

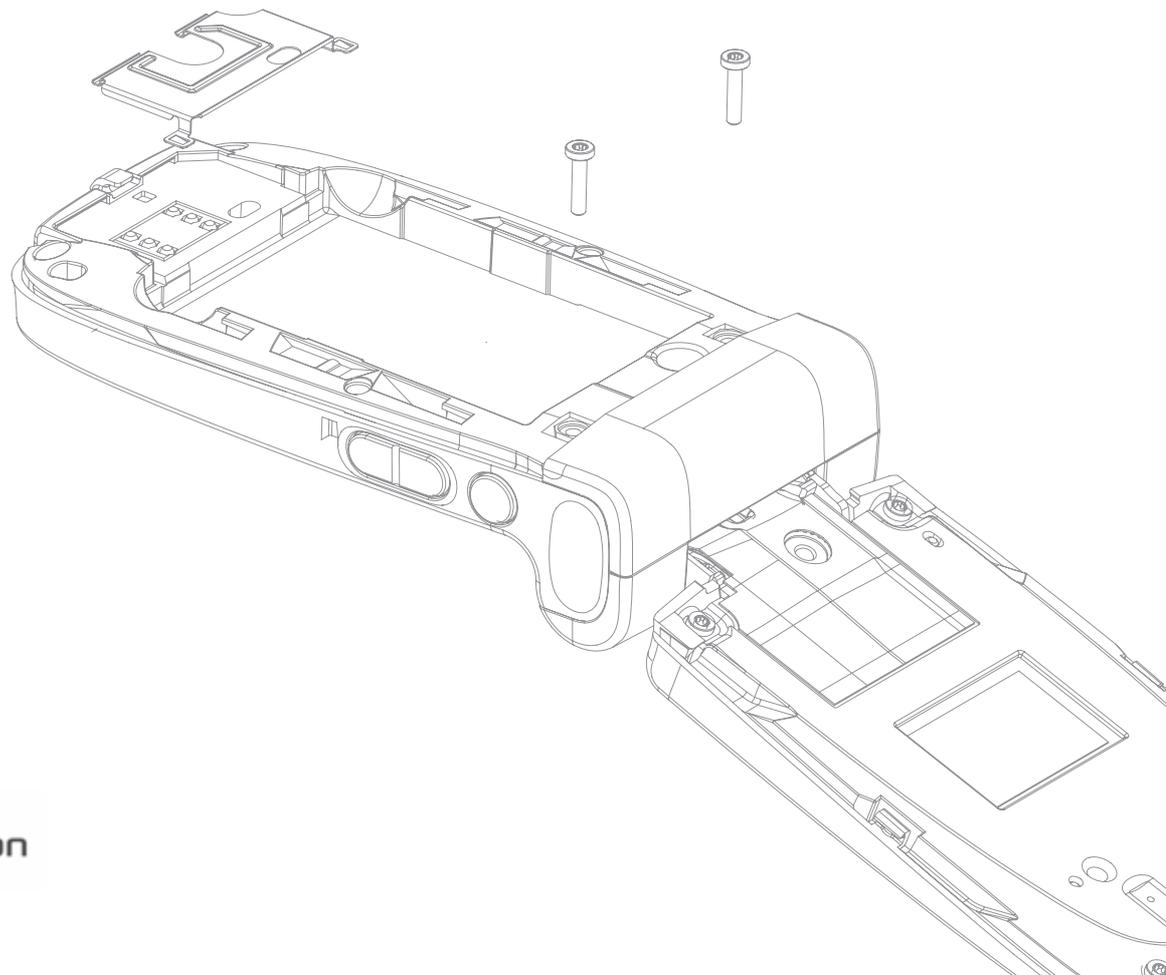
# Developers guidelines

**DEVELOPER**  
**WORLD THE FAST**  
**TRACK FROM**  
**MIND TO MARKET**

January 2007

## AT commands

for Sony Ericsson phones



# Preface

## Purpose of this document

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The Developers guideline for AT commands is designed to give the reader a deeper insight into how to design applications with AT commands supported by mobile phones. The information here is not relevant for the day-to-day operation of the phone. This is described in the User guide supplied with the mobile phone.

This document is for advanced users who require detailed information in order to:

- Develop new communications software
- Add the mobile phone to a list of compatible modems in an application
- Adjust the settings of their mobile phones

People who can benefit from this document include:

- Application providers
- Content providers
- Content aggregators
- Operators and service providers
- Software developers
- Business decision-makers

It is assumed that the reader has a basic understanding of AT commands.

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# Sony Ericsson Developer World

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On [www.sonyericsson.com/developer](http://www.sonyericsson.com/developer), developers will find documentation and tools such as phone White papers, Developers guidelines for different technologies, SDKs (Software Development Kits) and relevant APIs (Application Programming Interfaces). The Web site also contains discussion forums monitored by the Sony Ericsson Developer Support team, an extensive Knowledge base, Tips and tricks, example code and news.

