



AT Command Interface Description

ACI - Application Control Interface

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0.2 References, Abbreviations, Terms

- [GSM 07.05] GTS 07.05: January 1998 (GSM 07.05 version 5.5.0) Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS), ETSI
- [GSM 07.07] ETS 300 916: February 1998 (GSM 07.07 version 5.5.0) AT command set for GSM Mobile Equipment (ME)
- [T.32] T.32 (08/95) Asynchronous facsimile DCE control - service class 2, ITU
- [T V.25_TER] (ITU-T V.25 ter, 1997) ITU-T Recommendation V.25 ter; Series V: data communication over the telephone network; Interfaces and voiceband modems; Serial asynchronous automatic dialing and control, ITU
- [TI 8411.802] 8411.802.99.104, January, 29, 1999, ACI - Application Control Interface, Functional Interface Description, Texas Instruments
- [TI 8410.001] 8410.001.98.102, September, 18, 1998, G23 Product Description, Texas Instruments

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1 Introduction

G23 is a software package implementing Layers 2 and 3 of the ETSI-defined GSM air interface signaling protocol, and as such represents the part of a GSM mobile station's protocol software which is both, platform and manufacturer independent. Therefore, G23 can be viewed as a building block providing standardized functionality through generic interfaces for easy integration.

The G23 suite of products consists of the following items:

- Layers 2 and 3 for speech & short message services,
- Layers 2 and 3 for fax & data services,
- Application Control Interface/AT Command Interface,
- MMI and MMI Framework (MFW) and
- Test and integration support tools.

This document describes AT Commands, which are special to the Condat implementation of the AT command interface. The commands are extensions to existing AT Commands (described by [GSM 07.07], [GSM 07.05], [T V.25_TER] and [T.32]), and new commands, which are implemented to access and control features of the Condat software that are not covered by the standardized AT Commands yet. Condat specific AT Commands are classified by the percent character '%' as the first character of a command. The document describes the syntax and parameters of the Condat specific commands, and should be understood as an Annex to [GSM 07.0x]. For further details regarding the principles of command syntax and parameter types of the AT interface, please refer to [T V.25_TER] and [GSM 07.05].

2 Texas Instruments Specific AT Commands

2.1 %NRG: Network registration and service selection

Command	Possible response(s)
%NRG=[<regMode>[,<srvMode>[,<oprFrmt>[,<opr>]]]]	OK +CME ERROR: <err>
%NRG?	%NRG: <regMode>,<srvMode>,<oprFrmt>,<srvStat>,<opr>
%NRG=?	%NRG: (list of supported <regMode>s), (list of supported <srvMode>s), (list of supported <oprFrmt>s)

Description

Set command forces an attempt to select and register the GSM network operator. <regMode> is used to select whether the selection is done automatically by the ME or is forced by this command to operator <opr> (it shall be given in format <oprFrmt>). If the selected operator is not available, no other operator is selected (except <regMode>=4). The selected operator name format shall apply to further read commands (%NRG?) also. <srvMode> is used to specify the different stages of service to register to. <srvMode>=3 can be used to change the behaviour of registration in case of a loss of coverage. If connection to the operator is lost and <regMode> was set to automatic, ME tries to register to the previous operator automatically. In case <regMode> was set to manual, ME stays unregistered and waits for a manual registration attempt. Refer sub clause 9.2 of [GSM 07.07] for possible <err> values. This command is abort able when registration attempt is made.

Read command returns the current registration mode, service mode, service status and the currently selected operator. If no operator is selected, <oprFrmt> and <opr> are omitted.

Test command returns facility values supported by the TA as a compound value.

NOTE: The command %NRG is an expansion of the +COPS command. The new command allows specifying the service state of the registration. For a list of current available network operators please use the test command of +COPS.

Defined Values

<regMode>:

- 0 automatic registration (<opr> field is ignored)
- 1 manual registration (<opr> field shall be present on registration attempt)
- 4 manual/automatic (<opr> field shall be present); if manual selection fails, automatic mode (<regMode>=0) is entered

<srvMode>:

- 0 full service
- 1 limited service
- 2 no service
- 3 set registration mode only

<oprFrmt>:

- 0 long format alphanumeric <opr>
- 1 short format alphanumeric <opr>
- 2 numeric <opr>

<opr>: String type; <oprFrmt> indicates if the format is alphanumeric or numeric; long alphanumeric format can be up to 16 characters long and short format up to 8 characters; numeric format is the GSM Location Area Identification number (refer GSM 04.08 sub clause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A, plus a two BCD digit

network code, which is administration specific; returned <opr> shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)

2.2 %CACM: Query accumulated call meter using PUCT

Command	Possible response(s)
%CACM	%CACM: <cur>,<price> +CME ERROR: <err>
%CACM=?	

Description

Returns the current value of the accumulated call meter, calculated with the values given by the price per unit and currency table stored in SIM. Refer sub clause 9.2 of [GSM 07.07] for possible <err> values.

Defined Values

<cur>: String type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set +CSCS

<price>: String type; calculated price value of accumulated call meter; dot is used as a decimal separator (e.g. "2.66")

2.3 %CAOC: Query current call meter using PUCT

Command	Possible response(s)
%CAOC	%CAOC: <cur>,<price> +CME ERROR: <err>
%CAOC=?	

Description

Returns the current value of the current call meter, calculated with the values given by the price per unit and currency table stored in SIM. Refer sub clause 9.2 of [GSM 07.07] for possible <err> values.

Defined Values

<cur>: String type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set +CSCS

<price>: String type; calculated price value of accumulated call meter; dot is used as a decimal separator (e.g. "2.66")

2.4 %CTV: Call timer value

Command	Possible response(s)
%CTV	%CTV: <dur> +CME ERROR: <err>
%CTV=?	

Description

Returns the current value of the last call duration in seconds. Refer sub clause 9.2 of [GSM 07.07] for possible <err> values.

Defined Values

<dur>:

Integer type; represents the duration of the last call in unit of seconds.

2.5 %CPI: Call progress information

Command	Possible response(s)
%CPI=<n>	OK +CME ERROR: <err>
%CPI?	%CPI: <n>
%CPI=?	%CPI: (list of supported <n>s)

Description

This command refers to call progress information, which is indicated by the network during call establishment. The set command enable/disables the presentation of unsolicited notification result codes from TA to TE.

When <n>=1 and a call progress information is received during a call establishment, intermediate result code %CPI: <cld>,<msgType>,<ibt>,<tch> is sent to TE. <cld> identifies the call in the call table. The value of <msgType> describes the layer 3 message type that was used to transfer the call progress information. The state of TCH assignment and the use of in-band tones for that call can be monitored by the values of <ibt> and <tch>.

When <n>=2 and a call progress information is received during a call establishment, intermediate result code %CPI: <cld>,<msgType>,<ibt>,<tch>,<dir>,<mode>,<number>,<ton>,<alpha> is sent to TE. <cld> identifies the call in the call table. The value of <msgType> describes the layer 3 message type that was used to transfer the call progress information. The state of TCH assignment and the use of in-band tones for that call can be monitored by the values of <ibt> and <tch>. <dir> describes the direction of the call. The value of <mode> describes the mode of the call (e.g. voice or data). <number> is call number. The value of <toa> describes the type of number (e.g. international number starting with '+'). <alpha> is the alpha identifier of the called number as stored in the phonebook.

When <n>=3 and a call progress information is received during a call establishment, intermediate result code %CPI: <cld>,<msgType>,<ibt>,<tch>,<dir>,<mode>,<number>,<ton>,<alpha>,<cause>,<line> is sent to TE. <cld> identifies the call in the call table. The value of <msgType> describes the layer 3 message type that was used to transfer the call progress information. The state of TCH assignment and the use of in-band tones for that call can be monitored by the values of <ibt> and <tch>. <dir> describes the direction of the call. The value of <mode> describes the mode of the call (e.g. voice or data). <number> is call number. The value of <toa> describes the type of number (e.g. international number starting with '+'). <alpha> is the alpha identifier of the called number as stored in the phonebook. The value of <cause> is the GSM specific cause values for call control defined in 3gpp specification 04.08 annex H. The value of <line> is the line parameter for ALS, which indicates whether the call is on line1, or line2, see ALS line value defined in %CLCC.

Test command returns values supported by the TA as compound value.

Defined Values

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

- 0 disable
- 1 enable
- 2 enable with call number information
- 3 enable with call number information, GSM cause information and ALS line information

<cld>: Integer type; call identification number as described in GSM 02.30 sub clause 4.5.5.1

<msgType>: (layer 3 message type)

0	setup message
1	disconnect message
2	alert message
3	call proceed message
4	synchronization message
5	progress message
6	call connected message
7	release message
8	reject message

<ibt>: (status of the usage of in-band tones)

0	no in-band tones
1	in-band tones

<tch>: (TCH assignment)

0	TCH not assigned
1	TCH assigned

<dir>

0	Mobile originated call
1	Mobile terminated call
2	Network initiated mobile originated call (CCBS)
3	Redialling mobile originated call (autocall)

<mode>

0	Voice	
1	Data	
2	Fax	
3	VFDVoice	
4	VADVoice	
5	VAFVoice	
6	VFDData	
7	VADDData	
8	VAFFax	
9	VAMMCVoice	alternating voice/ CS UDI multi media calls, first voice
10	VAMMCDData	alternating voice/ CS UDI multi media calls, first CS UDI multi media call

<number>: Number of dialed/connected call

<toa>: Type of address octet (ton/npi)

<alpha>: alpha identifier of dialed/connected call if available in phonebook

<cause>

GSM specific cause values for call control defined in 3GPP TS 24.008 section 04.08 annex H

Additional the following internal cause values defined by TI are reported:

MNCC_CAUSE_REEST_STARTED (0xc507) call re-establishment started

MNCC_CAUSE_REEST_FINISHED (0xc508) call re-establishment is finished

<line>

line parameter for ALS, which indicates whether the call is on line1, or line2:

- 0 Call on Line1.
- 1 Call on Line2.

2.6 %SATC: Configuration for SIM application toolkit

Command	Possible response(s)
%SATC=<n>,<satPrfl>	+CME ERROR: <err>
%SATC?	%SATC: <n>,<satPrfl>
%SATC=?	%SATC: (list of supported <n>s),(<prflLen>)

Description

This command refers to the SIM application toolkit download mechanism, which is used to indicate to the SIM the features that the ME is capable of. The different features that are possible for a proactive SIM card are summarized by a table called a profile, refer to GSM 11.14 for more details. Texas Instruments' ACI, SMS and SIM modules already implement some of these features. Therefore the profile that is indicated by <satPrfl> will be combined with the existing one. The current profile setting could be displayed using the read command. <n> is used to enable/disable the presentation of unsolicited notification result codes from TA to TE.

When <n>>0 and one of the following conditions have occurred, the respective unsolicited result is sent to TE.

- A command received from the SIM that is not handled by ME is indicated to TE by %SATI: <satCmd>.
- The result to an envelope command, which was sent by TE, is indicated using the result %SATE: <satRsp>. For more information regarding the sending of envelope commands to SIM, please refer to the %SATE command description.
- If SIM application toolkit tries to set up a call using the Set Up Call feature described in GSM 11.14, and the conditions for the call are checked by ME successfully, the call is indicated to TE using the result %SATA: [<rdl>]. If <n>=2, the result is %SATA: [<rdl>],<chnType>,<chnEst>. Using the accept command A, ME tries to establish the call, otherwise the hook-on command H rejects the pending SAT call and sends the respective response to SIM.
- In general, commands or responses sent by ME to SIM or commands handled by ME are indicated to TE using the result %SATN: <satNtfy>. With these notifications, TE shall be able to indicate appropriate messages to a user.

Defined Values

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

<satPrfl>: String type; SIM application toolkit profile (hexadecimal format; refer +CSCS) starting with first byte of the profile.

