppresses the +CSSU messages 1 Activates the +CSSU messages
Read command AT+CSSN?	Response **+CSSN: <n>,<m>OK** Parameter **<n>** See Test command **<m>** See Test command
Write command AT+CSSN=<n>[,<m>]	Response **OK** Parameter **<n>** See read command **<m>** See read command
	Unexpected message **+CSSI: <code1>** When **<n>=1** and a supplementary service notification is received after a mobile originated call setup, intermediate result code **+CSSI: <code1>** is sent to TE before any other MO call setup result codes **+CSSU: <code2>** When **<m>=1** and a supplementary service notification is received during a mobile terminated call setup or during a call, unsolicited result code **+CSSU: code2**>is sent to TE. Parameter **<code1>** Intermediate result code 3 Waiting call is pending **<code2>** Unsolicited result code 0 The incoming call is a forwarded call. 5 Held call was terminated
Reference GSM 07.07	Note

4.44 AT+CUSD Unstructured supplementary service data

Test command AT+CUSD=?	Response **+CUSD:** (list of supported **<n>**s) **OK** Parameter See write command
Read command AT+ CUSD?	Response TA returns the current <n> value. **+CUSD: <n> OK** If error is related to ME functionality: **+CME ERROR: <err>**
Write command AT+ CUSD= <n>[,<str>[,<dcs>]]	This command allows control of the Unstructured Supplementary Service Data (USSD) according to GSM 02.90. Both network and mobile initiated operations are supported. Parameter **<n>** is used to disable/enable the presentation of an unsolicited result code (USSD response from the network, or network initiated operation) **+CUSD:<m>[,<str>,<dcs>]** to the TE. When **<str>** is given, a mobile initiated USSD string or a response USSD string to a network initiated operation is sent to the network. The response USSD string from the network is returned in a subsequent unsolicited **+CUSD** result code. The interaction of this command with other commands based on other GSM supplementary services is described in the GSM standard. Parameter **<n>** 0 disable the result code presentation in the TA 1 enable the result code presentation in the TA 2 cancel session (not applicable to read command response) **<str>** string type USSD-string (when <str> parameter is not given, network is not interrogated). If <dcs> indicates that GSM 03.38 default alphabet is used ME/TA converts GSM alphabet into current TE character set according to rules of GSM 07.05 Annex A. **<dcs>** GSM 03.38 Cell Broadcast Data Coding Scheme in integer format (default 15) **<m>** 0 no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation) 1 further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 USSD terminated by network Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Reference GSM 07.07	Note • For the write command **<dcs>**=15 is supported only. • On an unsolicited result code with parameter **<m>**=1 a '> ' is given for further user action. The user action is finished with a <ctrl-Z> or aborted with <ESC>.

4.45 AT+VTD=<n> Tone duration

Test command AT+VTD=?	This command refers to an integer <**duration**> that defines the length of tones emitted as a result of the +VTS command. Response (list of supported <duration>s) **OK** Parameter See write command
Read command AT+VTD?	Response **<duration> OK** Parameter See write command
Write command AT+VTD= <duration>	Response **OK** Parameter **<duration>** 1 – 255 duration of the tone in 1/10 second
Reference GSM 07.07	Note

4.46 AT+VTS DTMF and tone generation (<Tone> in {0-9, *, #, A, B, C, D})

Test command AT+VTS=?	Response **+VTS:** (list of supported **<dtmf>s**)[, (list of supported **<duration>s**)] **OK** Parameter See write command
Write command 1. AT+VTS=<dtmf-string> 2. AT+VTS=<dtmf>,<duration>	Response This command allows the transmission of DTMF tones and arbitrary tones in voice mode. These tones may be used (for example) when announcing the start of a recording period. • This is interpreted as a sequence of DTMF tones whose duration is set with the +VTD command. • This is interpreted as a DTMF tone whose duration is determined by <duration>. **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<dtmfstring>** String of ASCII characters in the set 0-9,#,*,A, B, C, D. Maximal length of the string is 29. The string has to be entered between double-quote characters (””). **<dtmf>** ASCII character in the set 0-9,#,*, A, B, C, D. **<duration>** 1-255 duration of a tone in 1/10 second
Reference GSM 07.07	Note This command only works during active voice call

4.47 AT+WS46 Select wireless network

Test command AT+WS46=?	Response (list of supported <n>s) **OK**
Read command AT+WS46?	Response <n> **OK/ERROR/+CME ERROR**
	Parameter <n> 12 GSM digital cellular
Write command AT+WS46=[<n>]	Response **OK/ERROR/+CME ERROR**
Reference GSM 07.07	Note

5 AT commands originating from GSM 07.05 for SMS

These AT Commands are according to ETSI (European Telecommunications Standards Institute) GSM 07.05 document.

5.1 AT+CMGC Send an SMS command

Test command AT+CMGC=?	Response **OK**

Write command
if text mode (AT+CMGF=1):
AT+CMGC=<fo>,<ct>[,<pid>[,<mn>[,<da>[,<toda>]]]]<CR>
text is entered <ctrl-Z/ESC>
	Response
	if text mode (+CMGF=1) and sending successful:
	+CMGC: <mr>[,<scts>]
	if sending fails:
	+CMS ERROR: <err>

Write command
if PDU mode (AT+CMGF=0):
AT+CMGC=<length><CR>
PDU is given <ctrl-Z/ESC>
+CMGC=?
	Response
	if PDU mode (+CMGF=0) and sending successful:
	+CMGC: <mr>[,<ackpdu>]
	if sending fails:
	+CMS ERROR: <err>
	
	Parameter
	<length>Length of PDU
	<pdu> See ”AT+CMGL”
	<mr> Message reference
	<fo> depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS- STATUS-REPORT, or SMS -COMMAND (default 2) in integer format
	<ct> GSM 03.40 TP-Command-Type in integer format (default 0)
	<pid> GSM 03.40 TP-Protocol-Identifier in integer format (default 0)
	<toda> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of **<da>** is + (IRA 43) default is **145**, otherwise default is **129**)
	<da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<toda>**
	<scts> GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer to **<dt>**)

Reference GSM 07.05	Note • After invoking of the command CMGW, CMGS, CMGC it is necessary to wait for the ">" symbol and only afterwards the text can be sent to the module • At baudrates below 19200 it is recommended to use the line termination character only (refer to +ATS3, default <CR>, pg. 24) before entering the text/pdu. Use of the line termination character followed by the response formating character (refer to +ATS4, default <LF>, pg. 24) can cause problems.

5.2 AT+CMGD Delete SMS message

Test command AT+CMGD=?	Response **OK** Parameter
Execute command AT+CMGD=<index>	Response TA deletes message from preferred message storage <**mem1**> location <**index**>. **OK** If error is related to ME functionality: **+CMS ERROR <err>** Parameter <**index**> integer type; value in the range of location numbers supported by the associated memory
Reference GSM 07.05	Note If there is no SMS stored at the selected index, the response is OK too.

5.3 AT+CMGF Select SMS message format

Test command AT+CMGF=?	Response **+CMGF**: (list of supported <**mode**>**s) OK** Parameter See write command
Read command AT+CMGF?	Response **+CMGF: <mode> OK** Parameter See write command
Write command AT+CMGF = [<mode>]	Response TA sets parameter which specifies the input and output format of messages to be used. **OK** Parameter <**mode**> 0 PDU mode 1 text mode
Reference GSM 07.05	Note

5.4 AT+CMGL List SMS messages from preferred store

Test command AT+CMGL=?	Response **+CMGL:** (list of supported **<stat>s**) **OK** Parameter See execute command
Execute command AT+CMGL[= <stat>]	Parameter 1) If text mode: **<stat>** "REC UNREAD" Received unread messages (default) "REC READ" Received read messages "STO UNSENT" Stored unsent messages "STO SENT" Stored sent messages "ALL" All messages 2) If PDU mode: **<stat>** 0 Received unread messages (default) 1 Received read messages 2 Stored unsent messages 3 Stored sent messages 4 All messages Response TA returns messages with status value <stat> from message storage **<mem1>** to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'. Note: If the selected **<mem1>** can contain different types of SMs (e.g. SMS-DELIVERs, SMS- SUBMITs, SMS- STATUS-REPORTs and SMS-COMMANDs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.
	Response 1) If text mode (+CMGF=1) and command successful: for SMS- SUBMITs and/or SMS-DELIVERs: **+CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,** **<length>]<CR><LF><data>[<CR><LF>** **+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,** **<length>]<CR><LF><data>[...]] OK** for SMS-STATUS-REPORTs: **+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **[<CR><LF>** **+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **[...]] OK**

for SMS-COMMANDs:
+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>
+CMGL: <index>,<stat>,<fo>,<ct>[...]] OK

for CBM storage:
+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF>
+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>
<CR><LF><data>[...]]OK

2) If PDU mode (+CMGF=0) and command successful:
+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>
[<CR><LF>+CMGL: <index>,<stat>,[alpha],<length><CR><LF><pdu>
[...]] OK

for CBM storage:
+CMGL: <index>,<length><CR><LF><pdu>

3) If error is related to ME functionality:
+CMS ERROR: <err>

Parameter

<alpha> string type alphanumeric representation of <da> or <oa> corresponding to the entry found in phonebook; implementation of this feature is manufacturer specific.

<ct> GSM 03.40 TP-Command-Type in integer format (default 0)

<da> GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<toda>**

<data>

In case of SMS: GSM 03.40 TP-User-Data in text mode responses; format:

- if **<dcs>** indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format:

- if **<dcs>**indicates that GSM 03.38 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into hexadecimal numbers containing two IRA characters

	Parameter **<dt>** GSM 03.40 TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. For example, 6th of May 1994, 22:10:00 GMT+2 hours equals “94/05/06,22:10:00+08” **<fo>** depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS- STATUS-REPORT, or SMS -COMMAND (default 2) in integer format **<length>** integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) **<index>** integer type; value in the range of location numbers supported by the associated memory **<mid>** GSM 03.41 CBM Message Identifier in integer format **<mr>** GSM 03.40 TP-Message-Reference in integer format **<oa>** GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by <tooa> **<pages>** GSM 03.41 CBM Page Parameter bits 0-3 in integer format **<pdu>** In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexa-decimal format. **<page>** GSM 03.41 CBM Page Parameter bits 4-7 in integer format **<ra>** GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by <tora> **<scts>** GSM 03.40 TP- Service-Centre-Time-Stamp in time-string format (refer <dt>) **<sn>** GSM 03.41 CBM Serial Number in integer format **<st>** GSM 03.40 TP-Status in integer format **<toda>** GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) **<tooa>** GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>) **<tora>** GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer<toda>)
Reference GSM 07.05	Note