Sony Ericsson also offers technical support services to professional developers. For more information about these professional services, visit the Sony Ericsson Developer World Web site.

## Document conventions

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### Products

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Sony Ericsson mobile phones are referred to in this document using generic names as follows:

<b>Generic names</b> Series	<b>Sony Ericsson mobile phones</b>
K750	K750i, K750c, D750i
W800	W800i, W800c
Z520	Z520i, Z520c, Z520a
W600	W600i
W550	W550i, W550c
W900	W900i
W810	W810i, W810c, W810a
Z530	Z530i, Z530c
W300	W300i, W300c
K510	K510i, K510c
K310	K310i, K310c, K310a
W700	W700i, W700c
Z525	Z525a
Z550	Z550i, Z550c
Z558	Z558i, Z558c

K320	K320i, K320c
W200	W200i, W200c

## Typographical conventions

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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**”.

## Trademarks and acknowledgements

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The IrDA Feature Trademark is owned by the Infrared Data Association and is used under licence there from.

Other product and company names mentioned herein may be the trademarks of their respective owners.

# Document history

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Change history		
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# Introduction

---

This manual describes the operation of the AT commands supported by the K750, W800, Z520, W700 and Z525 series of mobile phones. Specific AT commands for the W600, W550, W900, W810, Z530, W300, K510, K310, Z550, Z558, K320 and W200 series are described in the appendix.

This online reference manual is helpful for advanced users who require detailed information in order to:

- Develop new communications software
- Add the mobile phone to a list of compatible modems in an application
- Adjust the settings of their mobile phones.

## Communications programs

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Please refer to the User Guide and support information found on [www.sonyericsson.com](http://www.sonyericsson.com) for instructions on the installation and use of the Sony Ericsson built-in modem software drivers.

### Configuring third-party communications programs

If you want to use a communications program which does not include the Sony 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 communications 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 the communications program may be available on either the Sony Ericsson disk supplied with the phone or from one of the online services, for example the support pages on [www.sonyericsson.com](http://www.sonyericsson.com)

#### Configure the data communications program manually

To configure your data communications 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`

# Result and Error Codes

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## Result codes

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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 screen of the sending device. This code is used 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 produces the **OK** result code but does not cause any change to the built-in modem. These commands are included in the command descriptions in “AT commands” on page 22.

**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 online operation of the telephone, result codes inform you about the progress of call connections:

<a href="#">CONNECT</a>	<speed>	A connection has been established and the data rate <speed> is shown.
<a href="#">BUSY</a>		The number you called is engaged.
<a href="#">NO DIALTONE</a>		Unable to establish the initial connection.
<a href="#">NO CARRIER</a>		A connection could not be established or an existing connection has been lost.
<a href="#">RING</a>		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, refer to the use of the [ATV](#) command on page 39.

To switch the display of result codes on or off, refer to the use of the [ATQ](#) command on page 38.

## Error codes

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The [+CME ERROR](#) result codes indicate an error relating to the functionality of the built-in modem or mobile phone and replace the final result code [ERROR](#) when enabled by the [AT+CMEE](#) command.

### Report mobile phone failure (+CME)

<a href="#">+CME ERROR: 0</a>	Phone failure
<a href="#">+CME ERROR: 1</a>	No connection to phone
<a href="#">+CME ERROR: 2</a>	Phone-adaptor link reserved
<a href="#">+CME ERROR: 3</a>	Operation not permitted
<a href="#">+CME ERROR: 4</a>	Operation not supported
<a href="#">+CME ERROR: 5</a>	PH-SIM PIN required
<a href="#">+CME ERROR: 6</a>	PH-FSIM PIN required
<a href="#">+CME ERROR: 7</a>	PH-FSIM PUK required
<a href="#">+CME ERROR: 10</a>	SIM card not inserted
<a href="#">+CME ERROR: 11</a>	SIM card PIN required
<a href="#">+CME ERROR: 12</a>	SIM card PUK required
<a href="#">+CME ERROR: 13</a>	SIM card failure
<a href="#">+CME ERROR: 14</a>	SIM card busy
<a href="#">+CME ERROR: 15</a>	SIM card wrong
<a href="#">+CME ERROR: 16</a>	Incorrect password
<a href="#">+CME ERROR: 17</a>	SIM PIN2 required

+CME ERROR: 18	SIM PUK2 required
+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 characters in dial string
+CME ERROR: 30	No network service
+CME ERROR: 31	Network timeout
+CME ERROR: 32	Network not allowed – emergency calls only
+CME ERROR: 40	Network personalization PIN required
+CME ERROR: 41	Network personalization PUK required
+CME ERROR: 42	Network subset personalization PIN required
+CME ERROR: 43	Network subset personalization PUK required
+CME ERROR: 44	Service provider personalization PIN required
+CME ERROR: 45	Service provider personalization PUK required
+CME ERROR: 46	Corporate personalization PIN required
+CME ERROR: 47	Corporate personalization PUK required
+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). This replaces the final result code `ERROR`.