<satCmd>: String type; SIM application toolkit command (hexadecimal format; refer +CSCS) starting with command tag.

<satRsp>: String type; SIM application toolkit response (hexadecimal format; refer +CSCS) starting with first byte of response data.

<satNtfy>: String type; commands or responses sent by ME to SIM or commands handled by ME (hexadecimal format; refer +CSCS) starting with first byte of response data or command tag.

<rdl>: Integer type; if a pending SIM application toolkit command is alerted to TE using result %SATA:, the value of <rdl> indicates the redial timeout for the call in unit of milliseconds.

<chnType>: Integer type; indicating the type of the channel: voice, CSD or GPRS type.

<chnEst>: Integer type; indicating the channel establishment method.

Command availability condition: SIM toolkit support.

2.7 %SATE: Send SAT envelope command

Command	Possible response(s)
%SATE=<satCmd>	OK +CME ERROR: <err>
%SATE=?	

Description

This command provides the possibility to send a command to the SIM, using the envelope mechanism of SIM application toolkit as described in GSM 11.14. If <satCmd> is present the contents is converted and send directly to SIM. The coding of the SIM command is the task of TE, no checking is done by ME. As soon as a response from the SIM is received, the contents are send to ME using the result %SATE: <satRsp>.

Defined Values

<satCmd>: String type; SIM application toolkit command (hexadecimal format; refer +CSCS) starting with command tag.

<satRsp>: String type; SIM application toolkit response (hexadecimal format; refer +CSCS) starting with first byte of response data.

Command availability condition: SIM toolkit support.

2.8 %SATR: Send SAT command response

Command	Possible response(s)
%SATR=<satRsp>	OK +CME ERROR: <err>
%SATR=?	

Description

This command provides the possibility to send a response to previous received SAT command. If a SIM application toolkit command was indicated to TE using the result %SATI: <satCmd>, the TE should send an appropriate response using the %SATR command. If <satRsp> is present the contents is converted and send directly to SIM. The coding of the SIM response is the task of TE, no checking is done by ME.

Defined Values

<satRsp>:

String type; SIM application toolkit response (hexadecimal format; refer +CSCS) starting with first byte of response data.

Command availability condition: SIM toolkit support.

2.9 %SATT: Terminate SAT command or session

Command	Possible response(s)
%SATT=<cs>	OK +CME ERROR: <err>
%SATT=?	

Description

This command is used to terminate a SIM application toolkit command or session. If <cs> is present the value is coded and send to the SIM to terminate the command or session. For example, is a SAT Call Set up was indicated with the result %SATA: 60, and the redialing time is exceeded, TE shall send the cause 'end of redialing reached' to ME.

Defined Values

<cs>: (cause of command or session termination)

- 0 user stopped redialing
- 1 end of redialing reached
- 2 user ends session

Command availability condition: SIM toolkit support.

2.10 %WAP: WAP Call activation/deactivation

Command	Possible response(s)
%WAP=<set>	OK +CME ERROR: <err>
%WAP=?	

Description

This command is used to activate or deactivate a WAP call. It sets (or sets back according to the value <set> indicated) a flag, which causes next data call to be a WAP Call.

Defined Values

<set>: (set or unset WAP)

- 0 set WAP call
- 1 set back to normal calls

2.11 %ALS: Alternate line service

Command	Possible response(s)
%ALS=<ALSMode>	OK +CME ERROR: <err>
%ALS?	%ALS: (<ALSMode>)
%ALS=?	%ALS: (range of ALSMode supported)

Description

Alternate Line Service provides the MS with the capability of associating two alternate lines with one IMSI. A user will be able to make and receive calls on either line as desired and will be billed separately for calls on each line. Each line will be associated with a separate directory number (MSISDN) and separate subscription profile.

Defined Values

<ALSMode>: ALS Mode

0 Speech Mode
1 Auxiliary Speech Mode

2.12 %SNCNT: GPRS Byte counter.

Command	Possible response(s)
%SNCNT=<rst>	OK +CME ERROR: <err>
%SNCNT?	%SNCNT: <nsapi1>, <upo>, <dno>, <upp>, <dnpp><CR><LF> %SNCNT: <nsapi2>, <upo>, <dno>, <upp>, <dnpp><CR><LF> ...
%SNCNT=?	%SNCNT: (0)

Description

Returns (or resets) the byte counts of every current connection

Defined Values

<rst>: Resets the counters if rst = 0

<nsapi>: Connection id

<upo>: Uplink octets count.

<dno>: Downlink octets count.

<upp>: Uplink packets count.

<dnpp>: Downlink packets count.

Command availability condition: GPRS or UMTS support.

2.13 %CGAATT: automatic attach mode

Command	Possible response(s)
%CGAATT=<att_m>, <det_m>	OK +CME ERROR: <err>
%CGAATT?	%CGAATT: <att_m>, <det_m>
%CGAATT=?	%CGAATT: (list of supported <att_m>s), (list of supported <det_m>s)

Description

This command is used to chose the behaviour of the attach procedure. After running this command %COPS applies to both GSM and GPRS. E.g. AT%CGAATT= 0,0;AT+COPS=0 command string will attach both GSM and GPRS.

Defined Values

<att_m>: automatic attach mode

- 0 automatic attach
- 1 manuel attach

<det_m>: automatic detach mode

- 0 automatic detach after last context deactivation
- 1 manuel detach

Command availability condition: GPRS or UMTS support.

2.14 %CPRI: ciphering indication

Command	Possible response(s)
%CPRI=<mode>	OK +CME ERROR: <err>
%CPRI?	%CPRI: <state>
%CPRI=?	%CPRI: (list of supported <mode>s)

Description

This command is used to enable or disable ciphering indications.

If enabled, ciphering indications are routed to the TE using unsolicited result code:

%CPRI: <network_state>,<network_state>. The first parameter is for GSM, the second parameter is for GPRS.

If ciphering indications are disabled on the SIM, the command %CPRI=<mode> returns +CME ERROR: <err>.

Defined Values

<mode>: enable or disable ciphering indications

- 0 don't show ciphering indications
- 1 show ciphering indications

<network_state>:

- 0 ciphering disabled
- 1 ciphering enabled
- 2 ciphering state not applicable (ciphering state not changed)

<state>:

- 0 don't show ciphering indications (ciphering indications are enabled on the SIM or SIM is removed)
- 1 show ciphering indications (ciphering indications are enabled on the SIM or SIM is removed)
- 2 ciphering indications are disabled on the SIM

2.15 %CGREG: GPRS extended registration state

Command	Possible response(s)
%CGREG=<mode>	OK +CME ERROR: <err>
%CGREG?	%CGREG: <mode>, <state>[,<lac>,<cid>[,contextstate]]
%CGREG=?	%CGREG: (list of supported <mode>s)

Description

This command reports extended information about GPRS registration state.

%CGREG behaves exactly as +CGREG does. In addition %CGREG supports three states +CGREG does not support.

Defined Values

<mode>: enable or disable extended GPRS registration state reporting

- 0 do not report registration state unsolicited result code
- 1 do report registration state unsolicited result code

%CGREG: <stat>

- 2 do report registration state and location information unsolicited result code

%CGREG: <stat>[,<lac>,<ci>]

- 3 do report registration state, location information unsolicited result code and PDP context state

%CGREG: <stat>[,<lac>,<ci>[,<contextstate>]]

<state>:

- 0 not registered
- 1 registered to home network
- 2 not yet registered, but searching for network to register to
- 3 registration denied
- 4 unknown state
- 5 registered to foreign network (roaming)
- 6 limited service (cell might be overloaded)
- 7 GSM call active
- 8 no cell available
- 9 next attempt to update MS

<loc>: 2 bytes hex value in string; location area code

<cid>: 2 bytes hex value in string; cell Id

<contextstate>: indicates the state of PDP context activation

- 0 no PDP context activated
- 1 one or more PDP contexts activated

Unsolicited Result for %CGREG:

Unsolicited Result
%CGREG: <stat>[,<lac>,<ci>[,<contextstate>]]

Description

This unsolicited result will be displayed when information about GPRS registration state has changed.

Command availability condition: GPRS or UMTS support.

2.16 %CGCLASS: GPRS extended mobile station class

Command	Possible response(s)
%CGCLASS=<class>	OK +CME ERROR: <err>
%CGCLASS?	%CGCLASS: <class>
%CGCLASS=?	%CGCLASS: (list of supported <class>es)

Description

The set command is used to set the MT to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

The read command returns the current GPRS mobile class.

The test command is used for requesting information on the supported GPRS mobile classes.

Defined Values

<class>: a string parameter which indicates the GPRS mobile class

B	GSM and GPRS, GSM stops GPRS
BX	class BC and BG alternating mode.
BG	like B, but CC in NMO III with PBCCH
BC	like B, but CG in NMO III with PBCCH
C	class C in GPRS only mode
CG	class C in GPRS only mode
CC	class C in circuit switched only mode

The class 'BX' only exists in MMI/ACI. This value will not be provided to lower Entities. BX means an alternating mode between class BC and BG. This is an feature for network mode III.

If the MT is not GPRS attached when the set command is issued with a <class> witch supports GPRS, an attach request will be sent to the network.

If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a detach request will be sent to the network.

Command availability condition: GPRS **or** UMTS support.

2.17 %BAND: Dynamic Multiband

Command	Possible response(s)
%BAND=<mode>[,<band>][,<umts_band>]	+CME ERROR: <err>
%BAND?	%BAND: <mode>[,<band>][, <umts_band>]
%BAND=?	%BAND: (list of supported <mode>s),(list of supported <band>s) [, (list of supported UMTS <umts_band>s)]

Description

This command is used to manage which radio bands are to be scanned.

Defined Values

<mode>: set the radio band switch mode

0	automatic
1	manual

<band>: is a sum of integers each representing a band. **Caution:** it is strongly hardware dependent.

0	GSM bands not available (valid for query command AT%BAND?) or disabled (for set command).
1	GSM 900

- 2 DCS 1800
- 4 PCS 1900
- 8 E-GSM
- 16 GSM 850
- 32 GSM 450
- 64 GSM 480
- 128 R_GSM

(e.g: Triple band -GSM 900 / E-GSM / DCS 1800 / PCS 1900- would be set with AT%BAND=1,15)

<umts_band>: is an integer representing UMTS FDD bands. **Note:** only available for TI dual mode PS.

- 0 UMTS FDD bands not available (valid for query command AT%BAND?) or UMTS FDD bands disable (for set command)
- 1 UMTS Band 1 1920-1980MHz UL & 2110-2170MHz DL (Rel.5)
- 2 UMTS Band 2 1850-1910MHz UL & 1930-1990MHz DL (Rel.5)
- 4 UMTS Band 3 1710-1785MHz UL & 1805-1880MHz DL (Rel.5)
- 8 UMTS Band 4 1710-1755MHz UL & 2110-2155MHz DL (prepared for Rel.6)
- 16 UMTS Band 5 824-849MHz UL & 869-894MHz DL (prepared for Rel.6)
- 32 UMTS Band 6 (prepared for Rel.7)
- 64 UMTS Band 7 (prepared for Rel.7)
- 128 UMTS Band 8 (prepared for Rel.7)
- 256 UMTS Band 9 (prepared for Rel.7)

Supported selections for <band> [and for <umts_band> if applies] are displayed by the test command (AT%BAND=?) as the lists of numbers (number_1, number_2, ..., number_x). Each number represents an allowed and settable band.

Parameter availability condition: Dual Mode (GSM/GPRS and UMTS) support; applies for SET , QUERRY and TEST commands. For the TEST command UMTS patterns are being shown as supported by given hardware.

NOTE: After having successfully written the new scan mask with this command you have to re-register on the network (using e.g. AT+COPS=0).

2.18 %CUNS: unsolicited messages management.

