EN/LZT 108 4445 R1B

Mobile Phone R520 Developers' Guidelines

AT Commands Online Reference

ERICSSON

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Contents

1 Introduction

This manual describes the operation of the AT commands supported by the R520 Telephone. The information here is not relevant for day-to-day operation of the Telephone. This is described in the User Manual supplied with the R520 Telephone.
The On-line Reference Manual is for advanced users who require detailed information in order to:

- Develop new communications software
- Add the R520 to an application's list of compatible modems
- Adjust the settings of their mobile telephone

1.1 About this manual

This manual is designed to supplement the Ericsson R520 Telephone User's Manual.

1.2 Using this manual

The standard text in this manual is modified to distinguish between the text displayed on the screen, typed instructions and examples of command dialogue. The distinctions are as follows:

- Typed commands and option values are written in bold text; for example: S2=<esc>; <esc>=0-127
- Any key strokes are written in bold text in brackets; for example <CR>
- Examples of command dialogue, including keyboard entries and on-screen responses, are written in `Courier` text
- The default parameter setting used by a command is indicated by the text "Default setting"

1.3 Using the built-in modem in the phone

The built-in modem can be accessed via Bluetooth, irDA, or RS-232 cable connection.

Standards
IrDA DATA with secondary implementation of IrLAP 1.0 and IrDA-Ultra, IRMC 1.1., ETSI 07.05, 07.07 and 07.10.
Fax specifications Group III, class 1 and 2. Class 2 is recommended. WAP 1.2.1.

Data rates (up to)
- 115,200 bits/s between phone and IrDA device (e.g. PC, another phone).
- 108,800 bits/s via Bluetooth (one time slot).
- 9,600/14,400 bits/s for GSM data communication, no compression. 38,400 bits/s for GSM data communication with V.42bis compression
- 28,800 bits/s (receiving data) using HSCSD, no compression. 115,200 bits/s (receiving data) using HSCSD with V.42bis compression
- 53,600 bits/s (receiving data)/13,400 bits/s (transmitting data) using GPRS. 214,400 bits/s (receiving data)/ 53600 bits/s (transmitting data) using GPRS with V.42bis compression

- 9,600/14,400 bits/s in fax communication

AT modem V.25ter command set supported

Power consumption

Slightly increased depending on type of communication.

1.4 Communication programs

Please refer to the User's Manual for instructions on the installation and use of the Ericsson built-in modem software drivers.

Configuring third-party communication programs

If you want to use a communication program which does not include the Ericsson built-in modem in the list of supported hardware, the following options are suggested:

Configure for V.25ter

The built-in modem supports the V.25ter command set. If your communication program can generate and support a V.25ter command, the built-in modem does not require the installation of a specific driver.

Locate a Mobile Phone Modem driver

A Mobile Phone Modem driver for your communication program may be available on either the Ericsson Infrared Mobile Phone Modem utilities disk or from one of the on-line services, for example http://mobileinternet.ericsson.com.

Configure the data communications program manually

To configure your data communication program manually:

1. Select a generic mobile phone modem driver from the list of available mobile phone modem drivers
2. Set the Init string to `AT&F`
3. Set the optional setup string to Asynchronous RLP:

```
AT+CBST=0,0,1
```

Configure your facsimile communication program manually

To manually configure your facsimile communications program, select a Fax Class 2 driver. The built-in modem supports Fax Class 1 facsimile which might be used if there are problems with the fax service or speed of the computer, or your fax application does not support Fax Class 2.

2 Result and Error Codes

2.1 Result codes

When you send a command from your PC or PDA to the built-in modem, the response is terminated by a result code which is shown on the computer screen. Use this code to confirm correct operation or to identify any problem with the command.
There are two types of result codes:

- Final result codes related to the operation of AT commands
- Result codes associated with call connections

Final result codes from AT commands

The built-in modem always terminates each response to an AT command with a final result code:

`OK`	The command(s) and any specified parameters were valid and the command has completed execution.

Some AT commands are not relevant to the built-in modem operations or can only be set to one parameter value. For completeness and to allow the parameter to be read, some of these commands are supported but not implemented. Calling a command of this type will produce the OK result code but will not cause any change to the built-in modem. These commands are included in the command descriptions in Chapters 4 and 5.

`ERROR`	An error has occurred during the command processing. This could arise because: • There is a fault in the command syntax • One or more parameters are outside the permitted range • The command you issued is not implemented in the built-in modem • The command is not appropriate to the service • Of the class the built-in modem is operating in

When an error is reported, the `ERROR` message is preceded by a copy of the text response from the last valid AT command. This is shown in the following example:

Valid command:	`AT+CBC=?`
Response:	`+CBC:(0,2),(0-100)` `OK`
Invalid command:	`AT+CBC=?;+FCLASS=3`
Response:	`+CBC:(0,2),(0-100)` `ERROR`

Result codes from call connections

During on-line operation of the telephone, result codes inform you about the progress of call connections:

CONNECT	<speed>	A connection has been established and the data rate <speed> is shown.
BUSY		The number you called is engaged.
NO DIALTONE		Unable to establish the initial connection.
NO CARRIER		Either a connection could not be established or an existing connection has been lost.
RING		There is an incoming call. This is not a consequence of local activity and is referred to as an unsolicited result code.

Format of the result codes

The result codes described above are in verbose format. You can command the built-in modem to display result codes in verbose or numeric format or you can switch them off completely.
To switch between verbose and numeric format, please refer to the use of the ATV command on page 26.
To switch the display of result codes on or off, please refer to the use of the ATQ command on page 25.

2.2 Error codes

The +CME ERROR result codes indicate an error relating to the functionality of the built-in modem or Mobile Phone and replaces the final result code ERROR when enabled by the AT+CMEE command.

Report mobile phone failure (+CME)

+CME ERROR: 0	Phone failure
+CME ERROR: 1	No connection to phone
+CME ERROR: 2	Phone modem link reserved
+CME ERROR: 3	Operation not permitted
+CME ERROR: 4	Operation not supported
+CME ERROR: 5	PH-SIM card PIN required
+CME ERROR: 10	SIM card not inserted
+CME ERROR: 11	SIM card PIN required
+CME ERROR: 12	SIM card PUK required
+CME ERROR: 13	SIM card failure
+CME ERROR: 14	SIM card busy
+CME ERROR: 15	SIM card wrong
+CME ERROR: 16	Incorrect password
+CME ERROR: 20	Memory full
+CME ERROR: 21	Invalid index
+CME ERROR: 22	Not found
+CME ERROR: 23	Memory failure
+CME ERROR: 24	Text string too long
+CME ERROR: 25	Invalid character in text string
+CME ERROR: 26	Dial string too long
+CME ERROR: 27	Invalid character in dial string
+CME ERROR: 100	Unknown

Report operational/access failure (+CMS)

The +CMS ERROR result codes indicate an error relating to the built-in modem, Mobile Phone, or Network relating to the Short Message Service (SMS). It replaces the final result code ERROR.

+CMS ERROR: 0	GSM 04.11 Annex E-2 values
to	
+CMS ERROR: 127	
+CMS ERROR: 128	GSM 03.40 Section 9.2.3.22 values
to	
+CMS ERROR: 255	
+CMS ERROR: 300	Mobile phone failure
+CMS ERROR: 301	Short message service of mobile phone reserved
+CMS ERROR: 302	Operation not allowed
+CMS ERROR: 303	Operation not supported
+CMS ERROR: 304	Invalid PDU mode parameter
+CMS ERROR: 305	Invalid text mode parameter
+CMS ERROR: 310	SIM card not inserted
+CMS ERROR: 311	SIM card PIN necessary
+CMS ERROR: 312	SIM card PIN necessary for PH-SIM
+CMS ERROR: 313	SIM card failure
+CMS ERROR: 314	SIM card busy
+CMS ERROR: 315	SIM card wrong
+CMS ERROR: 316	SIM PUK required
+CMS ERROR: 317	SIM PIN2 required
+CMS ERROR: 318	SIM PUK2 required
+CMS ERROR: 320	Memory failure
+CMS ERROR: 321	Invalid memory index
+CMS ERROR: 322	Memory full
+CMS ERROR: 330	SMSC address unknown
+CMS ERROR: 331	No network service
+CMS ERROR: 332	Network timeout
+CMS ERROR: 340	No +CNMA acknowledgement expected
+CMS ERROR: 500	Unknown error
+CMS ERROR: 511	Range 256...511 reserved
+CMS ERROR: 512	Manufacturer specific

Service Report (+CR)

When a data connection is being established, the +CR messages are sent to the PC before the final result code CONNECT. Use AT+CR to enable these messages.

+CR: ASYNC	Asynchronous transparent
+CR: SYNC	Synchronous transparent
+CR: REL ASYNC	Asynchronous non-transparent
+CR: REL SYNC	Synchronous non-transparent

Cellular Result Codes (+CRC)

The `+CRC` messages replace the unsolicited result code `RING` and provide more information about the type of the incoming call. Use AT+CRC to enable these messages.

`+CRING: ASYNC`	Asynchronous transparent
`+CRING: SYNC`	Synchronous transparent
`+CRING: REL ASYNC`	Asynchronous non-transparent
`+CRING: REL SYNC`	Synchronous non-transparent
`+CRING: FAX`	Facsimile
`+CRING: VOICE`	Normal voice

3 AT Commands

3.1 Introduction to AT commands

This chapter describes how AT commands are used to exchange information with the phone, the built-in modem and Bluetooth module. The AT commands are listed at the end of this chapter. For a description of each command, refer to Chapters 4, 5 and 6.
You use AT commands to:

- Configure the phone to connect via infrared port or the system bus
- Configure the modem to connect via infrared port or the system bus
- Request information about the current configuration or operational status of the phone or the modem
- Test availability in the phone or modem and, when applicable, request the range of valid parameters when applicable, for an AT command

3.2 Built-in modem operating modes

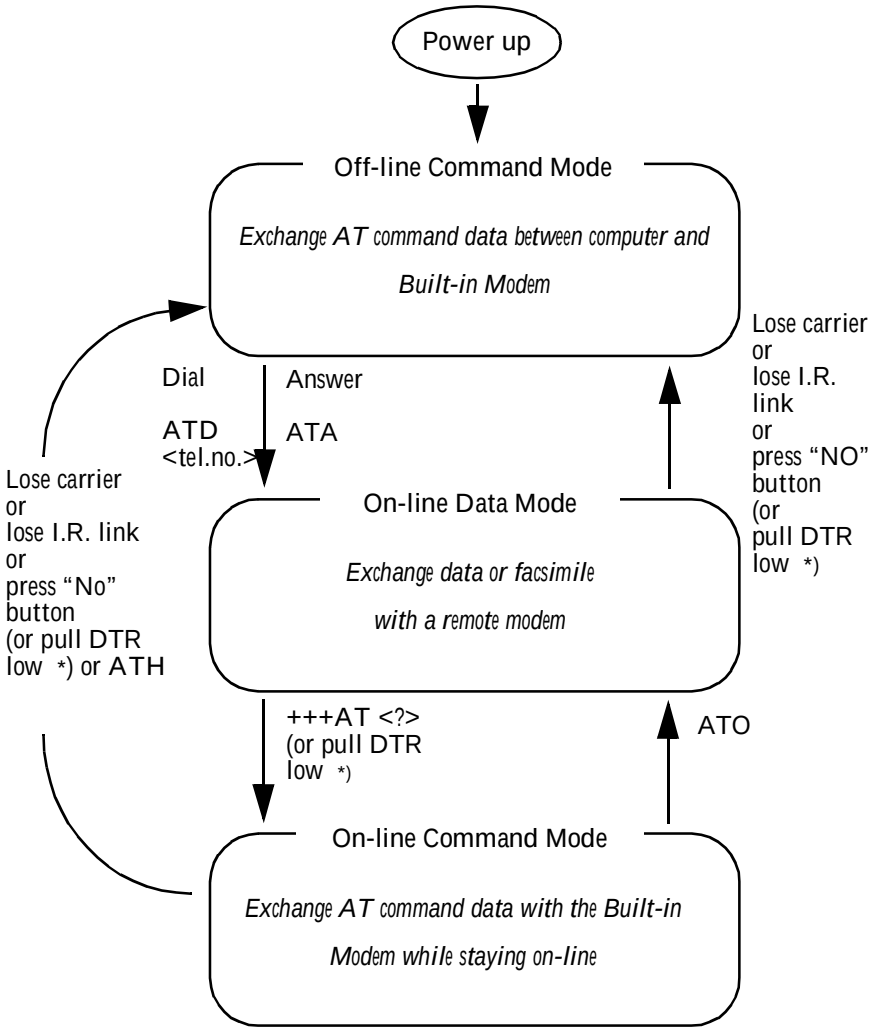
The built-in modem can be set in any one of following three modes of operation:

Off-line command mode:	The built-in modem is placed in off-line command mode when first powered up and is ready for entry of AT commands.
On-line data mode:	Allows “normal” operation of the built-in modem, exchanging data or facsimile with the remote modem.
On-line command mode:	It is possible to switch to on-line command mode when wanting to send AT commands to the built-in modem while still remaining connected to the remote modem.

3.3 Changing the built-in modem operating mode

The following illustration summarises the methods that are used to switch between the three built-in modem operating modes:

3.3.1 Operating in off-line command mode



* Pull DTR not available when using cable.

In off-line command mode, the built-in modem accepts data as commands and not as normal communication traffic. You enter commands by typing at the PC/PDA keyboard.

Switching to on-line data mode

To enter on-line data mode, for data to be exchanged with the modem at the other end of the link, enter the ATD command followed by the telephone number to make the call. Alternatively, typing ATA to answer an incoming call will also place the built-in modem in on-line mode.

Switching back to off-line command mode

Any of the following will return the built-in modem to off-line command mode from on-line data mode:

- Loss of the connection (`NO CARRIER` error)
- Loss of the infrared link between the built-in modem and your computer
- Pressing the "NO" button on your mobile phone

- Pulling DTR low (not available when using cable)

Using AT commands during a data connection

If wishing to use AT commands while connected to a remote modem in on-line data mode and maintain connection with the remote modem, first enter on-line command mode.
There are two ways to switch from on-line data mode to on-line command mode:

1.Type the escape sequence "+++" followed by an appropriate AT command. This command must be selected from the options AT, ATE, ATH, ATI, ATL, ATM, ATQ, ATV, and ATX. Using this method, an AT function can be performed as moving in to on-line command mode. For example, switching using

+++ATH**<CR>**

switches the built-in modem to on-line command mode. The AT command is executed, causing the connection to be terminated (hang-up executed). Typing the escape sequence "+++" without any following command will cause the system to wait one second, switch to on-line command mode, and respond OK;

2. Pull DTR low after previously setting AT&D=1.

Switching from on-line command mode to on-line data mode

To return to on-line data mode while in on-line command mode, type:

ATO**<CR>**

Switching from on-line command mode to off-line command mode

To return the built-in modem to off-line command mode from on-line command mode:

Use any of the methods described in "Switching back to off-line command mode" above;
Type +++ATH <CR> to switch to on-line command mode and hang up at once.

3.4 Operating the AT commands

In command mode, four types of command can be issued:

1. A set command to adjust the built-in modem's operating parameters
2. An execute command which directs action without the need of any parameters
3. A read command to view the current command settings
4. A test command to view the available command parameters

Not all AT commands support all four functions. The descriptions in Chapters 4, 5 and 6 list the functions available for each AT command.

1. Entering a set command

The standard format for entering a set command is:

AT<command>=<parameters><CR>

where	AT	Notifies the built-in modem that a command is being entered.
	<command>	The name of the command being entered.
	<parameters>	The values to be used by the command.
	<CR>	All command lines are terminated by pressing the <CR> (Return or Enter) key.

Note: All command lines are completed by pressing the <CR> key on the computer keyboard. For the remainder of this manual, appropriate use of the <CR> key is assumed.

To set the built-in modem to operate with autobaud over an asynchronous connection, the command line would be:

AT+CBST=0,0,1

However, the commands also have default settings. These are values which are assumed to have been entered when no actual value is placed in the command line.
For example, the above command can be entered as:

AT+CBST=,,1

The default values used by the commands are indicated by bold text in the following descriptions.
When the parameter is a character string (for example "<name>") then the value should be entered between quotes. For example "Peter".
Optional parameters are shown in square brackets. For example [<value>].

2. Entering an execute command

Execute commands are very similar to set commands. They usually do not require any parameters and are used to obtain information about the mobile phone or built-in modem or to execute an event.
For example, to find out information about the mobile phone battery, enter the +CBC command:

AT+CBC

The built-in modem responds:

```
+CBC: 0,60
```

indicating that the mobile phone battery is connected (0) and that it has 60% charge remaining.

To answer an incoming call, you execute the A command:

ATA

3. Using read command to view the command settings

To check the current settings of a command, use the '?' option.
For example, to check the current settings of the +CBST command, enter:

AT+CBST?

If CBST has been set according to the previous example, the settings are displayed as

```
+CBST: 0,0,1
```

4. Using test command to request command help

To test the availability of a command and the range of parameters, use the '=?' option with the command.
For example, to check the parameters available to the command line in the example above, enter:

AT+CBST=?

The line:

```
+CBST: (0,4,6,7,68,70,71),(0),(1)
```

is displayed indicating the range of valid entries that can be set for the parameters <data rate>, <bearer service>, and <connection element>.

3.5 AT command list

AT Commands Phone Terminal Terminated

4 AT Commands Phone Terminal Terminated

4.1 Ensemble C2: Control and Identification

4.1.1 Commands

AT	Attention Command

Description: Checks the communication between the phone and any accessory. Determines the presence of a phone.

Execution command: AT

AT*	List All Supported AT Commands

Description: Lists one or more lines of AT commands supported by the phone.

Execution command: AT*

Response:
<AT Command1><CR><LF>
[<AT Command2><CR><LF>
[...]]

<AT Command>	Description
AT...	Defines the AT command, including the prefix AT

Example:

```
AT*
AT+CGMI
AT+CGMM
AT+CGMR
...
OK
```

AT+CLAC	List All Available AT Commands

Description: Execution command causes the ME to return one or more lines of AT Commands.
Note: This command only returns the AT commands available to the user.

Execution command: AT+CLAC

Test command: AT+CLAC=? Shows if the command is supported.

Possible execution command response(s):
<AT Command1><CR><LF>
[<AT Command2><CR><LF>
[...]]

+CME Error: <err>

<AT Command>	Description
AT...	Defines the AT command, including the prefix AT

Example:

```
AT+CLAC
AT+CGMI
AT+CGMM
AT+CGMR
...
OK

+AT+CLAC=?
OK
```

ATZ Reset to User-Defined Configuration

Description: This command resets the values to default settings and closes all connections.

Execution command: ATZ

AT&F Set To Factory-Defined Configuration

Description: This command resets the values to default settings.

Execution command: AT&F

AT+CGMI Request Manufacturer Identification

Description: The command causes the phone to return one or more lines of information text <manufacturer> which is intended to permit the user of the ITAE/ETAE to identify the manufacturer of the phone to which it is connected to.

Execution command: AT+CGMI

Execution command response: <manufacturer>

Test command: AT+CGMI=? Shows if the command is supported.

Parameter:

<manufacturer>: String; manufacturer name. Not to exceed 2048 characters.

Example:

```
AT+CGMI
ERICSSON
OK

AT+CGMI=?
OK
```

AT+CGMM Request Model Identification

Description:	The command causes the phone to return one or more lines of information text <model> which is intended to permit the user of the ITAE/ETAE to identify the specific model of phone to which it is connected to.
Execution command:	AT+CGMM
Execution command response:	<model_type><model_name>
Test command:	AT+CGMM=? Shows if the command is supported.
Parameters:	
<model_type>:	10-character ASCII string; padded with space if needed.
<model_name>:	Model name for transceiver unit.

AT+CGMR Request Revision Identification

Description:	The command causes the phone to return a string containing information regarding SW version.
Execution command:	AT+CGMR
Execution command response:	<revision>
Test command:	AT+CGMR=? Shows if the command is supported.
Parameter:	
<revision>:	An ASCII string containing software revision plus KRC number.

Example:	`AT+CGMR`
	`R1A091 CXC125112`
	`OK`
	
	`AT+CGMR=?`
	`OK`

AT+CGSN Request Product Serial Number Identification

Description:	Returns the IMEI number of the phone.
Execution command:	AT+CGSN
Execution command response:	<sn>
Test command:	AT+CGSN=? Shows if the command is supported.
Parameter:	
<sn>:	String; contains the phone IMEI.

4.2 Ensemble C3: Call Control

4.2.1 Commands

ATA	Answer Incoming Call Command
Description:	Answers an incoming call.
Execution command:	ATA

ATH	Hook Control
Description:	Terminates an active call.
Execution command:	ATH

ATD	Dial Command
Description:	Causes the phone to dial a call. All characters appearing on the same command line after the "D" are considered part of the call-addressing information to be signalled to the network, or modifiers used to control the signalling process (collectively known as a "dial string"), up to a semicolon character or the end of the command line. The DCE dials the voice number to complete the call, returns to the on-line command state, and sends an **OK** final result code. Any characters appearing in the dial string that the DCE does not recognise as a valid part of the call addressing information or as a valid modifier is ignored. This permits characters such as parentheses and hyphens, that are typically used in formatting of telephone numbers, to be included.
Execution command:	ATD<dial_string>;
Parameter:	
<dial_string>:	Valid characters: '0-9, #'
Possible responses:	
NO DIALTONE	The line is busy.
ERROR	If ATD is unsuccessfully executed by the phone.
NO CARRIER	The mobile phone is not registered.

ATL	Monitor Speaker Loudness
Description:	This command controls the volume of the monitor speaker.
Set command:	ATL=[<value>]
Read command:	ATL? Displays the current <value> setting.

Test command: ATL=? Shows if the command is supported.

Test command response: L: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	-14 dB (minimum speaker volume)
1	-10.5 dB
2	-7 dB
3	-3.5 dB
4	0 dB (nominal speaker volume)
5	3.5 dB
6	7 dB
7	10.5 dB
8	14 dB (maximum speaker volume)

Example:

```
ATL=2
OK

ATL?
L: 2
OK

ATL=?
L: (0-8)
OK
```

AT+CFUN Set Phone Functionality

Description: Selects the level of functionality in the phone. Sets the power status to either ON or OFF.

Set command: AT+CFUN=<fun>

Read command: AT+CFUN? Displays the current <fun> setting.

Test command: AT+CFUN=? Shows if the command is supported.

Test command response: +CFUN: (list of supported <fun>s)

Parameter:

<fun>:

<fun>	Description
0	Minimum functionality; minimum power is drawn Default setting
1	Maximum functionality; maximum power is drawn

4.3 Ensemble C4: Interface Commands

4.3.1 Commands

ATS3 Command Line Termination Character

Description: Defines the character to be used as the line termination character. This is used both for detection of an end-of-command and in formatting of responses.

Set command: ATS3=<value>

Read command: ATS3? Displays the current <value> setting.

Test command: ATS3=? Shows if the command is supported.

Test command response: S3: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-127	Command line termination character
13	Command line termination character = <CR> Default setting.

ATS4 Response Formatting Character

Description: Defines the character to be used as the response formatting character.

Set command: ATS4=<value>

Read command: ATS4? Displays the current <value> setting.

Test command: ATS4=? Shows if the command is supported.

Test command response: S4: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-127	Command line termination character
10	Formatting character = <LF> Default setting

ATS5 Command-Line Editing Character

Description: Defines the character to be used as the command-line editing character.

Set command: ATS5=<value>

Read command: ATS5? Displays the current <value> setting.

Test command: ATS5=? Shows if the command is supported.

Test command response: S5: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-127	Command line termination character
8	Default setting

ATE Command Echo

Description: Determines if the DCE echoes characters received from the DTE during command state and on-line command state.

Set command: ATE[<value>]

Read command: ATE? Displays the current <value> setting.

Test command: ATE=? Shows if the command is supported.

Test command response: E: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	DCE does not echo characters during command state and on-line command state
1	DCE echoes characters during command state and on-line command state Default setting

ATQ Result Code Suppression

Description: Determines if the DCE transmits result codes to the DTE.

Set command: ATQ[=]<value>

Read command: ATQ? Displays the current <value> setting.

Read command response: Q: <value>

Test command: ATQ=? Shows if the command is supported.

Test command response: Q: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	DCE transmits result codes Default setting
1	Result codes are suppressed and not transmitted

ATV DCE Response Mode

Description: Selects either verbose or numeric response codes.

Set command: ATV[=]<value>

Read command: ATV? Displays the current <value> setting.

Read command response: V: <value>

Test command: ATV=? Shows if the command is supported.

Test command response: V: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Display numeric result code
1	Display verbose result code Default setting

Result code (ATV1)	Result code (ATV0)	Description
OK	0	Acknowledges execution of a command
CONNECT	1	A connection has been established; the DCE is moving from command state to on-line data state
RING	2	The DCE has detected an incoming call from the network
NO CARRIER	3	The connection has been terminated, or the attempt establish a connection failed
ERROR	4	Command not recognized, command line maximum length exceeded, parameter value invalid, or other problem with processing the command line
NO DIALTONE	6	No dial tone detected
BUSY	7	Engaged (busy) signal detected
NO ANSWER	8	“@” (Wait for Quiet Answer) dial modifier was used, but remote ringing followed by five seconds of silence was not detected before expiration of the connection timer

4.4 Ensemble C9: Mode Management

4.4.1 Commands

AT+WS46	Mode Selection

Description: Allows an accessory to query and control the cellular-protocol mode of a multi-mode phone. The setting remains in effect until another AT+WS=<setting> command is issued, the phone is reset, a call is terminated, or the phone itself makes a mode change.

Set command: AT+WS46=<select>

Read command: AT+WS46? Displays the current <value> setting.

Test command: AT+WS46=? Shows if the command is supported.

Test command response: WS46: (list of supported <select>s)

Parameter:

<select>:

<select>	Description
12	GSM Digital Cellular
240	Charge-only mode; indicates that no wireless stack is active The phone is connected to a charger

4.5 Ensemble C20: Audio Control

4.5.1 Commands

AT*EALR	Audio Line Request

Description: The AT*EALR command is used by accessories to request the ATMS and AFMS. This command enables the unsolicited result code *EALV.

Set command: AT*EALR=<mode>[,<activation>[,<aud_status>]]

Read command: AT*EALR? Displays the current <mode>, <activation>, and <resp> settings.

Test command: AT*EALR=? Shows if the command is supported.

Test command response: (list of supported <mode>s, <activation>s, and <aud_status>s)

Parameters:

<mode>:

<mode>	Description
0	No request of ATMS nor AFMS
1	Request of ATMS and no request of AFMS

<mode>	Description
2	No request of ATMS and request of AFMS
3	Request of ATMS and AFMS Default setting

<activation>: Used to indicate if the accessory wants to be activated directly or not. Direct-activated means that the accessory immediately gets access to the audio lines if a call is established from the phone. If the accessory does not request direct activation, it has to indicate to the phone when it wants to get access to the audio lines.

<activation>	Description
0	Not direct-activated audio accessory, for example a Cordless Portable Handsfree Default setting
1	Direct-activated audio accessory, for example a Vehicle Handsfree

<aud_status>: Used to demand the audio lines and the call, or hand over the audio lines and the call to the phone.

<aud_status>	Description
0	No change of the audio status Default setting
1	Audio Handover; the accessory hands over control of both the audio lines and the call to the phone
2	Audio Demand; the accessory demands control of both the audio lines and the call

<resp>: See *EMIV.

Example:

```
AT*EALR=0,0,1
*EALR: 0,0,1
OK

AT*EALR?
*EALR: 0,0,1
OK

AT*EALR=?
*EALR: (0-3),(0-1),(0-2)
OK
```

AT*EARS Analog Ring Signal (AFMS) Request

Description: This command is used to enable an analog ring signal, as an indication of an incoming call, in an external loudspeaker.

Set command: AT*EARS=<mode>

Read command: AT*EARS? Displays the current <mode> setting.

Test command: AT*EARS=? Shows if the command is supported.

Test command response: *EARS: (list of supported <mode>s)

Parameter:

<mode>: Activates and deactivates the service.

<mode>	Description
0	Disable analog ring signal Default setting
1	Enable ring signal

Example:

```
AT*EARS=0
OK

AT*EARS?
*EARS: 0
OK

AT*EARS=?
*EARS: (0-1)
OK
```

AT*EMIR Music Mute Indication Request

Description: This command is used to request music mute indications. A music mute indication is sent to all accessories that have requested the indication when a call is set up. After the call has been disconnected, a new music mute indication, *EMIV, with the <resp> parameter set to zero is sent.

Set command: AT*EMIR=<mode>

Read command: AT*EMIR? Displays the current <mode> and <resp> settings.

Test command: AT*EMIR=? Shows if the command is supported.

Test command response: *EMIR: (list of supported <mode>s)

Parameters:

<mode>:

<mode>	Description
0	Off; Music Mute Indication result codes will not be sent to the accessory
1	On; Music Mute Indication result codes will be sent to the accessory Default setting

<resp>:

<resp>	Description
0	Music Mute inactive
1	Music Mute active

4.5.2 Unsolicited Result Codes

*EALV Audio Line Response

Description: This unsolicited result code is sent to the accessory when the phone wants that accessory to change audio state. This response is enabled by using AT*EALR.

Unsolicited result code: AT*EALV: <mode>,<activation>,<resp>

Parameters:

<mode>: See AT*EALR.

<activation>: See AT*EALR.

<resp>:

<resp>	Description
0	Disable ATMS and AFMS
1	Enable ATMS and disable AFMS
2	Disable ATMS and enable AFMS
3	Enable ATMS and AFMS

*EMIV Music Mute Indication response

Description: This music mute indication is sent out from the phone every time a parameter change occurs. The response is enabled by using AT*EMIR.

Unsolicited result code: AT*EMIV: <resp>

Parameter:

<resp>:

<resp>	Description
0	Music Mute inactive
1	Music Mute active

4.5.3 Use Scenarios

Handle Access to the Audio Lines

This scenario shows an example of how the access to the audio lines can be handled.
It includes:

- Request to access the audio lines
- Current settings query
- Unsolicited responses to the change of access to audio lines
- Audio line demand

AT command	Response	Comment
AT*EALR=3,1		Audio accessory requests ATMS and AFMS and indicates that the accessory wants to be activated directly if a call is established by the phone
	OK	

AT command	Response	Comment
AT*EALR?		Query the current settings
	*EALR: 3,1,0 OK	Phone responds with the current settings (Note: The last parameter indicates that the audio is either disabled or routed elsewhere)
		Call answered by using the 'Yes' button on the phone
	*EALV: 3,1,3	The audio accessory gets control of the audio lines
	...	Another audio accessory demands the audio lines
	*EALV: 3,1,0	The accessory is no longer allowed to use the audio lines
AT*EALR=3,1,2		The accessory demands the audio lines
	*EALV: 3,1,3	The accessory gets control of the audio lines
		The call is disconnected
	*EALV: 3,1,0	The accessory is no longer allowed to use the audio lines

Handle the Music Mute Service

This scenario shows an example of how the music mute service can be handled.
It includes:

- Request of the music mute service
- Query current settings
- Indication of music mute on/off

AT command	Response	Comment
AT*EMIR=1		Enable the music mute service
	OK	
AT*EMIR?		Query the current settings
	*EMIR: 1,0 OK	Phone responds with the current settings (Note: The last parameter indicates that the music mute is inactive)
		A call is established
	*EMIV: 1	Accessory mutes the car stereo
		The call disconnected
	*EMIV: 0	Accessory deactivates the mute of the car stereo

4.6 Ensemble C22: Accessory Authentication

4.6.1 Commands

AT+CSCC Secure Control Command

Description: This command is used for authentication of accessories.

Set command: AT+CSCC=<mode>,<cmd_set>[,<token>]

Set command response: +CSCC: <challenge>

Read command: AT+CSCC? Displays the current <mode>, <cmd_set>, and <token> settings.
Note: If the set command has not been executed before the read command is executed, the read command returns "OK"

Test command: AT+CSCC=? Shows if the command is supported.

Test command response: +CSCC: (list of supported <mode>s, and <cmd_set>)

Parameters:

<mode>:

<mode>	Description
1	Request challenge token to enable access to specified command set (<token> not used>)
2	Enable access to specified command set (<token> required)

<cmd_set>:

<cmd_set>	Description
0-127	Reserved by ETSI
128-198	Reserved for future use
199	Command set for Ericsson accessories for 3 volt platform
200-255	Reserved for future use

<token>: 1-byte IRA string. 1-byte token from the authentication algorithm.