+CMS ERROR: 0...127	GSM 04.11 Annex E-2 values
+CMS ERROR: 128...255	GSM 03.40 Section 9.2.3.22 values
+CMS ERROR: 300	ME failure
+CMS ERROR: 301	SMS service of ME 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	(U)SIM card not inserted
+CMS ERROR: 311	(U)SIM PIN required
+CMS ERROR: 312	PH-(U)SIM PIN required
+CMS ERROR: 313	(U)SIM card failure
+CMS ERROR: 314	(U)SIM card busy
+CMS ERROR: 315	(U)SIM card wrong
+CMS ERROR: 316	(U)SIM PUK required

+CMS ERROR: 317	(U)SIM PIN2 required
+CMS ERROR: 318	(U)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: 256...511	Values in range 256...511 are 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 (+CRING)

The +CRING 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

# AT commands

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## 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 “AT commands” on page 22.

You use AT commands to:

- Configure the phone to connect via USB cable, infrared port, Bluetooth or the system bus
- Configure the modem to connect via USB cable, infrared port, Bluetooth 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 for an AT command.

## Built-in modem operating modes

---

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

- Off-line command mode:** The built-in modem is placed in the off-line command mode when first switched on and 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.

## Changing the built-in modem operating mode

---

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

## Operating in off-line command mode

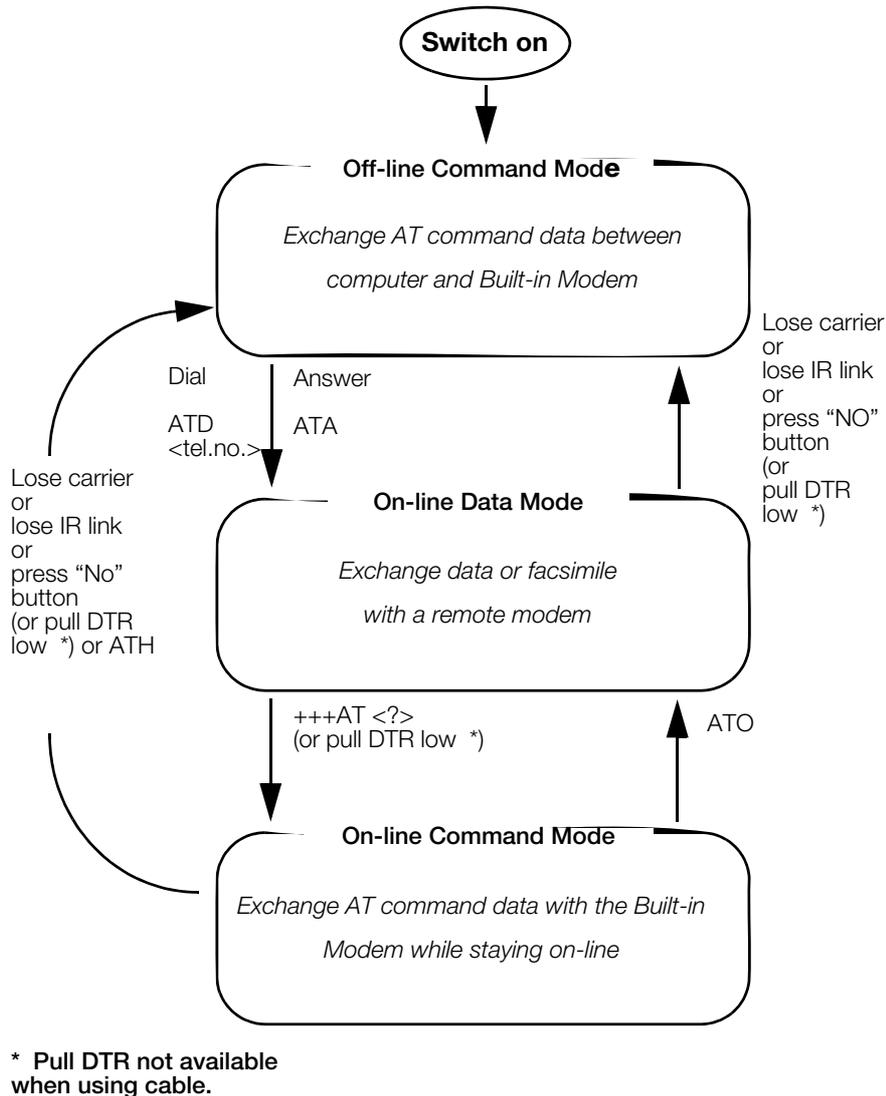


Figure 1. In the off-line command mode, the built-in modem accepts data as commands and not as normal communications traffic. You enter commands by typing at the PC/PDA keyboard.