Command	Possible response(s)
%CUNS=<bufMode>	OK +CME ERROR: <err>
%CUNS?	%CUNS: <bufMode>
%CUNS=?	%CUNS: (list of supported <bufMode>s)

Description

This command allows the user to control the buffering of unsolicited indications.

Set command sets the buffering mode: three different modes are available. Either no buffering at all - indications can occur at any moment, also when user is typing - or buffering while user is typing - when user has started typing, no indication will be displayed as long as the user has not pressed <CR> - or buffering until end of a command - when user has started typing, indications may only come after the final result.

Read command returns the current buffering mode.

Defined Values

<bufMode>: buffering mode

- 0 unsolicited messages may occur any time.
- 1 unsolicited messages cannot happen while typing a command.
- 2 unsolicited messages cannot happen between starting typing a command and its final result.

2.19 %CBHZ: Cell Broadcast Messagetype for Homezone

%CBHZ=<mode>[,<dcs>[,<timeo ut>]]	OK +CMS ERROR
%CBHZ?	%CBHZ: <mode>,<dcs>,<timeout>
%CBHZ=?	%CBHZ: (list of supported <mode>s),(valid range for <dcs>s),(valid range of <timeout> in seconds)

Description

This command is used to set or request homezone mode for activation or deactivation of the Homezone feature.

By using the set command a MMI_CBCH_REQ primitive with a special homezone mode and the message id for homezone CBMs will be send to ALR.

The benefits to use the %CBHZ command instead of selecting the homezone message id by +CSCB command are:

As soon as a homezone CBM has been received only one indication for this CBM will be send to the MMI entity.
After receiving the homezone CBM or after expiration of the timeout period the MO will not be carried out until the next cell reselection occurs.

The message id of the homezone CBM will not be added to the message id list.

Defined Values

<mode>: homezone activation mode:

- 0 deactivation
- 1 activation

<dcs>: integer type; data coding scheme

Default: 0

<timeout>: integer type; timeout period in seconds for waiting for homezone CBM

Default: 60

Command availability condition: Home Zone support.

2.20 %CNAP: Calling Name Presentation

Command	Possible response(s)
%CNAP=<set_mode>	OK +CME ERROR: <err>
%CNAP?	%CNAP: <set_mode>,<status>
%CNAP=?	

Description

The aim of this command is to provide the user with a possibility to access information delivered by the supplementary service CNAP. The set command allows the user to switch on/off the receiving of an unsolicited message when the network sends a NotifySS message including CNAP information. Unsolicited message would look as following:

%CNAP: <pres_mode>[,<dcs>,<name_length>,<name>]

The query command allows the user to query the current setting of set_mode and the status of the service, i.e whether it is provisioned or not.

Defined Values

<set_mode>: integer type value indicating: Switch on/off the receiving of CNAP unsolicited messages.

0 – switch off

1 – switch on

<status>: integer type value indicating:

Status of CNAP service.

0 – service is not provisioned

1 – service is provisioned

2 – service status is unknown (no information available from network)

<pres_mode>: integer type value indicating:

0 – Name presentation allowed.

1 – Presentation restricted.

2 – Name unavailable.

3 – Name presentation restricted.

<dcs>: integer type value indicating: Data coding scheme.

<name_length>: integer type value indicating: Number of characters contained in string Name.

<name>: string type value indicating: Calling name string.

2.21 %CPHS: CPHS Initialise/Close/Refresh CPHS Functionalities

Command	Possible response(s)
%CPHS=<init_mode>	+CME ERROR: <err>
%CPHS?	%CPHS: <init_mode> +CME ERROR: <err>
%CPHS=?	%CPHS: (list of supported <init_mode>s)

Description

This set command allows initialising and closing CPHS functionalities. Initialising is mandatory if the user aims at using CPHS functionality (e.g. retrieving voice waiting message). When initialising, the CPHS module proceeds to retrieve data from SIM to cache them internally, this allowing direct availability of these data. Initialising means also enabling all CPHS related indications (e.g. Call Diverted Indicator, Call Waiting Message Indicator, etc...).

Closing CPHS functionality will stop CPHS indications to be displayed. It will also free the related memory needed to cache CPHS data.

If setting fails in an ME error, +CME ERROR: <err> is returned. Refer subclause 9.2 for <err> values.

Read command returns the current state of CPHS functionalities: initialised, refreshing (only while refreshing is in progress. When progress is done, initialised will be shown) or closed.

Test command returns supported <init_mode>-values.

Defined values

<init_mode>: integer type value indicating:

- 0 Closes CPHS functionalities (default).
- 1 Initialises CPHS functionalities.
- 2 Refreshes CPHS data cached from SIM.

Command availability condition: Common PCN Handset Specification support.

2.22 %CPOP: CPHS Show Network Operator Name

Command	Possible response(s)
%CPOP?	%CPOP: <LONG_NAME> [, <SHORT_NAME>] +CME ERROR: <err>
%CPOP=?	

Description

%CPOP: "LONG NAME"[, "SHORT NAME"] will be displayed as intermediate result if operation is successful (short name is optional: it will be shown only if SIM supports this feature).

This query command returns the long and short names of the operator as stored in the corresponding SIM fields.

Defined values

<LONG_NAME>: String type indicating: Operator Long Name

<SHORT_NAME>: String type indicating: Operator Short Name (optional: may not be present in SIM)

Command availability condition: Common PCN Handset Specification support.

2.23 %CPVWI: CPHS Voice Message Waiting

Command	Possible response(s)
%CPVWI=<mode>,<line>	%CPVWI: <status>[,<line>] +CME ERROR: <err>
%CPVWI?	

%CPVWI=?	%CPVWI: (list of supported <mode>s,<line>s)
----------	--

%CPVWI parameter unsolicited result syntax

Unsolicited Result
%CPVWI: <status>,<line>

Description

This set command allows setting, clearing, querying of the status of the Voice Waiting Message Flag for one or several lines.

When querying, intermediate result is %CPVWI: status,(lines) (lines is optional: either Voice Waiting Message flag is set for no line and intermediate result is %CPVWI: 0, or Voice Waiting Message flag is set for at least one line and intermediate result is %CPVWI=1,set_lines).

An unsolicited result %CPVWI: status, line will be displayed upon receiving a Voice Message Waiting SMS from the network.

Defined values

<mode>: integer type value indicating:

- 0 Clear Voice Waiting Message Flag.
- 1 Set Voice Waiting Message Flag.
- 2 Query Voice Waiting Message Flag status.

<line>: bit field type value indicating possible sum of following values:

- 1 Line 1
- 2 Data
- 4 Fax
- 256 Line 2

<status>: integer type value indicating:

- 0 Clear
- 1 Set

Command availability condition: Common PCN Handset Specification support.

2.24 %CPCFU: CPHS Call Diverted Flag

Command	Possible response(s)
%CPCFU=<mode>,<line>	%CPCFU: <status>[,<line>] +CME ERROR: <err>
%CPCFU?	+CME ERROR: <err>
%CPCFU=?	%CPCFU: (list of supported <mode>s,<line>s)

Description

This set command allows setting, clearing, querying of the status of the Call Diverted Flag for one or several lines.

This query command allows querying the current status of the Call Diverted Flag on the SIM for one or several lines.

When querying, intermediate result is %CPCFU: status(,lines) (lines is optional: either Unconditional Call Forwarding has not been activated for any line and intermediate result is %CPCFU: 0, or Unconditional Call Forwarding has been activated for at least one line and intermediate result is %CPCFU= 1,set_lines).

Defined values

<mode>: integer type value indicating:

- 0 Clear Call Diverted Flag
- 1 Set Call Diverted Flag.
- 2 Query Call Diverted Flag status.

<line>: bit field type value indicating possible sum of following values:

- 1 Line 1
- 2 Data
- 4 Fax
- 256 Line 2

<status>: integer type value indicating:

- 0 Activated
- 1 Deactivated

Command availability condition: Common PCN Handset Specification support.

2.25 %CPALS: CPHS Current Line Indicator and ALS

Command	Possible response(s)
%CPALS=<call_id>	%CPALS: <line>,<MSISDN Id> +CME ERROR: <err>
%CPALS?	%CPALS: <line>,<MSISDN Id> +CME ERROR: <err>
%CPALS=?	

Description

This set command allows querying the bearer of a given call. The user has thus the possibility to query the line of a current call.

The query command returns the current active line.

Defined values

<call_id>: integer type value indicating: Call id of line being queried. This value is the same as the call id described in GSM 02.30 sub clause 4.5.5.1 (also see AT+CLCC).

<line>: integer type value indicating possible sum of following values:

- 1 Line 1
- 2 Data
- 4 Fax

256 Line 2

<MSISDN id>: string type value indicating: This is the MSISDN identification as found on the SIM. If no MSISDN identification can be found on the SIM then the default strings "Line 1", "Data", "Fax" and "Line 2" will be applied.

Command availability condition: Common PCN Handset Specification support.

2.26 %CPINF: CPHS Information and Customer Specific Profile

Command	Possible response(s)	Description
%CPINF?	%CPHS: <phase>,<sst>[,<csp>] +CME ERROR: <err>	This query comm and allows
%CPINF=?		

query the CPHS phase, the CPHS service table and the customer service profile.

Defined values

<phase>: integer type value indicating:

- 1 Phase 1.
- 2 Phase 2.

<sst>: 2 bytes Hexadecimal value indicating: CPHS Service Table: 2 bytes (format HEX) as defined in CPHS4_2.ww6.

<csp>: Hexadecimal string indicating: Customer Service Profile. Format is a hexadecimal string as following: "A1B1A2B2A3B3..." where byte An is the service group code (see CPHS B.4.7.1) and byte Bn the services Byte (see CPHS B.4.7.1)

Command availability condition: Common PCN Handset Specification support.

2.27 %CPMB: CPHS Mailbox Numbers

Command	Possible response(s)
%CPMB=<record_id>	%CPMB: <record_id>,<line>,<number>,<toa>,<alpha id> +CME ERROR: <err>
%CPMB=?	%CPMB: (max value of <record_id> on the SIM)

Description

This set command allows retrieving of the mailbox number by means of its record id on the SIM.

Test command returns the number of the existing record entries of mailbox numbers on the SIM.

Defined values

<record_id>: integer type value indicating: SIM record id of mailbox

<line>: integer type value indicating:

- 1 Line 1

2 Data
4 Fax
256 Line 2

<number>: string type value indicating: Mailbox number.

<toa>: Integer type value indicating: Type of address (coded as in GSM 04.08)

<alpha id>: string type value indicating: alpha identifier related to mailbox.

Command availability condition: Common PCN Handset Specification support.

2.28 %CPMBW: Write CPHS Mailbox Numbers

Command	Possible response(s)
%CPMBW=<record_id>[,<number>[,<toa>],<text>]]	+CME ERROR: <err>
%CPMBW=?	%CPMB: (list of supported <record_id>s),<nlength>, (list of supported <type>s),<tlength> +CME ERROR: <err>

Description

Execution command writes phonebook entry in location number <record_id> of the CPHS mailbox phonebook of the SIM. Entry fields written are phone number <number> (in the format <toa>) and text <text> associated with the number. If <number> is omitted, phonebook entry is deleted. If writing fails in an ME error, +CME ERROR: <err> is returned. Refer subclause 9.2 of 3GPP 07.07 for <err> values.

Test command returns location range supported by the CPHS mailbox phonebook as a compound value, the maximum length of <number> field, supported number formats of the storage, and the maximum length of <text> field. If ME is not currently reachable, +CME ERROR: <err> is returned. Refer subclause 9.2 of 3GPP 07.07 for <err> values.

Defined values

<record_id>: integer type values in the range of location number of mailbox phonebook memory.