<challenge>: 1 byte to be converted into a token by the authentication algorithm.

4.6.2 Use scenarios

Accessory Authentication

This use scenario consist of the following parts:

- The accessory requests a challenge token for command set '199'. (Ericsson accessories command set).
- The phone returns the challenge parameter.
- The accessory inputs challenge parameter to authentication algorithm and gets token.
- Accessory enables command set '199' with the calculated token.
- Phone compares the received token with calculated and responds `OK` if they are equal, or `ERROR` if they are not equal.

AT command	Response	Comment
`AT+CSCC=1,199`		Step 1
	`+CSCC: E3` `OK`	Step 2
`AT+CSCC=2,199,B9`		Step 3
	`OK`	Step 4

4.7 Ensemble C24: Voice Call Control

4.7.1 Commands

AT*EVA Answer Incoming Call

Description: Signals the phone to answer a call. The command is followed by a final result code such as `OK` or `ERROR` and the command state is entered.

Execution command: AT*EVA

AT*EVD Voice Dial Command

Description: Instructs the phone to dial a voice call.

Execution command: AT*EVD=[<dial_string>]

Parameter:

<dial_string>: Valid characters: '0-9 * # +'

AT*EVH Voice Hook Command

Description: Instructs the phone to terminate an active call.

Execution command: AT*EVH

4.7.2 Unsolicited result codes

RING	RING Incoming Call Indication

Description: Indication to the phone that there is an incoming call.

Unsolicited result code: RING

4.8 Ensemble C26: Accessory Identification

4.8.1 Commands

AT*EACS	Accessory Status

Description: Identifies an accessory, reports accessory status, and requests a unique identifier.

Set command: AT*EACS=<accessory_id>,<status_value>[,<unique_id>]

Set command response: *EACS: <unique_id>

Read command: AT*EACS? Displays the current device settings.

Read command response: *EACS: <accessory_id1>,<status_value1>,<unique_id1>
[*EACS: <accessory_id2>,<status_value2>,<unique_id2>
...]]

Test command: AT*EACS=? Shows if the command is supported.

Test command response: *EACS: (list of supported <accessory_id>s),(list of corresponding status_value>s)

Parameters:

<accessory_id>:

<accessory_id>	Description
1	Portable handsfree; presented in ME as PORTABLE_HF_TXT
2	Vehicle handsfree; presented in the ME as VEHICLE_HF_TXT
3	RS232 cord; presented in ME as DATA_CABLE_TXT
4	IR device; presented in ME as INFRARED_MODEM_TXT
6	Charger (intelligent); presented in ME as DESKTOP_CHARGER_TXT+<nr>
7	Charger (simple); presented in ME as TRAVEL_CHARGER_TXT
8	Reserved for MC-link
12	External handset; presented in ME as EXTERNAL_HANDSET_TXT
13	Internal IR device
15	Audio player
50	Chatboard

<accessory_id>	Description
16-255	Reserved for future accessories; presented in ME as ACCESSORY_TYPE_TXT+<accessory_id>

<status_value>: Integer type; Status values specific for each accessory.

<status_value>	Description
<connected_status>	Portable HF status
<connected_status>	Vehicle HF status
<connected_status>	RS232 cord status
<ir_status>	IR status
<connected_status>	Desktop charger status
<connected_status>	Travel charger status
<connected_status>	External handset status
<connected_status>	Accessory status used for all accessories unknown to the phone (<accessory_id>=13-255)

<connected_status>:

<connected_status>	Description
0	The device is not working
1	The device is connected and working

<ir_status>:

<ir_status>	Description
0	The device is not working
1	The device is connected and working
2	The device is connected and working, and is searching for other IrDA devices
4	The device is connected and working, and is engaged in an IrDA connection
5	The device is connected and working, and is engaged in an IrDA connection, but the IrDA beam is obstructed

<unique_id>:

<unique_id>	Description
0	Request a new unique identifier from the phone
1-65534	Unique identifier for a unique accessory
65535	Default value used by non-unique accessories

AT*EINA System Interface Active

Description: Returns the active interface (the interface currently used for communication).

Execution command: AT*EINA

Execution command response: *EINA: <interface>

Test command: AT*EINA=? Shows if the command is supported.

Test command response: *EINA: (list of supported <interface>s)

Parameter:

<interface>:

<interface>	Description
1	System connector
2	IR
3	MC link

Example:

```
AT*EINA
*EINA: 1
OK

AT*EINA=?
EINA: (1-3)
OK
```

4.9 Ensemble C31: Customized Menu

4.9.1 Commands

AT*EMLR Menu List Read

Description: Lists the menu items in the menu list.

Execution command: AT*EMLR

Execution command response: *EMLR: <index_1>,<name_1><CR><LF>
[*EMLR: <index_2>,<name_2><CR><LF>
[...]]

Test command: AT*EMLR=? Shows if the command is supported.

Parameters:

<index>: Integer; the position of a menu item in the menu list.

<name>: String; menu item name.

AT*ECMW Customized Menu Write

Description:	Puts a menu item, specified by <index>, from the menu list into the customized menu in the position given by <pos>. The item on this position and items below this position will be shifted down one step. If the parameter <pos> is not given, the item will be placed in the first empty space in the customized menu list.
Set command:	AT*ECMW=[<pos>,]<index> Adds the item to the customized menu list. AT*ECMW=<pos> Deletes an item from the customized menu.
Read command:	AT*ECMW? Lists the customized menu.
Read command response:	*ECMW: <pos_1>,<index_1><CR><LF> [*ECMW: <pos_2>,<index_2><CR><LF> [...]]
Test command:	AT*ECMW=? Shows if the command is supported.
Test command response:	*ECMW: (list of supported <pos>s and <index>s)
Parameters:	
<index>:	Integer; the position of a menu item in the menu list.
<pos>:	Integer; the position in the customized menu.

4.9.2 Use scenarios

Put a menu item into the customized menu

AT command	Response	Comment
AT*EMLR		List the items in the list
	*EMLR: 1,"Ring Type" *EMLR: 2,"Edit Melody" *EMLR: 3,"Mail Alert" *EMLR: 4,"Lock" OK	
AT*ECMW?		List the items in the customized menu
	*ECMW: 1,2 *ECMW: 2,4	"Edit Melody" and "Lock" are in the customized menu
AT*ECMW=2,3		Put a menu item into position 3 in the customized menu
	OK	
AT*ECMW?		List the items in the customized menu
	*ECMW: 1,2 *ECMW: 2,3 *ECMW: 3,4	"Mail Alert" has been added to the list

Delete an item in the customized menu

AT command	Response	Comment
AT*ECMW?		List the items in the customized menu
	*ECMW: 1,2 *ECMW: 2,3 *ECMW: 3,4	
AT*ECMW=2		Delete item 2 in the customized menu
	OK	
AT*ECMW?		List the items in the customized menu
	*ECMW: 1,2 *ECMW: 2,4	

4.10 Ensemble S1: GSM DTE-DCE Interface

4.10.1 Commands

AT+CSCS Select TE Character Set

Description: Informs the TA about the character set being used by the TE.

Set command: AT+CSCS=<chset>

Read command: AT+CSCS? Displays the current <chset> setting.

Test command: AT+CSCS=? Shows if the command is supported.

Test command response: +CSCS: (list of supported <chset>s)

Parameter:

<chset>:

<chset>	Description
"GSM"	GSM default alphabet. Can cause software flow-control problems Default setting
"IRA"	International Reference Alphabet (ITU-T T.50)
"8859-n"	ISO 5589 Latin n (n=1-6) character set
"ERICSSON"	International character set in the phone; may differ between different phones
"UTF-8"	Universal Text Format, 8 bits

4.11 Ensemble S2: GSM Call Control

4.11.1 Commands

AT+CMOD Call Mode

Description: Selects the call mode for future dialling commands or for the next answering command.

Set command: AT+CMOD=<mode>

Read command: AT+CMOD? Displays the current <mode> setting.

Test command: AT+CMOD=? Shows if the command is supported.

Test command response: +CMOD: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Single mode Default setting
1	Alternating voice/fax
4-127	Reserved

AT+CHUP Hang Up Call

Description: Request hang-up.

Execution command: AT+CHUP

Test command: AT+CHUP=? Shows if the command is supported.

AT+CRC Cellular Result Codes

Description: Decides if the extended format of incoming call indication is used or not. When enabled, an incoming call is indicated by the unsolicited result code +CRING instead of the normal unsolicited result code RING.

Set command: AT+CRC=[<mode>]

Read command: AT+CRC? Displays the current <mode> setting.

Test command: AT+CRC=? Shows if the command is supported.

Test command response: +CMOD: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Disables extended format Default setting
1	Enables extended format

AT+VTS DTMF and Tone Generation

Description: Allows the transmission of DTMF tones. The command is write-only.
Note: The command is used only during voice calls.

Set command: AT+VTS=<DTMF>

Test command: AT+VTS=? Shows if the command is supported.

Parameter:

<DTMF>: A character string with entries in the set '0-9, #, *, A-D' separated by commas. The string '8,9' sends two DTMF tones, '8' and '9'.

4.11.2 Unsolicited result codes

+CRING Call Mode Indication

Description: When enabled by using AT+CMOD, an incoming call is indicated with +CRING instead of +RING.

Unsolicited result code:+CRING: <type>

Parameter:

<type>:

<type>	Description
ASYNC	Asynchronous transparent
SYNC	Synchronous transparent
REL ASYNC	Asynchronous non-transparent
FAX	Facsimile
VOICE	Normal voice
VOICE/XXX	Voice followed by data ('XXX' is SYNC, ASYNC, REL ASYNC, or REL SYNC)
ALT VOICE/XXX	Alternating voice/data; voice first
ALT XXX/VOICE	Alternating voice/data; data first
ALT VOICE/FAX	Alternating voice/fax; voice first
ALT FAX/VOICE	Alternating voice/fax; fax first

4.11.3 Use scenarios

Mode Change and Call Hang-up

This scenario shows the following steps:

- Set call mode to voice/data
- Enable cellular result code indication
- Switch from voice to fax and answer fax call
- Hang up fax call

AT command	Response	Phone mode	Comment
AT+CMOD?			
	+CMOD: 0 OK		Single mode enabled
AT+CMOD=1			Change to alternating voice/ fax
	OK		
AT+CRC=1			Extended format enabled
	OK		
	+CRING: ALT VOICE/FAX	Voice call	Voice call followed by fax call indication
ATA		Voice call	Switch to fax call
AT+CHUP		Fax call	Hang up fax call
	OK		

4.12 Ensemble S3: GSM Data/Fax

4.12.1 Commands

AT+CBST Select Bearer Service Type

Description: Selects the bearer service <name> with the data rate <speed>, and the connection element <ce> to be used when data calls are made. Values may also be used during mobile-terminated data-call setup, especially in the case of single numbering-scheme calls.

Set command: AT+CBST=[<speed>[,<name>[,<ce>]]]

Read command: AT+CBST? Displays the current <speed>, <name>, and <ce> settings.

Test command: AT+CBST=? Shows if the command is supported.

Test command response: +CBST: (list of supported <speed>s, <name>s, and <ce>s)

Parameters:

<speed>:

<speed>	Description
0	Automatic selection of baud setting Default setting
4	2400 bits/s V.22bis
6	4800 bits/s V.32
7	9600 bits/s V.32
12	9600 bits/s V.34
14	14000 bits/s V.34
15	19200 bits/s V.34
16	28800 bits/s V.34
68	2400 bits/s V.110 (ISDN)
70	4800 bits/s V.110 (ISDN)
71	9600 bits/s V.110 (ISDN)
75	14400 bits/s V.110 (ISDN)
79	19200 bits/s V.110 (ISDN)
80	28800 bits/s V.110 (ISDN)
81	38400 bits/s V.110 (ISDN)
82	48000 bits/s V.110 (ISDN)
83	56000 bits/s V.110 (ISDN)

<name>:

<name>	Description
0	Asynchronous connection (UDI or 3.1 kHz modem) Default setting

<ce>:

<ce>	Description
1	Non-transparent Default setting

4.13 Ensemble S5: GSM HSCSD

4.13.1 Commands

AT+CHSD	HSCSD Device Parameters

Description: Shows HSCSD features supported by the ME/TA.

Execution command: AT+CHSD

Execution command response: +CHSD: <mclass>,<maxRx>,<maxTx>,<sum>,<codings>

Test command: AT+CHSD=? Shows if the command is supported.

Parameters:

<mclass>:

<mclass>	Description
2	Multi slot class is '2' Default setting

<maxRx>:

<maxRx>	Description
2	Maximum number of receive time slots that the ME can use Default setting

<maxTx>:

<maxTx>	Description
1	Maximum number of time slots that the ME can use Default setting

<sum>:

<sum>	Description
3	Total number of send and receive time slots that the ME can use The following applies in an HSCSD call: (receive slots)+(transmit slots) may not equal less than 2, and not more that <sum>

<codings>:

<codings>	Description
4	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 9600 bits/s only
8	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 14000 bits/s only
12	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is both 9600 bits/s and 14000 bits/s

AT+CHSN HSCSD Non-transparent Call Configuration

Description: Set HSCSD configuration. This command is also used during a call if a new <wAiur> and/or <wRx> are/is desired.

Set command: AT+CHSN=[<wAiur>[,<wRx>[,<topRx>[,<codings>]]]]

Read command: AT+CHSN? Displays the current <wAiur>, <wRx>, <topRx>, and <codings> settings.

Test command: AT+CHSN=? Shows if the command is supported.

Test command response: +CHSN: (list of supported <wAiur>s, <wRx>s, <topRx>s, and <codings>s)

Parameters:

<wAiur>:

<wAiur>	Description
0	TA/ME calculates a proper number of receive time slots from the currently selected fixed-network user rate See note below Default setting
1	Wanted air-interface user rate is 9600 bits/s
2	Wanted air-interface user rate is 14400 bits/s
3	Wanted air-interface user rate is 19200 bits/s
4	Wanted air-interface user rate is 28800 bits/s

<wRx>:

<wRx>	Description
0	TA/ME calculates a proper number of receive time slots from currently selected <wAiur> and <codings> See note below
1	Wanted number of time slots is 1 Default setting
2	Wanted number of time slots is 2

Note: If the <wAiur> and <wRx> are both set to '0', the number of receive time slots is calculated from <speed> and <codings>. Furthermore, if <speed> is '0', the number of receive time slots is mapped from <maxRx>.

<topRx>:

<topRx>	Description
0	The user is not going to change <wAiur> and/or <wRx> during the next call
1	'1' is the top <wRx> value that the user is going to request during the next established non-transparent HSCSD call
2	'2' is the top <wRx> value that the user is going to request during the next established non-transparent HSCSD call Default setting

<codings>:

<codings>	Description
4	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 9600 bits/s only
8	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 14000 bits/s only
12	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is both 9600 bits/s and 14000 bits/s

AT+CHSC HSCSD Current Call Parameters

Description: Shows current HSCSD call parameter settings.

Execution command: AT+CHSC

Execution command response: +CHSC: <rx>,<tx>,<aiur>,<coding>

Test command: AT+CHSC=? Shows if the command is supported.

Parameters:

<rx>:

<rx>	Description
0	No HSCSD call is active; see note below
1	One receive time slot is currently in use
2	Two receive time slots are currently in use

<tx>:

<tx>	Description
0	No HSCSD call is active; see note below
1	One transmit time slot is currently in use

<aiur>:

<aiur>	Description
0	No HSCSD call is active; see note below
1	Current air-interface user rate is 9600 bits/s
2	Current air-interface user rate is 14400 bits/s
3	Current air-interface user rate is 19200 bits/s
4	Current air-interface user rate is 28800 bits/s

<coding>:

<coding>	Description
0	No HSCSD call is active; see note below
4	Current channel coding is 9600 bits/s
1	Current channel coding is 14400 bits/s

Note: The value ‘0’ only applies when no HSCSD call is active. In such case, all parameter values will be ‘0’.

4.14 Ensemble S6: GSM Network Services

4.14.1 Commands

AT+CNUM Subscriber Number

Description: The command requests the subscriber number.

Execution command: AT+CNUM

Execution command response: +CNUM: [<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]]<CR><LF>
[+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>[,<itc>]]<CR><LF>
[...]]

Test command: AT+CNUM=? Shows if the command is supported.

Parameters:

<alpha*x*>: Alphanumeric string. Associated with <number*x*>. The character set used is selected with AT+CSCS.

<number*x*>: String; phone number of format specified by <type*x*>.

<type*x*>: String; type of address.

<speed>: Integer; data rate.

<service>:

<service>	Description
0	Asynchronous modem
4	Voice
5	Fax

<itc>:

<itc>	Description
0	3.1 kHz
1	UDI

AT+CREG Network Registration

Description: Controls the presentation of the unsolicited result code +CREG.

Set command: AT+CREG=[<n>]

Read command: AT+CREG? Displays the current <n> and <stat> settings.

Test command: AT+CREG=? Shows if the command is supported.

Test command response: +CREG: (list of supported <n>s)

Parameters:

<n>:

<n>	Description
0	Disable network registration unsolicited result code Default setting
1	Enable network registration unsolicited result code

<stat>: Shows the availability status for the operator.

<stat>	Description
0	Not registered The ME is currently not searching for a new operator to register to
1	Registered; home network
2	Not registered The ME is currently searching for a new operator to register to
3	Registration denied
4	Unknown
5	Registered; roaming

AT+COPS Operator Selection

Description: Forces an attempt to select and register the GSM network operator.

Set command: AT+COPS=[<mode>[,<format>[,<oper>]]]

Read command: AT+COPS? Displays the current <mode>[, <format>, and <oper>] setting(s).

Test command: AT+COPS=? Shows if the command is supported.

Test command response: +COPS: (list of supported <stat>s, long alphanumeric <oper>s, short alphanumeric <oper>s, and numeric <oper>s)

Parameters:

<mode>: Selects whether the registration is done automatically by the ME or is forced by this command to operator <oper>.

<mode>	Description
0	Automatic (<oper> field ignored) Default setting
1	Manual (<oper> field used)
3	Set only <format> Do not attempt registration/de-registration This value is not applicable in read command response
4	Manual/automatic If manual selection fails, automatic mode is chosen

<format>:

<format>	Description
0	Automatic (<oper> field ignored) Default setting
1	Short-format (8 characters) alphanumeric <oper>
2	Numeric <oper>

<oper>: String; format determined by the <format> setting.

<stat>: Shows the availability status for the operator.

<stat>	Description
0	Operator unknown
1	Operator available
2	Operator is currently selected
3	Operator forbidden

Example:

```
AT+COPS=?
+COPS: (2,"Telia Mobilel","Mobitel","12345")
+COPS: (3,"Europolitan","Euro","23456")
OK
```

Two operator networks have been found. Telia Mobitel is currently selected and Europolitan is forbidden.

AT+CLIP Calling Line Identification

Description: Requests calling line identification. Determines if the +CLIP unsolicited result code is activated.

Set command: AT+CLIP=<n>

Read command: AT+CLIP? Displays the current <n> and <m> settings.

Test command: AT+CLIP=? Shows if the command is supported.

Test command response: +CLIP: (list of supported <n>s)

Parameters:

<n>:

<n>	Description
0	Unsolicited result code disabled Default setting
1	Unsolicited result code enabled

<m>:

<m>	Description
0	CLIP not provisioned
1	CLIP provisioned
2	Unknown

AT+CLIR Calling Line Identification Restriction

Description: Requests calling line identification restriction.

Set command: AT+CLIR=[<n>]

Read command: AT+CLIR? Displays the current <n> and <m> settings.

Test command: AT+CLIR=? Shows if the command is supported.

Test command response: +CLIR: (list of supported <n>s)

Parameters:

<n>:

<n>	Description
0	Presentation is used according to the subscription to the CLIR service Default setting
1	CLIR invocation
2	CLIR suppression

<m>:

<m>	Description
0	CLIP not provisioned
1	CLIR provisioned in permanent mode
2	Unknown
3	CLIR temporary mode presentation restricted
4	CLIR temporary mode presentation allowed

AT+CCFC Calling Forwarding Number and Conditions

Description: Sets the call-forwarding number and conditions. Registration, erasure, activation, deactivation and status query operations are supported.

Set command: AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class*x*>]]]

Test command: AT+CCFC=? Shows if the command is supported.

Test command response: +CCFC: (list of supported <reason>s)

Parameters:

<reason>:

<reason>	Description
0	Unconditional
1	Mobile phone busy
2	No reply
3	Not reachable
4	All calls are forwarded
5	All conditional calls are forwarded

<mode>:

<mode>	Description
0	Disable
1	Enable
2	Query status
3	Registration
4	Erasure

<number>: String-type phone number of forwarding address. Format specified by <format>.

<type>: Integer; type of address octet.

<class*x*>: Sum of integers; each representing a class of information.

<class*x*>	Description
1	Voice L1
2	Data
4	Fax
128	Voice L2

Response when <mode>=2:

+CCFC: <status>,<class1>[,<number>,<type>]
[+CCFC: <status>,<class2>[,<number>,<type>]
[...]]

<status>:

<status>	Description
0	Not active
1	Active

AT+CCWA Calling Waiting

Description: Allows control of the Call Waiting supplementary service. Enables or disables the +CCWA unsolicited result code.

Set command: AT+CCWA=[<n>,[<mode>[,<class*x*>]]]

Test command: AT+CCWA=? Shows if the command is supported.

Test command response: +CCWA: (list of supported <n>s)

Parameters:

<n>:

<n>	Description
0	Disables the unsolicited result code Default setting
1	Enables the unsolicited result code

<mode>:

<mode>	Description
0	Disable
1	Enable

<mode>	Description
2	Query status

<class*x*>:

<class*x*>	Description
1	Voice L1
2	Data
4	Fax
128	Voice L2

Response when <mode>=2:

+CCWA: <status>,<class1>
[+CCWA: <status>,<class2>
[...]]

<status>:

<status>	Description
0	Not active
1	Active

AT+CHLD Call Hold and Multiparty

Description: Request call-related supplementary services. Refers to a service that allows a call to be temporarily disconnected from the ME but the connection to be retained by the network, and to a service that allows multiparty conversation. Calls can be put on hold, recovered, released and added to a conversation.

Set command: AT+CHLD=<n>

Test command: AT+CHLD=? Shows if the command is supported.

Parameter:

<n>:

<n>	Description
0	Releases all held calls, or sets User-Determined User Busy for a waiting call
1	Releases all active calls and accepts the other (waiting or held) call
1X	Releases the specific active call X
2	Places all active calls on hold and accepts the other (held or waiting) call
2X	Places all active calls, except call X, on hold
3	Adds a held call to the conversation
4	Connects two calls and disconnects the subscriber from both calls

AT+CSSN Supplementary Service Notification

Description: Determines if the +CSSU and +CSSI unsolicited result codes are enabled.

Set command: AT+CSSN=[<n>[,<m>]]

Read command: AT+CSSN? Displays the current <n> and <m> settings.

Test command: AT+CSSN=? Shows if the command is supported.

Test command response: +CSSN: (list of supported <n>s and <m>s)

Parameters:

<n>:

<n>	Description
0	Disables the +CSSI result code presentation status in the TA Default setting
1	Enables the +CSSI result code presentation status in the TA

<m>:

<m>	Description
0	Disables the +CSSU result code presentation status in the TA Default setting
1	Enables the +CSSU result code presentation status in the TA.

AT+CAOC Advice of Charge

Description: Sets the current call meter value in hexadecimal format. Must be supported on the SIM card. Enables the +CCCM unsolicited result code reporting.

Execution command: AT+CAOC[=<mode>]

Read command: AT+CAOC Displays the current <mode> setting.

Test command: AT+CAOC=? Shows if the command is supported.

Test command response: +CAOC: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Query CCM value.
1	Deactivate the unsolicited reporting of CCM value
2	Activate the unsolicited reporting of CCM value

AT+CACM Accumulated Call Meter

Description: Resets the Advice-of-Charge related accumulated call meter value in the SIM file EFACM.

Set command: AT+CACM=[<passwd>]

Read command: AT+CACM? Displays the current <ccm> value.

Test command: AT+CACM=? Shows if the command is supported.

Parameters:

<passwd>: String; SIM-PIN2.

<ccm>: String; accumulated call meter value. Similarly coded as <ccm> in AT+CAOC.

AT+CAMM Accumulated Call Meter Maximum

Description: Sets the maximum Advice-of-Charge related accumulated call meter value in the SIM file $EFACM_{max}$.

Set command: AT+CACM=[<accmax>[,<passwd>]]

Read command: AT+CAMM? Displays the current <accmax> value.

Test command: AT+CAMM=? Shows if the command is supported.

Parameters:

<passwd>: String; SIM-PIN2.

<ccm>: String; accumulated call meter value. Similarly coded as <ccm> in AT+CAOC. The value '0' disables the ACMmax feature.

AT*EALS Request ALS Status

Description: Requests the phone to give the ALS (Alternate Line Services) status. If ALS is active, the user has two lines for voice calls.

Read command: AT*EALS

Test command: AT*EALS=? Shows if the command is supported.

Response: *EALS: <status>

Parameter:

<status>: String type; SIM-PIN2.

<status>	Description
0	ALS function not active
1	ALS function active

AT*ECSP Customer Service Profile

Description: Reads the Customer Service Profile (CSD) from the SIM. CSP indicates the services that are user accessible. Each of the services has a related bit within the CSP. The services are grouped into service groups, with a maximum of 8 services in a group. For each group, a bit mask indicates the services available (bit=1).

Read command: AT*ECSP=<service_group>

Read command response: *ECSP: <service_group>,<services>

Test command: AT*ECSP=? Shows if the command is supported.

Parameters:

<service_group>: Byte type; Service group code.

<services>: Bit mask (8 bits) indicating the services available.
bit='1': Service available.
bit='0': Service unavailable, or unused.

AT*ESLN Set Line Name

Description: Sets the name tag for a selected line

Set command: AT*ESLN=<line>[,<name>]

Read command: AT+ESLN? Returns the current <line> and <name> settings.

Test command: AT+ESLN=? Shows if the command is supported.

Test command response: +ESLN: (List of supported <line>s),<lname>

Parameters:

<line>:

<line>	Description
0	The two lines will use the default name tags "L1" and "L2" Default setting
1	Line 1
2	Line 2

<name>: Optional when <line>='0'.
Character string for name tag.

<lname> Maximum number of characters to use in <name> string.

AT*ELIN Set Line

Description: Sets the current <line>.

Set command: AT*ELIN=<line>

Read command: AT+ELIN? Returns the current <line> setting.

Test command: AT+ELIN=? Shows if the command is supported.

Test command response: +ELIN: (List of supported <line>s)

Parameter:

<line>:

<line>	Description
1	L1
2	L2

AT*EPNR Read SIM Preferred Network

Description: Reads $EFPLMN_{sel}$, the SIM-preferred list of networks.

Execution command: AT*EPNR=<format>[,<index1>[,<index2>]]
Returns entries in the range <index1> to <index2>. If <index2> is omitted, only location <index1> is returned. If both <index1> and <index2> are omitted, the whole list is presented.

Test command: AT*EPNR=? Shows if the command is supported.

Test command response: *EPNR: (List of supported <line>s and <format>s)

Parameters:

<format>:

<format>	Description
2	Numeric <oper> Default setting

<index1>: Start index (>0).

<index2> Integer; stop index (>0).

<oper>: String; indicates the operator code.

AT*EPNW Write SIM Preferred Network

Description: Writes/deletes entries in $EFPLMN_{sel}$, the SIM-preferred list of networks.

Execution command: AT*EPNW=[<index>][,<format>,<oper>]
If both <format> and <oper> fields are omitted, the entry will be deleted. If <index> is omitted, the <oper> will be put in the next free entry.
Note: The entered <oper> is compared to the <oper>s already in the list. If the <oper> is already in the list, no new entry is made, but "OK" is returned.

Test command: AT*EPNW=? Shows if the command is supported.

Test command response: *EPNW: (List of supported <index>s and <format>s)

Parameters:

<index>: Integer; index to entry in SIM-preferred list.

<format>:

<format>	Description
2	Numeric <oper> Default setting

<oper>: String indicating the operator code.

AT*ESCN Set Credit Card Number

Description: Used for setting up a credit card number in the ME, disabling credit card calls, enabling one of the credit card call services, querying the settings for one of the services, or querying the active credit call access server.

Set command: AT*ESCN=<mode>[,<passwd>][,<indexn>][,<asn>,<type>,<name>,<vercode>[,<sendorder>]]

Test command: AT*ESCN=? Shows if the command is supported.

Test command response: *ESCN: (List of supported <index>s, <mode>s, and <sendorder>s)

Parameters:

<mode>:

<mode>	Description
0	Settings for a credit card call (<passwd>, <indexn>, <asn>, <type>, <name>, <vercode>[, <sendorder>]) When mode='0', the <passwd>, <indexn>, <asn>, and <vercode> parameters must be supplied, else ERROR will be returned
1	Disable credit card calling (<passwd>) Any other parameters submitted are ignored
2	Enable one of the credit card calling services (<passwd>, <indexn>) Any other parameters submitted are ignored
3	Query (<passwd>, <indexn>) Any other parameters submitted are ignored Gives the response *ESCN: <indexn>,<asn>,<type>, <name>,<vercode>,<sendorder>
4	Query for the selected credit call access server. Any other parameters submitted are ignored Gives the response *ESCN: <selindexn>

<passwd>: Character string; phone lock code "PS".

<indexn>:

<indexn>	Description
1	Index number to the first credit card call-access server
2	Index number to the second credit card call-access server

<selindexn>:

<selindexn>	Description
0	Credit card calling disabled Default setting
1	Index number to the first credit card call-access server
2	Index number to the second credit card call-access server

<asn>: Character string; '0-9,+'. Maximum 20 characters. Phone number of type specified by <type>.

<type>: Integer; type of format.

<name>: Character string; name tag.

<vercode>: Character string; '0-9,#,*'. Maximum 20 characters.

<sendorder>:

<sendorder>	Description
1	Verification code first Default setting
2	Phone number first

AT+CPUC Price Per Unit and Currency Table

Description: Sets the parameters of Advice-of-Charge related price per unit and currency in SIM file EFPUCT. PUCT information can be used to convert the home units (as used in AT+CAOC, AT+CACM, and AT+CAMM) into currency units.

Set command: AT+CPUC=<currency>,<ppu>[,<passwd>]

Read command: AT+CPUC? Displays the current <currency> and <ppu> settings.

Test command: AT+CPUC=? Shows if the command is supported.

Parameters:

<currency>: String; alpha-identifier of the currency code.

<ppu>: String; price per unit. Dot is used as decimal separator.

<passwd>: String; SIM PIN2.

AT*ESVM Set Voice Mail Number

Description: Sets the voice mail server number.

Set command: AT*ESVM=<line>,<index>,<onoff>,[,<number>[,<type>]]

Read command: AT*ESVM? Displays the current parameter setting.

Read command response:
*ESVM: <line1>,<index1>,<onoff1>,<number1>,<type1><CR><LF>
*ESVM: <line1>,<index2>,<onoff2>,<number2>,<type2><CR><LF>
*ESVM: <line2>,<index1>,<onoff1>,<number1>,<type1><CR><LF>
*ESVM: <line2>,<index2>,<onoff2>,<number2>,<type2>

Test command: AT*ESVM=? Shows if the command is supported.

Test command response: *ESVM: (List of supported <line>s and <onoff>s),<nlength>,(list of supported <type>s)

Parameters:

<line>:

<mode>	Description
1	Line 1
2	Line 2

<index>:

<index>	Description
1	Home network voice mail number
2	Roaming voice mail number

<onoff>:

<onoff>	Description
1	Enable the voice mail number

<number>: Character string; '0-9,+'.

<nlength>: Maximum length of number string.

<type>: Integer; type of address octet.

<type>	Description
128-255	Valid values
129	ISDN / telephony numbering plan, national/international unknown Default setting
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number

AT*EDIF Divert Function

Description: This command enables and disables notification of divert status changes with the unsolicited result code *EDIF.

Set command: AT*EDIF=<onoff>

Read command: AT*EDIF? Displays the current <onoff> setting.

Test command: AT*EDIF=? Shows if the command is supported.

Test command response: *EDIF: (List of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	Disable notification with the unsolicited result code *EDIF
1	Enable notification with the unsolicited result code *EDIF

AT*EDIS Divert Set

Description: This command enables and disables the divert setting in the currently active profile. The command is also used to set the divert number for the profile. The command does not perform any call forwarding. To perform call forwarding, use AT+CCFC.