## Switching to the on-line data mode

To enter the 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 also places the built-in modem in the on-line mode.

## Switching back to the off-line command mode

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

- Loss of connection (**NO CARRIER** error)
- Loss of the 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

To use AT commands while connected to a remote modem in the on-line data mode and maintain connection with the remote modem, first enter the on-line command mode.

There are two ways to switch from the on-line data mode to the on-line command mode:

- Type the escape sequence “+++” followed by an appropriate AT command. This command must be selected from the options **AT**, **ATE**, **ATH**, **ATI**, **ATQ**, **ATV** or **ATX**. By using this method, an AT function, such as moving into the on-line command mode, can be performed. For example, switching using

```
+++ATH<CR>
```

switches the built-in modem to the 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 causes the system to wait one second, switch to the on-line command mode, and respond **OK**;

- Pull DTR low after setting **AT&D=1**.

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

To return to the on-line data mode while in the 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 the off-line command mode from the on-line command mode:

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

## Operating the AT commands

---

In command mode, the following types of commands can be issued:

- A set command to adjust the operating parameters of the built-in modem
- An execute command to direct action without any need for parameters
- A read command to view the current command settings
- A test command to view the available command parameters.

Not all AT commands support all functions listed above. The descriptions in “AT commands” on page 22 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, many commands also have default settings.

For example, the above command can be entered as:

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

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 the remaining charge is 60%.

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>.

# AT command list

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AT+WS46	Mode Selection .....	47
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AT*SESTRI	SEMC Create String Input.....	55
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# AT commands

## Ensemble C2: Control and Identification

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### Commands

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<b>AT</b>	<b>Attention Command</b>
<b>Description:</b>	Checks the communication between the phone and any accessory. Determines the presence of a phone.
<b>Execution command:</b>	<b>AT</b>
<b>ATZ</b>	<b>Restore to User Profile (ver. 2)</b>
<b>Description:</b>	This command instructs the DCE to set all parameters to their default values as specified by the user. It 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 (ver. 2)

**Description:** This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take in consideration hardware configuration and other manufacturer-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 settings to factory defaults.

## ATI Identification information (ver. 3)

**Description:** This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, followed by a final result code. The <value> parameter may optionally be used to select among multiple types of identifying information, specified by the manufacturer. This command provides compatibility with Microsoft Windows 95.

**Execution command:** **ATI[<value>]**

**Execution command response:** <information>

**Parameters:** <value>:

<value>	Description
0	Same information as <b>AT+GMM</b> command (Model Identification).

<value>	Description
1	Software ID
3	Modem Model Description.
5	Active settings.
7	Modem Configuration Profile (brief listing of the modem functionality: fax classes, Bluetooth, IrDA, modem type, etc.).
8	DCE hardware type version.
9	PnP (Plug and Play) information
10	Same information as <b>AT+GMI</b> command (Manufacturer Identification).

<information>:

<information>	Description
string type	The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. <b>Note:</b> The information text shall not contain the sequence "0" or "OK", so that DTE can avoid false detection of the end of this information text.

## 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+CGMI

### Request manufacturer identification (ver. 1)

**Description:**

Execution command causes the phone to return one or more lines of information text <manufacturer>, determined by the phone 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. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired.

**Execution command:**

**AT+CGMI**

**Execution command** <manufacturer>

**response:**

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

**Parameter:**

<manufacturer>:

<manufacturer>	Function
<b>Sony Ericsson</b>	Manufacturer name. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence "0<CR>" or "OK<CR>".

## AT+CGMM Request Model Identification

**Description:** The execution command causes the phone to return one or more lines of information text <model>, determined by the phone manufacturer, which is intended to permit the user of the ITAE/ETAE to identify the specific model of the phone to which it is connected to. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.

**Execution command:** **AT+CGMM**

**Execution command** <model>

**response:**

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

**Parameters:**

<model>:

<model>	Description
<b>String</b> Example: AAB-1022011-BV	A unique 10-character ASCII string, padded with space if needed. The response may include blank characters.

## 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** <revision>

**response:**

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

**Parameter:**

<revision>:

<revision>	Description
String	An ASCII string containing software revision plus KRC number.

## AT+CGSN Request Product Serial Number Identification

**Description:** Returns the IMEI number of the phone.

**Execution command:** **AT+CGSN**

**Execution command** +CGSN:<sn>

**response:**

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

**Parameter:**

<sn>:

<sn>	Description
string	Contains the phone IMEI.