Attention:

Since there is no support for the parameter the following convention is used
(refer to the CPHS specification)

<record_id>	line_id	line description
1	1	Line 1
2	2	Data
3	4	Fax
4	256	Line 2

<number>: string type phone number

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

<text>: string type field of maximum length <length>

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

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

Command availability condition: Common PCN Handset Specification support.

2.29 %CPNUMS: CPHS Information Numbers

Command	Possible response(s)
%CPNUMS=<element_id>,<mode>	%CPNUMS: <element_id>,<alpha_tag>,<number>,<index_level>,<premium_flag>,<network_flag> +CME ERROR: <err>
%CPNUMS=?	list the whole table: %CPNUMS: <element_id>,<alpha_tag>,<number>,<index_level>,<premium_flag>,<network_flag> +CME ERROR: <err>

Description

This set command has 2 modes: exploring and querying. Exploring is only allowed for elements of type folder. Exploring returns the elements belonging to folder having id "element_id" (To be able to start, an extra element ROOT is here defined with element_id 0. It is of type folder). Querying element returns information related to element having id "element_id".

Test command queries a list of all entries to be found on the SIM.

Defined values

<element_id>: integer type value indicating:

Each information number entry on the SIM gets a unique Id from the CPHS module.

0 Default Id for element ROOT (to be used for getting the first elements: exploring ROOT)

<mode>: integer type value indicating:

1 Exploring element (only if element is a folder): returns elements belonging to folder.

2 Querying element: returns information related to element.

<alpha_tag>: string type value indicating: alpha tag of element

<number>: string type value indicating: Telephone number of element (empty string if element is a folder)

<index_level>: integer type value indicating: Index level of element. The elements belonging to ROOT have index level 1.

<premium_flag>: integer type value indicating:

0 Premium flag is not set for element.

1 Premium flag is set for element.

<network_flag>: integer type value indicating:

0 Network specific flag is not set for element.

1 Network specific flag is set for element.

Command availability condition: Common PCN Handset Specification support.

2.30 %CTTY: Controls the TTY Service

Command	Possible Response
%CTTY=<n>,<req> [,<audio_mode>]	OK +CME ERROR: <err>
%CTTY?	%CTTY: <n>,<req>,<m>,[<trx>],<audio_mode>
%CTTY=?	%CTTY: (list of supported <n>s),(list of supported <req>s),(list of supported < audio_mode >s)

Description

This command controls the TTY Service of the ME. It enables unsolicited notifications about changes of the state of the TTY Service and controls the activation on incoming and outgoing voice calls. The settings of the command have no impact on any kind of non-voice calls. They remain effective until they are changed with another invocation of command. The request for TTY can be temporarily overwritten by a Dial Prefix (see below).

If parameter <n> is set to 1, then Unsolicited Message %CTYI: <neg>[,<trx>] is given under the conditions described below.

Defined Values

<n> sets/shows whether unsolicited notifications are generated on change of the TTY Service

- 0 disable (default)
- 1 enable

<req> set/shows how TTY shall be handled for an outgoing or incoming call. This affects the Compatibility Check for income calls done in Entity CC, therefore on any change of this setting ACI has to send a primitive MNCC_CONFIGURE_REQ to CC to adjust the Bearer Capabilities.

- 0 do not request TTY for the next and subsequent calls (default)
- 1 request TTY for the next and subsequent calls

<m> actual state of the TTY Service

- 0 call active with TTY deactivated
- 1 call active with TTY activated
- 2 unknown (i. e. no call active)

<trx> (optional) integer representation of a 2 bit field, where bit 0 indicates actual reception of a TTY signal and bit 1 indicates actual transmission of a TTY signal. If the ME is not able to determine the state of the signal paths, or the current state of the ME is not applicable to provide this information (i. e. no call or call without TTY), then the parameter shall be omitted.

- 0 no TTY reception and transmission ongoing
- 1 TTY reception ongoing
- 2 TTY transmission ongoing
- 3 TTY reception and transmission ongoing

<neg> shows the state of the negotiation of the TTY Service for the current call. This is done by the appropriate reading/setting of the Bearer Capabilities Information Element of the related Call Control Primitives.

- 0 TTY Service not requested
- 1 TTY Service requested
- 2 TTY Service not granted
- 3 TTY Service granted

<audio_mode> This parameter defines the possible TTY mode that has been selected by the user. By default the audio mode is text mode. This parameter is sent to GTT with primitive GTT_START_REQ.

- 0 Enable the text mode (default)
- 1 Enable the VCO mode

Command availability condition: TTY support.

2.31 %CGPCO: Set the GPRS PCOs (protocol configuration options)

Command	Possible response(s)
%CGPCO=<mode>,<format>,[<pco>], [<cid>]	+CME ERROR: <err> %CGPCO: <cid>,<pco hex string> %CGPCO: <cid>,<pco hex string> ... %CGPCO: <pco ASCII string>,<cid> %CGPCO: <pco ASCII string>,<cid> ...
%CGPCO?	%CGPCO: <pco ASCII string>,<cid> %CGPCO: <pco ASCII string>,<cid> ...
%CGPCO=?	%CGPCO: (list of supported <mode>s,(list of supported <format>s),(list of supported <cid>s)

Description

This command sets the PCO for all PDP context related procedures (activation, secondary activation, deactivation, modify, network activation). While the set command sets the PCO, which is sent out by the ME (user-PCO), the query command queries the PCO, which is received by the ME (network-PCO).

A once set user-PCO will be sent out with each PDP context related message until the user-PCO is explicitly overwritten by another set command (e.g. with %CGPCO=0,0,"",1). A once received network-PCO will be overwritten by the next received PDP context related message.

For the set and the query command one of two formats may be chosen: ASCII or hex format. The set command using ASCII format is limited to the Password Authentication Protocol (PAP) parameters. The query command in ASCII format is limited to returning the DNS1, DNS2 and the gateway address. The coding of the hex format is defined by 3GPP TS 24.008 (starting with octet 3 of the PCO IE).

The query command may be called by '%CGPCO?' or by '%CGPCO=<mode>,<format>' with <mode> set to 'query network-PCO'. The first variant of the query command '%CGPCO?' results always in the return of the ASCII format. The second variant of the query command '%CGPCO=<mode>,<format>' returns either the ASCII or hex format according to the setting of the <format> argument.

Defined Values

<mode>: execution mode (numeric)

- 0 set user-PCO
- 1 query network-PCO

<format>: format of the PCO parameter (numeric)

- 0 hex format
- 1 ASCII format

<pco>: protocol configuration options (string)

hex format hex byte string (coding defined in 3GPP TS 24.008 starting with octet 3 of the PCO IE)

ASCII format ASCII which include the following elements, separated with a comma (string)

protocol id (currently only supported value 'PAP'),	(set)
user,	(set)
password	(set)
DNS1	(set/query)
DNS2	(set/query)
gateway	(query)

The string as a whole is enclosed in double quotation marks; undefined elements are left empty; commas are not omitted. Example for query output in ASCII format: %CGPCO: "80.167.23.19,,",1

<cid>: parameter which specifies a particular PDP context definition (numeric)

0 (or omitted cid) is used to indicate that this PCO should be set for all possible PDP contexts

Command availability condition: GPRS or UMTS support.

2.32 %CGPPP: PPP authentication protocol

Command	Possible response(s)
%CGPPP=<protocol>	OK +CME ERROR: <err>
%CGPPP=?	%CGPPP: (list of supported <protocol>s)
%CGPPP?	%CGPPP: <protocol>

Description

Set the PPP authentication protocol in case of GPRS.

Defined values

<protocol>: authentication protocol

- | | |
|---|---|
| 0 | no authentication |
| 1 | password authentication protocol |
| 2 | challenge handshake authentication protocol |
| 3 | automatic authentication |

Command availability condition: GPRS or UMTS support.

2.33 %CGEQREQ: Set the requested QOS parameter (implemented for R5 only)

Command	Possible Response(s)
%CGEQREQ=[<cid> [,<Traffic class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority> [,<Source Statistic Descriptor> [,<Signalling Indication>]]]]]]]]]]]]]]]]]	OK ERROR
%CGEQREQ?	%CGEQREQ: <cid>, <Traffic class> ,

Command	Possible Response(s)
	<p><Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>, <Source Statistic Descriptor>, <Signalling Indication></p> <p>...</p>
%CGEQREQ=?	<p>%CGEQREQ: <PDP_type>, (list of supported <Traffic class>s), (list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s), (list of supported <Delivery order>s), (list of supported <Maximum SDU size>s), (list of supported <SDU error ratio>s), (list of supported <Residual bit error ratio>s), (list of supported <Delivery of erroneous SDUs>s), (list of supported <Transfer delay>s), (list of supported <Traffic handling priority>s), (list of supported <Source Statistic Descriptor>), (list of supported <Signalling Indication>)</p> <p>...</p>

Description

This command allows the TE to specify all parameters, which can be specified by command +CGEQREQ and additionally allows the TE to specify the Signalling Indication and the Source Statistic Descriptor for the Quality of Service (QoS) IE.

The set command specifies a QoS profile for the context identified by the context identification parameter <cid>. The specified profile will be stored in the MT and sent to the network only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the %CGEQREQ command is effectively an extension to these commands.

A special form of the set command, %CGEQREQ= <cid> causes the requested profile for context number <cid> to become undefined.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.107 [46] -

<Traffic class>: a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

- 0 - conversational
- 1 - streaming
- 2 - interactive
- 3 - background
- 4 - subscribed value

If the Traffic class is specified as conversational or streaming, then the Guaranteed and Maximum bitrate parameters should also be provided. Other values are reserved.

<Maximum bitrate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT%CGEQREQ=...,32, ...). This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 [8] subclause 10.5.6.5).

<Maximum bitrate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT%CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 [8] subclause 10.5.6.5).

<Guaranteed bitrate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT%CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 [8] subclause 10.5.6.5).

<Guaranteed bitrate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT%CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 [8] subclause 10.5.6.5).

<Delivery order>: a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

- 0 - no
- 1 - yes
- 2 - subscribed value.

Other values are reserved.

<Maximum SDU size>: a numeric parameter (1,2,3,...) that indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested (refer TS 24.008 [8] subclause 10.5.6.5).

<SDU error ratio>: a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT%CGEQREQ=..., "5E3", ...). '0E0' means subscribed value (refer TS 24.008 [8] subclause 10.5.6.5).

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT%CGEQREQ=..., "5E3", ...). '0E0' means subscribed value (refer TS 24.008 [8] subclause 10.5.6.5).

<Delivery of erroneous SDUs>: a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

- 0 - no
- 1 - yes
- 2 - no detect
- 3 - subscribed value

Other values are reserved.

<Transfer delay>: a numeric parameter (0,1,2,...) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested (refer TS 24.008 [8] subclause 10.5.6.5).

<Traffic handling priority>: a numeric parameter (1,2,3,...) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested (refer TS 24.008 [8] subclause 10.5.6.5).

<PDP_type>: (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol
 IP Internet Protocol (IETF STD 5)
 IPV6 Internet Protocol, version 6 (IETF RFC 2460)

<Source Statistic Descriptor>: a numeric parameter (0,1,...) that specifies characteristics of the source of submitted SDUs.
 0 – unknown,
 1 – speech.

<Signalling Indication>: a numeric parameter (0,1) that indicates the signalling nature of the submitted SDUs.
 0 – Not optimised for signalling traffic,
 1 – Optimised for signalling traffic.

Command availability condition: 3GPP Release 5 support and GPRS support or 3GPP Release 5 support and UMTS support

2.34 %CGTFT: Set the GPRS TFTs (implemented for R5 only)

Command	Possible Response(s)
%CGTFT=[<cid>],[<packet filter identifier>],[<evaluation precedence index>],[<source address and subnet mask>],[<protocol number (ipv4) / next header (ipv6)>],[<destination port range>],[<source port range>],[<ipsec security parameter index (spi)>],[<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>],[<flow label (ipv6)>],[<parameter list>]	OK ERROR
%CGTFT?	%CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <parameter list> ...