Set command: AT*EDIS=<onoff>[,<number>[,<type>]]

Read command: AT*EDIS? Displays the current <onoff>, <number>, and <type> settings.

Test command: AT*EDIS=? Shows if the command is supported.

Test command response: *EDIS: (List of supported <onoff>s, <number>s, and <type>s)

Parameters:

<onoff>:

<onoff>	Description
0	Disable unconditional divert for the profile
1	Enable unconditional divert for the profile

<number>: String; phone number of forwarding address. Format specified by <type>.

<type>: Integer; type of address octet.

<type>	Description
145	Default setting when dialling string includes the international access code character '+'
129	Default setting when dialling string does not include the international access code character '+'

AT*EIPS Identify Presentation Set

Description: Enables or disables the presentation of the alpha tag (first name and last name) of the caller ID and called ID to the TE if the ID is recognised. The presentation is performed by unsolicited result codes, *ELIP for caller ID and *EOLP for called ID.

Set command: AT*EIPS=<ID>,<alphatag_mode>

Read command: AT*EIPS? Displays the current parameter settings.

Read command response: *EIPS: <ID1>,<alphatag_mode1><CR><LF>
*EIPS: <ID2>,<alphatag_mode2>

Test command: AT*EIPS=? Shows if the command is supported.

Test command response: *EIPS: (List of supported <ID>s and <alphatag_mode>s)

Parameters:

<ID>:

<ID>	Description
1	Caller ID (*ELIP)
2	Called ID (*EOLP)

<alphatag_mode>:

<alphatag_mode>	Description
0	Off
1	First name and last name displayed

4.14.2 Unsolicited result codes

+ Network Registration

Description: Indicates there is a change in the ME network registration status. This result code is enabled by using AT+CREG.

Unsolicited result code:+CREG: <stat>

Parameter:

<stat>:

<stat>	Description
0	Not registered The ME is currently not searching for a new operator to register to
1	Registered; home network
2	Not registered The ME is currently searching for a new operator to register to
3	Registration denied
4	Unknown
5	Registered; roaming

+CLIP Calling Line Identification

Description: This result code is returned after every RING (or +CRING) result code sent from TAE to TE. This response is also sent when a normal voice call is answered. This result code is enabled by using AT+CLIP.

Unsolicited result code:+CLIP: <number>,<type>

Parameters:

<number>: String; phone number. Format specified by <type>.

<type>: Integer; type of address octet.

*ELIP Calling Line Alpha Tag

Description: This result code is returned after every RING (or +CRING) result code sent from TAE to TE. This response is also sent when a normal voice call is answered. This result code is enabled by using AT*EIPS.

Unsolicited result code:*ELIP: <alpha_tag>

Parameters:

<alpha_tag>: String; a text with the first name and last name of the caller ID.

*EOLP Connected Line Alpha Tag

Description: This result code is returned after every RING (or +CRING) result code sent from TAE to TE. This response is also sent when a normal voice call is answered. This result code is enabled by using AT*EIPS.

Unsolicited result code:*EOLP: <alpha_tag>

Parameter:

<alpha_tag>: String; a text with the first name and last name of the called ID.

+CCWA Call Waiting Notification

Description: This unsolicited result code displays the specifics concerning the call waiting supplementary service. This result code is enabled by using AT+CCWA.

Unsolicited result code:+CCWA: <number>,<type>,<class>

Parameters:

<number>: String; phone number. Format specified by <type>.

<type> Integer; type of address octet.

<class>: Integer; sum of integers, each representing a class of information.

<class>	Description
1	Voice L1
128	Voice L2

+CSSI Supplementary Service Notification

Description: Refers to supplementary service related network-initiated notifications. This unsolicited result code is sent when AT+CSSN <n>='1' and a supplementary service notification is received after a mobile-originated call setup.
This result code is enabled by using AT+CSSN.

Unsolicited result code:+CSSI: <code1>[,<cindex>]

Parameters:

<code1>:

<code1>	Description
0	Unconditional call forwarding is active
1	Some of the conditional call forwardings are active
2	A call has been forwarded
3	A call is waiting
5	Outgoing calls are barred
6	Incoming calls are barred
7	CLIR suppression rejected
8	This is a CUG call (<cindex> present)

<cindex>: Integer; CUG index. Range: 0-32767.

+CSSU Supplementary Service Notification

Description: Refers to supplementary-service related network-initiated notifications. This unsolicited result code is sent when AT+CSSN <m>='1' and a supplementary service notification is received during a mobile-originated call setup or during a call, or when a forward-check supplementary service notification is received.
This result code is enabled by using AT+CSSN.

Unsolicited result code:+CSSU: <code2>[,<cindex>]

Parameters:

<code2>:

<code2>	Description
0	This is a forwarded call
2	A call has been put on hold (during voice call)
3	A call has been retrieved (during voice call)
4	A multiparty call entered (during voice call)
5	The call on hold has been released (during voice call) (this is not an SS notification)
6	Forward check SS messages received (can be received whenever)
10	This is a CUG call (<cindex> present)

<cindex>: Integer; CUG index. Range: 0-32767.

+CCCM Advice of Charge Call Meter Notification

Description: This unsolicited result code is sent when the CCM value changes, but not more often than every 10 seconds. The result code is enabled by using AT+CAOC.

Unsolicited result code:+CCCM: <ccm>

Parameter:

<ccm>: String; hexadecimal form of three bytes of the current call meter value. The value is in home units and the bytes are coded similarly as the ACMmax value in the SIM.

*EDIF Divert Function

Description: This unsolicited result code is sent when the call forwarding information for the phone is changed. The result code is enabled by using AT*EDIF.

Unsolicited result code:*EDIF: <reason>,<status>,<classx>[,<number>[,<type>]]

Parameters:

<reason>:

<reason>	Description
0	Unconditional
1	Mobile phone busy
2	No reply

<reason>	Description
3	Not reachable

<status>:

<status>	Description
0	Disabled
1	Enabled; the phone is diverted for the <reason> above

<class*x*>:

<class*x*>	Description
1	Voice L1
2	Data
4	Fax
1-127	All other values below 128 are reserved by ETSI
128	Voice L2

<number>: String; phone number of forwarding address. Format specified by <type>.

<type>: Integer; type of address octet.

<type>	Description
145	Default setting when dialling string includes the international access code character '+'
129	Default setting when dialling string does not include the international access code character '+'

4.14.3 Use scenarios

Calling Line Identification

This use scenario performs the following steps:

- Enable calling line identification
- Receive calling line identity indication when receiving a mobile-terminated call
- Disable calling line identification

AT command	Response	Comment
AT+CLIP=1		Enable
	OK	
	+CRING: VOICE +CLIP: "0706123456", 129	After every CRING, the calling line identity is presented
		Reject call
AT+CLIP?		
	+CLIP: 1,1 OK	CLIP enabled and provisioned
AT+CLIP=0		Disable
	OK	

Call Hold and Multiparty

This use scenario uses the call hold functionality to switch between two calls.

AT command	Response	Comment
AT+CCWA=1,1		Activate call waiting
ATD046193000;	OK	Originate a voice call
	+CCWA: "+46706123456",145	Another call is waiting
AT+CHLD=2		Put first call on hold and answer the second call
	OK	
AT+CHLD		Release the second call and recover the first call
	OK	

4.15 Ensemble S7: GSM USSD

4.15.1 Commands

AT+CUSD Unstructured Supplementary Service Data

Description: Allows control of the Unstructured Supplementary Service Data (USSD). Both network- and mobile-initiated operations are supported.
This command is used to enable the unsolicited result code +CUSD.

Set command: AT+CUSD=[<n>[,<str>]]

Read command: AT+CUSD? Displays the current <n> setting.

Test command: AT+CUSD=? Shows if the command is supported.

Test command response: +CUSD: (list of supported <n>s)

Parameters:

<n>:

<n>	Description
0	Disable result code presentation Default setting
1	Enable result code presentation
2	Terminate USSD dialogue This value is not applicable to the read command response

<str>: String; USSD string.

4.15.2 Unsolicited result codes

+CUSD	CUSD Indication

Description: Indicates a network-initiated operation.
This command is enabled by using AT+CUSD.

Unsolicited result code: +CUSD: <m>[,<str>,<dcs>]

Parameters:

<m>:

<m>	Description
0	No further user action needed (Network-initiated USSD notify, or no further information needed after mobile-initiated operation)
1	Further user action needed (Network-initiated USSD request, or further information needed after mobile-initiated operation)
2	USSD dialogue terminated
3	Other I/O client has responded This result code is received if the network initiates a USSD dialogue and some other I/O client responds
4	Operation not supported
5	Network time out

<str>: String; USSD string.

<dcs>: Integer; Cell Broadcasting Data Coding Scheme.

4.16 Ensemble S8: GSM Facility Lock

4.16.1 Commands

AT+CLCK	Facility Lock

Description: The command is used to lock, unlock, or interrogate an ME or network facility <fac>. A password is normally needed to carry out such operations.

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

Set command response (When <mode>=2): +CLCK: <status>[,<class1>]<CR><LF>
[+CLCK: <status>[,<class2>]<CR><LF>
[...]]

Test command: AT+CLCK=? Shows if the command is supported.

Test command response: +CLCK: (list of supported <fac>s)

Parameters:

<fac>:

<fac>	Description
“CS”	CNTRL (lock control surface, for example the phone keyboard)
“PS”	PH-SIM (lock phone to SIM card) The ME asks for the password when other than current SIM card is inserted
“SC”	SIM (lock SIM card) The ME asks for the password when the ME is in power-up and when the lock command is issued
“P2”	SIM PIN2
“AO”	BAOC (Bar All Outgoing Calls)
“OI”	BOIC (Bar Outgoing International Calls)
“AI”	BAIC (Bar All Incoming Calls)
“IR”	BIC-Roam (Bar Incoming Calls when Roaming outside the home country)
“OX”	BOIC-exHC (Bar Outgoing International Calls except to Home Country)
“AB”	All-Barring service
“AG”	All outGoing barring services
“AC”	All inComing barring services

<mode>:

<mode>	Description
0	Unlock
1	Lock
2	Query status Gives the response +CLCK: <status>,<class1><CR><LF> [+CLCK: <status>,<class2><CR><LF> [...]]
10	Full lock (only valid for <fac>=”PS”; after power-on, always ask for password

<passwd>: String; the same as the password specified for the facility from the ME user interface or with AT+CPWD.

<class*x*>: Integer; sum of integers, each representing a class of information.

<class*x*>	Description
1	Voice L1
2	Data
4	Fax
8-127	Also all other values below 128 are reserved by ETSI
128	Voice L2

If no value is specified, all classes are included.

Note: “PS” and <mode>=1 correspond to Auto Lock

AT+CPWD Change Password

Description: Sets a new password for the facility lock function defined by the AT+CLCK command.

Set command: AT+CPWD=<fac>,<old_pwd>,<new_pwd>

Test command: AT+CPWD=? Shows if the command is supported.

Test command response: +CPWD: (list of supported <fac>s and <pwd_length>s)

Parameters:

<fac>:

<fac>	Description
"PS"	PH-SIM (lock phone to SIM card) The ME asks for the password when other than current SIM card is inserted
"SC"	SIM (lock SIM card) The ME asks for the password when the ME is in power-up and when the lock command is issued
"P2"	SIM PIN2
"AO"	BAOC (Bar All Outgoing Calls)
"OI"	BOIC (Bar Outgoing International Calls)
"AI"	BAIC (Bar All Incoming Calls)
"IR"	BIC-Roam (Bar Incoming Calls when Roaming outside the home country)
"OX"	BOIC-exHC (Bar Outgoing International Calls except to Home Country)
"AB"	All Barring service
"AG"	All outGoing barring services
"AC"	All inComing barring services

<old_pwd>: String; The same as password specified for the facility from the ME user interface or with command AT+CPWD.

<new_pwd>: String; The new password. The maximum length of the password can be defined with <pwd_length>.

<pwd_length>: Integer; the maximum length of the password for the facility.

4.16.2 Use scenarios

Phonelock Function

This scenario describes:

- PhoneLock status query
- Set lock
- Set auto lock
- Set full lock

AT command	Response	Comment
AT+CLCK="PS",2		Query status
	OK	
AT+CLCK="SC",1,"1234"		Set lock
	OK	
AT+CLCK="PS",1,"1234"		Set automatic lock
	OK	
AT+CLCK="PS",10,"1234"		Set full lock
	OK	

4.17 Ensemble S9: GSM Mobile Equipment, Control, and Status

4.17.1 Commands

AT+CPAS Phone Activity Status

Description: Returns the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone. If the command is executed without the <mode> parameter, only <pas> values from 0 to 128 are returned. If the <mode> parameter is included in the execution command, <pas> values from 129 to 255 may also be returned.

Execution command: AT+CPAS[=<mode>]

Execution command response: +CPAS: <pas>

Test command: AT+CPAS=? Shows if the command is supported.

Test command response: +CPAS: (list of supported <pas>s)

Parameters:

<mode>:

<mode>	Description
1	Allows the CPAS to return Ericsson-specific <pas> values Default setting

<pas>:

<pas>	Description
0	Ready (ME allows commands from TA/TE)
3	Ringing (ME is ready for commands from TA/TE, but the ringer is active)
4	Call in progress (ME is ready for commands from TA/TE, but a call is in progress)
129	MMI is in idle state. This is a sub-state to 'ready' (0) and has the following definition: • MMI in idle state, meaning that operator, clock, and date is shown on the display • No conversation or data call in progress • No sub-menus shown on the display • Only digits, 'clear', '*', 'NO', and '#' allowed in this state
130	Mobile-oriented call in progress. Sub-state to 'Call in progress' (4)
131	Mobile-terminated call in progress. Sub-state to 'Call in progress' (4)

AT+CPIN PIN Control

Description: Sends the password to the ME, which is necessary to make the ME operational.

Execution command: AT+CPIN=<pin>[,<new_pin>]

Read command: AT+CPIN? Displays the current <code> setting.

Test command: AT+CPIN=? Shows if the command is supported.

Test command response: +CPIN: (list of supported <code>s)

Parameters:

<pin>: String: the range for the SIM PIN and the PH-SIM PIN is 4-8 digits.
The SIM PUK consists of 8 digits.

<new_pin>: String: the range for the SIM PIN and the PH-SIM PIN is 4-8 digits.
The SIM PUK consists of 8 digits.

<code>:

<code>	Description
READY	ME is not pending for any password
SIM PIN	ME is waiting for SIM PIN
SIM PUK	ME is waiting for SIM PUK
PH-SIM PIN	ME is waiting for PHone-to-SIM password to be given
SIM PIN2	ME is waiting for SIM2
SIM PUK2	ME is waiting for SIM PUK2
BLOCKED	The SIM card is blocked for the user

AT+CBC Battery Charge

Description: Execution and read command returns battery connection status <bcs> and battery level <bcl> of the ME.

Execution command: AT+CBC

Execution command response: +CBC: <bsc>,<bcl>

Read command: AT+CBC? Displays the current <bcs> and <bcl> values.

Test command: AT+CBC=? Shows if the command is supported.

Test command response: +CBC: (list of supported <bcs>s and <bcl>s)

Parameters:

<bcs>:

<bcs>	Description
0	ME powered by the battery (no charger connected)
1	ME has a battery connected, but it is powered by the charger
2	ME does not have a battery connected

<bcl>:

<bcl>	Description
0	Battery exhausted
1-99	Battery charging level; the battery has 1-99 percent of capacity remaining
100	Battery fully charged

AT+CSQ Signal Quality

Description: The command returns received signal strength indication <rssi> and channel bit error rate <ber> from the ME.

Execution command: AT+CSQ

Execution command response: +CSQ: <rssi>,<ber>

Test command: AT+CSQ=? Shows if the command is supported.

Test command response: +CSQ: (list of supported <rssi>s and <ber>s)

Parameters:

<rssi>:

<rssi>	Description
0	-113 dBm or less
1	-111 dBm
2-30	-109 dBm to -53 dBm
31	-51 dBm or greater

<rssi>	Description
99	Not known or not detectable

<ber>:

<ber>	Description
0-7	RXQUAL values
99	Not known or not detectable

AT+CKPD Keypad Control

Description: Emulates ME keypad by giving each keystroke as a character in a string <keys>.

Execution command: AT+CKPD=<keys>[,<time>[,<pause>]]

Test command: AT+CKPD=? Shows if the command is supported.

Parameters:

<keys>:

<keys>	Description
“#”	Hash (number)
“*”	Star (*)
“0”-”9”	Number keys
“<“	Left arrow
“>”	Right arrow
“C”/”c”	Clear display (C/CLR)
“D”/”d”	Volume down.
“E”/”e”	Connection end (END)
“F”/”f”	Function (FCN) - option key
“S”/”s”	Connection start (SEND)
“U”/”u”	Volume up
“V”/”v”	Down arrow
“^”	Up arrow
“H”/”h”	Button pushed on the MC link handset

<time>: Time to strike each key.

<time>	Description
0-255	0-25.5 seconds

<pause>: Pause between keystrokes.

<pause>	Description
0-255	0-25.5 seconds

AT+CIND Indicator Control

Description: Displays the value of ME indicators.

Read command: AT+CIND?

Read command response: +CIND: <ind>,<ind>, ...
The command displays the current value for the different <descr> given below.

Test command: AT+CIND=? Shows if the command is supported.

Test command response: +CIND: (<descr>,(list of supported <ind>s)),(<descr>,(list of supported <ind>s)), (<descr>,(list of supported <ind>s)), ...

Parameters:

<ind>: Integer; in the range given by <descr>. <ind> value '0' means that the indicator is off, '1' means the indicator is on, '2' is more substantial than '1', and so on.

<descr>:

<descr>	Description
"battchg"	Battery charge level (0-5)
"signal"	Signal quality (0-5)
"batterywarning"	Battery warning (0-1)
"chargerconnected"	Charger connected (0-1)
"service"	Service availability (0-1) (value = '1' means there is contact with the net)
"sounder"	Sounder activity (0-1) (Phone silent status, '1' = phone silent)
"message"	Message received (0-1)
"call"	Call in progress (0-1)
"roam"	Roaming indicator (0-1) (Home net status, '0' = Home Net)
"smsfull"	A short message memory storage in the MT has become full ('0'), or memory locations are available ('1')

Example:

```
AT+CIND?
+CIND: 2,3,1,1,1,1,1,0,0,1
OK

AT+CIND=?
+CIND: ("battchg",(0-1)),("signal",(0-5)),
("batterywarning",(0-1)),("chargerconnected",(0-1)),
("service",(0-1)),("sounder",(0-1)),("message",(0-1)),
("call",(0-1)),("roam",(0-1)),("smsfull",(0-1))
```

AT+CMER Mobile Equipment Event Reporting

Description: Enables or disables the unsolicited result codes +CKEV and +CIEV for key presses, display changes, and indicator state changes.

Set command: AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]]]]]

Read command: AT+CMER? Displays the current <mode>, <keyp>, <disp>, <ind>, and <bfr> settings.

Test command: AT+CMER=? Shows if the command is supported.

Test command response: +CMER: (list of supported <mode>s, <keyp>s, <disp>s, <ind>s, and <bfr>s)

Parameters:

<mode>:

<mode>	Description
0	Buffer unsolicited result codes in the TA If the TA result code buffer is full, codes can be buffered elsewhere, or the oldest result codes can be removed to make room for the new result codes Default setting
3	Forward the unsolicited result codes directly to the TE; TA-TE link-specific inband technique used to embed result codes and data when TA is in on-line data mode.

<keyp>:

<keyp>	Description
0	No keypad event reporting Default setting
2	Keypad event reporting using +CKEV Enables keypad event reporting of all key presses

<disp>:

<disp>	Description
0	No display event reporting Default setting

<ind>:

<ind>	Description
0	No indicator event reporting Default setting
1	Indicator event reporting using +CIEV Only those indicator that are not caused by AT+CIND shall be indicated by the TA to the TE

<bfr>:

<bfr>	Description
0	TA buffer of unsolicited result codes defined within this command is cleared when <mode>='0' or <mode>='3' is entered Default setting

AT+CVIB Vibrator Mode

Description: Enables and disables the vibrator alert function of the ME.

Set command: AT+CVIB=<mode>

Read command: AT+CVIB? Displays the current <mode> setting.

Test command: AT+CVIB=? Shows if the command is supported.

Test command response: +CVIB: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Disable vibrator alert function
1	Enable vibrator alert function
16	Enable vibrator alert function when silent mode is selected

AT*ECAM Call Monitoring

Description: Activates or deactivates the call monitoring function in the ME. Also see the unsolicited result code *ECAV.

Set command: AT*ECAM=<onoff>

Set command response: *ECAM: <ccid>,<ccstatus>,<calltype>[,<processid>][,<exit_cause>] [,<number>,<type>]

Read command: AT*ECAM? Displays the current <onoff> setting.

Test command: AT*ECAM=? Shows if the command is supported.

Test command response: *ECAM: (list of supported <onoff>s)

Parameters:

<onoff>:

<onoff>	Description
0	The call log function is disabled
1	The call log function is enabled

<ccid>:

<ccid>	Description
1-7	A number that uniquely identifies a call in the phone. The maximum number of call control processes is 7: 5 multiparty members, one call on hold and one waiting call

<ccstatus>:

<ccstatus>	Description
0	IDLE
1	CALLING

<ccstatus>	Description
2	CONNECTING
3	ACTIVE
4	HOLD
5	WAITING
6	ALERTING
7	BUSY

<calltype>:

<calltype>	Description
1	VOICE
2	DATA
4	FAX
128	VOICE2

<processid>: Integer; reported when returning to IDLE state (<ccstatus>=0)

<processid>	Description
8=H´08	CC (Call Control)
68=H´44	MM (Mobile Management)
69=H´45	MS (Mobile Station)
122=H´7A	RR (Radio Resources)

<exit_cause>: Integer; reported when returning to IDLE state (<ccstatus>='0'.

<number>: Integer string; Phone number. Format specified by <type>.
Only valid for <ccstatus>=1 (CALLING).

<type>: Type of address octet. Only valid for <ccstatus>=1 (CALLING).

<type>	Description
145	Default setting when dialling string includes the international access code character '+'
129	Default setting when dialling string does not include the international access code character '+'

AT*ELAN Language Set

Description: Sets the language in the ME. If the language has been set to "AUTO", the read command returns the current language set from the SIM card. Hence, the "AUTO" code is never returned by the read command.

Set command: AT*ELAN=<code>

Read command: AT*ELAN? Displays the current language setting.

Test command: AT*ELAN=? Shows if the command is supported.

Test command response: *ELAN: (list of supported <code>s)

Parameter:

<code>: Language codes defined in ISO 639. Consist of two characters, for example “sv”, “en” etc.

<code>	Description
“AUTO”	Read the language code from the SIM card “AUTO” is never returned by the read command
...	Miscellaneous language codes

AT+CLAN Language Set

Description: Sets the language in the ME. If the language has been set to “AUTO”, the read command returns the current language set from the SIM card. Hence, the “AUTO” code is never returned by the read command.

Set command: AT+CLAN=<code>

Read command: AT+CLAN? Displays the current language setting.

Test command: AT+CLAN=? Shows if the command is supported.

Test command response: +CLAN: (list of supported <code>s)

Parameter:

<code>: Language codes defined in ISO 639. Consist of two characters, for example “sv”, “en” etc.

<code>	Description
“AUTO”	Read the language code from the SIM card “AUTO” is never returned by the read command
...	Miscellaneous language codes

AT*EMAR Master Reset

Description: Requests the ME to reset user data.

Set command: AT*EMAR=<phone_lock_code>

Test command: AT*ELAN=? Shows if the command is supported.

Parameter:

<phone_lock_code>: String; security code (phone lock code) must be verified before performing the master reset. Also see AT+CLCK.

AT*ERIN Ring Set

Description: Sets the sound for incoming voice, line L1 and L2, fax and data calls, and alarm. A sound type is selected for each call type.

Set command: AT*ERIN=<sound_type>[,<call_type>]

Read command: AT*ERIN?

Read command response:
*ERIN: <sound_type1>,<call_type1><CR><LF>
*ERIN: <sound_type2>,<call_type2><CR><LF>
...
*ERIN: <sound_type*n*>,<call_type*n*>

Test command: AT*ERIN=? Shows if the command is supported.

Test command response: *ERIN: (list of supported <sound_type>s and <call_type>s)

Parameters:

<sound_type>:

<sound_type>	Description
1	Low ring signal
2	Medium ring signal
3	High ring signal
4	Mixed ring signal
11	Melody 1
12-20	Melody 2 - Melody 10 Reserved for preset melodies
31-34	Own melodies 1-4

<call_type>:

<call_type>	Description
1	Line 1 Default setting
2	Line 2
3	Fax
4	Data
5	Alarm

AT*ERIL Ring Level Set

Description: Sets the volume for the ring signal used for incoming voice, Line 1 and Line 2, fax, and data calls.

Set command: AT*ERIL=<volume>[,<call_type>[,<place>]]

Read command: AT*ERIL?

Read command response:
*ERIL: <volume1>[,<call_type1>[,<place1>]]<CR><LF>
*ERIL: <volume2>[,<call_type2>[,<place2>]]<CR><LF>
...
*ERIL: <volume*n*>[,<call_type*n*>[,<place*n*>]]

Test command: AT*ERIL=? Shows if the command is supported.

Test command response: *ERIL: (list of supported <volume>s, <call_type>s, and <place>s)

Parameters:

<volume>:

<volume>	Description
0	Off
1-6	Volume setting; no increasing ring
129-134	Volume setting; increasing ring

<call_type>:

<call_type>	Description
1	Line 1 Default setting
2	Line 2
3	Fax
4	Data

<place>:

<place>	Description
0	Hand-held Default setting
1	Car mounted

AT*ERIP Ring Signal Playback

Description: Plays one of the sound types available as ring/message signal in the phone.

Set command: AT*ERIP=<volume>,<sound_type>

Test command: AT*ERIP=? Shows if the command is supported.

Test command response: *ERIP: (list of supported <volume>s and <sound_type>s)

Parameters:

<volume>:

<volume>	Description
0	Off
2-*n*	Volume setting

<sound_type>:

<sound_type>	Description
1	Low ring signal
2	Medium ring signal
3	High ring signal
4	Mixed ring signal
11	Melody 1

<sound_type>	Description
12-20	Melody 2 - Melody 10 Reserved for preset melodies
31-34	Own melodies 1-4

AT*ESAM Answer Mode

Description: Sets the answer mode in the phone.

Set command: AT*ESAM=<mode>

Read command: AT*ESAM? Displays the current <mode> setting.

Test command: AT*ESAM=? Shows if the command is supported.

Test command response: *ESAM: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Answer mode is neither set to ‘Any Key’, nor ‘Auto’
1	‘Any Key’ mode on
2	‘Auto’ mode on

AT*ESBL Backlight Mode

Description: Sets the backlight mode in the phone.

Set command: AT*ESBL=[<place>,]<mode>

Read command: AT*ESBL?

Read command response: *ESBL: <place0>,<mode0><CR><LF>
*ESBL: <place1>,<mode1>

Test command: AT*ESBL=? Shows if the command is supported.

Test command response: *ESBL: (list of supported <place>s and <mode>s)

Parameters:

<place>:

<place>	Description
0	Hand-held
1	Car mounted

<mode>:

<mode>	Description
0	OFF, Back light always switched off
1	ON, always on
2	AUTO, backlight is turned on when the ME reacts to a user event or when receiving a call The light is then turned off after a short while

AT*ESIL Silence Command

Description: Orders the phone to enter or leave silent mode.

Set command: AT*ESIL=<mode>

Read command: AT*ESIL? Displays the current <mode> setting.

Test command: AT*ESIL=? Shows if the command is supported.

Test command response: *ESIL: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Silent mode off Default setting
1	Silent mode on

AT*ESKL Key-Lock Mode

Description: Sets the key-lock mode in the phone.

Set command: AT*ESKL=<mode>

Read command: AT*ESKL? Displays the current <mode> setting.

Test command: AT*ESKL=? Shows if the command is supported.

Test command response: *ESKL: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	MANUAL; the user has to manually lock the keyboard Default setting
1	AUTOMATIC; the phone will, after a time delay, automatically lock the keyboard

AT*ESKS Key Sound

Description: Sets the key sound in the phone.

Set command: AT*ESKS=<mode>

Read command: AT*ESKS? Displays the current <mode> setting.

Test command: AT*ESKS=? Shows if the command is supported.

Test command response: *ESKS: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	SILENT; no sound when a key is pressed Default setting
1	CLICK; short click when a key is pressed
2	TONE, a continuous tone when a key is pressed

AT*ESMA Message Alert Sound

Description: Sets the message alert sound of the phone.

Set command: AT*ESMA=<mode>

Read command: AT*ESMA? Displays the current <mode> setting.

Test command: AT*ESMA=? Shows if the command is supported.

Test command response: *ESMA: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	SILENT; no sound when a key is pressed Default setting
1	CLICK; short click when a key is pressed
2	TONE, a continuous tone when a key is pressed

AT*ESMM Minute Minder

Description: Sets the minute minder setting in the phone.

Set command: AT*ESMM=<mode>

Read command: AT*ESMM? Displays the current <mode> setting.

Test command: AT*ESMM=? Shows if the command is supported.

Test command response: *ESMM: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	OFF; minute minder off Default setting
1	ON; minute minder on

AT*ESOM Own Melody

Description: Sets the user-defined melodies in the phone.

Set command: AT*ESOM=<melody_index>,<melody_string>

Read command: AT*ESOM? Displays the current parameter settings.

Read command response:
*ESOM: <melody_index>,<melody_string1><CR><LF>
*ESOM: <melody_index>,<melody_string2><CR><LF>
...
*ESOM: <melody_index>,<melody_string*n*>

Test command: AT*ESOM=? Shows if the command is supported.

Test command response: *ESOM: (list of supported <melody_index>s, <pause>s, and <tone>s),<mlength>,<mtones>.

Parameters:

<melody_index>:

<melody_index>	Description
1	Melody 1 Default setting
2	Melody 2
3	Melody 3
4	Melody 4

<melody_string>: A sequence of <tones> and <pause> entries. The <tones> may be preceded by one or two <prefix>(s).

<pause>:

<pause>	Description
“p”	Pause

<prefix>:

<prefix>	Description
“#”	Half tone higher
“(b)”	Half tone lower
“+”	One octave higher

<tones>:

<tones>	Description
“c”, “d”,” e”, “f”, “g”, “a”, “h”	Short tones
“C”, “D”, “E”, “F”, “G”, “A”, “H”	Long tones

<mlength> Integer; indicates the maximum length of <melody_string>.

<mtones>: Integer; indicates the maximum number of tones in a melody.

AT*ETXT Text Command

Description: Sets and activates the greeting text in the phone. The greeting is shown in the phone display when the phone is turned on. The command can also deactivate the greeting. Note: The optional <text> parameter is only be used when activating the custom greeting (<mode>=1). If the <mode> parameter is set to 1, but no text is provided, the greeting text previously stored in the phone shall be used.

Set command: AT*ETXT=<mode>[,<text>]

Read command: AT*ETXT? Displays the current <mode> and <text> settings.

Test command: AT*ETXT=? Shows if the command is supported.

Test command response: *ETXT: (list of supported <mode>s),<ltext>.

Parameters:

<mode>:

<mode>	Description
0	No greeting <text> shall not be sent
1	Custom text, given in <text>
2	Standard ('ERICSSON') start-up message <text> shall not be sent Default setting

<text>: Text to be displayed; may not contain <CR>.

<ltext>: Integer; maximum number of characters in <text>.

AT*EKSE Keystroke Send

Description: Sends a keystroke identifier to the MT. The MT will make a context-sensitive interpretation of the keystroke, based on the state of the MMI.

Set command: AT*EKSE=<key>[,<time>]

Test command: AT*EKSE=? Shows if the command is supported.

Test command response: *EKSE: (list of supported <key>s and <time>s)

Parameters:

<key>:

<key>	Description
0-65535	Keystroke identifier

<time>: Reports how long the key is pressed.

<time>	Description
0-255	0-25.5 seconds

AT*EIMR Input Method Change Report

Description: Enables/disables unsolicited result code *EIMV, that indicates that the input method has been changed.

Set command: AT*EIMR=<onoff>

Read command: AT*EIMR? Displays the current <onoff> setting.

Test command: AT*EIMR=? Shows if the command is supported.