5.5 AT+CMGR Read SMS message

Test command AT+CMGR=?	Response OK
Execute command AT+CMGR= <index>	Parameter **<index>** integer type; value in the range of location numbers supported by the associated memory Response TA returns SMS message with location value <index> from message storage <mem1> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'. 1) If text mode (+CMGF=1) and command successful: for SMS-DELIVER: **+CMGR: <stat>,<oa>,[<alpha>],<scts> [,<tooa>,<fo>,<pid>,<dcs>,** **<sca>,<tosca>,<length>]<CR><LF><data>** for SMS-SUBMIT: **+CMGR: <stat>,<da>,[<alpha>] [,<toda>,<fo>,<pid>,<dcs>,[<vp>],** **<sca>,<tosca>,<length>]<CR><LF><data>** for SMS-STATUS-REPORT: **+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** for SMS- COMMAND: **+CMGR: <stat>,<fo>,<ct> [,<pid>,[<mn>],[<da>],[<toda>],<length>** **<CR><LF><cdata>]** for CBM storage: **+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** 2) If PDU mode (+CMGF=0) and command successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> OK** for CBM storage: +CMGR: <length><CR><LF><pdu> 3)If error is related to ME functionality: **+CMS ERROR: <err>** Parameter **<alpha>** string type alphanumeric representation of **<da>** or **<oa>** corresponding to the entry found in phonebook; implementation of this feature is manufacturer specific **<stat>** integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory: defined values:

0 “REC UNREAD” received unread message (i.e. new message)
1 “REC READ” received read message
2 “STO UNSENT” stored unsent message (only applicable to SMs)
3 “STO SENT” stored sent message (only applicable to SMs)

<ct> GSM 03.40 TP-Command-Type in integer format (default 0)

<da> GSM 03.40 TP- Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<toda>**

<data>

In case of SMS: GSM 03.40 TP-User-Data in text mode responses; format:

-if **<dcs>** indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules covered in Annex A

-if **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)

In case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format:

- if **<dcs>** indicates that GSM 03.38 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules covered in Annex A

-if **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into hexadecimal numbers containing two IRA characters

<dcs> depending on the command or result code: GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format

<cdata> GSM 03.40 TP-Command-Data in text mode responses; ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<dt> GSM 03.40 TP-Discharge-Time in time-string format: ”yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. For example, 6th of May 1994, 22:10:00 GMT+2 hours equals ”94/05/06,22:10:00+08”

<fo> depending on the command or result code: first octet of GSM 03.40 SMS- DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format

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

In text mode, the maximum length of an SMS depends on the used

		coding scheme: It is **160** characters if the 7 bit GSM coding scheme is used, and **140** characters according to the 8 bit GSM coding scheme.
	<index>	integer type; value in the range of location numbers supported by the associated memory
	<mid>	GSM 03.41 CBM Message Identifier in integer format
	<mr>	GSM 03.40 TP-Message-Reference in integer format
	<oa>	GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by <tooa>
	<page>	GSM 03.41 CBM Page Parameter bits 4-7 in integer format
	<pages>	GSM 03.41 CBM Page Parameter bits 0-3 in integer format
	<pdu>	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: <ra> GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<tora>**
	<pid>	GSM 03.40 TP-Protocol-Identifier in integer format (default 0)
	<ra>	GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer command AT+CSCS Select TE character set.); type of address given by <tora>
	<sca>	GSM 04.11 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer command AT+CSCS Select TE character set); type of address given by `<tosca>`
	<scts>	GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
	<sn>	GSM 03.41 CBM Serial Number in integer format
	<st>	GSM 03.40 TP-Status in integer format
	<toda>	GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
	<tooa>	GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>)
	<tora>	GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer<toda>)
	<tosca>	GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer <toda>)
	<vp>	depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)
Reference	Note	
GSM 07.05	Response to a CMGR to an empty record index: +CMGR: 0,,0 Response to a CMGR to a not existing record index: +CMS ERROR: invalid memory index	

5.6 AT+CMGS Send SMS message

Test command AT+CMGS=?	Response **OK** Parameter
Execute command 1) If text mode (+CMGF=1): +CMGS=<da>[,<toda>]<CR> text is entered <ctrl-Z/ESC> 2) If PDU mode (+CMGF=0): +CMGS=<length><CR> PDU is given <ctrl-Z/ESC> ESC aborts message	Response TA transmits SMS message from TE to network (SMS-SUBMIT). Message reference value **<mr>** is returned to TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. 1) If text mode (+CMGF=1) and sending successful: **+CMGS: <mr>[,scts>] OK** 2) If PDU mode (+CMGF=0) and sending successful: **+CMGS: <mr>[,ackpdu>] OK** 3) If error is related to ME functionality: **+CMS ERROR: <err>** Parameter **<da>** GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<toda>** **<toda>** GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of **<da>** is + (IRA 43) default is **145**, otherwise default is **129**) **<length>** integer type value indicating in text mode (+CMGF=1) the length of the message body **<data>** (or **<cdata>**) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) In text mode, the maximum length of an SMS depends on the used coding scheme: It is **160** characters if the 7 bit GSM coding scheme is used, and **140** characters according to the 8 bit GSM coding scheme. **<mr>** GSM 03.40 TP-Message-Reference in integer format **<scts>** GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer **<dt>**) **<dt>** GSM 03.40 TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. For example, 6th of May 1994, 22:10:00 GMT+2 hours equals “94/05/06,22:10:00+08” **<ackpdu>** GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for **<pdu>** in case of SMS, but without GSM 04.11 SC address field and parameter shall be enclosed in double quote characters like a normal string type parameter **<pdu>** For SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

Reference	Note
GSM 07.05	1. Use CTRL-Z at the end of input to send the message and return OK. 2. Use ESC at the end of message input to abort message send operation. NO message is sent although display returns OK! 3. Sending e-mails via SMS: Note that some providers do not recognise @ symbol. Possible alternative “!” for “@” 4. After invoking of the command CMGW, CMGS, CMGC it is necessary to wait for the ">" symbol and only afterwards the text can be sent to the module 5. At baudrates lower than 19200 it is recommended to use the line termination character only (refer to +ATS3, default <CR>, pg. 24) before entering the text/pdu. Use of the line termination character followed by the response formating character (see +ATS4, default <LF>, pg. 24) can cause problems. 6. All characters to write a SMS after the symbol ">" will be recognized as GSM character settings. As example the "Backspace" will not delete the character which was entered before. It will be send or stored in the SMS itself as an additional character. See also chapter **7.5** there you can find the character setting (GSM) of the module.

5.7 AT+CMGW Write SMS message to memory

Test command	Response
AT+CMGW=?	**OK**

Execute command	Response
1) If text mode (+CMGF=1): +CMGW[=<oa/da> [,tooa/toda>[,stat>]]] <CR> text is entered ctrl-Z/ESC><ESC> quits without sending 2) If PDU mode (+CMGF=0): +CMGW=<length> [,stat]<CR> PDU is given <ctrl-Z/ESC>	TA transmits SMS (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <mem2>. Memory location <index> of the stored message is returned. Message status will be set to 'stored unsent' unless otherwise given in parameter <stat>. Note: SMS-COMMANDs and SMS-STATUS-REPORTs cannot be stored in text mode. If writing is successful: **+CMGW: <index> OK** If error is related to ME functionality: **+CMS ERROR: <err>** Parameter **<oa>** GSM 03.40 TP-Originating-Address Address value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<tooa>** **<da>** GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<toda>** **<tooa>** GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer **<toda>**) **<toda>** GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of **<da>** is + (IRA 43) default is **145**, otherwise default is **129**) **<length>** integer type value indicating in the text mode (+CMGF=1) the length of the message body **<data>** (or **<cdata>**) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length). In text mode, the maximum length of an SMS depends on the used coding scheme: It is **160** characters if the 7 bit GSM coding scheme is used, and **140** characters according to the 8 bit GSM coding scheme. **<stat>** integer type in PDU mode (default 0), or string type in text mode (defauld "REC UNREAD"); indicates the status of message in memory; defined values: 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 **<pdu>** In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41

	TPDU in hexadecimal format. **<index>** Index of message in selected storage **<mem2>**
Reference GSM 07.05	Note 1. Use CTRL-Z at the end of input to send the message and return OK. 2. Use ESC at the end of message input to abort message send operation. NO message is sent although display returns OK! 3. Sending e-mails via SMS: Note that some providers do not recognise @ symbol. Possible alternative “!” for “@” 4. After invoking of the command CMGW, CMGS, CMGC it is necessary to wait for the ">" symbol and only afterwards the text can be sent to the module 5. At baudrates lower than 19200 it is recommended to use the line termination character only (refer to +ATS3, default <CR>, pg. 24) before entering the text/pdu. Use of the line termination character followed by the response formating character (refer to +ATS4, default <LF>, pg. 24) can cause problems. 6. All characters to write a SMS after the symbol ">" will be recognized as GSM character settings. As example the "Backspace" will not delete the character which was entered before. It will be send or stored in the SMS itself as an additional character. See also chapter **7.5** there you can find the character setting (GSM) of the module..

5.8 AT+CMSS Send SMS message from storage

Test command AT+CMSS=?	Response **OK** Parameter
Execute command +CMSS= <index>[,<da>[,<toda>]]	Response TA sends message with location value **<index>** from message storage **<mem2>** to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address **<da>** is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value **<mr>** is returned to the TE on successful message delivery. Values can be used to identify message upon unsolicited delivery status report result code. 1) If text mode (+CMGF=1) and send successful: **+CMSS: <mr>[,scts>] OK** 2) If PDU mode (+CMGF=0) and send successful: **+CMSS: <mr>[,ackpdu>] OK** 3) If error is related to ME functionality: **+CMS ERROR: <err>** Parameter **<ackpdu>** GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without GSM 04.11 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter. **<index>** integer type; value in the range of location numbers supported by the associated memory **<da>** GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<toda>** **<scts>** GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format. **<toda>** GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of **<da>** is + (IRA 43) default is **145**, otherwise default is **129**) **<mr>** GSM 03.40 TP-Message-Reference in integer format
Reference GSM 07.05	Note

5.9 AT+CNMA New SMS message acknowledge to ME/TE, only phase 2+

Test command AT+CNMA=?	Response 1) If text mode (+CMGF=1): **OK** 2) If PDU mode (+CMGF=0): **+CNMA:** (list of supported **<n>**s) **OK** Parameters See execute command
Execute command 1) If text mode: AT+CNMA 2) If PDU mode: AT+CNMA[=<n>]	Response TA confirms successful receipt of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE. TA shall not send another +CMT or +CDS result code to TE until previous one is acknowledged. If ME does not receive acknowledgment within required time (network timeout), ME sends RP-ERROR to the network. TA shall automatically disable routing to TE by setting both **<mt>** and **<ds>** values of +CNMI to zero. Note: The command shall only be used when +CSMS parameter **<service>** equals **1** (= phase 2+). 1) If text mode: **OK** 2) If PDU mode: **OK** 3) If error is related to ME functionality: **+CMS ERROR: <err>** Parameters **<n>** 0 command operates similarly as defined for the text mode
Reference GSM 07.05	Note If multiplex mode is activated (+CMUX=0) the +CNMI parameter in all channels will be set to zero, if one channel fails to acknowledge an incoming message within the required time.