Command	Possible Response(s)
%CGTFT=?	<p>%CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s), (supported <parameter list> size)</p> <p>...</p>

Description

This command allows the TE to specify all parameters, which can be specified by command +CGTFT and additionally allows the TE to specify the Parameter List for a Traffic Flow Template (TFT).

A TFT consists of up to eight Packet Filters and an optional Parameter List. The set command specifies a single Packet Filter and/or a Parameter List that is to be added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter <cid>.

A special form of the set command, %CGTFT= <cid> causes all of the Packet Filters and the Parameter List in the TFT for context number <cid> to become undefined. At any time there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address.

The read command returns the current settings for all Packet Filters for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be used.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.060[47]:

<packet filter identifier>: Numeric parameter, value range from 1 to 8.

<source address and subnet mask>: Consists of dot-separated numeric (0-255) parameters on the form 'a1.a2.a3.a4.m1.m2.m3.m4', for IPv4 and
'a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.
m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16', for IPv6.

<protocol number (ipv4) / next header (ipv6)>: Numeric parameter, value range from 0 to 255.

<destination port range>: Consists of dot-separated numeric (0-65535) parameters on the form 'f.t'.

<source port range>: Consists of dot-separated numeric (0-65535) parameters on the form 'f.t'.

<ipsec security parameter index (spi)>: Hexadecimal parameter, value range from 00000000 to FFFFFFFF.

<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>: Dot-separated numeric (0-255) parameters on the form 't.m'.

<flow label (ipv6)>: Hexadecimal parameter, value range from 00000 to FFFFF. Valid for IPv6 only.

<evaluation precedence index>: Numeric parameter, value range from 0 to 255.

Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060[47].

<parameter list>: Hexadecimal parameter (coded as described in 3GPP TS 24.008: octet z+1 to v of TFT IE)
 The list can explicitly be deleted by passing an empty hexadecimal string: "".

Command availability condition: 3GPP Release 5 support **and** GPRS support **or** 3GPP Release 5 support **and** UMTS support.

2.35 %DATA: Configure the data flow

Command	Possible response(s)
%DATA=<mode>,<des_dev_name>,<des_dev_no>,[<sub_no>],<cap>[,<src_dev_name>,<src_dev_no>[,<sub_no>[,<cid>]]]	OK +CME ERROR: <err>
%DATA?	%DATA: <mode>,<des_dev_name>,<des_dev_no>,<sub_no>,<cap>,<src_dev_name>,<src_dev_no>,<sub_no>[,<cid>][<CR><LF>%DATA: <mode>,<des_dev_name>,<des_dev_no>,<sub_no>,<cap>,<src_dev_name>,<src_dev_no>,<sub_no>[,<cid>]] ...
%DATA=?	%DATA: (list of supported <mode>s)

Description

This command configures the data flow. It is possible to split the data channel from the AT-Interpreter channel.

If no source device is given then the current channel (which has sent this command) is the source.

Defined Values

<mode>: redirection mode (numeric)

- 0 delete redirection
- 1 activate redirection (once)
- 2 activate redirection (always)

<des_dev_name>: destination device name (string)

- UART UART device
- PSI Protocol Stack Interface device

<des_dev_no>: destination device number (numeric)

<sub_no>: destination sub device number (numeric)
 (e.g. will be used for devices which are multiplexed)

<cap>: capability of the destination channel (string)

CMD command mode (AT-Interpreter or local MMI)
PKT channel for packet data
SER channel for serial data

<src_dev_name>: source device name (string)

<src_dev_no>: source device number (numeric)

<sub_no>: source sub device number (numeric)
(e.g. will be used for devices which are multiplexed)

<cid>: parameter which specifies a particular PDP context definition

Command availability condition: Data calls are supported.

2.36 %DINF: Show data information

Command	Possible response(s)
%DINF=<mode>	%DINF: <dev_name> , <dev_no> , <sub_no> , <cap> , <cur_cap> , <cur_chn> %DINF: <dev_name> , <dev_no> , <sub_no> , <cap> , <cur_cap> , <cur_chn> ...
%DINF=?	%DINF: (list of supported <format>s)

Description

This command lists all available data and AT-Interpreter channels and their capabilities.

Defined Values

<mode>: kind of information (numeric)

0 show only current channel information
1 show all available channel information

<dev_name>: device name (string)

UART UART device
PSI Protocol Stack Interface device

<dev_no>: device number (numeric)

<sub_no>: sub device number (numeric)
(e.g. will be used for devices which are multiplexed)

<cap>: possible capabilities

CMD command mode (AT-Interpreter or local MMI)
PKT channel for packet data
SER channel for serial data

<cur_cap>: current used capability

<cur_chn>: indicate which is the current channel

0 current channel
1 other channel

Command availability condition: Data calls are supported.

2.37 %PPP: Prepare Circuit-Switched Data call

Command	Possible response(s)
%PPP=<authprot>,<user>,<password>,[<conn_type>]	OK +CME ERROR: <err>
%PPP?	%PPP: <own_ipaddr>,<dns1_ipaddr>,<dns2_ipaddr>
%PPP=?	%PPP: (list of supported <authprot>s)

Description

This command is used to prepare a circuit-switched data call, set up authentication data for PPP, and to query IP-related information after PPP connection setup.

Defined Values

<authprot>: authentication protocol to use with PPP:

- 0 no authentication (authentication data is ignored)
- 1 PAP
- 2 CHAP
- 3 automatic authentication

Caution: For a CSD connection to any peer like an Internet Provider only PAP (=1) is supported, everything else will prevent from a successful connect.

<user>: user login name (string)

<password>: user password (string)

<conn_type>: connection type:

- 0: don't use PPP (Riviera application will be connected directly to L2R)
- 1: use PPP (Riviera application will be connected to PPP)

<own_ipaddr>: IP address of the mobile as negotiated with the network (valid only during PPP connection)

<dns1_ipaddr>,<dns2_ipaddr>: IP address of first and second DNS server to use (valid only during PPP connection)

Command availability condition: TCPIP or SAT class E support.

2.38 %CSQ: Signal quality

Command	Possible response(s)
%CSQ=<n>	%CSQ: <n> +CME ERROR: <err>
%CSQ?	%CSQ: <rssi>,<ber>,<actLevel>
%CSQ=?	%CSQ: (list of supported <rssi>), (list of supported <ber>),(range of <actLevel >)

Description

Set to enable or disable CSQ (signal quality).

Query returns received signal strength indication <rssi> and channel bit error rate <ber> and actual signal level.
Unsolicited message of the changed field string (as signal level) will be send to all the enabled sources.

Defined values

<n>:

Disable CSQ
Enable CSQ

<rssi>:

0 -113 dBm or less
1 -111 dBm
2...30 -109... -53 dBm
31 -51 dBm or greater
not known or not detectable

<ber> (in percent):

0...7 as RXQUAL values in the table in GSM 05.08 [20] subclause 8.2.4
not known or not detectable

<actLevel>:

0...4 as actual level of signal, divided into 4 levels.

2.39 %ATR: Answer to reset

Command	Possible response(s)
%ATR?	%ATR: <phase>[,<atr>] +CME ERROR: <err>
%ATR=?	

Description

The query command can be used by an application to obtain information about the phase and answer to reset (ATR) of the SIM. If the phase value of the SIM is not present, <phase> will be FFFF. If ATR data is not available, <atr> will not be included in the response.

Defined values

<phase> : integer type; phase of the SIM that is stored in the EF Phase (GSM 11.11)

<atr>: answer to reset (hexadecimal character format), described in GSM 11.11

2.40 %CHPL: Home Network Information

Command	Possible response(s)
---------	----------------------

%CHPL=<oprFrmt>	%CHPL: <opr>[<CR><LF> %CHPL: <opr>]... (when <oprFrmt> is 0 or 1) %CHPL: <mcc>,<mnc>[<CR><LF> %CHPL: <mcc>,<mnc>]... (when <oprFrmt> is 2) +CME ERROR: <err>
%CHPL=?	%CHPL: (list of supported <oprFrmt>s)

Description

This command is used to get the list of HPLMNs. It will return the list of operator names in either long alphanumeric, short alphanumeric or numeric format, depending upon the requested formats, and those that are supported.

Defined Values

<oprFrmt>: Operator String Format:

- 0 long alphanumeric format.
- 1 short alphanumeric format.
- 2 numeric format.

<type>: Type of the entry

- 0 from IMS

<opr>: Operator String:

This is the string containing the operator name in the format specified by <oprFrmt>. In the case of long alphanumeric, this can be up to 16 characters in length. For short alphanumeric it can be up to 8 characters in length.

<mcc>, <mnc>: Numeric format, is the Location Area Information (LAI) number, which consist of a 3 digit BCD country code (MCC) and a 2 or 3 digit BCD network code (MNC).

2.41 %VTS: Start or Stop DTMF Tones

Command	Possible response(s)
%VTS=<char>[,<mode>]	OK +CME ERROR: <err>
%VTS=?	%VTS: (list of supported <tone>s),(list of supported <mode>s)

Description

This command is used to start and stop DTMF tones. It is similar to +VTS, except that, instead of supplying <duration>, <mode> is used to indicate whether sending the DTMF tone should be started or stopped.

Defined Values

<char> : DTMF character:

This is the tone to start, in the range 0-9, #, *, A-D.

<mode> : DTMF mode:

- 0 stop DTMF tone.
- 1 start DTMF tone.
- 2 automatic mode – default value.

2.42 %CREG: Network registration and coverage indication

Command	Possible response(s)
%CREG=<mode>	+CME ERROR:<err>
%CREG?	%CREG: <mode>,<stat>,[<lac>,<cid>],<gprs_ind>,<rt> +CME ERROR:<err>
%CREG=?	%CREG: (list of supported <mode>s)

Description

This command is similar to +CREG, except that it returns the additional parameters <rt> and <gprs_ind>, which is used to determine whether a GPRS connection is available and GPRS can be started or not.

Defined Values

<mode> : Registration mode:

- 0 disable network registration unsolicited result code.
 - 1 enable network registration unsolicited result code.
- %CREG: <stat>,,,<gprs_ind>,<rt>
- 2 enable network registration and location information unsolicited result code.
- %CREG: <stat>,[<lac>,<ci>],<gprs_ind>,<rt>

<stat> : Registration status:

- 0 not registered, ME is not currently searching a new operator to register to
- 1 registered, home network
- 2 not registered, but ME is currently searching a new operator to register to
- 3 registration denied
- 4 unknown
- 5 registered, roaming

<lac> : Location area code:

Two byte location area code in hexadecimal format.

<cid> : Cell id:

Two byte cell id in hexadecimal format.

<gprs_ind> : GPRS Registration status:

- 0 GPRS is not supported by the cell.
- 1 GPRS with limited service.
- 2 GPRS is supported by the cell.

<rt>: Radio Technology, indicates whether the cell supports GSM, GPRS, EDGE or UMTS:

- 0 GSM Only.
- 1 GPRS is supported by the cell.
- 2 EDGE is supported by the cell.
- 3 UMTS is supported by the cell.

2.43 %CLCC: List Current Calls

Command	Possible response(s)
%CLCC	%CLCC: <idx>,[<dir>],[<stat>],[<mode>],[<empty>],[<class_type>][,<number>[,<type>][,<alpha>]][<CR><LF> %CLCC: <idx>,[<dir>],[<stat>],[<mode>],[<empty>],[<class_type>][,<number>[,<type>][,<alpha>]]... +CME ERROR: <err>
%CLCC=?	

Description

This command is used to set or request a list of all calls currently in progress, and their state. It is an extension of the +CLCC command, with the addition of the class_type parameter for ALS, which indicates whether the call is on line1, or line2. The return string will contain all calls. If there are currently no call, no string will be returned.