## AT+GCAP Request Modem Capabilities List

**Description:** Returns a list of valid modem command prefixes.

**Execution command:** **AT+GCAP**

**Execution command** +GCAP: (list of supported <capability>s)

**response:**

**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:** This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the manufacturer. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired (e.g. address, telephone number for customer service, etc.).

**Execution command:** **AT+GMI**

**Execution command** <manufacturer>

**response:**

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

**Parameter:**

<manufacturer>:

<manufacturer>	Description
<b>string</b>	The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. <b>Note</b> that the information text shall not contain the sequence "0 <CR>" or "OK<CR>", so that DTE can avoid false detection of the end of this information text.

Example:

```
AT+GMI
Sony Ericsson
OK
```

```
AT+GMI=?
OK
```

## AT+GMM Request Model Identification

**Description:** This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the specific model of device. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide any information desired.

**Execution command:** **AT+GMM**

**Execution command** <model>

**response:**

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

**Parameter:**

<model>:

<model>	Description
<b>String</b> Example: Sony Ericsson K750i	The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. <b>Note</b> that the information text shall not contain the sequence "0 <CR>" or "OK<CR>", so that DTE can avoid false detection of the end of this information text. The command returns the phone model number.

## AT+GMR Request Revision Identification

**Description:** This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the version, revision level or date, or other pertinent information of the device. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide any information desired.  
The response of this command is equal to that of the AT+CGMR command

**Execution command:** **AT+GMR**

**Execution command** <revision>  
**response:**

**Test command:** **AT+GMR=?** Shows if the command is supported

**Parameter:**  
<revision>:

<revision>	Description
<b>String</b> (ASCII)	The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. <b>Note</b> that the information text shall not contain the sequence "0<CR>" or "OK<CR>", so that the DTE can avoid false detection of the end of this information text.

## Ensemble C3: Call Control

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### Commands

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#### ATA Answer Incoming Call Command (ver. 2)

**Description:** Answers and initiates a connection to an incoming call.

**Execution command:** **ATA**

**Possible responses:**

CONNECT

CONNECT <text>

<text>	Description
<b>28800</b>	Connected with data bit rate of 28800 bits/s. (HSCSD)

<text>	Description
<b>19200</b>	Connected with data bit rate of 19200 bits/s. (HSCSD)
<b>14400</b>	Connected with data bit rate of 14400 bits/s. (HSCSD)
<b>9600</b>	Connected with data bit rate of 9600 bits/s.
<b>4800</b>	Connected with data bit rate of 4800 bits/s.
<b>2400</b>	Connected with data bit rate of 2400 bits/s.

**NO CARRIER  
ERROR**

The mobile phone is not registered.  
If ATA is unsuccessfully executed by the phone.

## **ATH** Hook Control (ver. 2)

**Description:** Signals the MS to terminate an active call.  
**Execution command:** **ATH**

## **ATD** Dial Command (ver. 5)

**Description:** Initiates a phone connection, which may be data or voice (phone number terminated by semicolon). The phone number used to establish the connection consists of digits and modifiers, or a stored number specification. It is also possible to initiate a phone connection with the use of the alphanumeric field for a phonebook entry location or by the use of the entry location, <n>, itself.

The **AT+CPBS** command is recommended to be used to select memory storage.

**Note:** Only phone and SM (SIM Memory) storage are supported by ATD. If the dial string is followed by a semicolon this informs the phone that the number is a voice rather than a data number.

If the dial string is omitted but the semicolon included the command instructs the phone to do a network detect. If the network is available OK is returned.

Aborting an ATD command is accomplished by the transmission from the DTE to the DCE of any character. A single character shall be sufficient to abort the command in progress; however, characters transmitted during the first 125 milliseconds after transmission of the termination character shall be ignored (to allow for the DTE to append additional control characters such as line feed after the command line termination character).

**Execution command:** **ATD**<dial\_string>[!][G];  
Originates a call and dials the phone number specified in the command as <dial\_string>. or does a network detect.  
**ATD**>ME<n>[!][G];  
Dials the phone number stored in the mobile phone which is located by the index <n>.

**ATD>SM<n>[!][G][:]**

Dials the phone number stored in the SIM card which is located by the index <n>

**ATD>LD<n>[!][G][:]**

Dials the phone number stored in the Last dialled number list on the SIM card, which is located by the index <n>. The most recently dialled number is assumed to have <n>="1".

**ATD><str>[!][G][:]**

Originates a call to phone number which corresponding alphanumeric field is <str> (if possible, all available memories should be searched for the correct entry).

**ATD><n>[!][G][:]**

Originates call to phone number in entry location <n>. The **AT+CPBS** command setting is recommended to be used, to select memory storage.