Test command response: *EIMR: (list of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	*EIMV disabled
1	*EIMV enabled

4.17.2 Unsolicited result codes

+CKEV Keypad Event

Description: Keypad event reporting is enabled by the AT+CMER command and indicates key press/release.

Unsolicited result code:+CKEV: <keys>,<press>

Parameters:

<keys>: See AT+CKPD.

<press>:

<press>	Description
0	Key released
1	Key pressed

+CIEV Indicator Event

Description: Indicates changes in indicator levels. Enabled with AT+CMER.

Unsolicited result code: +CKEV: <ind>,<value>

Parameters:

<ind>: Indicates the indicator order number (as specified for AT+CIND)

<ind>	Description
1	Battery charge level indicator
2	Signal quality indicator
3	Battery warning indicator
4	Charger connected indicator
5	Service availability indicator
6	Sounder activity indicator
7	Message received indicator
8	Call-in-progress indicator
9	Transmit activated by voice activity indicator
10	Roaming indicator
11	Short message memory storage indicator in the SMS

<value>: Integer; new value of the specific indicator.

*ECAV Call Monitoring Event

Description: Reports changes in call state for a certain call, indicated by <coid>. Enabled by AT+ECAM.

Unsolicited result code: *ECAV: <ccid>,<ccstatus><calltype>[,<processid>][,<exit_cause>] [,<number>,<type>]

Parameters:

<ccid>:

<ccid>	Description
1-7	A number that uniquely identifies a call in the phone. The maximum number of call control processes is 7: 5 multiparty members, one call on hold and one waiting call

<ccstatus>:

<ccstatus>	Description
0	IDLE
1	CALLING
2	CONNECTING
3	ACTIVE
4	HOLD
5	WAITING
6	ALERTING

<ccstatus>	Description
7	BUSY

<calltype>:

<calltype>	Description
1	VOICE
2	DATA
4	FAX
128	VOICE2

<processid>: Integer; reported when returning to IDLE state (<ccstatus>=0)

<processid>	Description
8=H´08	CC (Call Control)
68=H´44	MM (Mobile Management)
69=H´45	MS (Mobile Station)
122=H´7A	RR (Radio Resources)

<exit_cause>: Integer; reported when returning to IDLE state (<ccstatus>=0)

<number>: Integer string; Phone number. Format specified by <type>.
Only valid for <ccstatus>=1 (CALLING).

<type>: Type of address octet. Only valid for <ccstatus>=1 (CALLING).

<type>	Description
145	Default setting when dialling string includes the international access code character '+'
129	Default setting when dialling string does not include the international access code character '+'

*EIMV Input Method Event

Description: This unsolicited result code is issued when the input method, the language or the alphabet is changed on the MT and when the result code is first enabled.
If there is no input method currently active, the result code will be an empty string.
This indicates that keyboard emulation has to be done with AT+CKPD.
This result code is activated by AT*EIMR.

Unsolicited result code:*EIMV: [<method,<language>,<alphabet>]

Parameters:

<method>:

<method>	Description
0	Multitap
1	Digit
2	Integer
3	Real
4	T9
5	Zi8

<method>	Description
6	Zi8 Stroke
7	Zi8 BoPoMoFo
8	Zi8 Pinyin

<language>:

<language>	Description
0	Czech
1	Danish
2	German
3	Estonian
4	English
5	Spanish
6	French
7	Croatian
8	Italian
9	Latvian
10	Lithuanian
11	Hungarian
12	Dutch
13	Norwegian
14	Polish
15	Portuguese
16	Romanian
17	Slovak
18	Slovenian
19	Serbian
20	Finnish
21	Swedish
22	Turkish
23	Greek
24	Bulgarian
25	Russian
26	Hebrew
27	Arabic
28	Indonesian
29	Malay
30	Tagalog
31	Thai
32	Vietnamese
33	US_English
34	Latin_American_Spanish
35	Canadian
36	Brazilian_Portuguese

<language>	Description
37	HongKongChinese
38	SimplifiedChinese
39	TaiwanChinese
40	HongKongChinese_NoPunct
41	SimplifiedChinese_NoPunct
42	TaiwanChinese_NoPunct
43	Digits
44	Integer
45	Real
46	PhoneNo
47	DTMF
48	ExtDigits
49	ISO8859
50	URL
51	GSM
52	GSM_WML_A
53	GSM_WML_a
54	GSM_WML_X
55	GSM_WML_x
56	Greek_WML_A
57	Greek_WML_a
58	Greek_WML_X
59	Greek_WML_x
60	Cyrillic
61	Cyrillic_WML_A
62	Cyrillic_WML_a
63	Cyrillic_WML_X
64	Cyrillic_WML_x
65	Arabic_WML_A
66	Arabic_WML_X
67	Hebrew_WML_A
68	Hebrew_WML_X

<alphabet>:

<alphabet>	Description
0	GSM
1	Greek
2	Cyrillic
3	URL
4	Digits
5	ExtDigits
6	Integer
7	Real

<alphabet>	Description
8	PhoneNo
9	DTMF
10	ISO8859
11	Arabic
12	Hebrew
13	Chinese
14	GSM_WML_A
15	GSM_WML_a
16	GSM_WML_X
17	GSM_WML_x
18	Greek_WML_A
19	Greek_WML_a
20	Greek_WML_X
21	Greek_WML_x
22	Cyrillic_WML_A
23	Cyrillic_WML_a
24	Cyrillic_WML_X
25	Cyrillic_WML_x
26	Arabic_WML_A
27	Arabic_WML_X
28	Hebrew_WML_A
29	Hebrew_WML_X

4.17.3 Use scenarios

Mobile Equipment Control Mode and Event Reporting

This scenario operates the keypad and reads the keypad and indicator status.

AT command	Response	Comment
AT+CKPD="0461930 00S",5,1		Dial number 046193000 by emulating a sequence of key presses Each key is pressed for half a second and the pause between the keystrokes is 0.1 seconds
	OK	
AT+CKPD="E",5		End connection by emulating a stroke of the "on hook" button for half a second
	OK	
AT+CIND?		Query the current indicator values
	+CIND: 3,4,0,0,1,0,0,0,0 ,0,0 OK	
AT+CMER=,2,,1,		Request unsolicited result codes for keypad and indicator events
	OK	

AT command	Response	Comment
	+CKEV: 49,1	Number key ‘1’ is pressed
	+CKEV: 49,0	Number key ‘1’ is released
	+CIEV: 2,5	Signal strength indicator changes its state to ‘5’
AT+CMER=,0,,0,		Disable unsolicited result codes for keypad and indicator events
	OK	

Call Monitoring

This scenario shows how call monitoring is activated and how call events are received.

AT command	Response	Comment
AT*ECAM=1		Enable the call log function
	*ECAM: 1,0,1 OK	IDLE
ATD046193000;		Dial number
	OK	
	*ECAV: 1,1,1,,,046193000,129	CALLING, VOICE1
	*ECAV: 1,2,1,,	CONNECTING, VOICE1
	*ECAV: 1,3,1,,	ACTIVE CALL, VOICE1
AT+CHLD		Put call on hold
	OK	
	*ECAV: 1,4,1,,	HOLD, VOICE1
AT+CHLD=2		Retrieve held call
	OK	
	*ECAV: 1,3,1	ACTIVE CALL, VOICE1
ATH		Hang up
	OK	
	*ECAV: 1,0,1,8,16	IDLE. Call Control exit cause 16 (normal clearing)
	RING	Incoming call
	*ECAV: 1,6,128,,	ALTERING, VOICE2
	RING	
	RING	

MMI Configuration

This scenario shows various settings of the MMI

AT command	Response	Comment
AT*ELAN="sv"		Sets the MMI language to Swedish
	OK	
AT*ESAM=2		Answer mode 'AUTO'
	OK	
AT*ESBL=1,1		Back light always on when phone is car mounted
	OK	
AT*ESIL=1		Request phone silent mode
	OK	Silent mode icon displayed
AT*ESKS=1		Set 'key pressed' sound to CLICK
	OK	
AT*ESMA=2		Set 'mail received' sound to TONE
	OK	
AT*ESKL=1		Set key lock mode to AUTOMATIC
	OK	The phone keyboard will, after a time delay, be locked
AT*ETXT=1,"Good Evening"		New greeting text entered
	OK	
AT*ESMM=1		Activate minute minder during call
	OK	

4.18 Ensemble S10: GSM Mobile Equipment Error Control

4.18.1 Commands

AT+CMEE Report Mobile Equipment Error

Description: Request GSM mobile equipment error control. The command disables or enables the use of result code +CME ERROR as an indication of an error relating to the functionality of the ME. When enabled, the ME-related errors cause +CME ERROR final result code instead of the regular ERROR final result code. ERROR is returned only when the error is related to syntax, invalid parameters or TA functionality.

Set command: AT+CMEE=[<n>]

Read command: AT+CMEE? Displays the current <n> setting.

Test command: AT+CMEE=? Shows if the command is supported.

Test command response: +CMEE: (list of supported <n>s)

Parameter:

<n>:

<n>	Description
0	Disable +CME ERROR result code. Use ERROR instead Default setting
1	Enable +CME ERROR result code and use numeric <err> values
2	Enable +CME ERROR result code and use verbose <err> values

4.19 Ensemble S11: GSM SMS and PDU Mode

4.19.1 Commands

AT+CSMS	Select Message Service

Description: Selects the message service and returns the type of messages supported by the ME. If chosen service is not supported by the ME (but supported by the TA), +CME ERROR is returned.

Set command: AT+CSMS=<service>

Response: +CSMS: <mt>,<mo>,<bm>

Read command: AT+CSMS? Displays the current <service>, <mt>, <mo>, and <bm> settings.

Test command: AT+CSMS=? Shows if the command is supported.

Test command response: +CSMS: (list of supported <service>s)

Parameters:

<service>:

<service>	Description
0	GSM 03.40 and 03.41 specific. The syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 Version 4.7.0. Phase 2 features that do not require new command syntax may be supported Default setting
2-127	Reserved

<mt>:

<mt>	Description
0	Mobile terminated messages not supported
1	Mobile terminated messages supported

<mo>:

<mo>	Description
0	Mobile originated messages not supported
1	Mobile originated messages supported

<bm>:

<bm>	Description
0	Broadcast messages not supported
1	Broadcast messages supported

AT+CPMS Preferred Message Storage

Description: Selects memory storage spaces to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), +CME ERROR is returned.

Set command: AT+CPMS=<mem1>[,<mem2>][,<mem2>]

Set command response: +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

Read command: AT+CPMS?

Read command response. +CPMS: <mem1><used1>,<total1>,<mem2><used2>,<total2>, <mem3><used3>,<total3>

Test command: AT+CPMS=? Shows if the command is supported.

Test command response: +CPMS: (list of supported <mem1>s, <mem2>s, and <mem3>s)

Parameters:

<mem1>: Memory from which messages are read and deleted (see AT+CMGL, AT+CMGR, and AT+CMGD).

<mem1>	Description
“ME”	ME message storage
“SM”	SIM message storage
“TL”	Template message storage

<mem2>: Memory to which writing and sending options are made (see AT+CMSS and AT+CMGW).

<mem2>	Description
“ME”	ME message storage
“SM”	SIM message storage Default setting
“TL”	Template message storage

<mem3>: Memory to which received SMs are preferred to be stored (unless directly forwarded to the TE). Received CBMs are always stored in “BM” (unless directly forwarded to the TE).

<mem3>	Description
“ME”	ME message storage

<used*x*>: Integer; number of messages currently in <mem*x*>.

<total*x*>: Integer; total number of message locations in <mem*x*>.

AT+CMGF Message Format

Description: Sets the input and output format to be used by the TA.

Set command: AT+CMGF=<mode>

Read command: AT+CMGF? Displays the current <mode> setting.

Test command: AT+CMGF=? Shows if the command is supported.

Test command response: +CMGF: (list of supported <mode>s)

Parameter:

<mode>: Indicates the message format used for send, read, write, list commands, and unsolicited result codes resulting from received messages.

<mode>	Description
0	PDU mode Default setting

AT+CSCA Service Centre Address

Description: Updates the SMCS address, through which mobile-originated SMs are transmitted. In text mode, the setting is used by send (AT+CMGS) and write (AT+CMGW) commands. In PDU mode, the setting is used by the same commands, but only when the length of the SMCS address (coded into <pdu> parameter) equals zero.

Set command: AT+CSCA=<sca>[,<tosca>]

Read command: AT+CSCA? Displays the current <sca> and <tosca> settings.

Test command: AT+CSCA=? Shows if the command is supported.

Parameters:

<sca>: String; GSM 04.11 RP SC address-value field in string format. BCD numbers are converted to characters in the currently selected TE character set.

<tosca>: Integer; GSM 04.11 RP SC type-of-address octet in integer format.

<tosca>	Description
129	ISDN / telephony numbering plan, national/international unknown Default setting if '+' is not in <sca>
145	ISDN / telephony numbering plan, international number Default setting if '+' is in <sca>
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

AT+CSCB Cell Broadcast Message Type

Description: Selects which types of CBMs are to be received by the ME.

Set command: AT+CSCB=<mode>[,<mids>]

Read command: AT+CSCB? Displays the current <mode> and <mids> setting.

Test command: AT+CSCB=? Shows if the command is supported.

Test command response: +CSCB: (list of supported <mode>s and <mid>s)

Parameters:

<mode>:

<mode>	Description
0	Message types in <mids> are accepted Default setting
1	Message types in <mids> are not accepted

<mids>: String; all possible combinations of CBM message identifiers.

AT+CSAS Save Settings

Description: Saves the active message service settings to a non-volatile memory. A TA can contain several profiles of settings. The settings specified in AT+CSCA and AT+CSCB are saved. Certain settings, for example SIM SMS parameters, may not be supported by the storage and can therefore not be saved.

Execution command: AT+CSAS[=<profile>]

Test command: AT+CSAS=? Shows if the command is supported.

Test command response: +CSAS: (list of supported <profile>s)

Parameter:

<profile>:

<profile>	Description
0	Profile number where settings are to be stored Default setting

AT+CRES Restore Settings

Description: Restores the message service settings from non-volatile memory. A TA can contain several profiles of settings. The settings specified in AT+CSCA and AT+CSCB are restored. Certain settings, for example SIM SMS parameters, may not be supported by the storage and can therefore not be restored.

Execution command: AT+CRES[=<profile>]

Test command: AT+CRES=? Shows if the command is supported.

Test command response: +CRES: (list of supported <profile>s)

Parameter:

<profile>:

<profile>	Description
0	Profile number where settings are stored Default setting

AT+CNMI New Message Indication to TE

Description: Selects the procedure how the reception of new messages from the network is indicated to the TE when TE is active (DTR signal is ON). IF TE is inactive (DTR signal OFF), message reception is carried out as specified in GSM 03.38. This command enables the unsolicited result codes +CMT, +CMTI, +CBM, and +CDS.

Set command: AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]

Read command: AT+CNMI? Displays the current <mode>,< mt>, <bm>, <ds>, and <bfr> settings.

Test command: AT+CNMI=? Shows if the command is supported.

Test command response: +CNMI: (list of supported <mode>s,< mt>s, <bm>s, <ds>s, and <bfr>s)

Parameters:

<mode>:

<mode>	Description
3	Forward unsolicited result codes directly to the TE. TA-TE specific inband technique used to embed result codes and data when TA in on-line data mode Default setting

<mt>:

<mt>	Description
0	No SMS-DELIVER indications are routed to the TE Default setting
1	If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE, using the +CMTI result code
3	Class 3 SMS-DELIVERs are routed directly to the TE, using the +CMT result code. Messages of other data coding schemes results in indication as defined by <mt>='1'

<bm>:

<bm>	Description
0	Store message to "BM". No CBM indications are routed to the TE Default setting
2	New CBMs are routed directly to the TE, using the +CBM result code

<ds>:

<ds>	Description
0	No SMS-STATUS-REPORTs are routed to the TE Default setting
1	SMS-STATUS-REPORTs are routed to the TE, using the +CDS result code

<bfr>:

<bfr>	Description
0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1 or 2 is entered (Not yet supported) Default setting

AT+CMGL List Message

Description: Returns messages with status value <stat> from returned message storage <mem1> to the TE.

Execution command: AT+CMGL[=<stat>]

Execution command response: +CMGL: <index>,<stat>,[<alpha>],<length>,<pdu><CR><LF>
[+CMGL: <index>,<stat>,[<alpha>],<length>,<pdu><CR><LF>
[...]]

Test command: AT+CMGL=? Shows if the command is supported.

Test command response: +CMGL: (list of supported <stat>s)

Parameters:

<stat>:

<stat>	Description
0	Received unread (new) message Default setting
1	Received read message
2	Stored unread message (only applicable to SMs)
3	Stored sent message (only applicable to SMs)
4	All messages
16	Template message

<index>: Integer; value in the range of location numbers supported by the associated memory.

<alpha>: String; left empty, but not omitted (commas mark the place where it should be). The character set used is selected with AT+CSCS.

<length>: Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

<mem1>: Memory from which messages are read and deleted (see AT+CMGL, AT+CMGR, and AT+CMGD).

<mem1>	Description
“ME”	ME message storage
“SM”	SIM message storage
“TL”	Template message storage

AT+CMGR Read Message

Description: Returns messages with location value <index> from preferred message storage <mem1> to the TE. If the status of the message is ‘received unread’, the status in the storage changes to ‘received read’. If reading fails, +CMS ERROR is returned.

Execution command: AT+CMGR=<index>

Execution command response: +CMGR: <stat>,[<alpha>],<length>
<pdu>

Test command: AT+CMGR=? Shows if the command is supported.

Parameters:

<index>: Integer; value in the range of location numbers supported by the associated memory.

<stat>:

<stat>	Description
0	Received unread (new) message Default setting
1	Received read message
2	Stored unread message (only applicable to SMs)
3	Stored sent message (only applicable to SMs)
16	Template message

<alpha>: String; left empty but not omitted (commas mark the place where it should be). The character set used is selected with AT+CSCS.

<length>: Integer; with AT+CMGF=’0’, this value indicates the length of the actual TP data unit (in octet units).

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

<mem1>:

<mem1>	Description
“ME”	ME message storage
“SM”	SIM message storage
“TL”	Template message storage

AT+CMGS Send Message

Description: Sends message from a TE to the network (SMS-SUBMIT). <tr> is returned after successful message delivery. Optionally (when the network supports it, and AT+CSMS <service>='1'), <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or if there is an ME error, +CMS ERROR is returned.

Execution command: AT+CMGS=<length>
<pdu><'ctrl-z/ESC'>

Execution command response: +CMGS: <mr>,[<ackpdu>]

Test command: AT+CMGS=? Shows if the command is supported.

Parameters:

<length>: Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

<mr>: Integer; GSM 03.40 TP-Message-Reference.

<ackpdu>: GSM 03.40 RP-User-Data element of RP-ACK PDU; format is the same as for <pdu> in case of SMS, but without GSM 04.11 SC address field. The parameter is bounded by double quotation marks like a normal string-type parameter.

AT+CMSS Send From Storage

Description: Sends message with location value <index> from message storage <mem2> (see AT+CPMS) to the network (SMS-SUBMIT or SMS-COMMAND). <mr> is returned after successful delivery. If sending fails in a network, or if there is an ME error, +CMS ERROR is returned.

Execution command: AT+CMSS=<index>[,<da>[,<toda>]]

Execution command response: +CMSS: <mr>

Test command: AT+CMSS=? Shows if the command is supported.

Parameters:

<index>: Integer; value in the range of location numbers supported by the associated memory.

<da>: GSM 03.40 TP-Destination-Address. Address value field in string format; BCD numbers are converted into characters of the currently selected TE character set. The type of address is given by <toda>.

<toda>: GSM 04.11 TP-Address Type-Of-Address octet; in integer format.

<toda>	Description
129	ISDN / telephony numbering plan, national/international unknown Default setting if '+' is not in <da>
145	ISDN / telephony numbering plan, international number Default setting if '+' is in <da>
161	ISDN / telephony numbering plan, national number

<toda>	Description
128-255	Valid values, see GSM 04.08 section 10.5.4.7

<mr>: Integer; GSM 03.40 TP-Message-Reference.

AT+CMGW Write Message To Memory

Description: Stores a message to message storage <mem2> (see AT+CPMS). The memory location <index> of the stored message is returned. By default, message status will be set to 'stored unsent', but parameter <stat> also allows other status values. If writing fails, +CMS ERROR is returned.

Execution command: AT+CMGW=<length>[,<stat>]
<pdu><'ctrl-z/ESC'>

Execution command response: +CMGW: <index>

Test command: AT+CMGW=? Shows if the command is supported.

Parameters:

<length>: Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).

<stat>:

<stat>	Description
0	Received unread (new) message Default setting
1	Received read message
2	Stored unread message (only applicable to SMs)
3	Stored sent message (only applicable to SMs)

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

<index>: Integer; value in the range of location numbers supported by the associated memory.

AT+CMGD Delete Message

Description: Deletes message from preferred message <mem1> (see AT+CPMS) storage location <index>. If deletion fails, +CMS ERROR is returned.

Execution command: AT+CMGD=<index>

Test command: AT+CMGD=? Shows if the command is supported.

Parameter:

<index>: Integer; value in the range of location numbers supported by the associated memory.

AT+CMGC Send Command

Description:	Sends a command message from a TE to the network (SMS-COMMAND). The entering of PDU is done similarly to specified in AT+CMGS. <mr> is returned after successful message delivery. Optionally (when the network supports it, and the AT+CSMS <service>='1'), <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or if there is an ME error, +CMS ERROR is returned.
Execution command:	AT+CMGC=<length> <pdu><'ctrl-z/ESC'>
Execution command response:	+CMGC: <mr>,[<ackpdu>]
Test command:	AT+CMGC=? Shows if the command is supported.
Parameters:	
<length>:	Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).
<pdu>:	In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers. In case of CBS: GSM TPDU in hexadecimal format.
<mr>:	Integer; GSM 03.40 TP-Message-Reference.
<ackpdu>:	GSM 03.40 RP-User-Data element of RP-ACK PDU; format is the same as for <pdu> in case of SMS, but without GSM 04.11 SC address field. The parameter is bounded by double quotation marks like a normal string-type parameter.

AT*ESTL SMS Template List Edit

Description:	Adds an SMS template, specified by <text>, to the list of SMS templates at the position specified by <stix>. If the list already contains an entry in the <stix> position, the old template is overwritten by the new template. If the <text> parameter is omitted, the command deletes the SMS template from the <stix> position.
Set command:	AT*ESTL=<stix>[,<text>]
Read command:	AT*ESTL? Displays the current parameter settings.
Read command response:	*ESTL: <stix1>,<text1>[<stix2>,<text2>[...]]
Test command:	AT*ESTL=? Shows if the command is supported.
Test command response:	*ESTL: (list of supported <stix>s),<ntext>
Parameters:	
<stix>:	Integer; index to entry in list of SMS templates.
<text>:	String; SMS template text.
<ntext>:	Integer; maximum length of the <text> parameter.

4.19.2 Unsolicited result codes

+CBM Received Cell Broadcast

Description: Received CBMs are routed directly to the TE. Enabled by AT+CNMI.

Unsolicited result code: +CBM: <length>
<pdu>

Parameters:

<length>: Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

+CMTI New Message Indication

Description: Indication of the memory location where the message is located is routed to the TE. Enabled by AT+CNMI.

Unsolicited result code: +CMTI: <mem>,<index>

Parameters:

<mem>:

<mem>	Description
"ME"	ME message storage
"SM"	SIM message storage

<index>: Integer; value in the range of location numbers supported by the associated memory.

+CMT Received Message

Description: Received SMs are routed directly to the TE. Enabled by AT+CNMI.

Unsolicited result code: +CMT: <length>
<pdu>

Parameters:

<length>: Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

+CDS	SMS Status Report

Description: SMS status is indicated to the TE. Enabled by AT+CNMI.

Unsolicited result code: +CDS: <length>
<pdu>

Parameters:

<length>: Integer; with AT+CMGF='0', this value indicates the length of the actual TP data unit (in octet units).

<pdu>: In case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format. ME/TA converts each octet of TP data unit into two IRA-character long hexadecimal numbers.
In case of CBS: GSM TPDU in hexadecimal format.

4.19.3 Use scenarios

New Message Indication

This scenario shows how the new message indication result codes are handled..

AT Command	Response	Comment
AT+CNMI=?		Query new message unsolicited result code modes
	+CNMI: (3),(0-1),(0,2),(0),(0) OK	
AT+CNMI=0,1,2,0,0		Send SM indications to TE Forward unsolicited CBM result codes directly to the TE
	OK	
AT+CNMI?		Query current settings
	+CNMI: 3,1,2,0,0	
		The phone receives and stores incoming SM
	+CMTI: "ME",3	New message stores in index 3 of <mem1> storage
		The phone receives a CBM and routes it directly to the TE
	+CBM: 128 <128 byte PDU>	New CBM PDU of 128 byte received at TE

4.20 Ensemble S16: GSM Phonebook

4.20.1 Commands

AT+CPBS Phonebook Storage

Description: Selects the phonebook memory storage <storage> that is used by other phonebook commands.
Note: Each one of the defined profiles corresponds to one list of allowed callers. When <storage> is set to Callers Allowed (CA), the actual phone book storage to be used is represented by the list of allowed callers corresponding to the active profile, see AT*EAPS.

Set command: AT+CPBS=<storage>[,<password>]

Read command: AT+CPBS? Displays the current <storage> setting.

Test command: AT+CPBS=? Shows if the command is supported.

Test command response: +CPBS: (list of supported <storage>s)

Parameters:

<storage>:

<storage>	Description
"FD"	SIM fix-dialling phonebook
"ME"	ME phonebook
"SM"	SIM phonebook
"DC"	ME dialled-calls list
"RC"	ME received-calls list
"MC"	ME missed-calls list
"MV"	ME voice-activated dialling list
"HP"	Hierarchical phonebook
"BC"	Own business card Protected by phone lock code

<password>: String; represents the password required when selecting password protected <storage>s, for example PIN2 for "FD".

AT+CPBR Phonebook Read

Description: Returns phone book entries in location number range <index1>...<index2> from the current phonebook memory storage selected by AT+CPBS. If <index2> is omitted, only location <index1> is returned. Entry fields returned are location number <index*n*>, phone number <number> in <index*n*>, and text <text> associated with the number.

Set command: AT+CPBR=<index1>[,<index2>]

Set command response: +CPBR: <index1>,<number>,<type>,<text>[,<text_date>,<text_time>]<CR><LF>
+CPBR: <index2>,<number>,<type>,<text>[,<text_date>,<text_time>]

Test command: AT+CPBR=? Shows if the command is supported.

Test command response: +CPBR: (list of supported <index>s),<nlength>,<tlength>.

Parameters:

<index*n*>: Integer; values in the range of location numbers of phonebook memory.

<number>: String; phone number of format <type>.

<type>:

<type>	Description
128	Unknown numbering plan, national / international number unknown
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

<text>: String; maximum length <tlength>. Character set as specified by AT+CSCS.

<nlength>: Integer; maximum length of <number> field.

<tlength>: Integer; maximum length of <text> field.

AT+CPBF Phonebook Find

Description: Returns the phonebook entries whose alphanumeric field starts with <findtext>.

Execution command: AT+CPBF=<findtext>

Execution command response: +CPBF: <index1>,<number>,<type>,<text>

Test command: AT+CPBF=? Shows if the command is supported.

Test command response: +CPBF: <nlength>,<tlength>.

Parameters:

<findtext>: String; maximum length <tlength>. Character set as specified by AT+CSCS.

<index1>: Integer; values in the range of location numbers of phonebook memory.

<number>: String; phone number of format <type>.

<type>:

<type>	Description
128	Unknown numbering plan, national / international number unknown
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

<tlength>: Integer; maximum length of <findtext> field.

AT+CPBW Phonebook Write

Description: Writes phonebook entry in location number <index> in the current phonebook memory storage area, selected with AT+CPBS. If the <number> and <text> parameters are omitted, the entry is deleted. If <index> is omitted but <number> is included, the entry is written to the first free location in the phonebook.

Execution command: AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]

Test command: AT+CPBW=? Shows if the command is supported.

Test command response: +CPBW: (list of supported <index>s),<nlength>, (list of supported <type>s),<tlength>.

Parameters:

<index>: Integer; values in the range of location numbers of phonebook memory.

<number>: String; phone number of format <type>.

<type>:

<type>	Description
128	Unknown numbering plan, national / international number unknown
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number Default if no '+' in sca
161	ISDN / telephony numbering plan, national number Default if '+' in sca
128-255	Valid values, see GSM 04.08 section 10.5.4.7

<text>: String; maximum length <tlength>. Character set as specified by AT+CSCS.

<nlength>: Integer; maximum length of <number> field.

<tlength>: Integer; maximum length of <text> field.

AT*EPRR Personal Ringtype Read

Description: Returns phone number, phone number type, and sound type of entry <index*r*>.

Execution command: AT*EPRR=<index*r*>,<number>,<type>,<sound_type>

Test command: AT*EPRR=? Shows if the command is supported.

Test command response: *EPRR: (list of supported <index*r*>s)

Parameters:

<index*r*>:

<index*r*>	Description
1-10	Location number

<number>: String; phone number of format <type>.

<type>:

<type>	Description
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

<sound_type>:

<sound_type>	Description
1	Low ring signal
2	Medium ring signal
3	High ring signal
4	Mixed ring signal
11	Melody 1
12-30	Melody 2 - melody 20 Reserved for pre-set melodies
31-34	Own melody 1-4

AT*EPRW Personal Ringtype Write

Description: Writes phone number, phone number type, and sound type to entry <indexr>. It is possible to use wild-cards for phone number by substituting the digits with question marks. If all parameter but <indexr> are omitted, the entry at <indexr> is deleted. If the phone number is not in the ME phonebook, the command fails.

Execution command: AT*EPRW=<index*r*>,<number>,<type>,<sound_type>

Test command: AT*EPRW=? Shows if the command is supported.

Test command response: *EPRW: (list of supported <index*r*>s),<nlength>,(list of supported <type>s and <sound_type>s)

Parameters:

<index*r*>:

<index*r*>	Description
1-10	Location number

<number>: String; phone number of format <type>.

<type>:

<type>	Description
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

<nlength>: Integer; maximum length of <number> field.

<sound_type>:

<sound_type>	Description
1	Low ring signal
2	Medium ring signal
3	High ring signal
4	Mixed ring signal
11	Melody 1
12-30	Melody 2 - melody 20 Reserved for pre-set melodies
31-34	Own melody 1-4

AT*ECAS Callers Allowed Set

Description: Sets different alternatives for call screening.

Set command: AT*ECAS=<callscreen>

Read command: AT*ECAS? Displays the current <callscreen> setting.

Test command: AT*ECAS=? Shows if the command is supported.

Test command response: *ECAS: (list of supported <callscreen>s)

Parameter:

<callscreen>:

<callscreen>	Description
0	No callers allowed. The phone invokes a CFU request to the destination number stored for this purpose
1	All callers allowed. Normal action taken in response to incoming call Default setting
2	Some callers allowed. If the Calling Line Indicator (CLI) matches the one of the entries on the white list, the call is accepted as normal, else the call is rejected without alerting the user The data of the rejected call is stored as a normal missed call, and an indication is given in IDLE mode

AT*ECAR Callers Allowed Read

Description: Lists the calls allowed.

Execution command: AT*ECAR=<CAindex1>[,<CAindex2>]

Execution command response: *ECAR: <CAindex>[,<groupname>][,<storage>][,<PBindex>][,<CLUID>]

Test command: AT*ECAR=? Shows if the command is supported.

Test command response: *ECAR: (list of supported <CAindex>s),<gn_length>,
(list of supported <storage>s)

Parameters:

<CAindex*n*>: Integer; start value of location number.

<groupname>: String; name of callers-allowed group.

<storage>:

<storage>	Description
“ME”	ME phonebook Default setting

<PBindex>: Integer; values in the range of location numbers in phonebook memory.

<CLUID>: LUID for contact.

AT*ECAW Callers Allowed Write

Description: Writes to or removes entries from Callers Allowed list.

Execution command: AT*ECAW=[<CAindex>[,<storage>,<PBindex>]

Test command: AT*ECAW=? Shows if the command is supported.

Test command response: *ECAW: (list of supported <CAindex>s),(list of supported <storage>s)

Parameters:

<CAindex>: Integer; values in the range of location numbers in CA list.

<storage>:

<storage>	Description
“ME”	ME phonebook
“SM”	SIM phonebook

<PBindex>: Integer; values in the range of location numbers in phonebook memory.