Defined Values

<idx>: call index:

<dir>: call direction:

- 0 Mobile originated call.
- 1 Mobile terminated call.

<stat>: call state:

- 0 Call active.
- 1 Call held.
- 2 Dialing.
- 3 Alerting.
- 4 Incoming call.
- 5 Call waiting.

<mode>: bearer/teleservice associated with the call:

- 0 Voice call.
- 1 Data call.
- 2 Fax call.
- 3 Voice followed by data, voice mode.
- 4 Alternating voice/data, voice mode.
- 5 Alternating voice/fax, voice mode.
- 6 Voice followed by data, data mode.
- 7 Alternating voice/data, data mode.
- 8 Alternating voice/fax, fax mode.
- 9 Unknown mode.

<empty>: call part of a multiparty call:

- 0 Call is not part of a multiparty call.
- 1 Call is part of a multiparty call.

<class_type>: ALS indication:

- 0 Call on Line1.
- 1 Call on Line2.

<number>: number string in the format indicated by <type>:

<type>: type of number:

- 0 Unknown.
- 1 International.
- 2 National.
- 3 Network specific.
- 4 Dedicated access.
- 5 Alphanumeric.
- 6 Abbreviated.
- 7 Extended.

<alpha>: alphanumeric string associated with <number>, as extracted from the phonebook:

2.44 +CPWD: Change password

Command	Possible response(s)
+CPWD=<fac> , <oldpwd> , <newpwd>	OK +CME ERROR: <err>
+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>)s

Description

Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK. Refer subclause 9.2 for possible <err> values.

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

Defined values

<fac>:

- "P2" SIM PIN2
- "AS" All services

refer Facility Lock +CLCK for other values

<oldpwd>, <newpwd>: string type; <oldpwd> shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with <pwdlength>

<pwdlength>: integer type maximum length of the password for the facility

2.45 %CWUP: Wakeup

Command	Possible response(s)
%CWUP=<type>	+CME ERROR: <err>
%CWUP=?	

Description

This command is used to wake up parts of the protocol stack.

Defined Values

<type>: Wake Up Type:

1 Wake Up RR.

2.46 %PVRF: Status of PIN

Command	Possible response(s)
%PVRF=<type>,<old pin>, <new pin>	OK +CME ERROR: <err>
%PVRF?	%PVRF: <pn1cnt>, <pn2cnt>, <pk1cnt>, <pk2cnt>, <ps1>, <ps2>

Description

This command is responsible to verify or check the status of the PIN.

Defined Values

<type>:

0 PVRF_TYPE_Pin1

1 PVRF_TYPE_Pin2

2 PVRF_TYPE_Puk1

3 PVRF_TYPE_Puk2

<pn1cnt>: PIN1 counter

<pn2cnt>: PIN2 counter

<pk1cnt>: PUK1 counter

<pk2cnt>: PUK2 counter

<ps1>: PIN1 status

<ps2>: PIN2 status

2.47 %CCBS: Completion of calls to busy subscriber

Command	Possible response(s)
%CCBS=[<mode>],[<idx>]	OK +CME ERROR: <err>
%CCBS?	%CCBS: [<ind>],[[<idx>],[<no>],[<toa>],[<subaddr>],[<tos

	>],[<class>],[<ptn>]]
%CCBS=?	%CCBS: (list of supported <mode>s),(list of supported <idx>s)

Description

This command is used to handle CCBS. If the index is given then the CCBS entry will be cleared.

If mode=1 then unsolicited CCBS Messages will be displayed.

%CCBS: [<ind>],[<idx>],[<no>],[<toa>],[<subaddr>],[<toa>],[<class>],[<ptn>]]

This feature is dependent on the network.

Defined Values

<mode>: displaying unsolicited CCBS messages

- 0 disable
- 1 enable

<idx>: CCBS index

- 0 clear all entiers
- 1...5 specific CCBS index

<ind>: type of CCBS indication

- 0 possibility time out
- 1 possible
- 2 registered
- 3 recall time out

<no>: number

<toa>: type of address

<subaddr>: sub address

<tos>: type of sub address

<class>: > is a sum of integers each representing a class of information

- 0 none
- 1 voice
- 2 data
- 4 FAX
- 8 SMS
- 256 auxiliary voice

<ptn>: alerting pattern

- 0 level 0
- 1 level 1
- 2 level 2
- 4 category 1
- 5 category 2
- 6 category 3
- 7 category 4
- 8 category 5

2.48 % CMGRS: Message Retransmission Service

Command	Possible response(s)
%CMGRS=<mode>	%CMGRS: <mode>, <mr> +CME ERROR: <err>
%CMGRS?	%CMGRS: <auto_rep_flag>
%CMGRS =?	%CMGRS: (list of supported <mode>s)

Description

This AT command can be used to do the following two

Control the message retransmission mechanism provided by SMS entity.

Do manual retransmission of the last failed message.

This command is having three modes SET MODE, READ MODE and TEST MODE.

In the SET mode, the format of the command is

%CMGRS=<mode>, where

mode = 0 disable automatic retransmission,

mode = 1 enable automatic retransmission

mode = 2 send manual resent request to SMS

If automatic retransmission is activated by %CMGRS=1, then the SMS module will try retransmission as mentioned in sec 9.2.3.6 of 23.040. For each retransmission of the SMS message, an indication will be received from SMS entity and the following information will be sent to user. The setting of this flag will not affect messages sent from the SAT module.

"%CMGRS: <mode>, <resend count>, <max retransmission>"

where <mode> is 1 (to indicate that this answer is the result of the automatic retransmission),

< retransmission count> is the number of current retransmission attempt and

<max retransmission> the max number of retransmission attempts.

If automatic retransmission is deactivated by %CMGRS=0 automatic retransmission will not be attempted and hence user will not get the following message

"%CMGRS: <mode>, <resend count>, <max retransmission >"

Mode 2 of this command ("%CMGRS=2") can be used to request retransmission of the last failed message. This can be done if the SMS transmission immediately before this command failed. Also, this cannot be done in the case of concatenated SMS. The response to this request in the case of a successful retransmission would be

"%CMGRS: <mode>, <mr>"

"OK"

where <mode> will be 2. and <mr> is the message reference number for this message.

Or if the retransmission is not possible, +CME ERROR: <err> will be returned

The read mode of the command can be used to find the status of the automatic retransmission. i.e It will return a value of 0 or 1, where 0 indicates that automatic retransmission is disabled.

Defined Values

<mode>:

- 0 clear auto_repeat_flag
- 1 set auto_repeat_flag
- 2 send manual resent request to SMS

<auto_rep_flag>: integer type; indicates whether auto retransmission is enabled or disabled

disabled

enabled

2.49 %RDL: Automatic Call Repeat

Command	Possible response(s)
%RDL=[<mode>] [, <n>]	OK +CME ERROR: <err>
%RDL?	%RDL: <mode>, <n>
%RDL =?	%RDL: (supported < mode >, supported <n>s)

Description

This function allows the user to set and reset the automatic calling repeat of unsuccessful outgoing call attempts. If the max counter of call attempts is reached the number is set in the blacklist. If a number is entry of the blacklist a MOC with this number is not possible. The causes starting the automatic call repeats are described in GSM 2.07.

When <n>=1 the unsolicited result %RDL: <state> is sent to TE.

Defined values

<mode> :

Disable automatic calling repeat

Enable automatic calling repeat

<n>:

No redial state indication to TE

Redial state indication to TE

<state>:

Redialling timer is started

Automatic call repeat is started

Call attempt fails
Call attempt successful
Automatic call repeat is stopped

2.50 %RDLB: Control black list

Command	Possible response(s)
%RDLB = [<mode>] [, <n>]	OK +CME ERROR: <err>
%RDLB?	%RDLB: <n> %RDLB: <number>,<type>[<CR><LF>%RDLB: <number>,<type>]... +CME ERROR: <err>
%RDLB =?	%RDLB: (list of supported <max counter >), (supported <n>s)

Description

This function allows the user to show and delete the entries of the blacklist. This list contains forbidden phone numbers filled by unsuccessful automatic call repeats.
When <n>=1 the unsolicited result %RDLB: <state> is sent to TE.

Defined values

<mode>:

No delete black list
Delete black list

<n>:

No black list state indication to TE
Black list state indication to TE

<counter> : number of black list entries

<number>: phone number

<type>: type of address

<max counter >: maximal number of black list entries

<state>:

Black list is full
Phone number entry is set in black list
Phone number is an black list entry

2.51 %CSCN Network service change notify

Command	Possible response(s)
%CSCN=[<ss>], [<ss_dir>],[<cc>], [<cc_dir>]	OK +CME ERROR: <err>
%CSCN?	%CSCN: <ss>, <ss_dir>, <cc>, <cc_dir>
%CSCN=?	%CSCN: (0,1), (0,1,2), (0,1) (0,1,2)

Description

This function allows the user to be notified when a network service is changed.

Some can be mapped with the command +CSSN(+CSSI/+CSSU) but some notifications required new AT Commands such as the ECT status. May be create a new unsolicited message for all these notifications or check one by one how these notifications can be found?

The %CSCN switched the trace output to the AT-command interface, separate by supplementary service and call control service.

If a service is switched on, the unsolicited commands will be raised if a network service change occurs:

- %CCCN displays the NW service change for call control service
- %CSSN displays the NW service change for supplementary service

Command	Possible response(s)
- %CCCN: <direction>,<cld>,<Facility>EString	
- %CSSN: <direction>,<trans_part>,<Facility>EString	

Defined values

<ss> :

- 0 Disable
- 1 Enable

<ss_dir> :

- 0 in
- 1 out
- 2 both

<cc> :

- 0 Disable
- 1 Enable

<cc_dir> :

- 0 in
- 1 out

2 both

<direction> :

0 in

1 out

2 both

<trans_part>

0 BeginTrans

1 FacTrans

2 EndTrans

<cd> : integer type; call identification number as described in GSM 02.30 subclause 4.5.5.1

<FacilityIEString> : "string" of information elements as described in 'fac.doc' (Air Interface Message Specification)

2.52 %CSTAT: State information

Command	Possible response(s)
%CSTAT=<n>	OK +CME ERROR: <err>
%CSTAT?	%CSTAT: <n>
%CSTAT =?	%CSTAT: (list of supported <n>s)

Description

This command refers to state information, which is indicated by the MS. The set command enable/disables the presentation of unsolicited notification result codes from TA to TE.

When <n>=1, result code %CSTAT: <entity>,<status> is sent to TE. The value of <entity> describes which entity is reporting. The value of <status> reports the status of the reporting entity Test command returns values supported by the TA as compound value.

Defined values

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

0 Disable

1 Enable

<entity>: (code of reporting entity)

EONS

PHB (Phonebook)

SMS

RDY (Ready when both PHB and SMS have reported they are ready)

<status>: (state of reporting entity)

0 Not Ready

1 Ready

2.53 &W: Store profile to FFS

Command	Possible response(s)
AT&W<prfl>	ERROR

Description

Set command stores the current settings (profile) according to the pre-defined command list stored in the non-volatile memory. If the storing of the profile fails, an unknown error message will be returned and the profile has not been stored.

Defined values

<prfl>:

- 0 Profile 0
- 1 Profile 1

2.54 Zn

Command	Possible response(s)
ATZ<prfl>	ERROR

Description

ATZ is an extension of the existing AT command ATZ that resets the related parameters to the default values.

ATZ(n) command retrieves the settings from the given profile. If setting fails, an unknown error is returned.

Defined values

<prfl>:

- 0 Profile 0
- 1 Profile 1

2.55 %CTZV-Set Time and Date Report

Command	Possible response(s)
%CTZV = <onoff>	OK +CME ERROR: <err>
%CTZV?	%CTZV: <onoff> +CME ERROR: <err>
%CTZV=?	%CTZV: (list of supported <onoff>s)

Description

Set command enables and disables automatic time and date report to the MT when time and date information is received from the network. If setting fails in an MT error, +CME ERROR: <err> is returned.