**Note:** Only phone and SM memory storage are supported by ATD.

**ATDL[!][G][:]**

Re-dials the last phone number dialled

**Execution command response:**

- CONNECT
- CONNECT <text>
- NO CARRIER
- ERROR
- NO DIAL TONE
- BUSY
- OK

**Parameters:**

<dial\_string>:

<dial_string>	Description
"0 1 2 3 4 5 6 7 8 9 * # + A B C"	Valid characters for origination.
<b>D</b>	The D modifier is ignored but is included only for compatibility purposes.
<b>W</b>	The W modifier is ignored but is included only for compatibility purposes.
,	The comma modifier is ignored but is included only for compatibility purposes.
<b>T</b>	The T modifier is ignored but is included only for compatibility purposes.
<b>P</b>	The P modifier is ignored but is included only for compatibility purposes.
<b>!</b>	The ! modifier is ignored but is included only for compatibility purposes.
<b>@</b>	The @ modifier is ignored but is included only for compatibility purposes.

<Final Result Code>:

<Final Result Code>	Description
<b>CONNECT</b>	If connection is successfully established, only valid for data connections.
<b>CONNECT &lt;text&gt;</b>	If connection is successfully established, only valid for data connections.
<b>NO CARRIER</b>	Unable to establish a connection or the connection attempt was aborted by the user.
<b>ERROR</b>	An unexpected error occurred while trying to establish the connection.
<b>NO DIALTONE</b>	The mobile phone is being used for a voice call or is not within coverage of the network.
<b>BUSY</b>	The phone number called is engaged, valid for data and voice connections.
<b>OK</b>	Only valid for voice connections.

<text>:

<text>	Description
<b>28800</b>	Connected with data bit rate of 28800 bits/s. (HSCSD)
<b>19200</b>	Connected with data bit rate of 19200 bits/s. (HSCSD)
<b>14400</b>	Connected with data bit rate of 14400 bits/s. (HSCSD)
<b>9600</b>	Connected with data bit rate of 9600 bits/s.
<b>4800</b>	Connected with data bit rate of 4800 bits/s.
<b>2400</b>	Connected with data bit rate of 2400 bits/s.

<str>:

<str>	Description
<b>string type</b>	String type value, which should equal to an alphanumeric field in a phonebook entry in the searched memories. <b>Note:</b> The character specifying which number in the contact entry that should be used must be included in the string; "/H" for home number, "/M" for mobile number and so on. The character set used should be the one selected with <b>AT+CSCS</b> .

[I] [G]:

<Character>	Description
<b>I or i</b>	Overrides the CLIR supplementary service subscription default value for this call; I = invocation (restrict CLI presentation) and i = suppression (allow CLI presentation); See <b>AT+CLIR</b> .

<Character>	Description
<b>G or g</b>	Controls the CUG supplementary service information for this call; G = enable CUG supplementary service and g = disable CUG supplementary service.

## 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
<b>0</b>	Returns from on-line command state to on-line data state.

## AT+CVHU

### Voice Hangup Control

**Description:**

Set command selects whether **ATH** or “drop DTR” shall cause a voice connection to be disconnected or not. By voice connection is also meant alternating mode calls that are currently in voice mode.

**Note:** When <mode> = 2, this command must be seen in conjunction with the V.25ter, *Serial Asynchronous Automatic Dialing and Control*, command &D. Else, &D shall be ignored.

**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
<b>0</b>	“Drop DTR” ignored but OK response given. ATH disconnects the call.
<b>1</b>	“Drop DTR” and ATH ignored but OK response given.
<b>2</b>	“Drop DTR” behaviour according to &D setting. ATH disconnects the call.

## AT+CLCC List Current Calls

**Description:** This command returns list of current calls of phone. If command succeeds but no calls are available, no information response is sent to TE.

**Execution command:** **AT+CLCC=[<mode>]**

**Execution command response** [+CLCC:  
 <id1>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>[,<alpha>[,<priority>]]] [**<CR><LF>**  
 +CLCC:  
 <id2>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>[,<alpha>[,<priority>]]]  
 [...]]]

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

**Parameters:**

<idx>:

<idx>	Description
Integer	Call identification number as described in 3GPP TS 22.030. This number can be used in <b>AT+CHLD</b> command operations.

<dir>:

<dir>	Description
0	Mobile originated (MO) call
1	Mobile terminated (MT) call

<stat>:

<stat>	Description
0	Active
1	Held
2	Dialling (MO call)
3	Alerting (MO call)
4	Incoming (MT call)
5	Waiting (MT call)

<mode>:

<mode>	Description
0	Voice
1	Data
2	Fax
9	Unknown

<empty>:

<b>&lt;empty&gt;</b>	<b>Description</b>
<b>0</b>	Call is not one of multiparty (conference) call parties.
<b>1</b>	Call is one of multiparty (conference) call parties.