5.10 AT+CNMI New SMS message indications

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**) **OK** Parameter See set command
Read command AT+CNMI?	Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK** Parameter See set command
Write command AT+CNMI = [<mode>] [,<mt>][,<bm>] [,<ds>][,<bfr>]	Response TA selects the procedure how the receipt of new SMS 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. Note1: If the DTR signal is not available or the state of the signal is ignored (V.25ter command &D0), reliable message transfer can be assured by using +CNMA acknowledgment procedure. Note2: The rules **<mt>=2** and **<mt>=3** for storing received SM are possible only if phase 2+ compatibility is activated with **+CSMS=1** Note3: The parameter **<ds>=1** is only available in phase 2+ **OK** If error is related to ME functionality: **+CMS ERROR: <err>** 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. 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 Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode. **<mt>** Rules for storing received SMS depend on the relevant data coding method (refer to GSM 03.38 [2]), preferred memory storage (+CPMS) setting and this value Note: If 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) **+CMT: <oa>,, <scts> [,<tooa>, <fo>, <pid>, <dcs>, <sca>, <tosca>, <length>] <CR> <LF> <data>** (text 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 [2]), the setting of Select CBM Types (+CSCB) and this value:
		0	No CBM indications are routed to the TE.
		2	New CBMs are routed directly to the TE using unsolicited result code: **+CBM: <length><CR><LF><pdu>** (PDU mode enabled) or **+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** (text mode enabled).
		3	Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2.
	<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)** or **+CDS**: **<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st>** (text 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.

Unsolicited result code	Syntax of responses output when SMS is received: **+CMTI: <mem>,<index>** — Indicates that new message has been received **+CBMI: <mem>,<index>** — Indicates that new CB message has been received **+CMT: ,<length><CR><LF><pdu>** — Short message is output directly **+CBM: <length><CR><LF><pdu>** — Cell broadcast message is output directly During each SMS or Cell Broadcast Messages the Ring Line will remain Logic „0“ for one second.

Reference	Note
GSM 07.05	Parameters **<mt>=2,3** and **<ds>=1** are only available with GSM phase 2+ (see **+CSMS=1**). Incoming SMs or Status Reports have to be acknowledged with AT+CNMA=0 when using these phase 2+ parameters. Requirements specific to Multiplex mode: • In multiplex mode (AT+CMUX=0) only one channel can use a phase 2+ parameter. The parameter for **<mt>** and **<ds>** on the other channels have to be set to zero. • If either a SM or a Status Report is not acknowledged, all +CNMI parameter in all channels will be set to zero.

5.11 AT+CPMS Preferred SMS message storage

Test command AT+CPMS=?	Response **+CPMS:** (list of supported **<mem1>s**), (list of supported **<mem2>s**), (list of supported **<mem3>s**) Parameter See write command
Read command AT+CPMS?	Response **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>, <mem3>,<used3>,<total3> OK** If error is related to ME functionality: **+CMS ERROR** Parameter See write command
Write command AT+CPMS= <mem1> [,<mem2> [,<mem3>]]	Response TA selects memory storages **<mem1>, <mem2> and <mem3>** to be used for reading, writing, etc. **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK** If error is related to ME functionality: **+CMS ERROR:<err>** Parameter **<mem1>** Messages to be read and deleted from this memory storage “SM” SIM message storage **<mem2>** Messages will be written and sent to this memory storage “SM” SIM message storage **<mem3>** Received messages will be placed in this memory storage if routing to PC is not set (“+CNMI”) “SM” SIM message storage **<usedx>** Number of messages currently in **<memx>** **<totalx>** Number of messages storable in **<memx>**
Reference GSM 07.05	Note

5.12 AT+CSCA SMS service centre address

Test command AT+CSCA=?	Response **OK**
Read command AT+CSCA?	Response **+CSCA: <sca>,<tosca> OK** Parameter See write command
Write command AT+CSCA=<sca> [,<tosca>]	TA updates the SMSC address, through which mobile originated SMs are transmitted. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero. Note: this command writes the service centre address to non-volatile memory. Response **OK** Parameter **<sca>** GSM 04.11 RP SC address Address value field in string format; BCD numbers (or GSM default alphabet characters) are converted into characters; type of address given by **<tosca>** Maximum length of address: 20 characters **<tosca>** Service centre address format GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer **<toda>**)
Reference GSM 07.05	Note In case of using no parameter after AT+CSCA= the content of **<sca>** will be deleted.

5.13 AT+CSCB Select cell broadcast messages

Test command AT+CSCB=?	Response +CSCB: (list of supported <mode>s) Parameter See write command
Read command AT+CSCB?	Response +CSCB: <mode>,<mids>,<dcss> Parameter See write command
Write command AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	Parameter <mode> 0 Accepts messages that are defined in <mids> and <dcss> 1 Does not accept messages that are defined in <mids> and <dcss> <mids> String type; combinations of CBM message IDs (e.g. "0,1,5,320-478,922"). The number of ranges in <mids> parameter string is limited to 6 <dcss> String type; combinations of CBM data coding schemes (e.g. "0-3,5") Note: If <mode>=1 is selected the parameter <mids> has to be given as only one area (e.g. “0-99“)
Reference GSM 07.05	Note

5.14 AT+CSDH Show SMS text mode parameters

Test command AT+CSDH=?	Response **+CSDH**: (list of supported **<show>**s) **OK** Parameter See write command
Read command AT+CSDH?	Response **+CSDH:<show> OK** Parameter See write command
Write command AT+CSDH= <show>	Response TA sets whether or not detailed header information is shown in text mode result codes. **OK** Parameter **<show>** 0 do not show header values defined in commands +CSCA and **+CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>)** nor **<length>, <toda>** or **<tooa>** in **+CMT, +CMGL, +CMGR** result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in **+CMGR** result code, do not show **<pid>, <mn>, <da>, <toda>, <length>** or **<cdata>** 1 show the values in result codes
Reference GSM 07.05	Note

5.15 AT+CSMP Set SMS text mode parameters

Test command AT+CSMP=?	Response **OK**
Read command AT+CSMP?	Response **+CSMP:<fo>,<vp/scts>,<pid>,<dcs> OK** Parameter See set command
Set command AT+CSMP= [<fo>[,<vp/scts> [,<pid> [,<dcs>]]]]	Response TA selects values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (**<vp>** is in range 0... 255) or define the absolute time of the validity period termination (**<vp>** is a string). The format of **<vp>** is given by **<fo>.** If TA supports the enhanced validity period format, see GSM 03.40), it shall be given as a hexadezimal coded string (refer e.g. **<pdu>**) with quotes. Note: When storing a SMS_DELIVER from the TE to the preferred memory storage in text mode (refer write command to Message Memory **+CMGW),** **<vp>** field can be used for **<scts>** Parameter **<fo>** depending on the command or result code: first octet of GSM 03.40 SMS- DELIVER, SMS-SUBMIT (default 17), or SMS-COMMAND (default 2) in integer format **<scts>** GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer **<dt>**) **<vp>** depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167)), in time-string format (refer **<dt>**), or if is supported, in enhanced format (hexadecimal coded string with quotes) **<pid>** Protocol-Identifier in integer format (default 0), refer GSM 03.40 **<dcs>** SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format depending on the command or result code: GSM 03.38
Reference GSM 07.05	Note The command writes the parameters to the non-volatile memory.

5.16 AT+CSMS Select Message Service

Test command AT+CSMS=?	Response **+CSMS**: (list of supported **<service>**s) **OK** Parameter See write command
Read command AT+CSMS?	Response **+CSMS: <service>,<mt>,<mo>,<bm> OK** Parameter See write command
Write command AT+CSMS= <service>	Response **+CSMS: <mt>,<mo>,<bm> OK** If error is related to ME functionality: **+CMS ERROR: <err>** Parameter **<service>** 0 GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 version 4.7.0; Phase 2+ features which do not require new command syntax may be supported, e.g. correct routing of messages with new Phase 2+ data coding schemes) 1 GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2+ version; the requirement of <service> setting 1 is mentioned under corresponding command descriptions). **<mt>** Mobile Terminated Messages: 0 Type not supported 1 Type supported **<mo>** Mobile Originated Messages: 0 Type not supported 1 Type supported **<bm>** Broadcast Type Messages: 0 Type not supported 1 Type supported
Reference GSM 07.05	Note If CSMS Mode is switched from Phase 2+ to Phase 2 and one or more CNMI Parameter are Phase 2+ specific a '+CMS ERROR: unknown error' will apear. It is recommended to switch the CNMI Parameters to Phase 2 specific values before entering Phase 2.

6 Siemens defined AT commands for enhanced functions

Self-defined commands do not have to be implemented in accordance with the official syntax. The "+C" string can therefore be replaced by "^S" ("^" = 0x5E). If a self-defined command with the same syntax will be included in future in the GSM recommendations, the command can be addressed with both strings.

6.1 AT+CXXCID Display card ID (identical to AT^SCID)

Test command AT+CXXCID=?	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter
Execute command AT+CXXCID	Response TA returns the card identification number in SIM (SIM file EF ICCID, see GSM 11.11 Chap.10.1.1) as string type. See **^SCID** Parameter See **^SCID**
Reference Siemens	Note See also GSM Engine A1: ^SCID

6.2 AT^MONI Monitor idle mode and dedicated mode

Test command AT^MONI=?	Response ^MONI: (list of supported < **period** >s) **OK**
Write command AT^MONI[=<period>]	This command can be used to retrieve information of the serving/dedicated cell *automatically* every *n* seconds. It is cancelled by any character sent to serial port except if autobauding is enabled (+IPR=0). Then type character ´a´ to abort. Note: The two header lines (see below) are output after every ten data lines. Response See execute command Parameter **<period>** 1 – 254 Display period in seconds
Execute command AT^MONI	This command can be used to retrieve the cell parameters of the serving/dedicated cell *on request*. Note: The length of following output lines exceeds 80 characters. Therefore a terminal program may draw a carriage return on a screen. However, this is not part of the response.

Response (Examples)

ME is not connected:

```
Serving Cell                                          I Dedicated channel
chann rs  dBm  PLMN  LAC cell NCC BCC PWR RXLev  C1 I chann TS timAdv PWR  dBm Q
 ChMod
 428  26  -61 26203 0049 01CF   3   7  30  -105  44 I    No connection

OK
```

ME is connected:

```
Serving Cell                                          I Dedicated channel
chann rs  dBm  PLMN  LAC cell NCC BCC PWR RXLev  C1 I chann TS timAdv PWR  dBm Q
 ChMod
 428  26  -61 26203 0049 01CF   3   7  30  -105  43 I  428   3      0   7  -61 0
 S_EFR

OK
```

Parameters

Serving Cell:

chann	traffic channel number
rs	RSSI value 0 – 63 (RSSI = Received signal strength indication)
dBm	receiving level in dBm
PLMN	PLMN ID code
LAC	location area code, see note below.
cell	Cell ID, see note below.
NCC	PLMN colour code
BCC	Base Station colour code
PWR	maximal power level used on RACH channel
RXLev	minimal receiving level (in dBm) to allow registration
C1	coefficient for base station selection

	Dedicated channel: **chann** traffic channel number Note: <**chann**> = **0** signals frequency hopping. **TS** timeslot no. **timAdv** timing advance in bits **PWR** current power level **dBm** receiving level in dBm **Q** receiving quality (0–7) **ChMod** channel mode (S_HR: Half rate, S_FR: Full rate, S_EFR: Enhanced Full Rate)
Reference Siemens	Note • If during a connection the radio cell is changed, the parameters **LAC** and **Cell** will not be updated (see also +**CREG**, pg 90). • As a result of this command the requested output may be issued by the ME at any moment (related to <**period**>). To indicate such unsolicited result codes to a connected application, the ME usually activates it´s Ring Line (Logic "0") for one second. This is not true for the unsolicited output of AT^MONI and AT^MONP.