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

Defined Values

<on/off>: integer type value indicating:

0 - Disable automatic time and date reporting (default).

1 - Enable automatic time and date reporting.

If this feature is set to on, an unsolicited code will be received when the time and date information is received from the network. Refer to 3.3. for more details.

2.56 %CNIV- Set Operator Name Report/Query

Command	Possible response(s)
%CNIV = <onoff>	OK +CME ERROR: <err>
%CNIV?	%CNIV: <onoff> +CME ERROR: <err>
%CNIV=?	%CNIV: (list of supported <onoff>s)

Description

This proposal is a simple way of making use of the operator name information. When ACI receives the NITZ primitive MMR_INFO_IND, ACI checks the CNIV mode. If the CNIV mode is activated, ACI will provide an unsolicited report to the MT in the following format:

Set command enables and disables network identity report to the MT when NI is received from the network. If setting fails in an MT error, +CME ERROR: <err> is returned.

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

Defined values

<on/off>: integer type value indicating:

0 - Disable NI reporting (default).

1 - Enable NI reporting.

If this feature is set to on, an unsolicited code will be received when the time and date information is received from the network. Refer to 3.4. for more details.

2.57 %CHLD Call related supplementary services

Command	Possible response(s)
%CHLD= [<n>]	OK +CME ERROR: <err>
%CHLD=?	%CHLD: (list of supported <n>s)

Description

This command allows the control of the following call related services:

- a call can be temporarily disconnected from the ME but the connection is retained by the network
- multiparty conversation (conference calls)
- the served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection

Calls can be put on hold, recovered, released, added to conversation, and transferred similarly as defined in GSM02.30. Refer subclause 9.2 for possible <err> values.

This is based on the GSM supplementary services HOLD (Call Hold; refer GSM 02.83 clause 2), MPTY (MultiParty; refer GSM 02.84) and ECT (Explicit Call Transfer; refer GSM 02.91). The interaction of this command with other commands based on other GSM supplementary services is described in the GSM standard.

NOTE: Call Hold, MultiParty and Explicit Call Transfer are only applicable to teleservice 11.

It is recommended (although optional) that test command returns a list of operations which are supported. The call number required by some operations shall be denoted by "x"

(e.g. %CHLD: (0,1,1x,2,2x,3,4,5,6,6x,7x,h|h|)).

Defined values

<n>: char type; equals to numbers entered before SEND button in GSM02.30 [19] subclause 4.5.5.1. Additionally the following numbers and chars are also valid for this command:

- 6 retrieve the first held call and hold the active call. Held calls are still held. Waiting calls are still waiting.
- 6x retrieve a specified held call and hold the active call. Held calls are still held. Waiting calls are still waiting.
- 7x releases a specified call regardless of the state.
- 'h' or 'H' put active call on hold without accepting waiting or held calls automatically
- 'i' or 'I' release dialling call, without dropping current call.

NOTE: The "directory number" case shall be handled with dial command D, and the END case with hangup command H (or +CHUP). The 4*"directory number" case is handled with +CTFR command.

2.58 %COLR Query Setting for Connected Line Restriction Supplementary Service

Command	Possible response(s)
%COLR	OK +CME ERROR: <err>

Description

This AT command is used to query the current connected line restriction supplementary service status.

Defined values

none

2.59 %CPRIM Send a system primitive (CONFIG PRIMITIVE)

Command	Possible response(s)
%CPRIM=<receiver_name> , <config_str>	OK +CME ERROR: <err>

Description

This AT command is used to send a system primitive (CONFIG PRIMITIVE) to an entity or frame.

Defined values

<receiver_name>: string type; the name of the receiver handle.

<config_str>: string type; config string.

2.60 %CPRSM Pause Receiving Short Messages

Command	Possible response(s)
%CPRSM=<set_mode>	OK +CME ERROR: <err>
%CPRSM?	%CPRSM: <set_mode> +CMS ERROR: <err>
%CPRSM=?	%CPRSM: (0 , 1) +CMS ERROR: <err>

Description

The aim of this command is to provide the user the possibility to pause and resume the receiving of short messages. If the user sets the <set_mode> parameter to 1 and the command is performed successfully, the ME will block all incoming messages until the <set_mode> is set to 0. The SMSC will buffer the messages that have not been acknowledged. Receiving the resume the SMSC will immediately start to send the short messages stored in the buffer.

The query command informs the user about the current mode of the %CPRSM.

Defined values

<set_mode> :

- 0 Resume receiving of short messages
- 1 Pause receiving of short messages

2.61 %COPN: Read Operator Name

Command	Possible response(s)
%COPN=<format>,<oper>	%COPN: <long_oper>,<short_oper>,<numeric_oper> +CME ERROR: <err>
%COPN=?	

Description

Set command is used to query the Information about the Network Operator by giving in the format and the name of the operator (Either in short form or in long form) or a string that contains the country and network code. Test command will not be implemented because the user can use the test command of +COPN to query the list of possible network operators.

Defined Values

<format>: format of the input operator name, same as defined in 27.007 subclause 7.3 for +COPS

<oper>: operator name, same as defined in 27.007 subclause 7.3 for +COPS*

<long_oper>: long network operator name in string type with up to 25 characters*

<short_oper>: short network operator name in string type with up to 25 characters*

<numeric_oper>: 5 or 6 digit string where the first three digits are mobile country code and the last two to three digits are mobile network code

*Note: the limitations of spec 27.007 don't apply so we have a "dynamic extendable" approach for the future, which means in real implementation the definition of the long and short operator name length can be up to 25 characters long instead of 16 or 8 characters long.

Informative Examples

AT%COPN = 0,"T-Mobile D"

%COPN: "T-Mobile D", "TMO D", "26201"

OK

AT%COPN = 2, '26201"

%COPN: "T-Mobile D", "TMO D", "26201"

OK

2.62 %COPS Operator selection.

Command	Possible response(s)
%COPS=[<mode>[,<format> [,<oper>]]]	+CME ERROR: <err>
%COPS?	%COPS: <mode>[[,<format>,<oper>][,,<svrStat>]] +CME ERROR: <err>
%COPS=?	%COPS: [list of supported (<stat> ,long alphanumeric <oper> , short alphanumeric <oper> , numeric <oper>)s] +CME ERROR: <err>

Description

Set command forces an attempt to select and register the GSM/UMTS network operator. <mode> is used to select whether the selection is done automatically by the MT or is forced by this command to operator <oper> (it shall be given in format <format>).

If <mode>=1, <oper> is not given, and the SIM card has not been changed since the last network registration, the MT will try to register to that operator which had been registered the last time. That operator will be stored in the Flash File System. If the SIM card has been changed, the MT will try to register to the operator stored in the EF(LOCI) in the SIM Card.

To achieve the “limited service” state, <mode>=0 should be set when the SIM is not activated or, if the SIM is already activated and there is Full service status, “limited service” will be obtained by using <mode>=2.

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?) also. <mode>=2 forces an attempt to deregister from the network and leads the MT to limited service.

The selected mode affects to all further network registration (e.g. after <mode>=2, MT shall be unregistered until <mode>=0 or 1 is selected). Refer subclause 9.2 for possible <err> values. This command should be abortable when registration/deregistration attempt is made.

Read command returns the current mode, the currently selected operator, and the current service status <svrStat>. Please note that an additional comma has been added for “forward compatibility” reasons, to support the new <AcT> (Access technology) parameter in the future, added to +COPS in G3PP 27.007, version 5.0.

Test command returns a list of quadruplets, each representing an operator present in the network. Quadruplet consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM/UICC, and other networks.

Defined values

<mode>:

0 automatic (<oper> field is ignored)

- 1 manual (<oper> field shall be present)
- 2 deregister from network
- 3 set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> field is ignored); this value is not applicable in read command response
- 4 manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered

<format>:

- 0 long format alphanumeric <oper>
- 1 short format alphanumeric <oper>
- 2 numeric <oper>

<oper>: string type; <format> indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer GSM 04.08 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)

<stat>:

- 0 unknown
- 1 available
- 2 current
- 3 forbidden

<svrStat>

- 0 full service
- 1 limited service
- 2 no service

2.63 %PBCF: Phonebook Configuration

Command	Possible response(s)
%PBCF = [<ldn>],[<lrn>],[<lmn>]	OK +CME ERROR: <err>
%PBCF?	%PBCF: <ldn>,<lrn>,<lmn>

%PBCF=?	%PBCF: (0 , 1) , (0 , 1) , (0 , 1)
---------	--

Description

Set command sets the phone configuration for last dialled and/or last received and/or last missed number. The automatic storing function of the last dialled and/or last received and/or last missed number can be enabled and disabled with this function. Query command returns the configuration of the <ldn>, <lrn> and <lmn>.

Defined Values

<ldn>: last dialled number configuration

- 0: automatic storing enabled
- 1: automatic storing disabled

<lrn>: last received number configuration

- 0: automatic storing enabled
- 1: automatic storing disabled

<lmn>: last missed number configuration

- 0: automatic storing enabled
- 1: automatic storing disabled

Informative Examples

AT%PBCF=1, 1, 1

OK

AT%PBCF?

%PBCF: 1,1,1

OK

2.64 %DAR: Reason for last stack crash

Command	Possible response(s)
%DAR	%DAR: <reason> [<CR><LF>%DAR: <reason>[...]]
%DAR=?	

Description

Print the in DAR stored cause for the last stack crash.

Defined values

<reason> Plaintext from GPF about the last stack crash.

Example

if a crash occurred:

%DAR: DAR: SYSTEM ERROR: write attempt to L1 queue failed, vsi_com.c(297)

If no crash occurred:

%DAR: No DAR entry stored

2.65 %CPKY (Press Key)

Command	Possible Response(s)
%CPKY=<mode>	+CME ERROR: <err>

Description

This command activates or deactivates the ‘press key’ indications from ACI to the source that has issued this command (usually the source that owns/controls the keypad driver).

Defined values

<mode>:

- 0 : ACI does not send %CPKY
- 1 : ACI sends %CPKY when +CKPD is received

Unsolicited Result code

Unsolicited result code
%CPKY: <keys>[,<time>[,<pause>]]

Description

This ‘press key’ indication shall be sent from the ACI to the source that owns/controls the keypad driver (MMI). If the ACI receives a +CKPD from any source it sends %CPKY. If the MMI receives the indication, it has to interpret this %CPKY and it has to process the keystrokes likes the ones received from the keypad driver.

Defined values

<keys>: string of characters representing keys as listed in a table, see GSM 07.07 chapter 8.7 (based on PCCA STD-101 Annex table I-3). Colon character (IRA 58) followed by one character can be used to indicate a manufacturer specific key not listed here. All characters from a semicolon character (IRA 59) to the next single semicolon character are treated as alpha entries and are not converted to key equivalents. All semicolon characters inside alpha entries should be duplicated in the TE and stripped to one before entering to the ME. Pause character (IRA 87 or 119) can be used to pause between key pressings for a time specified by <pause>. All IRA values not listed here are reserved.

<time>, <pause>:

0...255 0... 25.5 seconds (default values is 1)

2.66 %CKWP (Key was pressed)

Command	Possible Response(s)
%CKWP=<src> , <key> , <press>	+CME ERROR: <err>

Description

This is an indication from the MMI to the ACI that a key was pressed. There is only a set command, no query or test command is available for %CKWP. It makes only sense if this command is issued by the source, which owns/controls the keypad driver.

Defined values

<src>:

- 0 : local (internal) keypad was pressed
- 1 : keypad command was issued by an external source (+CKPD)

It depends on the value of this <src> parameter and the +CMER settings if ACI sends +CKEV.