4.20.2 Use scenarios

Phonebook Read

This scenario shows how reading from the phonebook is performed.

AT command	Response	Comment
AT+CPBR=?		Read index range and element lengths
	+CPBR: (1-99), 30,30 OK	Max 99 entries Max number length equals 30
AT+CPBR=2		Read one entry at index 2
	+CPBR: 2,”90510”, 129,”Dieter” OK	
AT+CPBR=1,4		Read entries from index 1 to 4 Only entries set are returned

AT command	Response	Comment
	+CPBR: 1,"12356",129,"Klaus" +CPBR: 2,"90510",129,"Dieter" +CPBR: 4,"54321",129,"Helmut" OK	Index 1 Index 2 Index 4

Callers Allowed Write

This scenario shows how call screening is controlled.

AT command	Response	Comment
AT*ECAW="ME",15		Write ME PB entry 15 to first free position in CA list
	OK	
AT*ECAW=2		Delete position 2 in CA list
	OK	
AT*ECAW=4,"ME",15		Supplying all three parameters will result in an error
	ERROR	

4.21 Ensemble S18: GSM Clock, Date and Alarm Handling

4.21.1 Commands

AT*ESDF Date Format

Description: Sets the date format in the phone.

Set command: AT*ESDF=<mode>

Read command: AT*ESDF? Displays the current <mode> setting.

Test command: AT*ESDF=? Shows if the command is supported.

Test command response: *ESDF: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Off Default setting
1	DD-MMM-YY
2	DD-MM-YY
3	MM/DD/YY
4	DD/MM/YY
5	DD.MM.YY
6	YYMMDD

<mode>	Description
7	YY-MM-DD

AT*ESTF Time Format

Description: Sets the time format of the time information in the phone.

Set command: AT*ESTF=<mode>

Read command: AT*ESTF? Displays the current <mode> setting.

Test command: AT*ESTF=? Shows if the command is supported.

Test command response: *ESTF: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
1	HH:MM (24-hour clock)
2	HH:MM (a.m./p.m.)

AT+CCLK Clock

Description: Sets the real-time clock in the ME.

Set command: AT+CCLK=<time>

Read command: AT+CCLK? Displays the current <time> setting.

Test command: AT+CCLK=? Shows if the command is supported.

Parameter:

<time>: String; “yy/MM/dd,hh:mm:ssz”. “z” is the time zone difference from GMT.

AT+CALA Alarm

Description: Sets an alarm time in the ME. There can be an array of different alarms and the alarms may be recurrent. When the alarm is timed out and executed, the unsolicited result code +CALV is returned, even if the alarm is set up to be silent.

Set command: AT+CALA=<time>[,<n>[,<recurr>]]

Read command: AT+CALA?

Read command response: +CALA: <time1>,<n1>[,<recurr1>]
[+CALA: <time2>,<n2>[,<recurr2>]
[...]

Test command: AT+CALA=? Shows if the command is supported.

Test command response: +CALA: (list of supported <n>s),(list of supported <type>s),<tlength>,<rlength>,(list of supported <silent>s)
Note: <type> and <silent> are not supported. <tlength> is the maximum length of <type>.

Parameters:

<time>: String; ‘yy/MM/dd,hh:mm:ssz’.
Note: only hours and minutes are used for setting the alarm. The other parameters are ignored.

<n>: Integer; identifies an active alarm.

<recurr>:

<recurr>	Description
<1-7>[,<1-7>[...]	For setting an alarm for one or more days in the week. ‘1’=Monday, ‘7’=Sunday
0	Sets the alarm for all days in the week

<rlength>: Integer; maximum length of the <recurr> parameter.

AT+CALD Alarm Delete

Description: Removes an active alarm.

Execution command: AT+CALD=<n>

Test command: AT+CALD=? Shows if the command is supported.

Parameter:

<n>: Integer; identifies an active alarm.

AT+CAPD Postpone or Dismiss an Alarm

Description: Controls an active alarm by either postponing or dismissing it.
If more then one active alarm occurs, this command influences the last activated alarm.
Note: if the snooze function is disabled, see AT+ESZS, the alarm cannot be postponed.

Execution command: AT+CAPD=[<sec>].

Test command: AT+CAPD=? Shows if the command is supported.

Test command response: +CAPD: (list of supported <sec>s)

Parameter:

<sec>:

<sec>	Description
0	Dismisses the alarm Default setting
540	Postpones the alarm (snooze) for 540 seconds (9 minutes)

AT*ESZS Snooze Set

Description: Enables and disables the motion snooze function, meaning this command enables the possibility to postpone an alarm via an IR proximity switch on the phone. The ordinary alarm snooze function is not affected by this command.
Also see AT+CAPD.

Set command: AT*ESZS=<onoff>

Read command: AT*ESZS? Displays the current <onoff> setting.

Test command: AT*ESZS=? Shows if the command is supported.

Test command response: *ESZS: (list of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	The motion snooze function is disabled Default setting
1	The motion snooze function is enabled

AT*EDST Daylight Saving Time

Description: Sets the daylight saving time hours.
Note: it is recommended that the daylight saving time is set with this command before setting the actual local time with AT+CCLK.

Set command: AT*EDST=<dst>

Read command: AT*EDST? Displays the current <dst> setting.

Test command: AT*EDST=? Shows if the command is supported.

Test command response: *EDST: (list of supported <dst>s)

Parameter:

<dst>:

<dst>	Description
0	Standard time Default setting
1	Daylight saving time, +1 hour
2	Daylight saving time, +2 hours

AT+CTZU Automatic Time Zone Update

Description: Enables and disables the automatic time zone update via NITZ.

Set command: AT+CTZU=<onoff>

Read command: AT+CTZU? Displays the current <onoff> setting.

Test command: AT+CTZU=? Shows if the command is supported.

Test command response: +CTZU: (list of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	The automatic time zone update is disabled Default setting
1	The automatic time zone update is enabled

4.21.2 Unsolicited result codes

+CALV Alarm Event

Description: This unsolicited result code is returned when an alarm is activated. The alarm is set using AT+CALA.

Unsolicited result code:+CALV: <n>

Parameter:

<n>: Integer; identifies an alarm event.

4.21.3 Use scenarios

Alarm Functionality

AT Command	Response	Comment
AT+CALA=?		Test if the command is supported
	+CALA: 1,,0,13,(0-13) OK	Only one alarm is supported, <type> is not supported
AT*ERIN=3,5		Set alarm ring type to 'High' ring signal
	OK	
AT+CALA="14:25"		Set alarm time to 14:25
	OK	
AT+CALA?		Shows all active alarms
	+CALA: "14:25",1,,, OK	One alarm is set The alarm index is '1' The alarm has no text set - default is set The alarm is not recurrent

AT Command	Response	Comment
AT+CALA="06:10",2,,,"1,2,3,4,5"		Set a new alarm for 06:10 on all weekdays
	OK	
AT+CALA?		
	+CALA: "14:25",1,,, +CALA: "06:10",2,,, "1,2,3,4,5" OK	
	+CALV: 1	Alarm event reported Alarm is executed (at 06:10 every weekday)
AT+CAPD=540		Postpone the alarm for 9 minutes
	OK	
	+CALV: 1	9 minutes later; alarm event report
AT+CAPD=0		Dismiss the alarm
	OK	

4.22 Ensemble S19: GSM Subscriber Information

4.22.1 Commands

AT+CIMI	Request International Mobile Subscriber Identity

Description:	Causes the TA to return <IMSI>, identifying the individual SIM attached to the ME.
Execution command:	AT+CIMI
Execution command response:	+CIMI: <IMSI>
Test command:	AT+CIMI=? Shows if the command is supported.
Parameter:	
<IMSI>:	String without double quotes; International Mobile Subscriber Identity.

4.23 Ensemble S20: Ericsson Specific AT Commands For GSM

4.23.1 Commands

AT*ECUR Current Report

Description: Reports the current consumption of a connected device. The value reported is used to adjust the phone's charging parameters.

Execution command: AT*ECUR=<mapm>

Test command: AT*ECUR=? Shows if the command is supported.

Parameter:

<mapm>: Integer; number of milliamps, multiplied by 10 (120 mA reported as "1200"). Range: 0-65500.

AT*EMIC Microphone Mode

Description: Enables or disables the phone microphone.

Set command: AT*EMIC=<mode>

Read command: AT*EMIC? Displays the current <mode> setting.

Test command: AT*EMIC=? Shows if the command is supported.

Test command response: *EMIC: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Microphone is disabled
1	Microphone is enabled Default setting

AT*EPEE PIN Event

Description: Requests the phone to inform when the PIN code has been entered and accepted. This command activates the unsolicited result code *EPEV.

Set command: AT*EPEE=<onoff>

Read command: AT*EPEE? Displays the current <onoff> setting.

Test command: AT*EPEE=? Shows if the command is supported.

Test command response: *EPEE: (list of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	Request for report on entered PIN is not activated Default setting
1	Request for report on entered PIN is activated

AT*ESNU Settings Number

Description: Sets a <type> number, in the format <number_type>, in the phone.

Set command: AT*ESNU=<type>,<number>[,<number_type>]

Read command: AT*ESNU? Displays the current parameter settings.

Read command response: *ESNU: <type1>,<number1>,<number_type1><CR><LF>
[*ESNU: <type2>,<number2>,<number_type2><CR><LF>
[...]]

Test command: AT*ESNU=? Shows if the command is supported.

Test command response: *ESNU: (list of supported <type>s)

Parameters:

<type>

<type>	Description
0	Voice L1
1	Voice L2
2	Fax
3	Data

<number>: '0-9, +'

<number_type>: Integer; type of address octet, in hexadecimal format.

<number_type>	Description
129	Default setting when dialling string does not include the international access code character '+'
145	Default setting when dialling string includes the international access code character '+'

AT*ETCH Rear Slot Trickle Charge

Description: The charger may disconnect the phone slot (charger supply voltage) for 30 seconds to trickle charge rear slot without affecting the phone functionality. This command indicates if the phone is ready for immediate disconnection.

Execution command: AT*ETCH

Execution command response: *ETCH: <disconnect>

Test command: AT*ETCH=? Shows if the command is supported.

Test command response: *ETCH: (list of supported <disconnect>s)

Parameter:

<disconnect>:

<disconnect>	Description
0	The phone **not** ready to disconnect **Default setting**
1	The phone ready to disconnect

AT*EKSP Key Sound Playback

Description: Generates a key playback sound.

Execution command: AT*EKSP

Test command: AT*EKSP=? Shows if the command is supported.

AT*EQVL External Volume Status

Description: Turns on/off the unsolicited result code *EVOLC. The command also queries the status of the volume level of the phone. The user changes the volume via the phone keypad and the phone sends *EVOLC accordingly. The vehicle handsfree then adjusts the volume accordingly.

Set command: AT*EQVL=<report>

Read command: AT*EQVL? Displays the current <report> and <current_volume> settings.

Test command: AT*EQVL=? Shows if the command is supported.

Test command response: *EQVL: (list of supported <report>s)

Parameters:

<type>

<report>	Description
0	*EVOLC report disabled Default setting
1	*EVOLC report enabled

<current_volume>:

<current_volume>	Description
0	Volume low
1–(n-1)	Steps in volume
n	Volume high

AT*EXVC Set External Volume Control

Description: Sets or queries whether an external accessory, such as a vehicle handsfree, controls the audio volume. The set command is effective only as long as the phone senses it is connected to an external accessory that has issued the command. Once the phone is disconnected from the accessory, <external_volume> is reset to the default setting.

Set command: AT*EXVC=<external_volume>

Read command: AT*EXVC? Displays the current <external_volume> setting.

Test command: AT*EXVC=? Shows if the command is supported.

Test command response: *EXVC: (list of supported <external_volume>s)

Parameter:

<external_volume>

<external_volume>	Description
0	The phone controls the audio volume over AFMS Default setting
1	Audio volume over AFMS is set the maximum level where no clipping occurs The external accessory controls the actual volume heard by the user

AT*EENL Environment List

Description: Lists all environments known to the phone. Note that the accessories are added automatically to the known-environment list when they are connected to the phone, meaning that the number of environments may increase during the phone lifetime.

Execution command: AT*EENL

Execution command response: *EENL: <accessory_id1>,<unique_id1>,<env_name1><CR><LF>
[*EENL: <accessory_id2>,<unique_id2>,<env_name2><CR><LF>
[...]]

Test command: AT*EENL=? Shows if the command is supported.

Test command response: *EENL: <nenvnr>

Parameters:

<accessory_id>:

<accessory_id>	Description
1	Portable handsfree; presented in ME ass PORTABLE_HF_TXT

<accessory_id>	Description
2	Vehicle handsfree; presented in the ME as VEHICLE_HF_TXT
3	RS232 cord; presented in ME as DATA_CABLE_TXT
4	IR device; presented in ME as INFRARED_MODEM_TXT
6	Charger (intelligent); presented in ME as DESKTOP_CHARGER_TXT+<nr>
7	Charger (simple); presented in ME as TRAVEL_CHARGER_TXT
8	Reserved for MC-link
12	External handset; presented in ME as EXTERNAL_HANDSET_TXT
13	Internal IR device
15	Audio player
50	Chatboard
16-255	Reserved for future accessories; presented in ME as ACCESSORY_TYPE_TXT+<accessory_id>

<unique_id>:

<unique_id>	Description
0	Request a new unique identifier from the phone
1-65534	Unique identifier for a unique accessory
65535	Default value used by non-unique accessories

<env_name>: String; name of the environment.

<nenvnr>: Integer; maximum number of environments known to the phone.

AT*EKSR Key Sound Change Report

Description: Sets and queries the key sound settings of the phone as sent over the AFMS. The command is also used to turn on/off the unsolicited result code *EKSC that reports changes in key sound settings.

Execution command: AT*EKSR=<report>

Read command: AT*EKSR? Displays the current <report> and <mode> settings.

Test command: AT*EKSR=? Shows if the command is supported.

Test command response: *EKSR: (list of supported <report>s and <mode>s)

Parameters:

<report>:

<report>	Description
0	Key sound change report (*EKSC) disabled Default setting
1	Key sound change report (*EKSC) enabled

<mode>:

<mode>	Description
0	SILENT; no sound when a key is pressed
1	CONTINOUS TONE; a continuous tone while key is pressed
2	CLICK; a click when a key is pressed

AT*EPED Environment Delete

Description: Deletes an environment from the list of environments associated with the current profile.

Execution command: AT*EPED=<accessory_id>[,<unique_id>]

Test command: AT*EPED=? Shows if the command is supported.

Parameters:

<accessory_id>:

<accessory_id>	Description
1	Portable handsfree; presented in ME ass PORTABLE_HF_TXT
2	Vehicle handsfree; presented in the ME as VEHICLE_HF_TXT
3	RS232 cord; presented in ME as DATA_CABLE_TXT
4	IR device; presented in ME as INFRARED_MODEM_TXT
6	Charger (intelligent); presented in ME as DESKTOP_CHARGER_TXT+<nr>
7	Charger (simple); presented in ME as TRAVEL_CHARGER_TXT
8	Reserved for MC-link
12	External handset; presented in ME as EXTERNAL_HANDSET_TXT
13	Internal IR device
15	Audio player
50	Chatboard
16-255	Reserved for future accessories; presented in ME as ACCESSORY_TYPE_TXT+<accessory_id>

<unique_id>:

<unique_id>	Description
0	Request a new unique identifier from the phone
1-65534	Unique identifier for a unique accessory
65535	Default value used by non-unique accessories

AT*EPEW Environment Write

Description: Adds an environment to the list of environments associated with the current profile.

Execution command: AT*EPEW=<accessory_id>[,<unique_id>]

Read command: AT*EPEW?

Read command response: *EPEW: <accessory_id1>,<unique_id1>,<env_name1><CR><LF>
[*EPEW: <accessory_id2>,<unique_id2>,<env_name2><CR><LF>
[...]]

Test command: AT*EPEW=? Shows if the command is supported.

Test command response: *EPEW: <nenvnr>

Parameters:

<accessory_id>:

<accessory_id>	Description
1	Portable handsfree; presented in ME ass PORTABLE_HF_TXT
2	Vehicle handsfree; presented in the ME as VEHICLE_HF_TXT
3	RS232 cord; presented in ME as DATA_CABLE_TXT
4	IR device; presented in ME as INFRARED_MODEM_TXT
6	Charger (intelligent); presented in ME as DESKTOP_CHARGER_TXT+<nr>
7	Charger (simple); presented in ME as TRAVEL_CHARGER_TXT
8	Reserved for MC-link
12	External handset; presented in ME as EXTERNAL_HANDSET_TXT
13	Internal IR device
15	Audio player
50	Chatboard
16-255	Reserved for future accessories; presented in ME as ACCESSORY_TYPE_TXT+<accessory_id>

<unique_id>:

<unique_id>	Description
0	Request a new unique identifier from the phone
1-65534	Unique identifier for a unique accessory
65535	Default value used by non-unique accessories

<env_name>: String; environment name.

<nenvnr>: Integer; maximum number of environments possible to associate with a profile.

AT*EAPS Active Profile Set

Description: Selects the active phone profile. The profiles may be renamed using AT+EAPN. The profile consists of the parameters and settings for the following commands:

AT Command	Name	Ensemble
AT+CCFC AT*EDIF AT*EDIS	Call Forwarding Number and Conditions Divert Function and Reporting Divert Set	S6
AT*ELIN	Set Line	S6
AT*ERIL	Ring Level Set	S9
AT*ECAS	Set Callers Allowed	S16
AT*ESBL	Set Back Light Mode	S9
AT*ESCN	Set Credit Card Number	S6
AT*ESIL	Silence Command	S9
AT+CVIB	Vibrator Mode	S9
AT*EPEW AT*EPED	List of Environments	S20

Set command: AT*EAPS=<index>

Read command: AT*EAPS? Displays the current <index> and <name_tagx> settings.

Test command: AT*EAPS=? Shows if the command is supported.

Test command response: *EAPS: (list of supported <index>s),<nlength>

Parameters:

<index>:

<index>	Description
1-7	Profile number

<name_tagx>: String; profile name tag.

<nlength>: Integer; maximum length of <name_tagx>.

AT*EAPN Active Profile Rename

Description: Sets a new name for the active profile.

Set command: AT*EAPN=<name_tag>

Read command: AT*EAPN? Displays the current parameter settings.

Read command response: *EAPN: <index1>,<name_tag1><CR><LF>
[*EAPN: <index2>,<name_tag2><CR><LF>
[...]]

Test command: AT*EAPN=? Shows if the command is supported.

Test command response: *EAPN: <nlength>

Parameters:

<index>:

<index>	Description
1-7	Profile number

<name_tagx>: String; name tag for the profile.

<nlength>: Integer; maximum length of <name_tagx>.

AT*EBCA Battery and Charging Algorithm

Description: Requests status of battery/charging and turns on/off unsolicited result code *EBCA.

Set command: AT*EBCA=<onoff>

Set command response: *EBCA: <vbat1>,<vbat2>,<vbat3>,<vbat4>,<btype>,<dcio>,<icharge>,<iphone>,<acapacity>,<ccapacity>,<pacapacity>,<ncapacity>,<tempbattery>,<tempphone>,<bcapacity>,<chargestate>

Read command: AT*ECBA? Displays the current <onoff> setting.

Test command: AT*ECBA=? Shows if the command is supported.

Test command response: *ECBA: (list of supported <vbat1>s, <vbat2>s, <vbat3>s, <vbat4>s, <btype>s, <dcio>s, <icharge>s, <iphone>s, <acapacity>s, <ccapacity>s, <pacapacity>s, <ncapacity>s, <tempbattery>s, <tempphone>s, <bcapacity>s, and <chargestate>s)

Parameters:

<onoff>:

<onoff>	Description
0	Disable unsolicited result code *EBCA Default setting
1	Enable unsolicited result code *EBCA

<vbat1>: Integer; battery voltage. Number of mV, multiplied by 10. Range: 0-65500.

<vbat2>: Integer; battery voltage. Number of mV, multiplied by 10. Range: 0-65500.

<vbat3>: Integer; battery voltage. Number of mV, multiplied by 10. Range: 0-65500.

<vbat4>: Integer; battery voltage. Number of mV, multiplied by 10. Range: 0-65500.

<btype>:

<btype>	Description
0	NiMH battery
1	Li battery
2	Unknown battery

<dcio>: Integer; battery voltage from the charge. Number of mV, multiplied by 10. Range: 0-65500.

<icharge>: Integer; current charge. Number of mA. Range: 0-65500.

<iphone>: Integer; phone current consumption. Number of mA. Range: 0-65500.

<acapacity>: Integer; added capacity during charge. Number of mAh, multiplied by 20. Range: 0-65500.

<ccapacity>: Integer; consumed capacity during charge. Number of mAh, multiplied by 20. Range: 0-65500.

<ncapacity>: Integer; nominal capacity during charge. Number of mAh, multiplied by 20. Range: 0-65500.

<tempbatt>: Integer; battery temperature in degrees Celsius, -20 deg C - +70 deg C.

<tempphone>: Integer; phone temperature in degrees Celsius, -20 deg C - +70 deg C.

<bcapacity>:

<bcapacity>	Description
0	Slim battery
1	Standard battery
2	High-capacity battery

<chargestate>:

<chargestate>	Description
0	Start
1	Charge
2	Await
3	Handheld
4	Charge completed; safety timer
5	Charge completed; dT/dt
6	Charge completed; dv2/dt2
7	Charge completed; flat V

AT*ENAD Internet Account Define

Description: This command is used for defining an Internet Account. An IA is called a “Data Account” in the phone MMI.

Set command: AT*ENAD=[<index>][,<name>,<userid><password>,<bearer>,(bearer settings_1)]

<bearer>	(bearer_settings_1)
0	<dialup_nr>,<dial_type>,<data_rate>
1	<pref_serv>,<pap_chap>

Set command response: *ENAD: <index>[,<cid>]

Note: If the *ENAD command is issued with only the <index> parameter, this is interpreted as a request for the corresponding account to be deleted.

Read command: AT*ENAD? Displays the current <index>s <name>s,<userid>,,<bearer>,(bearer_settings_2).

Note: Extra comma between <userid> and <bearer>.

<bearer>	(bearer_settings_2)
0	<dialup_nr>,<dial_type>,<data_rate>
1	<pref_serv>,<pap_chap>,<cid>

Test command: AT*ENAD=? Shows if the command is supported.

Test command response: *ENAD: (list of supported <index>s),max length of <name>,max length of <userid>,max length of <password>,0,max length of <dial_up_nr>,(list of supported <dial_type>s,<data_rate>s)

*ENAD: (list of supported <index>s),max length of <name>,max length of <userid>,max length of <password>,1,(list of supported <pref_serv>s,<pap_chap>s)

Parameters:

<index>: Integer; When a new account is defined, the phone assigns an index that is returned as a result code. This is a unique index: even if a certain index is deleted, its index is never reused unless explicitly demanded. If the created account uses GPRS as the bearer, the <cid> of the PDP context associated with the account shall also be returned.

Note: There is a one-to-one mapping between PDP Contexts and Internet Accounts with GPRS as the bearer. When a PDP Context is defined via an AT command, an Internet account is thus automatically created with GPRS as the bearer and an association to this PDP Context. In the same way, a PDP Context with default values set is defined when an IA is created with GPRS as the bearer.

The easiest way to create a GPRS Internet account is to first use AT*ENAD, remember the <cid> being returned by the phone, and then modify this PDP Context using the standard GPRS commands in ensemble S15.

<index>	Description
1-65000	Unique index for each Internet Account

<name>: String; Internet Account name. Maximum of 20 16-bit characters.

<userid>: String; user ID. Maximum of 20 8-bit characters.

<password>: String; password. Maximum of 20 8-bit characters.

Note: If the <passwd> parameter is left blank this shall be interpreted as a request for the <userid> and <passwd> parameters to be set dynamically. The user will then be prompted for these values each time a connection is set up.

<bearer>:

<bearer>	Description
0	Circuit-switched dial-up
1	GPRS

<dialup_nr>: String; the phone number to be used when setting up the connection. Maximum of 30 8-bit characters.

<dial_type>:

<dial_type>	Description
0	GSM Data (CSD)
1	Digital (ISDN)

<data_rate>:

<data_rate>	Description
1	9600 bits/s
2	14400 bits/s
3	19200 bits/s
4	28800 bits/s Default setting

<cid>: Integer; ID number of a PDP Context as defined in AT+CGDCONT (S15).
Note: There is a one to one mapping between an IA and a PDP context. A certain context can thus not be reused in another IA.

<pref_serv>:

<pref_serv>	Description
0	Automatic Default setting
1	GPRS only

<pap_chap>:

<pap_chap>	Description
0	Normal; only PAP allowed Default setting
1	Secure; only CHAP allowed
2	None, No authentication scheme is used

4.23.2 Unsolicited result codes

*EPEV	PIN Code Event

Description: This unsolicited result code is returned when a PIN code has been entered and accepted. The result code is activated using AT*EPEE.

Unsolicited result code:*EPEV

*EVOLC PIN Code Event

Description: This unsolicited result code is returned when a user has made a change in the volume control. The result code is activated using AT*EQVL.

Unsolicited result code:*EVOLC: <current_volume>

Parameter:

<current_volume>:

<current_volume>	Description
0	Volume low
1-6	Steps in volume
7	Volume high

*EKSC Key Sound Change Report

Description: This unsolicited result code is returned when a user has made a change in the key sound setting. This result code is also sent upon successful execution of AT*EKSR='1'. The result code is activated using AT*EKSR.

Unsolicited result code:*EKSC: <mode>

Parameter:

<mode>:

<mode>	Description
0	SILENT; no sound when a key is pressed
1	CONTINOUS TONE; a continuous tone while key is pressed
2	CLICK; a click when a key is pressed

*EBCA Indication Algorithm Status

Description: This unsolicited result code indicates the changes in status for the parameters of the charging algorithm. The result code is activated using AT*EBCA.

Unsolicited result code:*EBCA: <vbat1>,<vbat2>,<vbat3>,<vbat4>,<btype>,<dcio>,<icharge>,<iphone>, <acapacity>,<ccapacity>,<pacapacity>,<ncapacity>,<tempbattery>,<tempphone>, <bcapacity>,<chargestate>

Parameters: See AT*EBCA.

4.23.3 Use scenarios

Environment and Profiles

AT Command	Response	Comment
AT*EAPS?		Read the current profile
	*EAPS: 1,"Normal" OK	"Normal" is the current profile
AT*EAPS=3		Change profile to "Car"
	OK	
AT*EENL		List all environments known to the phone
	*EENL: 1,65535, "Portable HF" *EENL: 2,65535, "Vehicle HF" *EENL: 6,65519, "Desktop Charger" OK	
AT*EACS=4,1		An IR-device is now connected to the phone The new accessory is added to the list of known environments
	OK	
AT*EENL		List all environments known to the phone
	*EENL: 1,65535, "Portable HF" *EENL: 2,65535, "Vehicle HF" *EENL: 4,65535, "IR" *EENL: 6,65519, "Desktop Charger" OK	The IR-device is now added to the list of known environments
AT*EPEW?		List all environments associated with the "Car" profile
	OK	No environments are associated with the "Car" profile
AT*EPEW=2		Associate the vehicle handsfree accessory with the "Car" profile
	OK	
AT*EPEW?		List all environments associated with the "Car" profile
	*EPEW: 1,65535, "Vehicle HF" OK	The vehicle HF is associated with the "Car" profile
AT*EAPS=1		Change profile to "Normal"
	OK	

4.24 Ensemble S24: MMI Settings

4.24.1 Commands

AT*EFOS Font Size Set

Description: Sets the font size used by the phone MMI.

Set command: AT*EFOS=<fs>

Read command: AT*EFOS? Displays the current <fs> setting.

Test command: AT*EFOS=? Shows if the command is supported.

Test command response: *EFOS: (list of supported <fs>s)

Parameter:

<fs>:

<fs>	Description
1	Font size small
2	Font size medium
3	Font size large

4.25 Ensemble S26: Voice Control

4.25.1 Commands

AT*EVAA Voice Answer Active

Description: Activates and deactivates the voice answering function.

Set command: AT*EVAA=<onoff>

Read command: AT*EVAA? Displays the current <onoff> setting.

Test command: AT*EVAA=? Shows if the command is supported.

Test command response: *EVAA: (list of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	Deactivate the voice answering function Default setting
1	Activate the voice answering function

AT*EMWS Magic Word Set

Description: Activates the Magic Word function. When activated, the voice recogniser continuously listens for the trained magic word. When the magic word is detected, the complete voice control functionality is activated.

Set command: AT*EMWS=<mode>

Read command: AT*EMWS? Displays the current <mode> setting.

Test command: AT*EMWS=? Shows if the command is supported.

Test command response: *EMWS: (list of supported <mode>s)

Parameter:

<mode>:

<onoff>	Description
0	The magic word function is not activated Default setting
1	The magic word function is activated

4.26 Ensemble S29: WAP Browser

4.26.1 Commands

AT*EWIL WAP Image Load

Description: Enables and disables image download in the WAP browser.

Set command: AT*EWIL=<onoff>

Read command: AT*EWIL? Displays the current <onoff> setting.

Test command: AT*EWIL=? Shows if the command is supported.

Test command response: *EWIL: (list of supported <onoff>s)

Parameter:

<onoff>:

<onoff>	Description
0	Disable image download
1	Enable image download Default setting

AT*EWHP WAP Homepage

Description: Sets the homepage (start page) for the WAP browser.

Set command: AT*EWHP=<url>

Read command: AT*EWHP? Displays the current <url> setting.

Test command: AT*EWHP=? Shows if the command is supported.

Test command response: *EWHP: <nurl>

Parameters:

<url>: String; the URL representing the homepage.

<nurl>: Integer; maximum length of <url>.

AT*EWPR WAP Profiles

Description: Selects active WAP settings profile

Set command: AT*EWPR=<profile>

Read command: AT*EWPR?

Read command response: *EWPR: <profile>

Test command: AT*EWPR=? Shows if the command is supported.

Test command response: *EWPR: (list of supported <profile>s)

Parameter:

<profile>:

<profile>	Description
1	WAP settings profile number 1
2	WAP settings profile number 2
...	...
5	WAP settings profile number 5

AT*EWPN WAP Profile Name

Description: Sets the name of <profile>.

Set command: AT*EWPN=<profile>,<name>

Read command: AT*EWPN?

Read command response: *EWPN: <profile1>,<name1><CR><LF>
[*EWPN: <profile2>,<name2><CR><LF>
[...]]

Test command: AT*EWPN=? Shows if the command is supported.

Test command response: *EWPN: (list of supported <profile>s),<nlength>

Parameters:

<profile>:

<profile>	Description
1	WAP settings profile number 1
2	WAP settings profile number 2
...	...
n	WAP settings profile number *n*

<name>: String; WAP profile name.

<nlength>: Integer; maximum length of <name>.

AT*EWDT WAP Download Timeout

Description: Sets the server response time used when downloading a WAP page.

Set command: AT*EWDT=<sec>

Read command: AT*EWDT? Displays the current <sec> setting.

Test command: AT*EWDT=? Shows if the command is supported.

Test command response: *EWDT: (list of supported <sec>s)

Parameter:

<sec>: Integer; number of seconds. Range: 15-300.

AT*EWLI WAP Login

Description: Sets the user identity and password to be used for logging on to a WAP proxy (service provider).

Set command: AT*EWLI=<user>,<password>

Read command: AT*EWLI? Displays the current <user> setting.

Test command: AT*EWLI=? Shows if the command is supported.

Test command response: *EWLI: <nuser>,<npassword>

Parameters:

<user>: String; user name for the WAP connection.

<password>: String; password for the WAP connection.

<nuser>: Integer; maximum length of <user>.

<npassword>: Integer; maximum length of <password>

AT*EWPB WAP Preferred Bearer

Description: This command sets the preferred bearer for WAP. If Internet Account is chosen as the preferred bearer, the index of the Internet Account to be used shall be sent as the second parameter: <IA_index>. If SMS is chosen as the preferred bearer, the second parameter is ignored.
Note: If Internet Account is chosen as the preferred bearer but no accounts are yet defined the phone shall return ERROR

Set command: AT*EWPB=<pbearer>[,<IA_index>]

Read command: AT*EWPB? Displays the current <pbearer> and <IA_index> settings.

Test command: AT*EWPB=? Shows if the command is supported.