6.3 AT^MONP Monitor neighbour cells

Test command AT^MONP=?	Response ^MONP: (list of supported < **period** >s) **OK**
Write command AT^MONP[=<period>]	This command can be used to retrieve information of up to six neighbour cells *automatically* every *n* seconds. It is cancelled by any character sent to the serial port except if autobauding is enabled (+IPR=0). Then type character ´a´ to abort. Response See execute command Parameter **<period>** 1 – 254 Display period in seconds
Execute command AT^MONP	This command can be used to obtain information of up to six neighbour cells *on request*. Response (Example) chann rs dBm PLMN BCC C1 C2 504 18 -78 26203 1 27 27 476 15 -83 26203 3 22 22 421 13 -88 26203 1 17 17 440 10 -93 26203 7 12 12 446 9 -95 26203 7 10 10 417 8 -97 26203 4 8 8 OK Parameter: **Chann** Channel number **rs** RSSI value 0 – 63 (RSSI = Received signal strength indication) **dBm** Receiving level in dBm **PLMN** PLMN ID code **BCC** Base Station colour code **C1** coefficient for base station selection **C2** coefficient for base station selection
Reference Siemens	Note • As a result of this command the requested output may be issued by the ME at any moment (related to<**period**>). To indicate such unsolicited result codes to a connected application, the ME usually activates it´s Ring Line (Logic "0") for one second. This is not true for output of AT^MONI and AT^MONP.

6.4 AT^SACM Advice of charge and query of ACM and ACMmax

Test command AT^SACM=?	Response **^SACM**: (list of supported <**n**>s) **OK** Parameter See write command
Execute command AT^SACM	Response TA returns the Advice of Charge supplementary service function mode and the SIM values for accumulated call meter (ACM) and accumulated call meter maximum (ACMmax). **^SACM: <n>,<acm>,<acm_max> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT^SACM=<n>	Response TA sets the Advice of Charge supplementary service function mode. **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<n>** 0 suppress unsolicited result code 1 display unsolicited result code **<acm>** ACM, string type; three bytes of the current ACM value in hexadecimal format (e.g. “00001E” indicates decimal value 30) 000000–FFFFFF **<acm_max>** ACMmax, string type; three bytes of the max. ACM value in hexadecimal format (e.g. “00001E” indicates decimal value 30) 000000 disable ACMmax feature 000001-FFFFFF **<ccm>** string type; three bytes of the current CCM value in hexadecimal format (e.g. “00001E” indicates decimal value 30); bytes are coded in the same way as ACMmax value in the SIM 000000-FFFFFF
	Unsolicited result code When activated, an unsolicited result code is sent when the CCM value changes, but not more often than every 10 seconds **+CCCM: <ccm>** Parameter See write command
Reference Siemens	Note See also GSM07.07: AT+CACM, AT+CAMM, AT+CAOC

6.5 AT^SBC Battery charge and Charger Control

Responses returned by this command vary with the operating mode of the ME:

Normal mode:	ME is switched on by Ignition pin and running the SLEEP, IDLE or TALK mode. Charger is not connected. AT^SBC can be used to query the battery capacity and the power consumption of ME and application (if value of application was specified before as <current>).
Normal mode + charging:	Allows charging while ME is switched on by Ignition pin and running the SLEEP, IDLE or TALK mode. AT^SBC returns charger status and power consumption of ME / application. Battery parameters are not available.
Charge-only mode:	Allows charging while ME is detached from GSM network. AT^SBC returns charger status and power consumption of ME / application. Percentage of battery capacity is not available. In Charge-only mode a limited number of AT commands is accessible (see Table 2). There are several ways to activate Charge-only mode: a) from Power Down mode: Connect charger while ME was powered down with AT^SMSO b) from Normal mode: Connect charger, then enter AT^SMSO.
Alarm mode:	No charging functionality, i.e. charging does not start even though the charger connects to the POWER lines. Battery parameters are not available.

Charging begins once the charger connects to the POWER pins of the ZIF connector (except for the Alarm mode). Please refer to the "Hardware Interface Despription" supplied with your GSM engine and the Application Note "Charging the Battery Pack" for details on the charging process.

Test command	Response
AT^SBC=?	^**SBC**: (list of supported <**bcs**>s),(list of supported <**bcl**>s),<**mpc**> module power consumption

Defined values

<**bcs**>

0	No charging adapter is connected
1	Charging adapter is connected
2	Charging adapter is connected, charging in progress
3	Charging adapter is connected, charging has finished
4	Charging error, charging is interrupted
5	False charging temperature, charging is interrupted while temperature is beyond allowed range

<**bcl**> Battery capacity

0, 20, 40, 60, 80, 100 percent of remaining capacity (6 steps)

0 indicates that either the battery is exhausted or the capacity value is not available

<**mpc**> Average power consumption

Value (0...5000) of average power consumption (mean value over a couple of seconds) in mA. <**mpc**> is obtained from the ME's power consumption and the value you have specified for the application by using the AT^SBC write command.

Read command AT^SBC?	Response **^SBC: <bcs>,<bcl>,<mpc>** Command returns battery connection status **<bcs>**, battery charge level **<bcl>** and module power consumption **<mpc>** of the ME. While charging is in progress (charging adapter is connected) the battery capacity is not available! To query battery capacity disconnect the charger.
Write command AT^SBC= <current>	Use the write command to specify the actual power consumption of your external application. This information enables the ME to calculate the average power consumption **<mpc>** and thus, to properly control the charging process. The write command registers the serial port as the output channel for unsolicited result codes related to charging. Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<current>** Enter the current consumption of your application in mA (0...5000). If used, the current provided over the by 2.9V VDD pin of the ZIF interface (maximum 70mA) should be included, too.
	Unsolicited result code **^SBC: Undervoltage** This Unsolicited Result Code is enabled by the write command. If undervoltage is recognized the string is sent to the registered output channel three or more times. If the module is in IDLE mode it takes typically one minute to deregister from the network and to switch off.
Reference Siemens	Note While charging is in progress, it is not possible to determine the capacity of the battery. Consequently, parameter <**bcl**>=0.

Table 2: Summary of AT commands available in Charge-only and Alarm mode

AT command	Use
AT+CALA	Set alarm time
AT+CCLK	Set date and time of RTC
AT^SBC	Monitor charging process Note: While charging is in progress, no battery parameters are available. To query the battery capacity disconnect the charger. If the charger connects *externally* to the host device no charging parameters are transferred to the module. In this case, the command cannot be used.
AT^SCTM	Query temperature of GSM engine, enable or disable URCs
AT^SMSO	Power down GSM engine

6.6 AT^SCID Display SIM card identification number

Test command AT^SCID=?	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter
Execute command AT^SCID	Response TA returns the identification number of the SIM card (see GSM 11.11 Chapter 10.1.1). **^SCID: <cid> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<cid>** string type: card identification number in SIM
Reference Siemens	Note

6.7 AT^SCKS Set SIM connection presentation mode and query SIM connection status

Test command AT^SCKS=?	Response **^SCKS:** (list of supported <**n**>s) **OK** Parameter See write command
Read command AT^SCKS?	Response TA returns SIM connected presentation mode and SIM connected status. **^SCKS: <n>, <m> OK** Parameter See write command
Write command AT^SCKS=<n>	Response TA sets SIM connected presentation mode whether or not an unsolicited result code is to be sent to TE when SIM is not connected. **OK** Parameter <**n**> 0 Suppress unsolicited result codes 1 Output unsolicited result codes <**m**> 0 No card 1 Card in card reader
	Unsolicited result code When the status SIM connected has changed, an unsolicited result code is sent to TE **^SCKS: <m>** Parameter See write command
Reference Siemens	Note

6.8 AT^SCNI List Call Number Information

Test command AT^SCNI=?	Response **OK**
Execute command AT^SCNI	Response TA returns a list of current calls of ME. **[^SCNI: <id1>[,<cs>[,<number>,<type>]]]** **[^SCNI: <id2>[,<cs>[,<number>,<type>]]]** **[...] OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameter **<idx>** 1–7 integer type; call identification number as described in GSM 02.30[19] subclause 4.5.5.1; this number can be used in +CHLD command operations **<cs>** Call status of respective call number (first parameter) 0 call hold 1 call in progress 2 Waiting call **<number>** string type phone number in format specified by <type> **<type>** type of address octet in integer format; 145 when dialling string includes international access code character “+”, otherwise 129
Reference Siemens	Note See also GSM 07.07: AT+CLCC

6.9 AT^SCTM Set critical operating temperature presentation mode or query temperature

Use this command to monitor the temperature range of the module and the battery. The write command enables or disables the presentation of URCs to report critical temperature limits.

Test command AT^SCTM=?	Response **^SCTM:** (list of supported <**n**>s) **OK** Parameter See write command
Read command AT^SCTM?	Response TA returns the URC presentation mode and information about the current temperature range of the module (not the battery). **^SCTM: <n>, <m> OK** Parameter See write command
Write command AT^SCTM=<n>	Select <**n**> to enable or disable the presentation of the URCs: Response **OK** Parameters <**n**> 0 Suppress unsolicited result codes. 1 Output unsolicited result codes. <**m**> -2 Below lowest-temperature limit (causes immediate switch-off) -1 Below low-temperature-alert limit 0 Normal operating temperature 1 Above upper-temperature-alert limit 2 Above uppermost-temperature limit (causes immediate switch-off)
	Unsolicited result code URCs will be automatically sent to TA when the temperature reaches or exceeds the critical level: **^SCTM_A: <m>** for battery (accumulator) temperature **^SCTM_B: <m>** for module (board) temperature Parameter See write command

Reference	Note
Siemens	**Important:** • Please refer to the "Hardware Inferface Description" supplied with your GSM engine for specifications on critical temperature ranges. • To avoid damage the module will shut down once the critical temperature is exceeded. The procedure is equivalent to the power-down initiated with **AT^SMSO**. • The shutdown takes effect no matter whether URCs are enabled or disabled: URCs indicating the alert level "2" or "-2" are followed by immediate shutdown. If <**n**> is 0 the user is not informed before the module shuts down. • URCs indicating the alert level "1" or "-1" are intended to enable the user to take appropriate precautions, such as protect the module or battery from exposure to extreme conditions, or save or back up data etc.
Examples	URCs issued in the event of undertemperature or overtemperature: `^SCTM_A: -1` Caution: Battery close to undertemperature limit. `^SCTM_A: -2` Alert: Battery below undertemperature limit. Engine switches off. `^SCTM_B: -1` Caution: Engine close to undertemperature limit. `^SCTM_B: -2` Alert: Engine is below undertemperature limit and switches off.