<key>: key code of the key that was pressed (refer IRA values, see [2])

<press>:

- 1 : key is pressed
- 0 : key is released

2.67 %CSSD Supplementary Service Diagnostic

Command	Possible response(s)
%CSSD	%CSSD: <ss_diagnostic> ERROR

Description

The aim of this command is to provide the information of the supplementary service byte sent by the network to the user <ss_diagnostic>. This byte provides a deeper analysis of the cause of the disconnection of the last call.

This byte is only set in for special disconnect causes. Please refer to 3GPP TS 24.008 V3.19.0 section 10.5.4.11 (2004-06) specification for further details.

In the cases that there has no diagnostic value been delivered by the network the ss diagnostic value will be set to default 255 (0xFF).

Defined values

<ss_diagnostic> :

- 1 Outgoing call bared within CUG
- 2 No CUG selected
- 3 Unknown CUG index
- 4 CUG index incompatible with requested basic service
- 5 CUG call failure, unspecified
- 6 CLIR not subscribed
- 7 CCBS possible
- 8 CCBS not possible
- 255 No information provided

2.68 %SECP Verify / Change MMI security code

Command	Possible response(s)
%SECP= [<security code>[,<new security code>]]	+CME ERROR
%SECP=?	

This is a customised AT command to Verify / Change MMI access security code.

2.69 %SECS Modify / Query MMI security code state

Command	Possible response(s)
%SECS= <state>,<security code>	+CME ERROR
%SECS=?	%SECS: (list of supported <state>s)
%SECS?	%SECS: <state>

This is a customised AT command to Modify / Retrieve MMI security code state.

Thus MMI will decide if a password is required for access.

Defined values

<state>:

- 0 The security code is not required
- 1 The security code is required

<security code>:

<security code> ,<new security code> string type: <security code> shall be the same as password specified for the facility using the command %SECP for change of password and <new security code> is the new password; passwords will have length = 5 as default but the length is programmable via FFS data.

2.70 %CUST: Activate MMI Customisation Mode

Command	Possible response(s)
%CUST=<cust_mode>	<i>OK</i> <i>ERROR</i>
%CUST=?	%CUST: (list of supported <cust_mode>s)
%CUST?	%CUST: current <cust_mode> value

Description

The purpose of the AT%CUST command is to provide a mechanism for customer specific modifications to be applied in the ACI and other entities, without impacting on the generic nature of the software. With this command the modem part switches to another mode with different SAT behaviour than before. This AT command must be received in the modem part earlier than either the AT%SATC command or the AT+CFUN command.

Defined values

<cust_mode>: integer type value indicating:

Customisation Mode required

<cust_mode> description

0 Normal Behaviour

1 Customisation Mode 1

2 ... 255 Reserved for Future Use

2.71 %SATCC: Enable, or Disable, Call or MO Short Msg Control By SIM

Command	Possible response(s)
%SATCC=<cc_mode>	<i>OK</i> <i>ERROR</i>
%SATCC?	%SATCC: current <cc_mode>

Description

The purpose of the AT%SATCC command is to allow the MMI to enable or disable Call Control By SIM, or the Short Message Control By SIM, functionality within the modem part. While this provides for a way in which the MMI may contravene the ETSI GSM SIM Application Toolkit Specifications, that is not the intention. However the conditions under which this command is used is left to the discretion of the MMI producer

Defined values

<cc_mode>: integer type value indicating:

Call or MO SM Control By SIM mode

<cc_mode> description

0 Call or MO SM Control is Disabled

1 Call or MO SM Control is Enabled

Note: *Enabling Call Control By SIM where it is not supported in the SIM Service Table will have no effect. It will remain inactive.*

2.72 %CSSN: Supplementary service notifications

Command	Possible response(s)
%CSSN=[<n> [, <m>]]	
%CSSN?	%CSSN: <n> , <m>
%CSSN=?	%CSSN: (list of supported <n>s) , (list of supported <m>s)

Description

This AT command allows using the AT command D in a non-blocking way when +CSSI is enabled.

Defined values

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

- 0 disable
- 1 enable
- 2 *enable and non-blocking atD*** (Added value to parameter <n>)

<m> (parameter sets/shows the +CSSU result code presentation status in the TA):

- 0 disable
- 1 enable

This parameter will have the same functionality as +CSSN, defined in 3GPP 27.007, version 3.13, section 7.17, plus the added value to the parameter <n>.

2.73 %CSNS: Single numbering scheme

Command	Possible response(s)
%CSNS=<mode>	OK +CME ERROR: <err>
%CSNS?	%CSNS: <mode>
%CSNS =?	%CSNS: (list of supported <mode>s)

Description

This AT command selects besides the bearer or teleservices which are defined for the command AT+CSNS (described by 3GPP TS 27.007) additional bearer or teleservices for alternating MT voice/data calls which are not based on BS 61. The command serves the protocol stack entity CC to accept/reject MT CS UDI multimedia calls. The user can set the preferred and less preferred service using mode 8 (alternating voice/data, voice first) or mode 9 (alternating voice/data, data first).

Defined additional values

<mode>:

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

Command availability condition: 3GPP Release 5 and UMTS support.

2.74 %CMOD: Call mode

Command	Possible response(s)
%CMOD=<mode>	OK +CME ERROR: <err>
%CMOD?	%CMOD: <mode>
%CMOD=?	%CMOD: (list of supported <mode>s)

Description

This AT command selects besides the call modes which are defined for AT+CMOD (described by 3GPP TS 27.007) an additional call mode “alternating voice/data” which are not based on BS 61. It serves for configuration of MO CS UDI multimedia calls

Defined values

<mode>:

- 0 single mode
- 1 alternating voice/fax (teleservice 61)
- 2 alternating voice/data (bearer service 61)
- 3 voice followed by data (bearer service 81)
- 4... 127 reserved
- 128 alternating voice/data (BS 30)

Command availability condition: 3GPP Release 5 and UMTS support.

2.75 %MMCC: CS UDI multi media call notification

Command	Possible response(s)
% MMCC =<n>	OK +CME ERROR: <err>
% MMCC?	% MMCC: <n>
% MMCC=?	% MMCC: (list of supported <n>s)

Description

This AT command sets the user indication %MMCI notifying about service change or fallback case during alternating voice/multi media call.

Defined values

<n>

0 indication off
 1 indication on

Command availability condition: 3GPP Release 5 and UMTS support.

2.76 %MMCR: Accept or reject MT CS UDI multi media call

Command	Possible response(s)
% MMCR =<resp>	OK +CME ERROR: <err>
% MMCR?	% MMCR: <resp>
% MMCR =?	% MMCR: (list of supported <resp>s)

Description

This AT command provides the user the possibility to accept or reject MT CS UDI multimedia calls. If the user does not answer during certain time period the according watch dog timer in the CC entity expires and the MT call modification request is rejected.

Defined values

<resp>:

0 reject CS UDI multimedia call
 1 accept CS UDI multimedia call

Command availability condition: 3GPP Release 5 and UMTS support.

2.77 %EINFO: Configure mode and frequency of dynamic engineering mode data

Command	Possible response(s)
% EINFO =<output format>, [<timer>]	OK +CME ERROR: <err>
% EINFO =?	% EINFO: (list of supported <output format>s, max <timer> values)

Description

This AT command provides the user the possibility to configure the output mode and the frequency of the unsolicited dynamic engineering mode data.

Defined values

<output format>:

0 None
 1 Hex format

<timer>: <timer> value of zero will disable the unsolicited dynamic engineering mode data from the protocol stack. Valid values are between 1 and 60. Omission of this parameter will result in the dynamic engineering data being provided only once.

Command availability condition: engineering mode support.

2.78 %ESINFO: Configure mode and frequency of static engineering mode data

Command	Possible response(s)
% ESINFO =<output format>, [<timer>]	OK +CME ERROR: <err>
% ESINFO =?	% ESINFO: (list of supported <output format>s, max <timer> values)

Description

This AT command provides the user the possibility to configure the output mode and the frequency of the unsolicited static engineering mode data.

Defined values

<output format>:

- 0 None
- 1 Hex format

<timer>: <timer> value of zero will disable the unsolicited static engineering mode data from the protocol stack. Valid values are between 1 and 60. Omission of this parameter will result in the static engineering data being provided only once.

Command availability condition: engineering mode support.

3 Unsolicited Result Codes

3.1 %CPROAM: CPHS Home Country Roaming Indicator

Unsolicited Result
%CPROAM: <roam_status>

Description

This unsolicited result will be displayed whenever the mobile's Roaming registration state has changed.

Defined values

<roam_status>: integer type value indicating:

- 0 Mobile is not in Roaming state.
- 1 Mobile is in Roaming state (mobile is registered to an other than the home network).

3.2 %CPVWI: CPHS Voice Message Waiting

See Section 2.23.

3.3 %CTZV: reports network time and date information

Unsolicited Result
%CTZV: <network-time>

Description

It is a customized AT command for automatic time and date reporting. the time and date information will be reported to the MT if this command is set to %CTZV =1. This feature is explicitly for P2 sample and Calypso+.

Defined Values

<network-time>: In the format of "yy/mm/dd, hh:mm:ss+/-tz", where characters indicate year (two last digits), month, Day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

3.4 %CNIV: reports network name information

Unsolicited Result
%CNIV: <full_name>, <short_name>, <plmn>

Description

It is a customized AT command for automatic network name reporting. The network name information will be reported to the MT if this command is set to %CNIV =1. This command is explicitly for P2 sample and Calypso.

Defined Values

<full_name>: Full network name in string, up to 40 characters

<short_name>: Short network name in string, up to 40 characters

<plmn>: The plmn of the network in digits, has the following structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1)

3.5 %CPKY: Press Key

Unsolicited result code

%CPKY: <keys>[,<time>[,<pause>]]

Description

This 'press key' indication shall be sent from the ACI to the source that owns/controls the keypad driver (MMI). If the ACI receives a +CKPD from any source it sends %CPKY. If the MMI receives the indication, it has to interpret this %CPKY and it has to process the keystrokes likes the ones received from the keypad driver.

Defined values

<keys>: string of characters representing keys as listed in a table, see GSM 07.07 chapter 8.7 (based on PCCA STD-101 Annex table I-3). Colon character (IRA 58) followed by one character can be used to indicate a manufacturer specific key not listed here. All characters from a semicolon character (IRA 59) to the next single semicolon character are treated as alpha entries and are not converted to key equivalents. All semicolon characters inside alpha entries should be duplicated in the TE and stripped to one before entering to the ME. Pause character (IRA 87 or 119) can be used to pause between key pressings for a time specified by <pause>. All IRA values not listed here are reserved.

<time>, <pause>:

0...255 0... 25.5 seconds (default values is 1)

3.6 %CMGRS: Message Retransmission Service

If automatic retransmission is activated by %CMGRS=1, then the SMS module will try retransmission as mentioned in sec 9.2.3.6 of **23.040**. For each retransmission of the SMS message, an indication will be received from SMS entity and the following information will be sent to user.

Unsolicited Result

"%CMGRS: <mode>, <resend count>, <max retransmission>"
--

Description:

Where <mode> is 1 (to indicate that this answer is the result of the automatic retransmission), retransmission count> is the number of current retransmission attempt and <max retransmission> the max number of retransmission attempts.

Defined Values:

<mode>:

0 clear auto_repeat_flag

1 set auto_repeat_flag

3 send manual resent request to SMS

3.7 %MMCI: user notification CS UDI multi media call

Unsolicited Result

%MMCI: <sc>

Description:

This unsolicited result will be sent during alternating voice/data call (BS 30) in two cases: either call upgrading to CS UDI multimedia call (service change) or fallback to speech. The indication is to be switch on/off via AT%MMCC.

Defined values

< sc >:

0 CS UDI multimedia call

1 fallback to speech call