Test command response: *EWPB: (list of supported <pbearer>s and <IA_index>s)

Parameters:

<pbearer>:

<pbearer>	Description
1	SMS
2	Not supported
3	Internet Account Default setting

<IA_index>: Index of Internet Account to be used by the WAP browser

<IA_index>	Description
0	Always ask Default setting
1-255	Valid values

AT*EWCG WAP CSD Gateway

Description: Sets the primary gateway to be used when CSD is the preferred bearer. The gateway is either an URL or an IP address on the network where the gateway can be reached.

Set command: AT*EWCG=<prim>,<gateway>

Read command: AT*EWCG? Displays the current <prim> and <gateway> settings.

Test command: AT*EWCG=? Shows if the command is supported.

Test command response: *EWCG: (list of supported <gateway>s),<ngateway>

Parameters:

<prim>:

<prim>	Description
1	Set primary gateway

<gateway>: String; gateway address.

<ngateway>: Integer; maximum length of <gateway>.

AT*EWSA WAP SMSC Address

Description: Sets the SMSC address to be used for WAP browsing over SMS. The command sets the MSISDN or MSID to the SMSC hosting the connection to the gateway on the network.

Set command: AT*EWSA=<smscaddr>,[<type>]

Read command: AT*EWSA? Displays the current <smscaddr> and <type> settings.

Test command: AT*EWSA=? Shows if the command is supported.

Test command response: *EWSA: <nsmscaddr>,(list of supported <type>s)

Parameters:

<smscaddr>: String; MSISDN or MSID to the SMSC.

<nsmscaddr>: Integer; maximum length of <smscaddr>.

<type>:

<type>	Description
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

AT*EWSG WAP SMS Gateway

Description: Sets the SME address to be used for WAP browsing over SMS. The command sets the MSISDN or MSID to the SME representing the SMS address of the gateway on the network.

Set command: AT*EWSG=<smeaddr>,[<type>]

Read command: AT*EWSG? Displays the current <smeaddr> and <type> settings.

Test command: AT*EWSG=? Shows if the command is supported.

Test command response: *EWSG: <nsmeaddr>,(list of supported <type>s)

Parameters:

<smeaddr>: String; SME address.

<nsmeaddr>: Integer; maximum length of <smeaddr>.

<type>:

<type>	Description
129	ISDN / telephony numbering plan, national/international unknown
145	ISDN / telephony numbering plan, international number
161	ISDN / telephony numbering plan, national number
128-255	Valid values, see GSM 04.08 section 10.5.4.7

AT*EWBA WAP Bookmark Add

Description: Adds or deletes a bookmark in the list of bookmarks. A bookmark is always added to the last position in the bookmark list. I <title> is omitted, the bookmark title is set to the first <ntitle> number of characters of the <url>. If the <url> parameter exceeds <nurl> number of characters, the bookmark URL is truncated to the last '/' character among the last <nurl> number of characters.
To delete a bookmark, <bmix> is set to a value greater than '0', and <url> and <title> must be omitted.

Set command: AT*EWBA=<bmix>,[<url>[,<title>]]

Read command: AT*EWBA?

Read command response:
*EWBA: <bmix1>,<url1>,<title1><CR><LF>
[*EWBA: <bmix2>,<url2>,<title2><CR><LF>
[...]]

Test command: AT*EWBA=? Shows if the command is supported.

Test command response: *EWBA: (list of supported <bmix>s),<nurl>,<ntext>

Parameters:

<bmix>:

<bmix>	Description
0	Add the bookmark to the last position in the list of bookmarks. This value is only valid for adding bookmarks
1	Reserved. The index '1' is reserved for the bookmark to Ericsson Mobile Internet and should not be deleted
2-25	Index to list of bookmarks These values are only valid for deleting bookmarks

<url>: String; the URL representing the bookmark.

<nurl>: Integer; maximum length of <url>.

<title>: String; bookmark title.

<ntitle>: Integer; maximum length of <title>.

AT*EWBR WAP Bookmark Read

Description: Reads a bookmark in the bookmark list

Read command: AT*EWBR=<bmix>

Read command response: *EWBR: <url>,<title>

Test command: AT*EWBR=? Shows if the command is supported.

Test command response: *EWBR: (list of supported <bmix>s)

Parameters:

<bmix>: Integer; index to the bookmark in the list.

<url>: String; the URL representing the bookmark.

<title>: String; bookmark title.

AT*EWCT WAP Connection Timeout

Description: Sets timeout time used when connecting to a WAP supplier, i.e. the time the WAP-browser will wait for a CSD call to be established.

Read command: AT*EWCT=<sec>

Read command response: *EWCT: <sec>

Test command: AT*EWCT=? Shows if the command is supported.

Test command response: *EWCT: (list of supported <sec>s)

Parameter:

<sec>: Integer; number of seconds.

<sec>	Description
60-300	Valid values

4.26.2 Use scenarios

WAP Browser Settings

AT Command	Response	Comment
AT*EWIL=1		Enable image download
	OK	
AT*EWHP="http://www.ericsson.se"		Set WAP homepage
	OK	
AT*EWDT=10		Set download timeout to 10 seconds
	OK	
AT*EWCT=10		Set connection timeout to 10 seconds
	OK	
AT*EWPR?		Query active WAP settings profile
	*EWPR: 2 OK	Profile '2' is active
AT*EWPN=2,"Off"		Change name of WAP settings profile number
	OK	
AT*EWPN?		Query WAP settings profile name(s)
	*EWPN: 1,"Priv" *EWPN: 2,"Off" *EWPN: 3,"Telia" OK	

WAP Browser Connection Settings

AT Command	Response	Comment
AT*EWLI="auser","apwd"		Set user identity and password for WAP proxy login
	OK	
AT*EWPB=2,0		Set preferred bearer to CSD Set the WAP browser to not ask for preferred bearer for every session
	OK	
AT*EWCG="1","192.18.178.143"		Set up IP address to CSD gateway
	OK	

5 AT Commands Modem Terminated

5.1 Ensemble C2: Control and Identification

5.1.1 Commands

AT	Attention Command

Description: Checks the communication between the phone and any accessory. Determines the presence of a phone.

Execution command: AT

AT*	List All Supported AT Commands

Description: The command causes the phone to return one or more lines of AT commands. It also causes the TAE to return a list of AT Commands. The phone's and the TAE's lists are separated by a '/' character.

Execution command: AT*

Execution command response:

<AT Command1><CR><LF>
[<AT Command2><CR><LF>
[...]]
/<CR><LF>
<AT Command1><CR><LF>
[<AT Command2><CR><LF>
[...]]

<AT Command>	Description
AT...	Defines the AT command, including the prefix AT

Example:

```
AT*
AT+CGMI
AT+CGMM
AT+CGMR
/
AT*
AT+CGMI
AT+CGMM
AT+CGMR
OK
```

AT+CLAC List All Available AT Commands

Description: Execution command causes the ME to return one or more lines of AT Commands.
Note: This command only returns the AT commands available to the user.

Execution command: AT+CLAC

Possible response(s): <AT Command1><CR><LF>
[<AT Command2><CR><LF>
[...]]
+CME Error: <err>

<AT Command>	Description
AT...	Defines the AT command, including the prefix AT

Test command: AT+CLAC=? Shows if the command is supported.

Example:

```
AT+CLAC
AT+CGMI
AT+CGMM
AT+CGMR
...
OK

+AT+CLAC=?
OK
```

ATI Identification Information

Description: Causes the DCE to transmit one or more lines of information text followed by a final result code. <value> may optionally be used to select from multiple types of identifying information.
This command provides compatibility with Microsoft Windows 95.

Execution command: ATI[<value>]

Possible response: <information>

Parameters:

<value>:

<value>	Description
0	Same information as AT+GMM Default setting
1	Same information as AT+GMR
3	Modem model description
5	Active setting.
7	Modem Configuration Profile Brief listing of the modem functionality: fax classes, Bluetooth, IrDA, modem type, etc.

<information>: String of characters.

ATZ Restore to User Profile

Description: This command instructs the DCE to set all parameters to their default values as specified by the user. Uploads a set of parameters set by AT&W. This may include taking into consideration the settings of hardware configuration switches or non-volatile parameter storage (if implemented). If AT&W is not used, ATZ gives the same effect as AT&F, and ATZ can be interpreted as ATH&F.

Execution command: ATZ

Extended format command: ATZ=<profile>

Test command: ATZ=? Shows if the command is supported.

Test command response: Z: (list of supported <profile>s)

Parameter:

<profile>:

<profile>	Description
0	User profile to restore

AT&F Set To Factory-Defined Configuration

Description: This command instructs the DCE to set all parameters to default values specified by the factory. Uploads the factory defaults. This may take in consideration hardware configuration and other factory-defined criteria.

Execution command: AT&F[=<profile>]

Test command: AT&F=? Shows if the command is supported.

Test command response: &F: (list of supported <profile>s)

Parameter:

<profile>:

<profile>	Description
0	Resets all the settings to the factory defaults

AT&W Store User Profile

Description: Stores the current user profile to non-volatile storage.

Execution command: AT&W[<pr>]

Test command: AT&W=? Shows if the command is supported.

Test command response: &W: (list of supported <pr>s)

Parameter:

<pr>:

<pr>	Description
0	Stores current settings in User Profile 0

AT*ESIR Read MS Systems Interface Release

Description: Reads the interface release version.

Execution command: AT*ESIR

Response: *ESIR: <major>,<minor>

Test command: AT*ESIR=? Shows if the command is supported.

Parameters:

<major>:

<major>	Description
Integer	Major version (one digit)

<minor>:

<minor>	Description
Integer	Minor version (one digit)

AT+GCAP Request Infrared Modem Capabilities List

Description: Returns a list of valid modem command prefixes.

Execution command: AT+GCAP

Execution command response: +GCAP: (list of supported <capability>s)

Test command: AT+GCAP=? Shows if the command is supported.

Parameter:

<capability>:

<capability>	Description
+CGSM	GSM commands
+FCLASS	Facsimile class 1 and 2 commands
+DS	V.42 bis compression

AT+GMI Request Manufacturer Information

Description: Returns the manufacturer information for the infrared modem.

Execution command: AT+GMI

Execution command response: <manufacturer>

Test command: AT+GMI=? Shows if the command is supported.

Parameter:

<manufacturer>: String of characters.

Example:

```
AT+GMI
ERICSSON
OK

AT+GMI=?
OK
```

AT+GMM Request Model Identification

Description: Returns the model identification for the infrared modem.

Execution command: AT+GMM

Execution command response: <model>

Test command: AT+GMM=? Shows if the command is supported.

Parameter:

<model>: String of characters.

Example:

```
AT+GMM
<MODEL XX>
OK

AT+GMM
OK
```

AT+GMR Request Revision Identification

Description: Returns the revision identification of the infrared modem.

Execution command: AT+GMR

Execution command response: <revision>

Test command: AT+GMR=? Shows if the command is supported

Parameter:

<revision>: String of characters.

Example:

```
AT+GMR
99229933
OK

AT+GMR
OK
```

5.2 Ensemble C3: Call Control

5.2.1 Commands

ATA Answer Incoming Call Command

Description: Answers and initiates a connection to an incoming call.

Execution command: ATA

Possible responses:

CONNECT

CONNECT <text>

<text>	Description
9600	Connected with data bit rate of 9600 bits/s
4800	Connected with data bit rate of 4800 bits/s
2400	Connected with data bit rate of 2400 bits/s

NO CARRIER The mobile phone is not registered.

ERROR If ATA is unsuccessfully executed by the phone.

ATH Hook Control

Description: Terminates a connection.

Execution command: ATH[<n>]

Parameter:

<n>:

<n>	Description
0	Disconnect data connection

ATD Dial Command

Description: Initiates a phone connection, which may be data, facsimile (+FCLASS> 0), or voice (phone number terminated by semicolon). The phone number used to establish the connection will consist of digits and modifiers, or a stored number specification.

Execution command: ATD<dial_string>[;] Dials the phone number specified in the <dial_string> parameter.

ATD> ME<I>[;] Dials the phone number stored in the mobile phone located by the index<I>.

ATD> SIM<I>[;] Dial the phone number stored in the SIM card located by the index <I>.

ATDL Redial the last phone number dialled.

Possible responses:

CONNECT

CONNECT <text>

<text>	Description
9600	Connected with data bit rate of 9600 bits/s
4800	Connected with data bit rate of 4800 bits/s
2400	Connected with data bit rate of 2400 bits/s

NO CARRIER — The mobile phone is not registered.

ERROR — If ATD is unsuccessfully executed by the phone.

NO DIALTONE — The mobile phone is being used for a voice call or is not within coverage of the network.

BUSY — The phone number called is engaged; only valid for data and fax connections.

OK — Only valid for voice calls.

Parameter:

<dial_string>:

<dial_string>	Description
“0 1 2 3 4 5 6 7 8 9 +”	Valid characters for origination
W	The W modifier is ignored but is included for compatibility reasons only
,	The comma modifier is ignored but is included for compatibility reasons only
;	Informs the Infrared Modem that the number is a voice number rather than a fax or data number
T	The T modifier is ignored but is included only for compatibility purposes
P	The P modifier is ignored but is included only for compatibility purposes

ATO Return To On-line Data Mode

Description: Switch from on-line command mode to on-line data mode during an active call. Returns ERROR when not in on-line command mode.

Execution command: ATO[<value>]

Parameter:

<value>:

<value>	Description
0	Return from on-line command state to on-line data state

ATP Select Pulse Dialling

Description: Would normally cause the next ATD command to use pulses when dialling the number, but this command is ignored and is implemented for compatibility reasons only.

Execution command: ATP

Test command: ATP=? Shows if the command is supported.

ATT Select Tone Dialling

Description: Would normally cause the next ATD command to use tones when dialling the number, but this command is ignored and is implemented for compatibility reasons only.

Execution command: ATT

Test command: ATT=? Shows if the command is supported.

AT+CVHU Voice Hang-up Control

Description: Selects whether ATH or “drop DTR” shall cause a voice connection to be disconnected or not.

Set command: AT+CVHU=[<mode>]

Read command: AT+CVHU? Displays the current <mode> setting.

Test command: AT+CVHU=? Shows if the command is supported.

Test command response: +CVHU: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	“Drop DTR” is ignored but OK response given ATH disconnects the call
1	“Drop DTR” and ATH ignored but OK response given
2	“Drop DTR” behaviour according to &D setting ATH disconnects the call

5.3 Ensemble C4: Interface Commands

5.3.1 Commands

ATS0 Automatic Answer Control

Description: Defines the automatic answering feature of the infrared modem. A non-zero value specifies the number of rings before the call is answered.
Note: The call always answers in the current fax class, regardless of whether the incoming call is voice, data, or fax.

Set command: ATS0=[<rcnt>]

Read command: ATS0? Displays the current <rcnt> setting.

Test command: ATS0=? Shows if the command is supported.

Test command response: S0: (list of supported <rcnt>s)

Parameter:

<rcnt>:

<rcnt>	Description
0	Disable automatic answer Default setting
1-7	Answer after the specified number of rings

ATS2 Escape Sequence Character

Description: Defines the character to be used as the escape sequence character when switching from on-line data mode to on-line command mode.

Set command: ATS2=[<esc>]

Parameter:

<esc>:

<esc>	Description
43	Escape sequence character Default setting
0-255	Escape sequence character

Note: If the <esc> parameter is set to a value in the range 128-255, the escape sequence detection is disabled.

ATS3 Command Line Termination Character

Description: Defines the character to be used as the line termination character. This is used both for the detection of an end-of-command and in formatting of responses.

Set command: ATS3=<value>

Read command: ATS3? Displays the current <value> setting.

Test command: ATS3=? Shows if the command is supported.

Test command response: S3: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-127	Supported values
13	Command line termination character = <CR> Default setting

ATS4 Response Formatting Character

Description: Defines the character to be used as the response formatting character.

Set command: ATS4=<value>

Read command: ATS4? Displays the current <value> setting.

Test command: ATS4=? Shows if the command is supported.

Test command response: S4: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-127	Supported values
10	Formatting character = <LF> Default setting

ATS5 Command Line Editing Character

Description: Defines the character to be used as the command line editing character.

Set command: ATS5=<value>

Read command: ATS5? Displays the current <value> setting.

Test command: ATS5=? Shows if the command is supported.

Test command response: S5: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-127	Supported values
8	Formatting character Default setting

ATS6 Blind Dial Delay Control

Description: Defines the number of seconds to wait before call-addressing when a dial tone is not detected. This command is ignored by the infrared modem and is included for compatibility reasons only.

Set command: ATS6=[<delay>]

Read command: ATS6? Displays the current <delay> setting.

Test command: ATS6=? Shows if the command is supported.

Test command response: S6: (list of supported <delay>s)

Parameter:

<delay>:

<delay>	Description
2	Wait 2 seconds before blind dialling Default setting
2-255	Number of seconds to wait before blind dialling

ATS7 Completion Connection Timeout

Description: Defines the maximum time allowed between completion of dialling and the connection being established. If this time is exceeded, the connection is aborted.

Set command: ATS7=[<tmo>]

Read command: ATS7? Displays the current <tmo> setting.

Test command: ATS7=? Shows if the command is supported.

Test command response: S7: (list of supported <tmo>s)

Parameter:

<tmo>:

<tmo>	Description
50	Timeout value in seconds Default setting
1-255	Timeout value in seconds

ATS8 Comma Dial Modifier Delay Control

Description: Sets the Comma dial modifier delay control. Implemented for compatibility only.

Set command: ATS8=[<delay>]

Read command: ATS8? Displays the current <delay> setting.

Test command: ATS8=? Shows if the command is supported.

Test command response: S8: (list of supported <delay>s)

Parameter:

<delay>:

<delay>	Description
2	The value of the dial modifier delay (in seconds) Default setting
1-255	The value of the dial modifier delay (in seconds)

ATS10 Automatic Disconnect Delay Control

Description: Specifies the amount of time that the DCE will remain connected to the line after the absence of received line signal. This command is ignored by the infrared modem and is implemented for compatibility reasons only.

Set command: ATS10=[<val>]

Read command: ATS10? Displays the current <val> setting.

Test command: ATS10=? Shows if the command is supported.

Test command response: S10: (list of supported <val>s)

Parameter:

<val>:

<val>	Description
2	Remains connected for two tenths of a second Default setting
1-254	Delay, specified in tenths of a second

ATE Command Echo

Description: Determines if the DCE echoes characters received from the DTE during command state and on-line command state.

Set command: ATE[<value>]

Read command: ATE? Displays the current <value> setting.

Test command: ATE=? Shows if the command is supported.

Test command response: E: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	DCE does not echo characters during command state and on-line command state
1	DCE echoes characters during command state and on-line command state Default setting

ATQ Result Code Suppression

Description: Determines if the DCE transmits result codes to the DTE.

Set command: ATQ[=]<value>

Read command: ATQ? Displays the current <value> setting.

Read command response: Q: <value>

Test command: ATQ=? Shows if the command is supported.

Test command response: Q: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	DCE transmits result codes Default setting
1	Result codes are suppressed and not transmitted

ATV DCE Response Mode

Description: Selects either verbose or numeric response codes.

Set command: ATV[=]<value>

Read command: ATV? Displays the current <value> setting.

Read command response: V: <value>

Test command: ATV=? Shows if the command is supported.

Test command response: V: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Display numeric result code
1	Display verbose result code Default setting

Result code (ATV1)	Result code (ATV0)	Description
OK	0	Acknowledges execution of a command
CONNECT	1	A connection has been established; the DCE is moving from command state to on-line data state
RING	2	The DCE has detected an incoming call from the network
NO CARRIER	3	The connection has been terminated, or the attempt establish a connection failed
ERROR	4	Command not recognized, command line maximum length exceeded, parameter value invalid, or other problem with processing the command line
NO DIALTONE	6	No dial tone detected
BUSY	7	Engaged (busy) signal detected
NO ANSWER	8	“@” (Wait for Quiet Answer) dial modifier was used, but remote ringing followed by five seconds of silence was not detected before expiration of the connection timer

M Monitor Speaker Control

Description: Defines the activity of the speaker. This command is ignored by the infrared modem and is included for compatibility reasons only.

Set command: ATM[=][<value>]

Read command: ATM? Displays the current <value> setting.

Test command: ATM=? Shows if the command is supported.

Test command response: M: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Off during the entire call Default setting
1-3	Different On-modes

ATX Call Progress Monitoring Control

Description: Defines if the dial-tone detection and busy-tone detection are to be used during a call.

Set command: ATX=[<speaker>] or ATX[<speaker>]

Read command: ATX? Displays the current <speaker> setting.

Test command: ATX=? Shows if the command is supported.

Test command response: X: (list of supported <speaker>s)

Parameter:

<speaker>:

<speaker>	Description
0	Busy and dial-tone detection off No line speed reported on connection
1	Busy and dial-tone detection off Report line speed on connection
2	Busy detection on and dial-tone detection off Report line speed on connection
3	Busy detect off and dial-tone detection on Report line speed on connection
4	Busy detection and dial-tone detection on Report line speed on connection Default setting

AT&C DCD Control

Description: Determines the behaviour of the carrier detect.

Set command: AT&C[<value>]

Parameter:

<value>:

<value>	Description
0	DCD always on
1	DCD follows the connection Default setting

AT&D DTR Response

Description: Controls all actions initiated by data terminal ready from DTE

Set command: AT&D[<value>]

Parameter:

<value>:

<value>	Description
0	Ignore Default setting
1	When in on-line data mode: Switch to on-line command mode All other states: Disconnect and switch to off-line command mode
2	Disconnect and switch to off-line command mode

AT+IFC Cable Interface DTE-DCE Flow Control

Description: Controls the flow between the infrared modem and the computer when in on-line data mode. No flow control is enabled in any of the command modes.

Set command: AT+IFC=[<by_te>,[<by_ta>]]

Read command: AT+IFC? Displays the current <by_te> and <by_ta> settings.

Test command: AT+IFC=? Shows if the command is supported.

Test command response: +IFC: (list of supported <by_te>s and <by_ta>s)

Parameters:

<by_te>:

<by_te>	Description
0	No flow control on DTE
1	Xon/Xoff flow control on DCE. Control characters are removed by the DCE interface
2	RTS flow control on DCE Default setting
3	Xon/Xoff flow control on DCE Control characters are passed to the remote DCE/DTE

<by_ta>:

<by_ta>	Description
0	No flow control on DCE
1	Xon/Xoff flow control on DTE
2	CTS flow control on DCE Default setting

AT+ICF Cable Interface Character Format

Description: Determines the local serial-port asynchronous character framing.

Set command: AT+ICF=[<format>[,<parity>]

Read command: AT+ICF? Displays the current <format> and <parity> settings.

Test command: AT+ICF=? Shows if the command is supported.

Test command response: +ICF: (list of supported <format>s and <parity>s)

Parameters:

<format>: Determines the number of data bits, parity bits, and stop bits in the start-stop frame.

<format>	Description
0	Auto-detect
1	8 Data bits, 2 Stop bits
2	8 Data bits, 1 Parity bit, 1 Stop bit
3	8 Data bits, 1 Stop bit Default setting
4	7 Data bits, 2 Stop bits
5	7 Data bits, 1 Parity bit, 1 Stop bit
6	7 Data bits, 1 Stop bit

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

<parity>	Description
0	Odd Default setting
1	Even
2	Mark
3	Space

AT+IPR Cable Interface Port Rate

Description: Specifies the data rate, in addition to 1200 bits/s or 9600 bits/s, at which the DCE will accept commands. May be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE.

Set command: AT+IPR=[<rate>]

Read command: AT+IPR? Displays the current <rate> setting.

Test command: AT+IPR=? Shows if the command is supported.

Test command response: +IPR: (list of supported auto detectable <rate>s)[, (list of fixed-only <rate>s)].

Parameter:

<rate>:

<rate>	Description
Discrete integer value	The rate, in bits per second, at which the DTE-DCE interface should operate. Currently, the following rates are supported: 0, 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400, and 460800 If unspecified, or set to zero, automatic detection is selected, and the character format is forced to auto-detect (AT+ICF=0)

AT+ILRR Cable Interface Local Rate Reporting

Description: Specifies whether or not the +ILRR intermediate result code is transmitted from the DCE to the DTE. The <rate> reported shall represent the current DTE-DCE rate. If enabled, the intermediate result code is transmitted after any modulation, error control, or data-compression reports are transmitted, and before any final result code (for example CONNECT) is transmitted. The <rate> is applied after the final result code is transmitted.

Set command: AT+ILRR=<value>

Read command: AT+ILRR? Displays the current <value> setting.

Test command: AT+ILRR=? Shows if the command is supported.

Test command response: +ILRR: (list of supported auto detectable <value>s)

Parameter:

<value>:

<value>	Description
0	Disables reporting of local port-rate (+ILRR: is not transmitted) Default setting
1	Enables reporting of local port-rate (+ILRR: is transmitted)

5.3.2 Intermediate result codes

+ILRR	+ILRR Result Code

Description: Reports cable interface speed. This response is enabled by AT+ILRR.

Intermediate result code: +ILRR: <rate>

Parameter:

<rate>	Description
Discrete integer value	The rate, in bits per second, at which the DTE-DCE interface should operate. Currently, the following rates are supported: 0, 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400, and 460800 If unspecified or set to zero, automatic detection is selected and the character format is forced to auto-detect (AT+ICF=0)

5.4 Ensemble C6: Data Compression

5.4.1 Commands

AT+DS	Data Compression

Description: Controls the V.42 bis data compression function, if provided in the TAE.

Set command: AT+DS=[<direction>[,<compresson_negotiation>[,<max_dict>[,<max-string>]]]]

Read command: AT+DS? Displays the current <direction>, <compression_negotiation>, <max_dict>, and <max_string> settings.

Test command: AT+DS=? Shows if the command is supported.

Test command response: +DS: (list of supported <direction>s, <compression_negotiation>s, <max_dict>s, and <max_string>s)

Parameters:

<direction>: Specifies the desired direction(s) of operation of the data compression function.

<direction>	Description
0	Disable V.42 bis
1	Enable V.42 bis in transmit direction only
2	Enable V.42 bis in receive direction only
3	Enable V.42 bis compression in both directions Default setting

<compression_ negotiation>: Specifies if the TAE should continue to operate if the desired result is not obtained.

<compression_ negotiation>	Description
0	Accept connection if compression is negotiated according to direction Default setting
1	Disconnect if compression is not negotiated according to direction

<max_dict>: Maximum number of dictionary entries to be negotiated.

<max_dict>	Description
512 to 4096	Maximum dictionary size
1024	Default setting

<max_string>: Maximum string length to be negotiated.

<max_string>	Description
6 to 250	Maximum string length
32	Default setting

AT+DR Data Compression Reporting

Description: Controls whether or not the extended-format +DR intermediate result code is transmitted from the TAE to the TE.
If enabled, the intermediate result code is transmitted after error-control negotiation.

Set command: AT+DR=<value>

Read command: AT+DR? Displays the current <value> setting.

Test command: AT+DR=? Shows if the command is supported.

Test command response: +DR: (list of supported <values>s)

Parameter:

<value>:

<value>	Description
0	Intermediate compression mode reporting disabled Default setting
1	Intermediate compression mode reporting enabled

5.4.2 Intermediate result codes

+DR	Data Compression Indication

Description: Data compression report. Enabled by using AT+DR.

Intermediate result code: +DR: <type>

Parameter:

<type>:

<type>	Description
NONE	No data compression negotiated
V42B	V.42 bis data compression negotiated
V42B RD	V.42 bis half duplex compression negotiated on received data
V42B TD	V.42 bis half duplex compression negotiated on transmitted data

5.5 Ensemble C18: Fax Class 1

5.5.1 Commands

AT+FCLASS	Select Mode

Description: Puts the TA in a specific mode of operation. This causes the TA to process information in a manner suitable for that type of information.

Set command: AT+FCLASS=<class>

Read command: AT+FCLASS? Displays the current <class> setting.

Test command: AT+FCLASS=? Shows if the command is supported.

Test command response: +FCLASS: (list of supported <class>s)

Parameter:

<class>:

<class>	Description
0	Data modem
1	Service Class 1 fax modem
2	Service Class 2 fax modem

AT+FMI Manufacturer Identification

Description: Request manufacturer identification.

Read command: AT+FMI?

Read command response: <text>

Example:

```
AT+FMI?
ERICSSON
OK
```

AT+FMM Model Identification

Description: Request model identification.

Read command: AT+FMM?

Read command response: <text>

Example:

```
AT+FMM?
ABC0123
OK
```

AT+FMR Revision Identification

Description: Request revision identification.

Read command: AT+FMR?

Read command response: <text>

Example:

```
AT+FMM?
0007121323
OK
```

AT+FTS Transmit Silence

Description: Stops a transmission for a specified time.

Execution command: AT+FTS=<time>

Test command: AT+FTS=? Shows if the command is supported.

Test command response: (list of supported <time>s)

Parameter:

<time>:

<time>	Description
0-255	Silence period in units of 10 ms

Example:

```
AT+FTS=12
OK

AT+FTS=?
(0-255)
OK
```

AT+FRS Receive Silence

Description: Waits for the specified time of silence on the line.

Execution command: AT+FRS=<time>

Test command: AT+FRS=? Shows if the command is supported.

Test command response: (list of supported <time>s)

Parameter:

<time>:

<time>	Description
0-255	Silence period in units of 10 ms

Example:

```
AT+FRS=12
OK

AT+FRS=?
(0-255)
OK
```

AT+FTM Facsimile Transmit

Description: Start transmission of fax data at given speed.

Set command: AT+FTM=<MOD>

Test command: AT+FTM=? Shows if the command is supported.

Test command response: (list of supported <MOD>s)

Parameter:

<MOD>:

<MOD>	Modulation	Rate (bits/s)
24	Rec. V.27 ter	2400
48	Rec. V.27 ter	4800
72	Rec. V.29	7200
96	Rec. V.29	9600

Example:

```
AT+FTM=24
CONNECT
OK

AT+FTM=?
(24,48,72,96)
OK
```

AT+FRM Facsimile Receive

Description: Start reception of fax data at given speed.

Set command: AT+FRM=<MOD>

Test command: AT+FRM=? Shows if the command is supported.

Test command response: (list of supported <MOD>s)

Parameter:

<MOD>:

<MOD>	Modulation	Rate (bits/s)
24	Rec. V.27 ter	2400
48	Rec. V.27 ter	4800
72	Rec. V.29	7200
96	Rec. V.29	9600

Example:

```
AT+FTM=24
CONNECT
OK

AT+FTM=?
(24,48,72,96)
OK
```

AT+FTH HDLC Transmit

Description: HDLC transmit speed.

Execution command: AT+FTH=<MOD>

Test command: AT+FTH=? Shows if the command is supported.

Test command response: +FTH: (list of supported <MOD>s)

Parameter:

<MOD>:

<MOD>	Modulation	Rate (bits/s)
3	Clause 2/V.21	300

AT+FRH HDLC Receive

Description: HDLC receive speed.

Execution command: AT+FRH=<MOD>

Test command: AT+FRH=? Shows if the command is supported.

Test command response: +FRH: (list of supported <MOD>s)

Parameter:

<MOD>:

<MOD>	Modulation	Rate (bits/s)
3	Clause 2/V.21	300

5.6 Ensemble C19: Fax Class 2

5.6.1 Commands

AT+FCLASS Select Mode

Description: Puts the TA in a specific mode of operation. This causes the TA to process information in a manner suitable for that type of information.

Set command: AT+FCLASS=<class>

Read command: AT+FCLASS? Displays the current <class> setting.

Test command: AT+FCLASS=? Shows if the command is supported.

Test command response: +FCLASS: (list of supported <class>s)

Parameter:

<class>:

<class>	Description
0	Data modem
1	Service Class 1 fax modem
2	Service Class 2 fax modem

AT+FAA Automatic Answer Parameter

Description: This command sets the automatic answer parameter.

Set command: AT+FAA=<value>

Read command: AT+FAA? Displays the current <value> setting.

Test command: AT+FAA=? Shows if the command is supported.

Test command response: +FAA: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Forces the TAE to answer as set by AT+FCLASS Default setting

AT+FAXERR T.30 Session Error Report

Description: Indicates the reason for the hang-up. Also see the +FHNG unsolicited result code.

Execution command: AT+FAXERR=?

Execution command response: +FAXERR=<value>

Test command: AT+FAXERR=? Shows if the command is supported.