6.10 AT^SDLD Delete the “last number redial“ memory

Test command AT^SDLD=?	Response **OK**
Execute command AT^SDLD	Response **OK/ERROR/+CME ERROR**
Reference Siemens	Note

6.11 AT^SHOM Display Homezone

Test command AT^SHOM=?	Response **OK** Parameter See execute command		
Execute command AT^SHOM	Response TA returns homezone state **^SHOM: <homezonestate> OK** Parameters **<homezonestate>**	0 1	ME is out of Homezone ME is within the Homezone
Reference Siemens	Note		

6.12 AT^SLCD Display Last Call Duration

Test command AT^SLCD=?	Response **OK** Parameter See execute command
Execute command AT^SLCD	Response TA returns last call duration or current call duration **^SLCD: <time> OK** Parameter **<time>** string type value; format is "hh:mm:ss", where characters indicate hours, minutes, seconds; e.g. 22:10:00 “22:10:00", max values are 9999:59:59
Reference Siemens	Note

6.13 AT^SLCK Facility lock (including self-defined locks)

Test command AT^SLCK=?	Response **^SLCK**: (list of supported **<fac>**s) **OK** Parameter See write command
Write command AT^SLCK= <fac>,<mode> [,<passwd> [,<class>]]	Response This command is used to lock, unlock or interrogate a ME or a network facility **<fac>**. Password is normally needed for such actions. When querying the status of a network service (**<mode>=2**) the response line for 'not active' case (**<status>=0**) should be returned only if service is not active for any <class>. It should be possible to abort the command when network facilities are set or interrogated. If **<mode><>2** and command is successful **OK** If **<mode>=2** and command successful **^SLCK: <status>[,<class1>[<CR><LF>** **^SLCK: <status>, class2....]] OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<fac>** "CS" Keypad lock (not supported since keypad cannot be connected) "PS" Phone locked to SIM card (phone code). ME requests password when other than current SIM card inserted; ME may remember certain number of previously used cards thus not requiring password when they are inserted. "SC" SIM (lock SIM cards). SIM requests password upon ME power-up and when this lock command issued. "FD" SIM fixed dialling memory feature (if PIN2 authentication has not been performed during the current session, PIN2 is required as **<passwd>)** "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 (applicable only for <mode>=0) "AG" All outGoing barring services (applicable only for <mode>=0) "AC" All inComing barring services (applicable only for <mode>=0) The following parameters depend on the factory settings: "PF" lock Phone to the very First SIM card "PN" Network Personalisation "PU" Network subset Personalisation "PP" Service Provider Personalisation "PC" Corporate Personalisation

	<mode> 0 unlock 1 lock 2 query status <passwd> password <class> 1 voice 2 data 4 fax 7 all classes except class 8 (default) 8 short message service <status> 0 off 1 on
Reference Siemens	Note See also GSM 07.07: AT+CLCK

6.14 AT^SMGL List SMS messages from preferred storage

Test command AT^SMGL=?	Response See write command + CMGL Parameters See command +CMGL
Execute/Write command AT^SMGL [=<stat>]	Response TA returns messages with status value <stat> from message storage <mem1> to the TE. The status of the messages is u n c h a n g e d (unread remains unread). Otherwise: See command +CMGL Parameters See command +CMGL
Reference Siemens	Note See also GSM 07.05: +CMGL

6.15 AT^SMGO Set or query SMS overflow presentation mode or query SMS overflow

Test command AT^SMGO=?	Response **^SGMO**: (list of supported <**n**>s) **OK** Parameter See write command
Read command AT^SMGO?	Response TA returns overflow presentation mode and SMS overflow status **^SGMO: <n>,<mode> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT^SMGO=<n>	Response TA sets overflow presentation mode **OK** Parameter <**n**> SMS overflow presentation mode 0 disable (default) 1 enable <**mode**> SMS overflow status 0 space available 1 SMS buffer full (chip card) 2 Buffer full and new message waiting in SC for delivery to phone
	Unsolicited result code When the status SIM overflow changes, an unsolicited result code is sent to TE **^SMGO: <mode>** Parameter See write command
Reference Siemens	Note Indication during data transfer via break (100ms). Data transmission will only be interrupted by a break and for only 100ms.

6.16 AT^SMSO Switch off mobile station

Test command AT^SMSO=?	Response **OK**
Execute command AT^SMSO	Response **^SMSO: MS OFF OK** Device will be switched off (power down mode)
Reference Siemens	Note Don't send any command after this command

6.17 AT^SMGR Read SMS message without set to REC READ

Test command AT^SMGR=?	Response **OK**
Execute command AT^SMGR=<index>	Parameter **See AT+CMGR**
Reference GSM 07.05	Note The AT^SMGR command is a specific Siemens command with the same syntax as "AT+CMGR Read SMS message". The only difference is that the SMS Message, which has REC_UNREAD status, is not overwritten to REC_READ.

6.18 AT^SM20 Set M20 Compatibility

Test command AT^SM20=?	Response **OK**
Read command AT^SM20?	Response **^SM20: <n>** **OK** Parameters See write command
Write command AT^SM20=<n>	Response TA switch the compatibility to other GSM modules **OK** Parameters **<n>** 0 Compatible to x35/37 Mobile Phones 1 Compatible to M20
Reference Siemens	Note There is a difference during call establishing (e.g. ATD): If x35/37 selected, the The GSM engine will respond always OK after attempting a call. If M20 is selected, it will respond OK only in case of a successful connection.

6.19 AT^SNFD Set audio parameters to manufacturer default values

Test command AT^SNFD=?	Response **OK**
Execute command AT^SNFD	Response TA sets the active audio parameters to manufacturer defined default values. **OK**
Reference Siemens	Note The restored values are: **<inBbcGain>, <inCalibrate>, <outBbcGain>, <outCalibrate[0 to 4]>, <sideTone>** of all audio modes

6.20 AT^SNFI Set microphone path parameters

Test command AT^SNFI=?	Response **^SNFI:** (list of supported **<inBbcGain>**s), (list of supported **<inCalibrate>**s) **OK** Parameters See write command
Read command AT^SNFI?	Response **+SNFI: < inBbcGain >, <inCalibrate> OK** Parameters See write command
Write command AT^SNFI=<inBbcGain>, <inCalibrate>	Response TA sets microphone path amplifying. **OK**
	Parameters **<inBbcGain>** Setting for ADC gain Amplifier 0 - 7 (0=0dB, 7=42dB, 8 steps of 6 dB) **<inCalibrate>** Multiplication factor 0 – 32767 for input samples attenuation=20*log (inCalibrate/32767)
Reference Siemens	Note 1. Write command works only in audio modes 2 to 6! 2. Read and write options of this command refer to the active audio mode. 3. The range of **<inCalibrate>** is up to 65535 but will be suppresed to 32767. Values above **<inCalibrate>** = 65535 will cause a failure 4. Changed values have to be stored with **^SNFW**. 5. Attention! When you adjust audio parameters avoid exceeding the maximum allowed level. Bear in mind that exposure to excessive levels of noise can cause physical damage to users! 6. The default values are customer specific.

6.21 AT^SNFM Mute microphone

Test command AT^SNFM=?	Response **^SNFM:** (list of supported **<mute>**s) **OK** Parameter See write command
Read command AT^SNFM?	Response **+SNFM: <mute> OK** Parameter See write command
Write command AT^SNFM=<mute>	Response TA switches on/off the microphone **OK** Parameter **<mute>** 0 Mute microphone 1 Microphone on
Reference Siemens	Note This command can be used in all audio modes and during a voice call only.

6.22 Audio programming model

The following figure illustrates how the signal path can be adjusted with the AT command parameters described in the Chapters 6.19 to 6.26

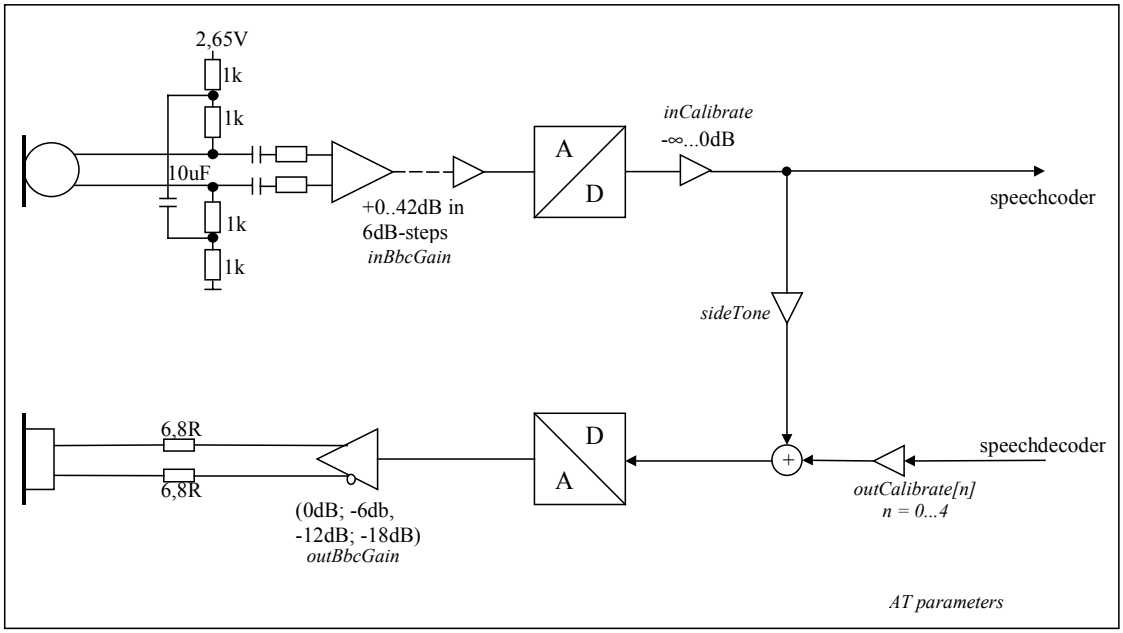

Figure 1: AT audio programming model

6.23 AT^SNFO Set audio output (= loudspeaker path) parameter

Test command AT^SNFO=?	Response **^SNFO**: (list of supported **<outBbc Gain>**), (list of supported **<outCalibrate[0...4]** >), (list of supported **<outStep>**), (list of supported **<sideTone>s**) OK Parameter See write command
Read command AT^SNFO?	Response **+SNFO: <outBbcGain>, <outCalibrate[0]>,...<outCalibrate[4]>, <outStep>, <sideTone>** **OK** Parameter See write command
Write command AT^SNFO=<outBbcGain>,<outCalibrate[0]>,...<outCalibrate[4]>,<outStep>,<sideTone>	Set TA´s loudspeaker path parameters. Response **<outBbcGain>** **<outCalibrate[0]>**...**<outCalibrate[4]>** **<(outStep)>** **<sideTone>** **OK** Parameters **<outBbcGain>** Setting for DAC gain amplifier attenuation 0 – 3 (0=0 dB, 3=-18 dB, 4 steps of 6 dB) **<outCalibrate[0]> ... <outCalibrate[4]>** Multiplication factor 0 – 32767 for output samples Attenuation = 20 * log (outCalibrate[n]/32767) **<outStep>** Setting of actual volume; 0 – 4, i.e. outCalibrate[n] **<sideTone>** Multiplication factor 0 – 32767 determining how much of the original microphone signal is added to the earpiece signal. Side Tone Gain/dB = 20 * log (sideTone/32767)
Reference Siemens	Note 1. Write command works only in audio modes 2 to 6! 2. Read and write options of this command refer to the active audio mode. 3. The values **<outStep>** can be changed also by ^SNFV. 4. The range of **<outCalibrate>** is up to 65535 but will be suppresed to 32767. A value above **<outCalibrate>** = 65535 will cause a error 5. Changed values will not be stored automatically, but via the AT command AT^SNFW except **<outStep>**. The parameter <outStep> will be saved after AT^SMSO only. 6. The volume level as well as mute affects all audio modes. 7. In case of audio mode 1 the parameter **<outStep>** has no effect. 8. CAUTION! When you adjust audio parameters avoid exceeding the maximum allowed level. Bear in mind that exposure to excessive levels of noise can cause physical damage to users!