<number>:

<b>&lt;number&gt;</b>	<b>Description</b>
<b>String type</b>	String type phone number of format specified by <type>.

<type>:

<b>&lt;type&gt;</b>	<b>Description</b>
<b>Integer format</b>	Type of address octet (refer to GSM 04.08 section 10.5.4.7)
<b>128</b>	Unknown numbering plan, national / international number unknown
<b>129</b>	ISDN / telephony numbering plan, national / international unknown
<b>145</b>	ISDN / telephony numbering plan, international number
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128 - 255</b>	Other values refer to GSM 04.08 section 10.5.4.7

<alpha>:

<b>&lt;alpha&gt;</b>	<b>Description</b>
<b>String</b>	Alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command <b>AT+CSCS</b> .

<priority>:

<b>&lt;priority&gt;</b>	<b>Description</b>
<b>Integer</b>	Optional digit type parameter indicating the eMLPP priority level of the call, values specified in 3GPP TS 22.067
<b>0-4</b>	Valid values

# Ensemble C4: Interface Commands

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## Commands

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### ATE Command Echo (ver. 2)

**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. <b>Default setting</b>

### ATS0 Automatic Answer Control

**Description:** Defines the automatic answering feature of the 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. <b>Default setting</b>
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
<b>0-255</b>	Supported values. <b>Note:</b> If the <esc> parameter is set to a value in the range 128-255, the escape sequence detection is disabled.
<b>43</b>	Escape sequence character = '+'. <b>Default setting</b>

## ATS3 Command Line Termination Character (ver. 3)

**Description:** This S-parameter represents the decimal IA5 value of the character recognised by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the **S4** parameter. The previous value of **S3** is used to determine the command line termination character for entry of the command line containing the **S3** setting command. However, the result code issued shall use the value of **S3** as set during the processing of the command line. For example, if S3 was previously set to 13 and the command line "**ATS3=30**" is issued, the command line shall be terminated with a <CR> character (IA5 0/13), but the result code issued will use the character with the ordinal value 30 (IA5 2/14) in place of the <CR>.

**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
<b>0-127</b>	Supported values.
<b>13</b>	Command line termination character = <CR> <b>Default setting</b>

## ATS4 Response Formatting Character (ver. 3)

**Description:** This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the **S3** parameter. If the value of **S4** is changed in a command line, the result code issued in response to that command line will use the new value of **S4**.

**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> <b>Default setting</b>

## ATS5 Command-Line Editing Character (ver. 3)

**Description:** This S-parameter represents the decimal IA5 value of the character recognized by the DCE as a request to delete from the command line the immediately preceding 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	Editing character = <BS> (Backspace). <b>Default setting</b>

## 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
<b>1-255</b>	Possible timeout values in seconds.
<b>50</b>	Timeout value in seconds. <b>Default setting</b>

## 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.  
**Note:** For mobile phones this is not applicable and the command is ignored by the TE. This command is included for compatibility reasons only.

**Set command:** **ATS10**=[<value>]  
**Read command:** **ATS10?** Displays the current <value> setting.  
**Test command:** **ATS10=?** Shows if the command is supported.

**Test command response:** S10: (list of supported <value>s)  
**Parameter:** <value>:

<value>	Description
<b>1-254</b>	Delay, specified in tenths of a second.
<b>2</b>	Remains connected for two tenths of a second. <b>Default setting</b>

## ATQ Result Code Suppression (ver. 2)

**Description:** The setting of this parameter determines whether or not the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code - header, result text, line terminator, or trailer - is transmitted.

**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. <b>Default setting</b>
1	Result codes are suppressed and not transmitted.

## ATV

### DCE Response Mode (ver. 2)

**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. <b>Default setting</b>

Result code (ATV1)	Result code (ATV0)	Description
<b>OK</b>	0	Acknowledges execution of a command.
<b>CONNECT</b>	1	A connection has been established; the DCE is moving from command state to on-line data state.
<b>RING</b>	2	The DCE has detected an incoming call from the network.
<b>NO CARRIER</b>	3	The connection has been terminated, or the attempt to establish a connection failed.
<b>ERROR</b>	4	Command not recognized, command line maximum length exceeded, parameter value invalid, or other problem with processing the command line.
<b>NO DIALTONE</b>	6	No dial tone detected.
<b>BUSY</b>	7	Engaged (busy) signal detected.

Result code (ATV1)	Result code (ATV0)	Description
<b>NO ANSWER</b>	<b>8</b>	“@” (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, <b>S7</b> .

## ATX

### Call Progress Monitoring Control

**Description:** Defines the format of the CONNECT message and if the BUSY and NO DIALTONE result codes shall be used during a data call setup. **Not** applicable for voice calls.