Test command response: +FAXERR: (list of supported <value>s)

<value>:

<value>	Description
0	Normal and proper end of connection
1	Ring Detect without successful handshake
2	Call aborted, from AT+FK
3	No Loop Current
10	Unspecified Phase A error
11	No Answer (T.30 T1 time out)
20	Unspecified Transmit Phase B error
21	Remote cannot receive or send
22	COMREC error in transmit Phase B
23	COMREC invalid command received
24	RSPEC error
25	DCS sent three times without response
26	DIS/DTC received 3 times; DCS not recognised
27	Failure to train at 2400 bits/s or FMINSP value
28	RSPREC invalid response received
40	Unspecified Transmit Phase C error
43	TE to TAE data underflow
50	Unspecified Transmit Phase D error
51	RSPREC error
52	No response to MPS repeated 3 times
53	Invalid response to MPS
54	No response to EOP repeated 3 times
55	Invalid response to EOP
56	No response to EOM repeated 3 times
57	Invalid response to EOM
58	Unable to continue after PIN or PIP
70	Unspecified Receive Phase B error
71	RSPREC error
72	COMREC error
73	T.30 T2 time out, expected page not received
74	T.30 T1 time out after EOM received
90	Unspecified Receive Phase C error

91	Missing EOL after 5 seconds
93	TAE to TE buffer overflow
94	Bad CRC or frame (ECM or BFT modes)
100	Unspecified Receive Phase D errors
101	RSPREC invalid response received
102	COMREC invalid response received
103	Unable to continue after PIN or PIP
120-255	-reserved codes-

AT+FBADLIN Bad Line Threshold

Description: Sets the maximum acceptable consecutive number of bad lines.

Set command: AT+FBADLIN=<value>

Possible set command responses:
```
Copy Quality OK.
Copy Quality Not OK.
```

Read command: AT+FBADLIN? Displays the current <value> setting.

Test command: AT+FBADLIN=? Shows if the command is supported.

Test command response: +FBADLIN: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Error checking not present, or disabled Default setting

AT+FBADMUL Error Threshold Multiplier

Description: Sets the maximum acceptable percentage of bad lines per page multiplication value.

Set command: AT+FBADMUL=[<value>]

Read command: AT+FBADMUL? Displays the current <value> setting.

Test command: AT+FBADMUL=? Shows if the command is supported.

Test command response: +FBADMUL: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Error checking not present, or disabled Default setting
20	Corresponds to a 5% error rate
0-255	Valid values

AT+FBOR Phase C Bit Order Parameter

Description: Sets the bit order for negotiation (<bit_n>) and facsimile page transfer (<bit_f>).

Set command: AT+FBADMUL=[<value>]. Value is the sum of <bit_n> and <bit_f>

Read command: AT+FBOR? Displays the current <value> setting.

Test command: AT+FBOR=? Shows if the command is supported.

Test command response: +FBOR: (list of supported <value>s)

Parameters:

<bit_n>:

<bit_n>	Description
0	Same bit order
1	Reverse bit order

<bit_f>:

<bit_f>	Description
0	Same bit order
1	Reverse bit order

<value>:

<value>	Description
0	<bit_n> + <bit_f>=0 Default setting
1	<bit_n> + <bit_f>=1
2	<bit_n> + <bit_f>=2
3	<bit_n> + <bit_f>=3

AT+FBUF Buffer Size Report

Description: Request buffering parameters.

Read command: AT+FBUF?

Read command response: <bs>,<xoft>,<xont>,<bc>

<bs>: Total buffer size.

<xoft>: XOFF threshold.

<xont>: XON threshold.

<bc>: Current buffer byte count.

Example:

```
AT+FBUF?
256,0,0,0
OK
```

AT+FBUG Session Message Reporting

Description: Handles session message reporting.

Set command: AT+FBUG=<value>

Read command: AT+FBUG? Displays the current <value> setting.

Test command: AT+FBUG=? Shows if the command is supported.

Test command response: +FBUG: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Disables HDLC frame reporting Default setting
1	Enables HDLC frame reporting

AT+FCQ Copy Quality Checking

Description: Copy quality checking.

Set command: AT+FCQ=[<value>]

Read command: AT+FCQ? Displays the current <value> setting.

Test command: AT+FCQ=? Shows if the command is supported.

Test command response: +FCQ: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	No copy quality checking performed Default setting

AT+FCR Capability to Receive Parameter

Description: Sets the TAE's capability to receive message data.

Set command: AT+FCR=<value>

Read command: AT+FCR? Displays the current <value> setting.

Test command: AT+FCR=? Shows if the command is supported.

Test command response: +FCR: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Can not receive message data, but can be polled

<value>	Description
1	The TAE can receive message data Default setting

AT+FCIG Local Polling ID Parameter

Description: Sets the local polling ID parameter.

Set command: AT+FCIG=<polling_id>

Read command: AT+FCR? Displays the current <polling_id> setting.

Test command: AT+FCR=? Shows if the command is supported.

Test command response: +FCR: (<string length>)(supported <polling_id> values)

Parameter:

<polling_id>: ASCII string; 0-20 characters.

Example:

```
AT+FCIG="Ericsson Fax"
OK

AT+FCIG?
Ericsson Fax
OK

AT+FCIG=?
(20)(32-127)
OK
```

AT+FCTCRTY ECM Retry Parameter

Description: Continue to correct count during ECM.

Set command: AT+FCTCRTY=[<value>]

Read command: AT+FCR? Displays the current <value> setting.

Test command: AT+FCR=? Shows if the command is supported.

Test command response: +FCR: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Functionality disabled Default setting
0-255	Number of partial pages; units of 4 retries

AT+FDFFC Data Compression Format Conversion

Description: Data format failure check. Determines the response to a mismatch between the data format negotiated for the facsimile session and the Phase C data desired by the TE.

Set command: AT+FDFFC=<value>

Read command: AT+FDFFC? Displays the current <value> setting.

Test command: AT+FDFFC=? Shows if the command is supported.

Test command response: +FDFFC: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Disables mismatch checking Default setting

AT+FDCC TAE Capability Parameters

Description: Allows the TE to sense and constrain the capabilities of the facsimile TAE.

Set command: AT+FDCC=<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Read command: AT+FDCC? Displays the current <vr>, <br>, <wd>, <ln>, <df>, <ec>, <bf>, and <st> settings.

Test command: AT+FDCC=? Shows if the command is supported.

Test command response: +FDCC: (list of supported <vr>s,
s, <wd>s, <ln>s, <df>s, <ec>s, <bf>s, and <st>s)

Parameters:

<vr>: Vertical resolution.

<vr>	Description
0	Normal, 98 lpi
1	Fine, 196 lpi Default setting

: Bit rate.

 	Description
0	2400 bits/s V.27ter
1	4800 bits/s V.27ter
2	7200 bits/s V.29 or V.17, optional
3	9600 bits/s V.29 or V.17, optional Default setting

<wd>: Page width.

<wd>	Description
0	1728 pixels in 215 mm Default setting
1	2048 pixels in 255 mm

<wd>	Description
2	2432 pixels in 303 mm
3	1216 pixels in 151 mm
4	864 pixels in 107 mm

<ln>: Page length

<ln>	Description
0	A4, 297 mm Default setting
1	B4, 364 mm
2	Unlimited length

<df>: Data compression format.

<df>	Description
0	1-D modified Huffman Default setting
1	1-D modified Read
2	2-D uncompressed mode
3	2-D modified Read

<ec>: Error correction.

<ec>	Description
0	Disable ECM Default setting

<bf>: Binary file transfer.

<bf>	Description
0	Disable ECM Default setting

<st>: scan time per line.

<st>	Description
0-7	0-40 ms, in steps of 5 ms Default setting=0

AT+FDIS Current Session Negotiation Parameters

Description:	Allows the TE to sense and constrain the capabilities used for the current session.
Set command:	AT+FDIS=<vr>, ,<wd>,<ln>,<df>,<ec>,<bf>,<st>
Read command:	AT+FDIS? Displays the current <vr>, , <wd>, <ln>, <df>, <ec>, <bf>, and <st> settings.
Test command:	AT+FDIS=? Shows if the command is supported.
Test command response:	+FDIS: (list of supported <vr>s, s, <wd>s, <ln>s, <df>s, <ec>s, <bf>s, and <st>s)
Parameters:	See AT+FDCC.

AT+FDCS Session Results

Description:	Reads the current-session results.
Read command:	AT+FDCS?
Read command response:	+FDCS: <vr>, ,<wd>,<ln>,<df>,<ec> <bf>,<st>
Test command:	AT+FDCS=? Shows if the command is supported.
Test command response:	+FDCS: (list of supported <vr>s, s, <wd>s, <ln>s, <df>s, <ec>s, <bf>s, and <st>s)
Parameters:	See AT+FDCC.

AT+FDR Fax Data Receive Command

Description:	Initiates transition to Phase C data reception. This can occur after answering, after dialling, after a document is received, or after a page is received.
Execution command:	AT+FDR
Example:	`AT+FDR` `OK`

AT+FDT Fax Data Transmission Command

Description:	The FDT command prefixes Phase C data transmission. When the TAE is ready to accept Phase C data, it will issue the negotiation responses and the CONNECT result code to the TAE. The <df>, <vr>, <wd>, and <ln> parameters are optional.
Execution command:	AT+FDT[=<df>,<vr>,<wd>,<ln>]
Test command:	AT+FDT=? Shows if the command is supported.
Test command response:	+FDT: (list of supported <df>s, <vr>s, <wd>s, and <ln>s)
Parameters:	See AT+FDCC.

AT+FECM Error Correction Mode Control

Description: Sets the error correction mode.

Set command: AT+FECM=<value>

Read command: AT+FECM? Displays the current <value> setting.

Test command: AT+FECM=? Shows if the command is supported.

Test command response: +FECM: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Error-correcting mode disabled or unsupported. Attempts to set the <ec> parameter in AT+FDCC or AT+FDIS to '1' will return an ERROR result code ECM.related commands will result in ERROR ECM-related responses will not be generated Default setting

AT+FET Page Punctuation

Description: Punctuates page and document transmission after one or more AT+FDT commands.

Set command: AT+FET=<ppm>

Possible set command response: +FPTS: <ppr>

Read command: AT+FET? Displays the current <ppm> setting.

Test command: AT+FET=? Shows if the command is supported.

Test command response: +FET: (list of supported <ppm>s)

Parameter:

<ppm>:

<ppm>	Description
0	Another page next, same document
1	Another document next
2	No more page(s) or document(s)

Example:

```
AT+FET=0
+FTPS: 1
OK

AT+FET?
0
OK

AT+FET=?
+FET: (0-2)
OK
```

AT+FK Session Termination

Description: Causes the TAE to terminate the session in an orderly manner.

Execution command: AT+FK

Unsolicited result code: +FHNG: <hsc>

Example:

```
AT+FK
+FHNG: 2
OK
```

AT+FLID Local ID String

Description: Allows user to define the local ID string.

Set command: AT+FLID=<ID_string>

Read command: AT+FLID? Displays the current <ID_string> content.

Test command: AT+FLID=? Shows if the command is supported.

Test command response: +FLID: (<string length>),(supported <id_string> values).
20-character string. The TAE supports printable ASCII.

Parameter:

<ID_string>: String; 20 characters.

Example:

```
AT+FLID="Ericsson"
OK

AT+FLID?
Ericsson
OK

AT+FLID=?
+FLID: (20)(30-127)
```

AT+FLNFC Page Length Format Conversion

Description: Determines the TAE response to a mismatch between the page length negotiated for the facsimile session indicated by the optional AT+FDT <ln> parameter, or the AT+FDIS <ln> parameter for AT+FDR operation.
A mismatch would require clipping or scaling a longer format to a shorter one.

Set command: AT+FLNFC=<value>

Read command: AT+FLNFC? Displays the current <value> setting.

Test command: AT+FLNFC=? Shows if the command is supported.

Test command response: +FLNFC: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Disables mismatch checking

AT+FLPL Indicate Document to Poll

Description: Indicates what document should be polled.

Set command: AT+FLPL=<value>

Read command: AT+FLPL? Displays the current <value> setting.

Test command: AT+FLPL=? Shows if the command is supported.

Test command response: +FLPL: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Indicates that the TE has no document to poll Default setting
1	Document available for polling

AT+FMDL Request Model Identification

Description: Returns the model identification of a Class 2 fax machine.

Read command: AT+FMDL?

Read command response: <TAE model identification>

AT+FMFR Request Manufacturer Identification

Description: Returns the manufacturer identification of a Class 2 fax machine.

Read command: AT+FMFR?

Example:

```
AT+FMFR
Ericsson
OK
```

AT+FMINSP Minimum Phase 3 Speed

Description: Limits the lowest negotiable speed for a session. If a facsimile cannot negotiate to a minimum speed, it will perform an orderly disconnect.

Set command: AT+FMINSP=

Read command: AT+FMINSP? Displays the current <br> setting.

Test command: AT+FMINSP=? Shows if the command is supported.

Test command response: +FMINSP: (list of supported
s)

Parameter:

:

 	Description
0	2400 bits/s V.27ter Default setting
1	4800 bits/s V.27ter
2	7200 bits/s V.29 or V.17
3	9600 bits/s V.29 or V.17
4	12000 bits/s V.33 or V.17
5	14400 bits/s V.33 or V.17

AT+FPHCTO Phase C Timeout

Description: Determines how long the TAE will wait for a command after reaching the end of data when transmitting in Phase C.

Set command: AT+FPHCTO=<value>

Read command: AT+FPHCTO? Displays the current <value> setting.

Test command: AT+FPHCTO=? Shows if the command is supported.

Test command response: +FPHCTO: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0-255	Timeout setting, in 100 ms units
30	Timeout after 3 seconds Default setting

AT+FPTS Page Transfer Status

Description: Sets the post-page transfer response.

Set command: AT+FPTS=<ppr>

Read command: AT+FPTS? Displays the current <ppr> setting.

Test command: AT+FPTS=? Shows if the command is supported.

Test command response: +FPTS: (list of supported <ppr>s)

Parameter:

<value>:

<ppr>	Description
0	Page good Default setting
1	Page bad; retrain requested
2	Page good; retrain requested

AT+FREV Request Product Revision Identification

Description: Returns the version, revision level, or other information related to a Class 2 device.

Read command: AT+FREV?

Example:

```
AT+FREV
<Revision ID>
OK
```

AT+FRBC Phase C Receive Data Block Size

Description: Selects stream mode or block mode for Phase C data transfer.

Set command: AT+FRBC=<value>

Read command: AT+FRBC? Displays the current <value> setting.

Test command: AT+FRBC=? Shows if the command is supported.

Test command response: +FRBC: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Stream mode only Default setting

AT+FREL Phase C Received EOL Alignment

Description: Sets the EOL alignments for received Phase C data.

Set command: AT+FREL=<value>

Read command: AT+FREL? Displays the current <value> setting.

Test command: AT+FREL=? Shows if the command is supported.

Test command response: +FREL: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	EOL patterns are bit-aligned as received Default setting

AT+FSPL Request to Poll

Description: Enables or disables the polling parameter.

Set command: AT+FSPL=<value>

Read command: AT+FSPL? Displays the current <value> setting.

Test command: AT+FSPL=? Shows if the command is supported.

Test command response: +FSPL: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	The TE does not want to poll Default setting
1	The TE can receive a polled document. After a polled document is received, the <value> setting is reset to '0'.

AT+FTBC Phase C Transmit Data Block Size

Description: Selects stream mode or block mode for Phase C data transfer. Sets the size of the transmit data block.

Set command: AT+FTBC=<value>

Read command: AT+FTBC? Displays the current <value> setting.

Test command: AT+FTBC=? Shows if the command is supported.

Test command response: +FTBC: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Stream mode only. Block size set to zero Default setting

AT+FVRFC Vertical Resolution Format Conversion

Description: Determines the TAE response to a mismatch between the vertical resolution negotiated for the facsimile session, indicated by the AT+FDCS <vs> parameter, and the Phase C data desired by the TE, indicated by the AT+FDT <vr> parameter, or the AT+FDIS <vr> parameter for the AT+FDR operation.

Set command: AT+FVRFC=<value>

Read command: AT+FVRFC? Displays the current <value> setting.

Test command: AT+FVRFC=? Shows if the command is supported.

Test command response: +FVRFC: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Disables mismatch checking. The TE must check the AT+FDCS <vr> parameter, and transfer matching data Default setting

AT+FWDFC Page Width Format Conversion

Description: Determines the TAE response to a mismatch between the page width negotiated for the facsimile session, indicated by the AT+FDCS <wd> parameter, and the Phase C data desired by the TE, indicated by the AT+FDT <wd> parameter, or the AT+FDIS <wd> parameter for AT+FDR operation.
A mismatch would require clipping or scaling a wider format to a narrower one.

Set command: AT+FWDFC=<value>

Read command: AT+FWDFC? Displays the current <value> setting.

Test command: AT+FWDFC=? Shows if the command is supported.

Test command response: +FWDFC: (list of supported <value>s)

Parameter:

<value>:

<value>	Description
0	Disables mismatch checking. The TE must check the AT+FDCS <wd> parameter, and transfer matching data Default setting

5.6.2 Unsolicited result codes

+FET FET Indication

Description: Post-page message. The +FET: <ppm> message is generated by a receiving facsimile TAE after the end of Phase C reception, on receipt of the post-page message from the transmitting station.

Unsolicited result code:+FET: <ppm>

Parameter:

<ppm>: See the AT+FET command.

+FHNG FHNG Indication

Description: Indicates that the call has been terminated. The hang-up cause is reported, and stored in the AT+FAXERR parameter for later inspection.

Unsolicited result code:+FHNG: <hsc>

Parameter:

<hsc>: Hang-up status code.

<hsc>	Description
0-9	Call placement and termination
0	Normal and proper end of connection
1	Ring Detect without successful handshake
2	Call aborted, from AT+FK
3	No Loop Current
10-19	Transmit Phase A & miscellaneous errors
10	Unspecified Phase A error
11	No Answer (T.30 T1 Timeout)
20-39	Transmit Phase B Hang-up Codes
20	Unspecified Transmit Phase B error
21	Remote cannot receive or send
22	COMREC error in transmit Phase B
23	COMREC invalid command received
24	RSPEC error
25	DCS sent three times without response
26	DIS/DTC received 3 times, DCS not recognized
27	Failure to train at 2400 bits/s or +FMINSP
28	RSPREC invalid response received
40-49	Transmit Phase C Hang-up Codes
40	Unspecified Transmit Phase D error
43	TE to TAE data underflow
50-69	Transmit Phase D Hang-up Codes
50	Unspecified Transmit Phase D error
51	RSPREC error
52	No response to MPS repeated 3 times
53	Invalid response to MPS
54	No response to EOP repeated 3 times
55	Invalid response to EOP
56	No response to EOM repeated 3 times
57	Invalid response to EOM
58	Unable to continue after PIN or PIP
70-89	Receive Phase B Hang-up Codes
70	Unspecified Receive Phase B error
71	RSPREC error
72	COMREC error
73	T.30 T2 time out, expected page not received
74	T.30 T1 time out after EOM received
90-99	Receive Phase C Hang-up Codes
90	Unspecified Receive Phase C error
91	Missing EOL after 5 seconds

93	TAE to TE buffer overflow
94	Bas CRC or frame (ECM or BFT modes)
100-119	Receive Phase D Hang-up Codes
100	Unspecified receive Phase D error
101	RSPREC invalid response received
102	COMREC invalid response received
103	unable to continue after PIN or PIP
120-255	-reserved codes

+FPTS FPTS Indication Transmit

Description: Reports a <ppr> number representing the copy quality and related post-page message responses received from the remote TAE. The response is generated in execution of an AT+FET command.

Unsolicited result code:+FPTS: <ppr>

Parameter:

<ppr>: See AT+FPTS.

+FPTS FPTS Indication Receive

Description: Receive page transfer status.

Unsolicited result code:+FPTS: <ppr>,<lc>[,<blc>,<cblc>][,<lbc>]

Parameters:

<ppr>:

<ppr>	Description
0	Partial page errors
1	Page good
2	Page bad; retrain requested
3	Page good; retrain requested
4	Page bad; interrupt requested
5	Page good; interrupt requested
6	Partial page reception failed after 4 retries (ECM only)
7	Acknowledge a CTC message (ECM)

<lc>: Line count.

<blc>: Bad line count.

<cblc>: Consecutive bad line count, see AT+FBADLIN.

<lbc> Lost byte count, due to TAE overflow.

+FDTC FDTC Indication

Description: Reports the negotiated parameters. This message may be generated in execution of AT+FDT or AT+FDR, before the CONNECT result code, if new DCS frames are generated or received.

Unsolicited result code: +FDTC: <vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Parameters: See AT+FDCC.

+FDCS FDCS Indication

Description: Reports DID/DCS/DTC frame. This message may be generated in execution of AT+FDT or AT+FDR, before the CONNECT result code, if new DCS frames are generated or received.

Unsolicited result code: +FDCS: <vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Parameters: See AT+FDCC.

5.6.3 Use Scenarios

FDT Handling

This scenario will demonstrate a transmission with the following steps:

- Enable fax data transmission.
- Send two pages, 1-D data, no errors.

TE command	TAE response
AT+FCLASS=2	OK
AT+FLID="local_ID"	OK
ATD<dial_string>	
	+FCON
	[+FCSI: "<csi>"]
	+FDIS: <dis_codes>
	OK
AT+FDT	
	+FDCS: <dcs codes>
	CONNECT
	<XON>
	OK
<First page data>	
<DLE><ETX>	
AT+FET=0	
	+FPTS: 1
	OK
	CONNECT

TE command	TAE response
	<XON>
AT+FDT	
	OK
<Second page data>	
<DLE><ETX>	
AT+FET=2	
	+FPTS: 1
	+FHNG: 0
	OK

5.7 Ensemble C25: GSM 07.10

5.7.1 Commands

AT+CMUX Switch to 07.10 Multiplexer

Description: Turns on the 07.10 multiplexer

Set command: AT+CMUX=<transparency>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>]]]]]]]

Read command: AT+CMUX? Displays the current <transparency>, <subset>, <port_speed>, <N1>, <T1>, <N2>, <T2>, and<T3> settings.

Test command: AT+CMUX=? Shows if the command is supported.

Test command response: +CMUX: (list of supported <transparency>s ,<subset>s, <port_speed>s, <N1>s, <T1>s, <N2>s, <T2>s, and <T3>s)

Parameters:

<transparency>:

<transparency>	Description
0	No transparency Default setting

<subset>:

<subset>	Description
0	Only UIH frames used Default setting

<port_speed>:

<port_speed>	Description
1	9600 bits/s
2	19200 bits/s
3	38400 bits/s
4	57600 bits/s
5	115200 bits/s

<N1>:

<N1>	Description
31	Maximum frame size Default setting

<T1>:

<T1>	Description
10	100 ms acknowledgement timer Default setting

<N2>:

<N2>	Description
3	Maximum number of re-transmissions Default setting

<T2>:

<T2>	Description
30	300 ms control channel response timer Default setting

<T3>:

<T3>	Description
10	10 s wake-up response timer Default setting

<k>:

<k>	Description
1-7	Window size

5.8 Ensemble C26: Accessory Identification

5.8.1 Commands

AT*EINA	System Interface Active

Description:	Returns the active interface (the interface currently used for communication).
Execution command:	AT*EINA
Execution command response:	*EINA: <interface>
Test command:	AT*EINA=? Shows if the command is supported.
Test command response:	*EINA: (list of supported <interface>s)

Parameter:

<interface>:

<interface>	Description
1	System connector
2	IR
3	MC link

Example:

```
AT*EINA
*EINA: 1
OK

AT*EINA=?
EINA: (1-3)
OK
```

5.9 Ensemble S2: GSM Call Control

5.9.1 Commands

AT+CRC Cellular Result Codes

Description: Decides if the extended format of incoming call indication is used or not. When enabled, an incoming call is indicated by the unsolicited result code +CRING instead of the normal unsolicited result code RING.

Set command: AT+CRC=[<mode>]

Read command: AT+CRC? Displays the current <mode> setting.

Test command: AT+CRC=? Shows if the command is supported.

Test command response: +CMOD: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Disables extended format Default setting
1	Enables extended format

AT+CR Service Reporting Control

Description: Enables or disables display of intermediate bearer capability reports during the handshake phase. This command enables the +CR result code.

Set command: AT+CR=<mode>

Read command: AT+CR? Displays the current <mode> setting.

Test command: AT+CR=? Shows if the command is supported.

Test command response: +CR: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Disable reporting Default setting
1	Enable reporting

5.9.2 Unsolicited result codes

+CME Mobile Equipment Error Result

Description: Produced to indicate completion of a command. Produced when the command is not recognised, the command line maximum length is exceeded, the parameter value is invalid, or when there are other problems with processing the command line.

Unsolicited result code: +CME: <err>

Parameter:

<err>: Numeric or verbose format. Decided by AT+CMEE.

+CR Service Reporting Control

Description: Transmitted at the point during connect negotiation at which the TA has determined what speed and quality-of-service will be used, before any error control or data compression reports are transmitted, and before any final result code is transmitted.

Unsolicited result code: +CR: <serv>

Parameter:

<serv>:

<type>	Description
ASYNC	Asynchronous transparent
SYNC	Synchronous transparent
REL ASYNC	Asynchronous non-transparent
REL SYNC	Synchronous non-transparent

5.10 Ensemble S3: GSM Data/Fax

5.10.1 Commands

AT+CRLP Radio Link Protocol

Description: Sets the radio link protocol parameters.

Set command: AT+CRLP=[<iws>[,<mws>[,<t1>[,<N2>[,<ver>[,<T4>]]]]]]

Read command: AT+CRLP? Displays the current parameter settings.

Read command response: +CRLP: <iws>,<mws>,<t1>,<N2>[,<ver1>[,<T4>]]<CR><LF>
[+CRLP: <iws>,<mws>,<t1>,<N2>[,<ver2>[,<T4>]]<CR><LF>
[...]]

Test command: AT+CRLP=? Shows if the command is supported.

Test command response: +CRLP: (list of supported <iws>s, <mws>s, <t1>s, and <n2>s)[,<ver1>[,(list of supported <T4>s]]<CR><LF>
[+CRLP: (list of supported <iws>s, <mws>s, <t1>s, and <n2>s)[,<ver2>[,(list of supported <T4>s]]<CR><LF>
[...]]

Parameters:

<iws>:

<iws>	Description
0-61	IWF to phone window size
61	Default setting

<mws>:

<mws>	Description
0-61	Phone to IWF window size
61	Default setting

<t1>:

<t1>	Description
38-100	Acknowledgement timer T1 setting, in 10 ms steps
48	T1=480 ms Default setting

<N2>:

<N2>	Description
0-255	Number of re-transmission attempts, N2
6	Default setting.

<ver>:

<ver>	Description
Integer	RLP version When version indication is not present, <ver>=0 is assumed

<T4>:

<T4>	Description
3-100	Resequencing period T4, in 10ms steps
5	Default setting

5.11 Ensemble S4: GSM Extended Error Reporting

5.11.1 Commands

AT+CEER	Extended Error Report
Description:	Causes the TA to return one or more lines of information text <report> which offers the user of the TA an extended report of the reason of the failure in the last unsuccessful call setup (originating or answering) or in-call modification, or the reason for the last call release.
Execute command:	AT+CEER
Test command:	AT+CHSR=? Shows if the command is supported.
Parameter:	
<report>:	Text string.

Example:	`AT+CEER`
	`+CEER: "failure"`
	`OK`

5.12 Ensemble S5: GSM High Speed Circuit Switched Data

5.12.1 Commands

AT+CHSR	HSCSD Parameter Report
Description:	Sets the HSCSD parameter reporting on or off. If enabled, the intermediate result code +CHSR is activated.
Set command:	AT+CHSR=[<mode>]
Read command:	AT+CHSR? Displays the current <mode> setting.
Test command:	AT+CHSR=? Shows if the command is supported.
Test command response:	+CHSR: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Disable reporting Default setting
1	Enable reporting

AT+CHSU HSCSD Automatic User-initiated Upgrade

Description: Enables or disables the HSCSD automatic user-initiated upgrade.

Set command: AT+CHSU=[<mode>]

Read command: AT+CHSU? Displays the current <mode> setting.

Test command: AT+CHSU=? Shows if the command is supported.

Test command response: +CHSU: (list of supported <mode>s)

Parameter:

<mode>:

<mode>	Description
0	Disable use of UP bit for upgrading
1	Enable use of UP bit for upgrading Default setting

5.12.2 Intermediate result codes

+CHSR HSCSD Parameters Report Result Code

Description: When enabled by using the AT+CHSR command, this intermediate result code is transmitted at the point of call setup negotiation where the ME/TA has determined what type of HSCSD connection will be used.

Intermediate result code: AT+CHSR: <rx>, <tx>,<auir>,<coding>

Parameters: See AT+CHSC.

5.13 Ensemble S15: GSM GPRS

5.13.1 Commands

AT+CGDCONT Define PDP Context

Description: Specifies the PDPcontext parameter values for a PDP context identified by the <cid> parameter.

Set command: AT+CDGCONT=[<cid>[,<pdp_type>[,<APN>[,<pdp_addr>[,<d_comp>[,<h_comp>[,<pd1>[,...[,<pd*N*>]]]]]]]]]

Read command: AT+CGDCONT? Displays the current parameter settings.

Read command response: +CGDCONT: <cid>,<pdp_type>,<APN>,<pdp_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,<pdN]]] <CR><LF>
[+CGDCONT: <cid>,<pdp_type>,<APN>,<pdp_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,<pdN]]] <CR><LF>
[...]]

Test command: AT+CGDCONT=? Shows if the command is supported.

Test command response: +CGDCONT: (range of supported <cid>s),<pdp_type>,(list of supported <d_comp>s and <h_comp>s)[,(list of supported <pd1>s, <pd2>s,..., and <pdN>s)]

Parameters:

<cid>: Integer; Specifies the particular PDP context definition. The parameter is local to the TA-TE interface and is used in other PDP-context related commands. The range of permitted values (minimum value='1') is returned by the test command.

<pdp_type>:

<pdp_type>	Description
"X25"	ITU-T/CCIT X.25 layer 3
"IP"	Internet Protocol
"OSPIH"	Internet Hosted Octet Stream Protocol
"PPP"	Point-to-Point Protocol

<APN>: String; used to select the GGSN or the external packet data network. If the value is null or is omitted, the subscription value will be requested.

<pdp_address>: String; identifies the MT in the address space applicable to the PDP. If the value is null or is omitted, a value may be provided by the TE during the PDP start-up procedure or, if that fails, a dynamic address will be requested.

<d_comp>:

<d_comp>	Description
0	PDP data compression OFF Default setting
1	PDP data compression ON
2-255	Reserved

<h_comp>:

<h_comp>	Description
0	PDP header compression OFF Default setting
1	PDP header compression ON
2-255	Reserved

<pd*N*>: Zero to *N* string parameters whose meanings are specific to the <pdp_type>.

AT+CGQREQ Quality of Service Profile (Requested)

Description: Allows the TE to specify a Quality-of-Service profile that is used when the MT sends an active PDP context request message to the network. The set command specifies a profile for the context identified by the <cid> parameter. Since this is the same parameter as used in AT+CGDCONT, AT+CGQREQ is effectively an extension of AT+CGDCONT. The QoS profile consists of a number of parameters, each which may be set to a separate value.
A special form of the command, AT+CGQREQ=<cid>, causes the requested profile for context number <cid> to become undefined.

Set command: AT+CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]

Read command: AT+CGQREQ? Displays the current parameter settings.

Read command response: +CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>
[+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>
[...]]

Test command: AT+CGQREQ=? Shows if the command is supported.

Test command response: +CGQREQ: <pdp_type>,(list of supported <precedence>s, <delay>s, <reliability>s, <peak>s, and <mean>s)

Parameters:

<cid>: Integer; specifies the particular PDP context definition. The parameter is local to the TA-TE interface and is used in other PDP-context related commands. The range of permitted values (minimum value='1') is returned by the test command.

<precedence>:

<precedence>	Description
0	Subscribed (from network) value used
1	High priority
2	Normal priority
3	Low priority

<delay>: Delay class; defined in GSM 03.60 Section 15.2.2.

<delay>	Description
0	Subscribed (from network) value used
1-4	Delay class

<reliability>: Reliability class; defined in GSM 03.60 Section 15.2.3.

<reliability>	Description
0	Subscribed (from network) value used
1-5	Reliability class

<peak>: Peak throughput class; defined in GSM 03.60 Section 15.2.4.1.