6.24 AT^SNFS Select audio hardware set

Test command AT^SNFS=?	Response **^SNFS**: (list of supported **<audMode>**s) **OK** Parameter See write command
Read command AT^SNFS?	Response **^SNFS: <audMode> OK** Parameter See write command
Write command AT^SNFS= <audMode>	The write command serves to set the audio mode required for the connected equipment. Please note that the selected mode is not saved to the non-volatile store and needs to be restored manually, if the GSM engine was powered down. Response **OK** If error is related to ME functionality: + **CME ERROR: <error>** Parameters **<audMode>** 1 Audio mode 1: Standard mode optimized for the default handset, that can be connected to the analog interface 1 (see your "Hardware Interface Description" for information on this handset.) To adjust the volume use the knob of the default handset. This handset can be used in audio mode 4 with user defined parameters. Note: The default parameters are determined for type approval and are not adjustable with AT commands. 2 Audio mode 2: Customer specific mode for a basic handsfree device (Siemens Car Kit Portable) connected to the analog interface 2. Audio parameters can be adjusted with AT commands 3 Audio mode 3: Customer specific mode for a mono-headset that connects to the analog interface 2. Audio parameters can be adjusted with AT commands. 4 Audio mode 4: Customer specific mode for a user handset that connects to the analog interface 1. Audio parameters can be adjusted with AT commands. 5 Audio mode 5: Customer specific mode intended for the analog interface 1. Audio parameters can be adjusted with AT commands. 6 Audio mode 6: Customer specific mode intended for the analog interface 2. Audio parameters can be adjusted with AT commands.
Reference Siemens	Note

6.25 AT^SNFV Set loudspeaker volume

Test command AT^SNFV=?	Response **^SNFV**: (list of supported **<outStep>**s) **OK** Parameter See write command
Read command AT^SNFV?	Response **^SNFV: <outStep>** **OK** Parameter See write command
Write command AT^SNFV=<outStep>	Response TA sets the volume of the loudspeaker to the value **<outCalibrate>** addressed by **<outStep>**. **OK** Parameter **<outStep>** Volume range 0 to 4
Reference Siemens	Note • Read and write commands are related to the active audio mode. • The changes are allowed in audio modes 2 to 6. • **<outStep>** can be changed by AT^SNFO, too. • **<outCalibrate>** can be changed by AT^SNFO. • AT^SNFW does no save the changed **<outStep>** value. The setting will be saved when you switch off the module with AT^SMSO.

6.26 AT^SNFW Write audio setting in non-volatile store

Test command AT^SNFW=?	Response **OK**
Execute command AT^SNFW	Response TA writes the active audio parameters in non-volatile store related to the active mode. **OK** If error is related to ME functionality: **+ CME ERROR: <error>** **<error>** memory failure Flash write error
Reference Siemens	Note • Execute command works only in audio mode 2 to 6. • TA writes the following audio parameter values in non-volatile store: **<inBbcGain>, <inCalibrate>, <outBbcGain>, <outCalibrate[0]> ... <outCalibrate[4]>, <side Tone>**

6.27 AT^SPBC Search the first entry in the sorted telephone book

Test command AT^SPBC=?	Response **^SPBC:** (list of sorted telephone books supported **<mem>s**) See **AT+CPBS/AT^SPBS** **OK/ERROR/+CME ERROR**
Write command AT^SPBC=<char>	Parameter **<char>** First letter of searched entry **<index>** Index in the sorted telephone book (access via AT^SPBG)
	Response **^SPBC: <index>** **OK/ERROR/+CME ERROR**
Reference Siemens	Note There is no difference between small and capital letters.

6.28 AT^SPBG Read entry from active telephone book via sorted index

This command sorts the active phonebook records by name, in alphabetical order. Please note that the alphabetical order is assigned an index of its own which is *not identical with the location numbers used in the various phonebooks*.

CAUTION: The AT^SBPG command is *intended for reading only*. For example, it helps you find entries starting with matching characters. However, do not use the listed index numbers to dial out or modify entries.

Test command AT^SPBG=?	Response **^SPBG:** (list of used **<index>s), <nlength>, <tlength>** **OK/ERROR/+CME ERROR**
	Parameter **<index>** Total number of entries stored in the active phonebook; displayed as a range of serial numbers (1 – n). **<nlength>** Max. length of phone number **<tlength>** Max. length of the text associated with the phone number
Execute command AT^SPBG= <index1> [, <index2>]	Response **^SPBG: <index1>, <number>, <type>, <text>[<CR><CL>** **^SPBG: .....** **^SPBG: <index2>, <number>, <type>, <text>]** **OK/ERROR/+CME ERROR**
	Parameter **<index1>** Serial number assigned to the position in the alphabetical list where reading of entries starts **<index2>** Serial number assigned to the position in the alphabetical list where reading of entries ends **<number>** Phone number **<type>** Type of phone number **<text>** Text associated with phone number
Reference Siemens	Note The AT^SPBG feature is able to sort by the first *6 matching characters* only. All the following characters will be ignored.
Example	1. First, run the *Test command* to find out the range of phonebook entries stored in the active phonebook: AT^SPBG=? TA returns the number of entries in the format: ^SPBG: (1-33),20,17 where 33 is the total number of entries. 2. Now, run the *Write command* to display the phonebook entries by alphabetical order. It is recommended to enter the full range to obtain best results. AT^SPBG=1,33 TA returns phonebook entries by alphabetical order: ^SPBG: 1,"+999999",145,"Arthur" ^SPBG: 2,"+777777",145,"Bill" ^SPBG: 3,"+888888",145,"Charlie" ..... The numbers at the beginning of each line are not the memory locations in the phonebook, but only serial numbers assigned to the alphabetical list.

6.29 AT^SPBS Steps the selected phonebook alphabetically

This command can be used to flick through the active phonebook records in alphabetical order by name. Proceeding from a given index, you can step up and down to view the next three entries that start with matching characters. You can start either from an index selected with AT^SPBC or straight from the first memory location of the active phonebook.

In contrast to the ^SPBG command, ^SPBS displays the physical index numbers of the phonebook memory locations. This allows you to use the listed index numbers to dial out or modify entries.

Test command AT^SPBS=?	Response ^SPBS: (list of supported <value>s) **OK** Parameter See write command
Write command AT^SPBS=<value>	Parameter **<value>** 1 to make a step downward in the alphabetically sorted phonebook 2 to make a step upward in the alphabetically sorted phonebook Response If **<value>**=1 TA steps down one entry. **^SPBS: <index2>,<number>,<type>,<text>** <CR,LF> **^SPBS: <index3>,<number>,<type>,<text>** <CR,LF> **^SPBS: <index4>,<number>,<type>,<text>** <CR,LF>,<CR,LF> **OK** If **<value>**=2 (after **<value>**=1) TA steps up one entry. **^SPBS: <index1>,<number>,<type>,<text>** <CR,LF> **^SPBS: <index2>,<number>,<type>,<text>** <CR,LF> **^SPBS: <index3>,<number>,<type>,<text>** <CR,LF>,<CR,LF> **OK** If error is related to ME functionality: **+CME ERROR: <err>** The response parameters are explained in the specification of the “AT^SPBG” command.
Reference Siemens	Note This command can be used for the ME, SM and FD phonebook.

6.30 AT^SPIC Display PIN counter

Test command AT^SPIC=?	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter
Execute command AT^SPIC	TA returns the number of attempts still available for entering the required password. Note: Use command "AT+CPIN?" to check if password entry is currently required. Response **^SPIC: <counter> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<counter>** Number of attempts still available for entering the required password.
Reference Siemens	Note

6.31 AT^SPLM Read the PLMN list

Test command AT^SPLM=?	Response **OK** Parameter See execute command
Execute command AT^SPLM	Response TA returns the list of operator names from the ME. Each operator code **<numericn>** that has an alphanumeric equivalent **<alphan>** in the ME memory is returned. **^SPLM:** numeric **<numeric1>**,long alphanumeric **<alpha1><CR><LF>** **^SPLM:.....OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<numericn>** string type; operator in numeric form; GSM location area identification number **<alphan>** string type; operator in long alphanumeric format; can contain up to 16 characters
Reference Siemens	Note See also GSM 07.07: +COPN, +COPS

6.32 AT^SPLR Read entry from the preferred operators list

Test command AT^SPLR=?	Response TA returns the whole index range supported by the SIM. **^SPLR:** (list of supported **<index>s**) **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT^SPLR=<index1>[,<index2>]	Response TA returns used entries from the SIM list of preferred operators with **<index>** between **<index1>** and **<index2>**. If **<index2>** is not given, only entry with **<index1>** is returned. **^SPLR: <index1>, <oper>** **^SPLR: .....** **^SPLR: <index2>, <oper> OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<index1>** location number to read from **<index2>** location number to read to **<oper>** string type; operator in numeric form; GSM location area identification number
Reference Siemens	Note GSM 07.07: AT+CPOL

6.33 AT^SPLW Write an entry to the preferred operators list

Test command AT^SPLW=?	Response TA returns the whole index range supported by the SIM. **^SPLW**: (list of supported **<index>s**) **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter See write command
Write command AT^SPLW=<index>[,<oper>]	Parameter TA writes an entry to the SIM list of preferred operators at location number **<index>**. If **<index>** is given but **<oper>** is left out, the entry is deleted. If **<oper>** is given but **<index>** is left out, **<oper>** is inserted in the next free location. **<index>** location number **<oper>** string type; operator in numeric form; GSM location area identification number Note: **<oper>** is a 5 digit number, 3 digits country code and 2 digits for the Network provider. Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Reference Siemens	Note See also GSM 07.07: AT+CPOL

6.34 AT^SPWD Change password for a lock (including locks defined by Siemens AG)

Test command AT^SPWD=?	Response **^SPWD:** (list of supported **(<fac>, <pwdlength>)**s) **OK** If error is related to ME functionality: **+CME ERROR: <err>** Parameter **<fac>** "P2" PIN2 otherwise see write command without "FD" **<pwdlength>**integer, max. length of password
Write command AT^SPWD = <fac>, <oldp-wd>,<newpwd>	Parameter **<fac>** "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 "P2" PIN 2 "PS" Phone locked to SIM (device code) "PF" lock Phone to the very first SIM card "PN" Network Personalisation "PU" Network subset Personalisation "PP" Service Provider Personalisation "PC" Corporate Personalisation **<oldpwd>** password specified for the facility from the user interface or with command. If an old password has not yet been set, **<oldpwd>** is not to enter. if <fac> = "SC" then PIN if <fac> = "AO"..."AC" (barring) then network password if <fac> = "P2" then PIN2 **<newpwd>** new password Response Facility locks: AO, OI, OX, AI, IR, AB, AG, AC, have the same ME **<password>** to lock and unlock. The **<password>** depends on the network provider. TA sets a new password for the facility lock function. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Reference Siemens	Note See also GSM 07.07: AT+CPWD

6.35 AT^SSYNC Configure SYNC Pin

The ^SSYNC command serves to configure the SYNC pin in the ZIF connector of the GSM engine. Please note that the pin may be assigned different functions, depending on the type of GSM engine. The following AT commands apply to the TC35, TC37 and MC35 modules and the TC35 Terminal, however the options available for mode 0 and 1 vary with the model.

For detailed information on the SYNC pin refer to the "Hardware Interface Description" supplied with your GSM engine. Before changing the mode of the SYNC pin, carefully read the technical specifications.

Test command AT^SSYNC=?	Response **^SSYNC:** (list of supported **<mode>**s) **OK** Parameter: See write command
Read command AT^SSYNC?	Response **+SSYNC: <mode> OK** Parameter: See write command
Write command AT^SSYNC= <mode>	Response **OK** Parameter **<mode>** 0 *TC35 / TC37 MC35 module*: Enables the SYNC pin to indicate growing power consumption during a transmit burst. You can make use of the signal generated by the SYNC pin, if power consumption is your concern. To do so, ensure that your application is capable of processing the signal. Your platform design must be such that the incoming signal causes other components to draw less current. In short, this allows your application to accomodate current drain and thus, supply sufficient current to the GSM engine if required. *TC35 Terminal:* not applicable (do not select mode 0). 1 Enables the SYNC Pin to control a status LED. On the *TC35 Terminal*, this is the LED placed on the front panel. If you use a *TC35*, *TC37* or *MC35* module, the SYNC pin can control an LED installed in your application. The options described below are applicable both to the module and the terminal. Note: Mode 1 is the default mode for the TC35 Terminal. Operating modes of the ME indicated to the user (if **<mode>** = 1): **LED** — **ME Mode** Off — ME is off, in SLEEP, Alarm or Charge-only mode 600ms On / 600ms Off — No SIM card inserted, or no PIN entered, or network search in progress, or ongoing user authentication, or network login in progess. 75ms High / 3s Low — Logged to a network (therefore monitoring control channels and user interactions), but no call in progress. On — *Voice call:* Connected to remote party. *Data call:* Connected to remote party or exchange of parameters between both parties while setting up or disconnecting a call.
Note	The SYNC pin mode is stored to the non-volatile Flash memory, and thus retained after Power Down.

6.36 AT^STCD Display Total Call Duration

Test command AT^STCD=?	Response **OK**
Execute command AT^STCD	Response TA returns total call duration (accumulated duration of all calls) **^STCD: <time> OK** Parameter **<time>** string type value; format is "hh:mm:ss", where characters indicate hours, minutes, seconds; E.g. 22:10:00 “22:10:00" max value is 9999:59:59
Reference Siemens	Note The Total Call Duration will not be reset by power off or other means.

7 APPENDIX

7.1 Summary of ERRORS and Messages

Final result code **+CMS ERROR:** <err> indicates an error related to mobile equipment or network. The operation is similar to **ERROR** result code. None of the following commands in the same command line is executed. Neither **ERROR** nor **OK** result code are returned.

<err> values used by common messaging commands:

7.1.1 Summary of CME ERRORS related to GSM 07.07

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

Code of <err>	Meaning
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
48	Master Phone Code required
100	Unknown
256	Operation temporary not allowed
257	call barred
258	phone is busy
259	user abort
260	invalid dail string
261	ss not executed
262	SIM blocked

Note: Values below 256 are reserved.

7.1.2 Summary of CMS ERRORS related to GSM 07.05

Code of <err>	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

Code of <err>	Meaning
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be actioned
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy

Code of <err>	Meaning
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

7.1.3 Summary of all Unsolicited Result Codes (URC)

A URC is a report message sent from the ME to the TE. An unsolicited result code can either be delivered automatically when an event occurs or as a result of a query the ME received before. However, a URC is not issued as a *direct* response to an executed AT command.

Typical URCs may be information about incoming calls, received SMS, changing temperature, status of the battery etc. A summary of all URCs is listed below. For each of these messages, you can configure the ME whether or not to send an unsolicited result code.

For the URC to be sent the ME activates its Ring Line (Logic "0"), i.e. the line goes active low for 1s.

Message	Meaning	How to activate URC
+CCCM: <ccm>	Current call meter value	AT^CACM=1
+CREG: <stat>[,<lac>,<ci>]	Registration to ME network changed	AT+CREG=1 or AT+CREG=2
+CRING: <type>	Indication of an incoming call	AT+CRC=1
+CLIP: <number>, <type>	Telephone number of caller	AT+CLIP=1
+CMTI:<mem>,<index>	Indication of a new short message	AT+CNMI=1,1
+CMT:<length><CR><LF><pdu>	Short message is output directly to the TE (in PDU mode)	Example: AT+CNMI=1,2
+CBMI:<sn>,<mid>,<dcs>,<page>,<pages><CR> <LF><data>	Cell broadcast message is output directly to the TE (in text mode)	Example: AT+CNMI=1,0,2
+CBM: <length><CR><LF><pdu>	Cell broadcast message is output directly to the TE (in PDU mode)	Examples: AT+CNMI=1,
+CDS: <length><CR><LF><pdu> +CDS: <fo>,<mr>,[<ra>],[<tora>], <scts>,<dt>, <st>	SMS status report routed directly to TE (in PDU mode) SMS status report routed directly to TE (in text mode)	Example: AT+CNMI=1,0,0,1
+CDSI: <mem>,<index>	SMS status report routed ME/TA. Can be queried from the memory with location index number	Example: AT+CNMI=1,0,0,2
+CSSI: <code1> +CSSU: <code2>	Supplementary service intermediate/unsolicited result code	AT+CSSN=1,1
^SMGO: <mode>	SMS overflow indicator	AT^SMGO=1
^SCKS: <m>	Indicates whether card has been removed or inserted	AT^SCKS=1
^SCTM_A: <m> ^SCTM_A: <m>	Battery or module is close to or beyond critical temperature limit. URC is issued repeatedly. If <m>=2 or <m>-2, ME switches off.	AT^SCTM=1
^SBC: Undervoltage	Undervoltage of battery detected. ME will be switched off within a minute.	AT^SBC=<current>
^SYSSTART	Indicates that ME has successfully been started. Note that this URC will not appear if autobauding is enabled.	Not defined by user
^SYSSTART CHARGE-ONLY MODE	Only applicable to battery operated MEs: URC indicates that ME has entered the Charge-only mode.	Not defined by user

Message	Meaning	How to activate URC
	Charge-only mode allows charging while ME is detached from network. Limited number of AT commands is accessible. Mode can be launched by connecting the battery charger to the POWER pins of the ZIF connector, before or after powering down ME with AT^SMSO. Note that this URC will not appear if autobauding is enabled.	
^SYSSTART ALARM MODE or, if individual text available: ^SYSSTART ALARM MODE +CALA: <text>	Indicates that ME has entered Alarm mode. RTC alert set with the AT+CALA command. Executed when ME has been powered down. Causes ME to wake up from Power Down mode. Preventing ME from unintentionally registering to the network, Alarm mode allows limited operation. Limited number of AT commands is accessible. Do not confuse with wake-up or reminder call. Note that this URC will not appear if autobauding is enabled.	Enabled when you configure Alarm mode
+CALA: <text>	Wake-up or reminder call set with AT+CALA command. Executed while ME is in normal operation. Do not confuse with Alarm mode.	Enabled when you set wake-up call
+FHNG: <code>	Returns Fax T.30 Error codes (defined in TR.29)	FAX oriented URC
+FPTS:<code>	Page Transfer Status <code>=[1..5]	FAX oriented URC

7.1.4 Result codes

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 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
ALERTING		Alerting at called phone
DIALING		Mobile phone is dialing

7.1.5 Cause Location ID for the extended error report (AT+CEER)

ID	Description
0	No error (default)
2	GSM cause for L3 Radio Resource Sublayer
4	GSM cause for L3 Mobility Management Sublayer
6	GSM cause for L3 Mobility Management Sublayer via MMR-SAP
8	GSM cause for L3 Call Control Entity
12	GSM cause for L3 SMS CP Entity
14	GSM cause for L3 SMS RL Entity
16	GSM cause for L3 SMS TL Entity
21	GSM cause for L3 Call-related SS

7.1.6 Release causes for the Extended Error Report (AT+CEER)

Number	Description
0	No Error (default)
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
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

Number	Description
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
	Notification
300	Called party barred incoming call

7.1.7 Release cause for last Supplementary Service Call (AT+CEER)

Number	Description
	Error Codes
0	No error (default)
1	UnknownSubscriber
9	IllegalSubscriber
10	BearerServiceNotProvisioned
11	TeleserviceNotProvisioned
12	IllegalEquipment
13	CallBarred
15	CUGReject
16	IllegalSSOperation
17	SSErrorStatus
18	SSNotAvailable
19	SSSubscriptionViolation
20	SSIncompatibility
21	FacilityNotSupported
27	AbsentSubscriber
29	ShortTermDenial
30	LongTermDenial
34	SystemFailure
35	DataMissing
36	UnexpectedDataValue
37	PWRegistrationFailure
38	NegativePWCheck
43	NumberOfPWAttemptsViolation
71	UnknownAlphabet
72	USSDBusy
126	MaxNumsOfMPTYCallsExceeded
127	ResourcesNotAvailable
	Problem Codes
300	Unrecognized Component
301	Mistyped Component
302	Badly Structured Component
Invoke Problem Codes	
303	Duplicate Invoke ID
304	Unrecognized Operation
305	Mistyped Parameter
306	Resource Limitation
307	Initiating Release
308	Unrecognized Linked ID

Number	Description
309	Linked Response Unexpected
310	Unexpected Linked Operation
	Return Result Problem Codes
311	Unrecognize Invoke ID
312	Return Result Unexpected
313	Mistyped Parameter
Return Error Problem Codes	
314	Unrecognized Invoke ID
315	Return Error Unexpected
316	Unrecognized Error
317	Unexpected Error
318	Mistyped Parameter

7.2 Summary of PIN requiring AT Commands

The following table lists all the AT commands that are available after the PIN was entered.