<peak>	Description
0	Subscribed (from network) value used
1	Up to 1000 (8 kbit/s)
2	Up to 2000 (16 kbit/s)
3	Up to 4000 (32 kbit/s)
4	Up to 8000 (64 kbit/s)
5	Up to 16000 (128 kbit/s)
6	Up to 32000 (256 kbit/s)
7	Up to 64000 (512 kbit/s)
8	Up to 128000 (1024 kbit/s)
9	Up to 256000 (2048 kbit/s)

<mean>: Mean throughput class; defined in GSM 03.60, section 15.2.4.2.

<mean>	Description
0	Subscribed (from network) value used
1	Best effort
2	100 (~0.22 bits/s)
3	200 (~0.44 bits/s)
4	500 (~1.1 bits/s)
5	1 000 (~2.2 bits/s)
6	2 000 (~4.4 bits/s)
7	5 000 (~11.1 bits/s)
8	10 000 (~22 bits/s)
9	20 000 (~44 bits/s)
10	50 000 (~111 bits/s)
11	100 000 (~0.22 kbit/s)
12	200 000 (~0.44 kbit/s)
13	500 000 (~1.11 kbit/s)
14	1 000 000 (~2.2 kbit/s)
15	2 000 000 (~4.4 kbit/s)
16	5 000 000 (~11.1 kbit/s)
17	10 000 000 (~22 kbit/s)
18	20 000 000 (~44 bits/s)
31	50 000 000 (~111 bits/s)

<pdp_type>:

<pdp_type>	Description
“X25”	ITU-T/CCIT X.25 layer 3
“IP”	Internet Protocol
“OSPIH”	Internet Hosted Octet Stream Protocol
“PPP”	Point-to-Point Protocol

AT+CGQMIN Quality of Service Profile (Minimum Acceptable)

Description: Allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Active PDP Context Accept Message. The set command specifies a profile for the context identified by the <cid> parameter. Since this is the same parameter as used in AT+CGDCONT, AT+CGQMIN is effectively an extension of AT+CGDCONT. The QoS profile consists of a number of parameters, each which may be set to a separate value.
A special form of the command, AT+CGQMIN=<cid>, causes the minimum accepted profile for context number <cid> to become undefined.

Set command: AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]

Read command: AT+CGQMIN? Displays the current parameter settings.

Read command response: +CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>[+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>[...]]

Test command: AT+CGQMIN=? Shows if the command is supported.

Test command response: +CGQMIN: <pdp_type>,(list of supported <precedence>s, <delay>s, <reliability>s, <peak>s, and <mean>s)

Parameters:

<cid>: Integer; specifies the particular PDP context definition. The parameter is local to the TA-TE interface and is used in other PDP-context related commands. The range of permitted values (minimum value=’1’) is returned by the test command.

<precedence>:

<precedence>	Description
0	Subscribed (from network) value used
1	High priority
2	Normal priority
3	Low priority

<delay>: Delay class; defined in GSM 03.60 Section 15.2.2.

<delay>	Description
0	Subscribed (from network) value used
1-4	Delay class

<reliability>: Reliability class; defined in GSM 03.60 Section 15.2.3.

<reliability>	Description
0	Subscribed (from network) value used
1-5	Reliability class

<peak>: Peak throughput class; defined in GSM 03.60 Section 15.2.4.1.

<peak>	Description
0	Subscribed (from network) value used
1	Up to 1000 (8 kbit/s)
2	Up to 2000 (16 kbit/s)
3	Up to 4000 (32 kbit/s)
4	Up to 8000 (64 kbit/s)
5	Up to 16000 (128 kbit/s)
6	Up to 32000 (256 kbit/s)
7	Up to 64000 (512 kbit/s)
8	Up to 128000 (1024 kbit/s)
9	Up to 256000 (2048 kbit/s)

<mean>: Mean throughput class; defined in GSM 03.60, section 15.2.4.2.

<mean>	Description
0	Subscribed (from network) value used
1	Best effort
2	100 (~0.22 bits/s)
3	200 (~0.44 bits/s)
4	500 (~1.1 bits/s)
5	1 000 (~2.2 bits/s)
6	2 000 (~4.4 bits/s)
7	5 000 (~11.1 bits/s)
8	10 000 (~22 bits/s)
9	20 000 (~44 bits/s)
10	50 000 (~111 bits/s)
11	100 000 (~0.22 kbit/s)
12	200 000 (~0.44 kbit/s)
13	500 000 (~1.11 kbit/s)
14	1 000 000 (~2.2 kbit/s)
15	2 000 000 (~4.4 kbit/s)
16	5 000 000 (~11.1 kbit/s)
17	10 000 000 (~22 kbit/s)
18	20 000 000 (~44 bits/s)
31	50 000 000 (~111 bits/s)

<pdp_type>:

<pdp_type>	Description
“X25”	ITU-T/CCIT X.25 layer 3
“IP”	Internet Protocol
“OSPIH”	Internet Hosted Octet Stream Protocol
“PPP”	Point-to-Point Protocol

AT+CGATT GPRS Attach or Detach

Description: Attaches the MT to, or detaches the MT from, the GPRS service. After the command has completed, the phone stays in V.250 command state. If the MT is already in the requested state, the command is ignored and OK is returned. If the requested state cannot be achieved, ERROR or +CME: ERROR is returned.

Set command: AT+CGATT=[<state>]

Read command: AT+CGATT? Displays the current <state> settings

Test command: AT+CGATT=? Shows if the command is supported.

Test command response: +CGATT: (list of supported <state>s)

Parameter:

<state>:

<state>	Description
0	Detached from GPRS service
1	Attached to GPRS service

AT+CGACT PDP Context Activate or Deactivate

Description: Activates or deactivates the specific PDP context(s). After the command has completed, the phone stays in V.250 command state. If the MT is already in the requested state, the command is ignored and OK is returned. If the requested state cannot be achieved, ERROR or +CME: ERROR is returned. If the MT is not attached to the GPRS service when the activation form of the command is executed, the MT first performs a GPRS attach and then attempts to activate the specific contexts.
If no <cid>s are specified, the activation form of the command activates all defined contexts.
If no <cid>s are specified, the deactivation form of the command deactivates all defined contexts.

Set command: AT+CGACT=[<state>[,<cid>[,<cid>[,...]]]]

Read command: AT+CGACT? Displays the current <cid> and <state> settings.

Read command response: +CGACT: <cid>,<state><CR><LF>
[+CGACT: <cid>,<state><CR><LF>
[...]]

Test command: AT+CGACT=? Shows if the command is supported.

Test command response: +CGACT: (list of supported <state>s)

Parameters:

<state>:

<state>	Description
0	PDP context activation deactivated
1	PDP context activation activated

<cid>: Integer; specifies the particular PDP context definition.

AT+CGDATA Enter Data State

Description: Causes the MT to perform whatever actions necessary to establish GPRS communication between the TE and the network by using one or more GPRS PDP types. This may include performing a GPRS attach and one or more PDP context activations.

Set command: AT+CGDATA=[<L2p>[,<cid>[,<cid>[,...]]]]

Test command: AT+CGDATA=? Shows if the command is supported.

Test command response: +CGDATA: (list of supported <L2p>s)

Parameters:

<L2p>: Layer 2 protocol used between ME and TE.

<L2p>	Description
"PPP"	Point-to-Point Protocol Default setting
"M-xxx"	Manufacturer-specific protocol

<cid>: Integer; specifies the particular PDP context definition.

AT+CGEREP GPRS Event Reporting

Description: Enables or disables sending of the unsolicited result code +CGEV from ME to TE in the case of certain events occurring in the GPRS MT or the network.

Set command: AT+CGEREP=[<mode>[,<bfr>]]

Read command: AT+CGEREP? Displays the current <mode> and <bfr> settings.

Test command: AT+CGEREP=? Shows if the command is supported.

Test command response: +CGEREP: (list of supported <mode>s and <bfr>s)

Parameters:

<mode>:

<mode>	Description
0	Buffer unsolicited result codes in the MT. No codes are forwarded to the TE Default setting
1	Discard unsolicited result codes when MT-TE link is reserved, otherwise forward them directly to the TE

<bfr>:

<bfr>	Description
0	MT buffer of unsolicited result codes defined with this command is cleared when <mode>='1' or '2' is entered Default setting

AT+CGREG GPRS Network Registration

Description: Controls the presentation of the unsolicited result code +CGREG: <stat> when <n>='1' and there is a change in the MT's GPRS network registration status, or +CGREG: <stat>[,<lac>,<ci>] when <n>='2' and there is a change of the network cell.
Note: If the GPRS MT also supports circuit mode services, AT+CREG and the +CREG result code apply to the registration status and location information for those services.

Set command: AT+CGREG=[<n>]

Read command: AT+CGREG? Displays the current <n>, <stat>[, <lac>, and <ci>] settings.

Test command: AT+CGREG=? Shows if the command is supported.

Test command response: +CGREG: (list of supported <n>s)

Parameters:

<n>:

<n>	Description
0	Disable network registration unsolicited result code. Default setting
1	Enable network registration unsolicited result code
2	Enable network registration and location information unsolicited result code

<stat>:

<stat>	Description
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>: Two byte location area code in hexadecimal format.

<ci>: Two byte cell ID in hexadecimal format.

AT+CGPADDR Show PDP Address

Description: Returns a list of PDP addresses for the specified context identifiers.

Execution command: AT+CGPADDR=[<cid>[,<cid>[,...]]]

Response: +CGPADDR: <cid>,<pdp_addr><CR><LF>
[+CGPADDR: <cid>,<pdp_addr><CR><LF>
[...]]

Test command: AT+CGPADDR=? Shows if the command is supported.

Test command response: +CGPADDR: (list of supported <cid>s)

Parameters:

<cid>: Integer; specifies a particular PDP context definition (see AT+CGDCONT). If no <cid> is specified, the addresses for all defined contexts are returned.

<pdp_address>: String; identifies the MT in the address space applicable to the PDP. <pdp_addr> is omitted if none is available.

Extension of ATD - Request GPRS Service

Description: Makes a GPRS call.

Execution command: ATD*<GPRS_SC>[*[<called_address>][*[<L2p>][*[<cid>]]]]#

Parameters:

<GPRS_SC>: Digit string; a digit string (value='99') which identifies a request to use the GPRS.

<called_address>: String; identifies the called party in the address space applicable to the PDP.

<L2p>:

<L2p>	Description
0	NULL
1	PPP
2	PAD
3	X25
9yyyy	M-xxxx

<cid>: Digit string; specifies a particular PDP context definition.

Extension of ATD - Request GPRS IP Service

Description: Makes a GPRS call.

Execution command: ATD*<GPRS_SC_IP>[*<cid>]#

Parameters:

<GPRS_SC>: Digit string; a digit string (value='98') which identifies a request to use the GPRS with IP (PDP types IP and PPP).

<cid>: Digit string; specifies a particular PDP context definition.

5.13.2 Unconditional result codes

+CGEV GPRS Event Reporting

Description: This result code is enabled by using the AT+CGEREP command.

Possible unsolicited result codes: +CGEV: X, where X is shown below.

<X>	Description
REJECT <pdp_type>,<pdp_addr>	A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected
NW REACT <pdp_type>,<pdp_addr> [,<cid>]	The network has forced a network reactivation. The <cid> that was used to reactivate the context is provided, if known to the MT
NW DEACT <pdp_type>,<pdp_addr> [,<cid>]	The network has forced a network deactivation The <cid> that was used to deactivate the context is provided, if known to the MT
ME DEACT <pdp_type>,<pdp_addr> [,<cid>]	The mobile equipment has forced a network deactivation The <cid> that was used to deactivate the context is provided, if known to the MT
NW DETACH	The network has forced a GPRS detach This implies that all active have been deactivated These are not reported separately.
ME DETACH	The mobile equipment has forced a GPRS detach This implies that all active have been deactivated These are not reported separately.
NW CLASS <class>	The network has forced a change of phone class The highest available class is reported
ME CLASS <class>	The mobile equipment has forced a change of phone class The highest available class is reported

Parameters: See AT+CGDCONT.

+CGREG Network Registration Reporting

Description: This result code is enabled by using the AT+CGREG command.

Possible unsolicited result codes: +CGREG: <stat> If AT+CGREG <n>='1'
+CGREG: <stat>[,<lac>,<ci>] If AT+CGREG <n>='2'

Parameters:

<stat>:

<stat>	Description
0	Not registered ME is currently searching for an operator to register to
1	Registered, home network
2	Registered, but ME is searching for a new operator to register to

<stat>	Description
3	Registration denied
4	Unknown
5	Registered, roaming

<lac>: String; two byte location area code in hexadecimal format.

<ci>: String; two byte cell ID in hexadecimal format.

5.14 Ensemble S27: OBEX

5.14.1 Commands

AT*EOBEX Object Exchange

Description: Starts an OBEX session. When the remote client sends AT*EOBEX, the modem tries to connect to the OBEX server. If successful, `CONNECT` is returned. If the `CONNECT` response is received, the client can start sending OBEX frames. If unable to connect, the response `NO CARRIER` is returned.
The modem connection always returns from OBEX mode when the OBEX session is ended.
Note: This command is abortable. An OBEX frame containing a disconnect code must be sent. The hexadecimal code for disconnect is ox81. This code must be sent in an OBEX frame and the hexadecimal value for the frame is 0x810003.

Execution command: AT*EOBEX

Test command: AT*EOBEX=? Shows if the command is supported.

6 OBEX Formats

6.1 OBEX File System Overview

One of the most basic and desirable uses of the IrDA infrared communication protocols is simply to send an arbitrary data object from one device to another, and to make it easy for both application developers and users to do so. This is referred to as object exchange (un-capitalized), and it is the subject of this section.
With the exception of Level 1 Information Exchange, whereby the objects are pushed into a device inbox, the object names passed to OBEX PUT and GET operations shall always include the path information.
The paths are specified in the IrMC specification from IrDA.

Filename	Description	Supported operations
Device Info		
telecom/devinfo.txt	Information hardware version, software version, serial number, etc. Character sets	GET
telecom/rtc.txt	The Real Time Clock Object contains the current date and time of the device	GET/PUT
Phone Book		
telecom/pb.vcf	Level 2 access (Access entire phonebook database)	GET/PUT
telecom/pb/luid/.vcf	Add new entry	PUT
telecom/pb/0.vcf	Own business card	GET/PUT
telecom/pb/###.vcf	Level 3 static index access	GET/PUT
telecom/pb/luid/*.vcf	Level 4 unique index access	GET/PUT
telecom/pb/info.log	Supported properties and memory info	GET
telecom/pb/luid/###.log	Change log	GET
telecom/pb/luid/cc.log	Change counter	GET
Calendar		
telecom/cal.vcs	Level 2 access	GET/PUT
telecom/cal/luid/.vcs	Add new entry	PUT
telecom/cal/###.vcs	Level 3 static index access	GET/PUT
Telecom/cal/luid/*.vcs	Level 4 unique index access	GET/PUT
Telecom/cal/info.log	Supported properties and memory info	GET
Telecom/cal/luid/###.log	Change log	GET
Telecom/cal/luid/cc.log	Change counter	GET

6.2 eMelody Format

eMelody Object

Description: This is a definition of the eMelody object. This object is used when a user-defined melody is exchanged.

Syntax:	<emelody-object> “BEGIN:EMELODY”<CR><LF> “VERSION:”<version><CR><LF> “MELODY:”<melody><CR><LF> “END:EMELODY”
File extension:	emy
Example filename	mymelody.emy
Parameters:	
<version>:	“1.0”
<basic_short_tone>:	“c”|”d”|”e”|”f”|”g”|”a”|”b”
<ess_short_tone>:	“(b)d”|”(b)e”|”(b)g”|”(b)a”|”(b)b”
<iss_short_tone>:	“#d”|”#e”|”#g”|”#a”|”#b”
<basic_long_tone>:	“C”|”D”|”E”|”F”|”G”|”A”|”B”
<ess_long_tone>:	“(b)D”|”(b)E”|”(b)G”|”(b)A”|”(bB”
<iss_long_tone>:	“#D”|”#E”|”#G”|”#A”|”#B”
<basic_tone>:	<basic_short_tone>|<ess_short_tone>|<iss_short_tone>|<basic_long_tone> |<ess_long_tone>|<iss_long_tone>
<octave_high_prefix>:	“+”
<pause>:	“p”
<tone>:	{[<octave_prefix>]<basic_tone>}
<melody>:	{<pause>|<tone>}
Maximum number of tones:	40
Maximum numbers of characters in melody:	120

Example:	`BEGIN:EMELODY`
	`VERSION:1.0`
	`MELODY:`
	`+f+a+fa(b)bdcC+GA+d+#c+dfg+daea+d+#c+e+f+e+fa(b)bdC+EA+d+#c+dfgba+d+#C`
	`END:EMELODY`

6.3 vCard Format

The vCard object in the R520 uses a subset of the properties defined in the vCard specification from the Internet Mail Consortium. The vCard standard is available from the Infrared Data Association at http://www.irmc.org.

vCard Object

Description: This is a definition of the vCard object. This object is used when a user-defined contact card is exchanged .

Syntax:	<vcard-object> “BEGIN:VCARD<CR><LF> “N:”<encoding>”;<character_set>”:”<name><CR><LF> “VERSION:”<version><CR><LF> [“FN:”<encoding>”;”<character_set>”:”<formatted_name><CR><LF>] [“TEL:”<telephone_number><CR><LF>] [“X-IRMC-LUID:”<x_irmc_local_unique_identifier><CR><LF>] “END:VCARD”
File extension:	vcf
Example filename:	person.vcf
Parameters:	
<version>:	“2.1”
<encoding>:	(“QUOTED-PRINTABLE”|”BASE-64”|”8BIT”)
<character_set>:	(“ISO-8859-1”|”UTF-8”)
<name>:	String; maximum length 18 bytes. Encapsulates the individual components of an object’s name. The property value is a concatenation of the Family Name (first field), Given Name (second field), Additional Names (third field), Name Prefix (fourth field), and Name Suffix (fifth field) strings.
<formatted_name>:	String; maximum length 20 bytes. Specifies the formatted name string associated with the vCard object. This is the way that the name is to be displayed.
<telephone_string>:	String; maximum length 20 bytes. Specifies the canonical number string for telephony communication with the vCard object. The value of this property is specified in a canonical form in order to specify an unambiguous representation of the globally unique telephony endpoint. This property is based on the X.520 Telephony Number attribute.
<x_irmc_local_unique_identifier>:	String; maximum length 12 bytes. IrMC Local Unique Identifier field label. Local Unique identifier 48 bits coded in its hexadecimal representation as 12 ASCII characters.

Example:	`BEGIN:VCARD`
	`VERSION:2.1`
	`N;QUOTED-PRINTABLE;CHARSET=ISO-8859-1:Book;Sven;Ola;Mr.`
	`FN;QUOTED-PRINTABLE;CHARSET=ISO-8859-1:Mr. Sven O. Book`
	`TEL:+4646123123`
	`END:VCARD`

6.4 vCalendar Format

The vCalendar standard is available from the Infrared Data Association at http://www.irmc.org.

vCalendar Object

Description: This is a definition of the vCalendar object, which is related to the vEvent object. These objects are used when a user-defined calendar entry is exchanged.

Syntax:

<vcalendar-object>

"BEGIN:VCALENDAR"<CR><LF>
"VERSION:"<version><CR><LF>
"PRODID:"<prodid><CR><LF>
"BEGIN:VEVENT"<CR><LF>
"END:VEVENT"<CR><LF>
"BEGIN:VEVENT"<CR><LF>
"END:VEVENT"<CR><LF>
...
"END:VCALENDAR"<CR><LF>

File extension: vcs

Example filename: filename.vcs

VEVENT: See vEvent Object.

Parameters:

<version>: "1.0"

<prodid>: "Ericsson Calendar 1.0"

Example vCalendar vEvent object (MEETING):

```
BEGIN:VCALENDAR
VERSION:1.0
PRODID:Ericsson Calendar 1.0
BEGIN:VEVENT
DTSTART:19990125T123000
DTEND:19990125T170000
AALARM:19990125T121500
CATEGORIES:MEETING
SUMMARY;QUOTED-PRINTABLE;CHARSET=ISO-8859-1:Meeting
with Lars
LOCATION;QUOTED-PRINTABLE;CHARSET=ISO-8859-1:At my room
X-IRMC-LUID:1E12FF7C01AB
END:VEVENT
END:VCALENDAR
```

vEvent Object

Description: This is a definition of the vEvent object, which is related to the vCalendar object. These objects are used when a user-defined calendar entry is exchanged. The phone supports all day event meetings. The sync engine shall send the vCalendar object with DTSTART set the date (YYYYMMDD), and leaving the time 'THHMMSS' out. The DTSTART is mandatory, as well as the DTEND. The same principles applies for DTEND, that is, 'THHMMSS' is skipped.

Syntax:	<vevent-object>
	"BEGIN:VEVENT"<CR> "DTSTART:"<date_and_time> "DTEND:"<date_and_time> "AALARM:"<date_and_time> "CATEGORIES:"<category> "SUMMARY;"<encoding>";"<character_set>":"<summary> "LOCATION;"<encoding>";"<character_set>":"<location> "X-IRMC-LUID:" <x_irmc_luid> "END:VEVENT"
Parameters:	
<date_and_time>:	String; <year><month><day>T<hour><minute<second>. The date and time values for all vCalendar properties are formatted as a string consistent with the ISO 8601 representation for combinations of dates and times. Note: All time values are given in local time
Example <date_and_time>:	19960415T083000. 8:30 AM on April 15, 1996 local time.
<category>:	"MEETING" | "PHONE CALL" | "MISCELLANEOUS"
<encoding>:	("QUOTED-PRINTABLE" | "BASE-64" | "8BIT")
<character_set>:	("ISO-8859-1" | "UTF-8")
<summary>:	String; maximum length 36 bytes.
<location>:	String; maximum length 20 bytes
<x_irmc_luid>:	String; maximum length 12 bytes. IrMC Local Unique Identifier field label. Local Unique identifier 48 bits coded in its hexadecimal representation as 12 ASCII characters. Holds the phone book index in decimal format.
Example DTSTART-DTEND:	DTSTART:1999-02-10, DTEND:1999-02-12. If the DTSTART and DTEND have different dates, the phone shall interpret it as a whole day event occurring over several days. In this example: the whole day on 1999-02-10, 1999-02-11, and 1999-02-12.

Glossary

3GPP
3rd Generation Partnership Project. http://www.3gpp.org

Analog
An analog signal can have any value between two limits. For example, traditional telephone lines transfer the human voice, itself an analogue signal, by means of a continuously varying electrical voltage. This voltage is an electrical representation of the pressure produced by the sound on the telephone microphone.

ASCII
Acronym for American Standard Code for Information Interchange. A standard code used for transferring data between computers and associated equipment.

Asynchronous communication
Data communication in which data elements are NOT separated according to time. Instead, a special code such as a start bit and a stop bit is used. By using a code, in lieu of time, asynchronous communication is more tolerant of time variations, and complex timing circuits are not needed. The serial port and the COM port of a computer are associated with asynchronous communication, as is the RS-232-C interface. Also some end to end modem protocols are asynchronous.

AT
The characters AT stand for Attention and tells the Infrared Modem that a command follows. AT must be used at the beginning of a command line or dial string.

AT command set
The set of commands used to control the Infrared Modem.

Auto-answer mode
The state in which the Infrared Modem automatically answers the telephone when it rings.

Beam
Sending an item to another phone or a compatible application using the infrared link.This can include ring signals, calendar entries and business cards.

Bearer
The method for accessing WAP from the phone, for example GSM Data (CSD) and SMS.

Bluetooth
Secure, fast, point-to-multipoint radio connection technology. http://www.bluetooth.com

Bps
Acronym for ‘bits per second’ (bits/s). A measure of speed at which bits are transmitted over the telephone lines.

Card
A single WML unit of navigation and user interface. May contain information to present to the user, instructions for gathering user input, etc.

Carrier
The frequency used by two connecting modems to transmit and receive data.

CCITT
Consultative Committee for International Telephony and Telegraphy. A European-based advisory committee established by the United Nations to recommend international communication protocol standards.

CD
Carrier Detect. An EIA232 signal sent from the Infrared Modem to your computer, usually indicating that the Infrared Modem has detected a carrier signal over the communications line.

Command line
A line of alphanumeric characters sent to the Infrared Modem to instruct the Infrared Modem to perform the commands specified in the line of characters.

COM (communications) port
The name allocated to the serial port through which digital signals are exchanged between the computer and a serial peripheral. For example COM1 and COM2.

CSD
Circuit Switched Data.

CTS
Clear To Send. An EIA232 signal sent from a modem to the computer, usually indicating that the modem is ready to receive data.

DCD
Data Carrier Connect. See AT&C.

DCE
Data Communications Equipment. This term applies to modems and to other equipment that provide communication between data terminal equipment and the telephone line.

Deck
A collection of WML cards.

Default setting
A setting that the Infrared Modem will always use unless specified otherwise.

Digital transmission
A digital signal can have only two values. These can, for example, be ON and OFF, HIGH and LOW, or 1 and 2. A digital signal is usually transferred by means of a voltage which is either HIGH or LOW. Conventional modems communicate by means of audio tones which can use the analog telephone network. The Infrared Modem links through your mobile telephone to a digital network and therefore has no need to use audio encoding. However, when you use your mobile telephone for a voice call, the analog signal from the microphone must be converted into a digital signal.
This is done by a converter which samples the signal voltage several thousand times per second. Each sample is converted into a binary number which represents the voltage at that instant, for example 10011010, and the binary numbers are sent as a serial stream down the digital network.

DSR
Data Set Ready. An EIA232 signal sent from the Infrared Modem to the computer, usually indicating that the Infrared Modem is ready to establish a connection.

DTE
Data Terminal Equipment. The equipment that provides data, such as a computer or terminal.

DTR
Data Terminal Ready. An EIA232 signal sent from the computer to the Infrared Modem, usually indicating that the computer is ready to begin communication.

EIA
Electronics Industries Association. A U.S. based group that forms technical standards and coordinates ITU-TCCITT activities in the United States.

eMelody
This object is used when a melody is exchanged over infrared between two devices.

EOL
End of line.

EOP
End of page.

EOM
End of message.

Escape code
A series of three consecutive characters (default is '+++') sent to the Infrared Modem, causing it to exit on-line data mode and enter on-line command mode.

Factory default settings
The profile configuration that is in effect when the Infrared Modem is shipped from the factory.

Fax Class
Standards for fax transmission are set as classes. Class I and II allow data transfer speeds ranging from 2400 bits/s to 9600 bits/s.

Final result code
A message sent from the Infrared Modem to inform the PC that execution of an entered AT command has been completed. Examples are `OK` and `ERROR`.

Flow control
The use of characters or EIA232 signals to start and stop the flow of data to avoid data loss during buffering.

Full duplex
Communication involving data transmitted in two directions simultaneously.

Gateway
A WAP Gateway typically includes the following functionality:

A Protocol Gateway. The protocol gateway translates requests from the WAP protocol stack to the WWW protocol stack (HTTP and TCP/IP).

Content Encoders and Decoders. The content encoders translate Web content into compact encoded formats to reduce the size and number of packets travelling over the wireless data network.

GIF
Graphics Interchange Format.

Half duplex
Communication involving data being transmitted in two directions, but not at the same time.

Intermediate result code
Information sent from the Infrared Modem to the PC as a response to an executed AT command. Intermediate result codes are always followed by a final result code. For example `+CBC: 0,100`.

IrMC
Infrared Mobile Communications standard.

IrDA
Infrared Data Association. http://www.irda.org.

ISDN
The term used to refer to the digital public switched telephone network.

ISP
Internet Service Provider.

ITU-T
The ITU Telecommunication Standardization Sector (ITU-T), is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunication on a world wide basis. As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993.

MMI
Man-Machine Interface.

ME
Mobile Equipment. The Ericsson wireless terminal, excluding the SIM card, which in most cases is a mobile phone.

Micro browser
Accesses and displays the Internet contents in your mobile phone, just as an ordinary browser does in your computer. The micro browser uses small file sizes and the bandwidth of the wireless handheld-network.

Modem
Modulator-Demodulator. A device that converts digital signals to analog for transmission over telephone lines, then converts them back to digital at the other end of the line.

MS
This is the Ericsson wireless terminal being controlled through the set of commands described in this document.

MT
Mobile Telephone.

OBEX
The OBEX specification consists of two major parts: a protocol and an application framework. The OBEX protocol is a session level protocol that specifies the structure for the conversation between devices. It also contains a model for representing objects. The OBEX application framework is built on top of the OBEX protocol. Its main purpose is to facilitate interoperability between devices using the OBEX protocol. Please refer to http://www.irda.org.

Off hook
The Infrared Modem state similar to picking up a telephone receiver. The Infrared Modem goes off hook to dial or answer, and remains off hook while connected.

Off-line command mode
The operational state in which the Infrared Modem can accept typed commands.

On hook
The Infrared Modem state similar to hanging up a telephone receiver.

On-line data mode
The state the Infrared Modem is in when transmitting or receiving data over the telephone line.

OTA
Over-the-Air Configuration. To provide settings for the phone by sending an SMS message over the network to

the phone. This reduces the need for the user to configure the phone manually.

PIN
Personal identification number.

PDA
Personal Digital Assistant.

Phone Book
A memory in your mobile phone or SIM card where phone numbers can be stored and accessed by name or position.

Protocols
The rules or procedures all modems must follow to communicate.

Reference Point
Mobile phone and accessory system external and internal reference points.

Result code
A message the Infrared Modem sends to the computer containing information about the state of the Infrared Modem.

RLP
Radio Link Protocol, an error correction protocol used during radio link connections.

RLSD
Received Line Signal Detect. See AT&C.

RTS
Request To Send. An EIA232 signal sent from the computer to the Infrared Modem, usually indicating that the computer is ready to send data to the Infrared Modem.

RS-232-C interface
A communication standard established by the Electronics Industry Association (Recommended Standard number 232, revision C). Originally established to standardize communication between computer and modem. It was later adapted to become a popular standard for communication between computer and any other peripheral equipment, including other computers.

SC
Service Centre (for SMS).

Serial port
The port through which digital signals are exchanged between the Infrared Modem and the computer.

Short message service (SMS)
A text messaging service permitting the transmission of up to 160 characters to a facsimile, X400, telex and voice services or mobile phone.

SIM card
Subscriber Identity Module card. It is a card that must be inserted in any GSM-based mobile phone. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized but both types have the same functions. Your phone uses the small plug-in card.

SIR
Serial Infrared.

SM
1. Short Message.

2. SIM message storage.

Synchronous Communication:
V.22bis
ITU-T standard for 2400 bps.

V.27ter
ITU-T standard for 4800 bps full-duplex modems connected to switched telephone networks.

V.29
ITU-T standard for 9600 bps half-duplex modems included in FAX machines.

V.42bis
ITU-T standard for the compression of asynchronous data. V.42bis is based on a dictionary that looks up common strings and replaces the strings with code words. This reduces the amount of characters actually being transmitted. V.42bis has been found to be most effective for file transfers that contain long strings of repetitive information and least effective for short strings of unique data. It requires LAPM, MNP2, MNP3, or MNP4 as error correcting.

TA
Terminal Adaptor, which in most cases is a PCMCIA (Personal Computer Memory Card International Association) card.

TAE
Terminal Adaptor Equipment.

TCP/IP
Transmission Control Protocol/Internet Protocol.

TE
Terminal Equipment, which in most cases is a computer.

Unsolicited result code
A message sent from the Infrared Modem to the PC that is not a response to an executed AT command. For example `RING`.

vCalendar
vCalendar and vEvent define a transport and platform-independent format for exchanging calendar and scheduling information for use in PIMs/ PDAs and group schedulers. vCalendar and vEvent are specified by IMC and can be further studied at http://www.imc.org.

vCard
vCard automates the exchange of personal information typically found on a traditional business card, for use in applications such as Internet mail, voice mail, Web browsers, telephony applications, call centres, video conferencing, PIMs /PDAs, pagers, fax, office equipment, and smart cards. vCard is specified by IMC at http://www.imc.org.

vEvent
See vCalendar.

WAP
Wireless Application Protocol. Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user. A collection of cards is called a deck, which usually constitutes a service.

WAP Application
A collection of WML cards, with the newcontext attribute set in the entry card.

WAP service
A WML application residing on a web site.

WBMP
WAP Bitmap.

WML
Wireless Markup Language. A markup language used for authoring services, fulfilling the same purpose as HyperText Markup Language (HTML) do on the World Wide Web (WWW). In contrast to HTML, WML is designed to fit small handheld devices.

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