AT command	Required PIN
Standard V25.ter AT commands	
ATA	PIN1
ATD	PIN1
ATH	PIN1
AT+GCAP	PIN1
AT+GMI	PIN1
AT+GMM	PIN1
AT+GMR	PIN1
AT+GSN	PIN1
AT+ILRR	PIN1
AT commands originating from GSM 07.07	
AT+CACM	PIN 1, PIN 2
AT+CAMM	PIN 1, PIN 2
AT+CAOC	PIN 1
AT+CCFC	PIN 1
AT+CEER	PIN 1
AT+CHLD	PIN 1
AT+CHUP	PIN 1
AT+CIMI	PIN 1
AT+CLCC	PIN 1
AT+CLCK	PIN 1
AT+CMUT	PIN 1
AT+COPN	PIN 1
AT+COPS	PIN 1
AT+CPBR	PIN 1
AT+CPBS	PIN 1
AT+CPBW	PIN 1
AT+CPUC	PIN 1, PIN 2
AT+CPWD	PIN 1, PIN 2
AT+CRSM	PIN 1
AT+CSSN	PIN 1
AT+ILRR	PIN 1
AT+VTS	PIN 1
AT^SMGL	PIN 1
AT^SMGO	PIN 1
AT^SMGR	PIN 1
AT+CMGC	PIN 1
AT+CMGD	PIN 1

AT command	Required PIN
AT+CMGF	PIN 1
AT+CMGL	PIN 1
AT+CMGR	PIN 1
AT+CMGS	PIN 1
AT+CMGW	PIN 1
AT+CMSS	PIN 1
AT+CNMA	PIN 1
AT+CNMI	PIN 1
AT+CPMS	PIN 1
AT+CSCA	PIN 1
AT+CSCB	PIN 1
AT+CSDH	PIN 1
AT+CSMP	PIN 1
AT+CSMS	PIN 1
AT+CSNS	PIN 1
Siemens defined AT commands	
AT+CXXCID	PIN 1
AT^SACM	PIN 1, PIN 2
AT^SCID	PIN 1
AT^SCNI	PIN 1
AT^STCD	PIN 1
AT^SDLD	PIN 1
AT^SLCD	PIN 1
AT^SLCK	PIN 1
AT^SPBG	PIN 1
AT^SPBS	PIN 1
AT^SPLM	PIN 1
AT^SPLR	PIN 1
AT^SPLW	PIN 1
AT^SPWD	PIN 1, PIN 2
AT^MONP	PIN 1
AT^MONI	PIN 1

7.3 AT commands available before entering the SIM PIN

The following table summarizes the AT commands you can use before the SIM PIN has been entered.

Explanation:

- ● AT command usable without PIN
- --- not usable witout PIN
- n.a. AT command not available at all

AT command	Test	Read	Write / Exceute	Note
Standard V.25ter AT commands				
ATD	n.a.	n.a	●	For emergency calls only
ATE	n.a.	n.a	●	
ATI	n.a.	n.a	●	
ATSn	n.a.	●	●	
ATS18	●	n.a	●	
ATV	n.a.	n.a	●	
ATX	n.a.	n.a	●	
ATZ	n.a.	n.a	●	
AT&C	n.a.	n.a	●	
AT&D	n.a.	n.a	●	
AT&F	n.a.	n.a	●	
AT&V	n.a.	n.a	●	
AT+IPR	●	●	●	
AT commands originating from GSM 07.07				
AT+CALA	●	●	●	
AT+CBST	●	●	●	
AT+CCLK	●	●	●	
AT+CFUN	●	●	●	
AT+CGMM	●	n.a.	●	
AT+CLIP	●	---	---	
AT+CLVL	●	●	●	Write commd. only in audio mode 2-6
AT+CMEE	●	●	●	
AT+CMUT	●	●	●	Write commd. depending on audio mode
AT+CMUX	●	●	Error	Only mode 0
AT+COPS	Phone busy	unknown	---	Not useful without PIN
AT+CPAS	●	n.a.	●	Only 0
AT+CR	●	●	●	
AT+CRC	●	●	●	
AT+CREG	●	●	●	
AT+CRLP	●	●	●	
AT+CSCS	●	●	●	
AT+CSQ	●	---	●	

AT+CSSN	●	●	●	
AT+VTD	●	●	●	
AT+WS46	●	●	●	12 (GSM digital cellular)
AT+CMGF	●	●	●	
Siemens defined AT commands				
AT^SBC	●	●	●	
AT^SCKS	●	●	●	
AT^SCTM	●	●	●	
AT^SMSO	●	●	●	
AT^SM20	●	●	●	
AT^SNFD	●	n.a.	●	
AT^SNFI	●	●	●	Write commd. only in audio mode 2-6
AT^SNFM	●	●	●	Write commd. only in audio mode 2-6
AT^SNFO	●	●	●	Write commd. only in audio mode 2-6
AT^SNFS	●	●	●	
AT^SNFV	●	●	●	
AT^SNFW	●	n.a.	●	
AT^SPIC	●	n.a.	●	
AT^SSYNC	●	●	●	

7.4 List of *# codes

The following commands can be used with ATD (for voice calls only, i.e. use ´;´)

*# code	Functionality	Possible response(s)
*#06#	Query IMEI:	<IMEI> OK
**04[2]*oldPin*newPin[2]*newPin[2]#	Change SIM pwd:	+CME ERROR: <err> / OK
**05[2]*unblKey*newPin[2]*newPin[2]#	Change/Unblocking SIM pwd:	
[*]03[ZZ]*oldPw*newPw*newPw#	Registration of net password:	
*#30#	Check status of CLIP	+CLIP : <n>,<m> OK (Chapter 4.19, p 69)
*#31#	Check status of CLIR	+CLIR : <n>,<m> OK (Chapter 4.20, p.70)
*31#<Phonenumber>[;]	Suppress CLIR	(Chapter 4.20, p.70)
#31#<Phonenumber>[;]	Activate CLIR	(Chapter 4.20, p.70)
*#76#	Check status of COLP	+COLP : 0,<m> OK
*#77#	Check status of COLR	+COLR : 0,<m> OK
(choice of *,#,*#,**,##)21*DN*BS#	Act/deact/int/reg/eras CFU	^SCCFC : <reason>, <status>, <class> [,...] like +CCFC *) (p 58)
(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	+CCWA : <status>, <class> *)
(choice of *,#,*#)33*Pw*BS#	Act/deact/int BAOC	^SCLCK : <fac>, <status>, <class> [, ...] like +CLCK *) (p 66)
(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	
[C]...[C]#	Send USSD message	+CME ERROR: <err> / OK
C[C] in call	Call hold and multiparty	+CME ERROR: <err> / OK
C[C] (excluded 1[C])	Send USSD message	+CME ERROR: <err> / OK

Meaning of Abbreviations:

ZZ	type of supplementary services:	Barring services	330
		All services	----
DN	dialling number: string of digits 0-9		
BS	basic service: Voice		11
		Sms	16
		Fax	13
		Sms+fax	12
		Voice+fax	19
		Voice+sms+fax	10
		Data circuit asyncron	25
		Data circuit syncron	24
		PAD	27
		packet	26

	data circuit async.+PAD	21
	data circuit sync.+packet	22
	data circ.async+sync.+PAD+packet	20
	all services	----
T	time in seconds	
Pw	net password	
C	character of TE character set	

*) ^SCCFC, ^SCCWA, ^SCLCK: The output depends on teleservices which are coded in <class>. If no teleservice or bearer service is active for a given interrogation a "7" is generated as default value for the <class> parameter. In addition only for every active class in the network one output line will be created. ^SCCFC and ^SCLCK are modified by giving an additional <reason> or <fac> in front of the regular output string generated by the standard commands +CCFC and +CLCK.

+COLP, +COLR: <m>
0 not active
1 active

+CCWA: <status>
0 not active
1 active
<class>
like +ccfc <class> (p 58)

7.5 Alphabet tables

This section provides tables for the special GSM 03.38 alphabet supported by the ME (see chapter „Supported character sets“, pg 10).

Character table of default GSM 03.38 alphabet (7 Bits per character):				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0	@	Δ	SP	0	¡	P	¿	p
0	0	0	1	1	£	_	!	1	A	Q	a	q
0	0	1	0	2	$	Φ	„	2	B	R	b	r
0	0	1	1	3	¥	Γ	#	3	C	S	c	s
0	1	0	0	4	è	Λ	¤	4	D	T	d	t
0	1	0	1	5	é	Ω	%	5	E	U	e	u
0	1	1	0	6	ù	Π	&	6	F	V	f	v
0	1	1	1	7	ì	Ψ	'	7	G	W	g	w
1	0	0	0	8	ò	Σ	(	8	H	X	h	x
1	0	0	1	9	Ç	Θ	)	9	I	Y	i	y
1	0	1	0	10 /A	LF	Ξ	*	:	J	Z	j	z
1	0	1	1	11 /B	Ø	[1]	+	;	K	Ä	k	ä
1	1	0	0	12 /C	ø	Æ	,	<	L	Ö	l	ö
1	1	0	1	13 /D	CR	æ	-	=	M	Ñ	m	ñ
1	1	1	0	14 /E	Å	ß	.	>	N	Ü	n	ü
1	1	1	1	15 /F	å	É	/	?	O	§	o	à

[1] This code is an escape to the following extension of the 7 bit default alphabet table.

Extension table of GSM 7 bit default alphabet				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0					|			
0	0	0	1	1								
0	0	1	0	2								
0	0	1	1	3								
0	1	0	0	4		^						
0	1	0	1	5							[2]	
0	1	1	0	6								
0	1	1	1	7								
1	0	0	0	8			{					
1	0	0	1	9			}					
1	0	1	0	10 /A	[3]							
1	0	1	1	11 /B		[1]						
1	1	0	0	12 /C				[				
1	1	0	1	13 /D				~				
1	1	1	0	14 /E				]				
1	1	1	1	15 /F			\					

In the event that an MS receives a code where a symbol is not represented in the above table then the MS shall display the character shown in the main default 7 bit alphabet table.

1) This code value is reserved for the extension to another extension table. On receipt of this code, a receiving entity shall display a space until another extension table is defined.
2) This code represents the EURO currency symbol. The code value is that used for the character ‘e’. Therefore a receiving entity which is incapable of displaying the EURO currency symbol will display the character ‘e’ instead.
3) This code is defined as a Page Break character and may be used for example in compressed CBS messages. Any mobile which does not understand the 7 bit default alphabet table extension mechanism will treat this character as Line Feed.