**Set command:** **ATX**=[<n>] or **ATX**[<n>]

**Read command:** **ATX?** Displays the current <n> setting.  
X:<n>

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

**Test command response:** X: (list of supported <n>s)

**Parameter:**

<n>:

<n>	Description
<b>0</b>	No BUSY or NO DIALTONE result codes given. No line speed reported together with CONNECT result code.
<b>1</b>	As for <n>=0, but reports line speed together with CONNECT result code.
<b>2</b>	No BUSY result code is given. NO DIALTONE result code returned if no network. Reports line speed together with CONNECT result code.
<b>3</b>	BUSY result code given if called line is busy. No NO DIALTONE result code is given. Reports line speed together with CONNECT result code.
<b>4</b>	BUSY result code given if called line is busy. NO DIALTONE result code returned if no network. Reports line speed together with CONNECT result code. <b>Default setting</b>

## AT&C

### Circuit 109 (DCD) control

**Description:** Determines the behaviour of the carrier detect signal (CT109).

**Set command:** **AT&C**[=][<value>]

**Read command:** **AT&C?** Displays the current <value> setting.

**Read command response:** &C: <value>

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

**Test command response:** &C: (list of supported <value>s)

**Parameter:**

<value>:

<value>	Description
0	DCD always on.
1	DCD follows the connection. <b>Default setting</b>

## AT&D Circuit 108 (DTR) response

**Description:** Controls how the DCE responds when the Data Terminal Ready (DTR) signal (ct 108.2) is changed from on to off condition.

**Set command:** **AT&D**=[<value>]

**Read command:** **AT&D?** Displays the current <value> setting.

**Read command response:** &D: <value>

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

**Test command response:** &D: (list of supported <value>s)

**Parameter:**

<value>:

<value>	Description
0	Ignore. <b>Default setting</b>
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 local Flow Control

**Description:** Defines the flow control between the 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.

**Read command response:** +IFC: <by\_te>,<by\_ta>

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

**Test command response:** +IFC: (list of supported <by\_te>s),(list of supported <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. <b>Default setting</b>
3	Xon/Xoff flow control on DCE. Control characters are passed to the remote DCE/DTE.

<DTE\_by\_DCE>:

<DTE_by_DCE>	Description
0	No flow control on DCE.
1	Xon/Xoff flow control on DTE.
2	CTS flow control on DCE. <b>Default setting</b>

## AT+ICF

### Cable Interface Character Format (ver. 2)

#### Description:

This extended-format compound parameter is used to determine the local serial port start-stop (asynchronous) character framing that the DCE shall use while accepting DTE commands and while transmitting information text and result code, if this is not automatically determined. AT+IPR=0 forces +ICF=0 (see [AT+IPR](#)).

**Note:** Only applicable for RS-232, dummy command on IrDA and USB.

#### Set command:

**AT+ICF**=[<format>[,<parity>]

#### Read command:

**AT+ICF?** Displays the current <format> and <parity> settings.

#### Read command response:

+ICF: <format>,<parity>

#### Test command:

**AT+ICF=?** Shows if the command is supported.

#### Test command response:

+ICF: (list of supported <format>s),(list of supported <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 <b>Default setting</b>
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 is generated and checked, if present.

<parity>	Description
0	Odd
1	Even
2	Mark
3	Space <b>Default setting</b>

## AT+IPR

### Cable Interface Port Rate

**Description:**

This numeric extended-format parameter specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s (as required in v25ter subclause 4.3). It 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.

Specifying a value of 0 disables the function and allows operation only at rates automatically detectable by the DCE. The specified rate takes effect following the issuance of any result code(s) associated with the current command line.

**Note:** Only applicable for RS-232, dummy command on IrDA and USB.

**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>:

The <rate> value specified shall be the rate in bits per second at which the DTE-DCE interface should operate, e.g. "19200" or "115200".

If unspecified or set to 0, automatic detection is selected for the range determined by v25ter, subclause 4.3 and the character format is also forced to autodetect, (**AT+ICF=0**).

<rate> (bps)	Autodetect possible	Manual setting possible
<b>0 (default)</b>	Yes	Yes
<b>300</b>	Yes	Yes
<b>600</b>	Yes	Yes
<b>1200</b>	Yes	Yes
<b>2400</b>	Yes	Yes
<b>3600</b>	Yes	Yes
<b>4800</b>	Yes	Yes
<b>7200</b>	Yes	Yes
<b>9600</b>	Yes	Yes
<b>14400</b>	Yes	Yes
<b>19200</b>	Yes	Yes
<b>28800</b>	Yes	Yes
<b>38400</b>	Yes	Yes
<b>57600</b>	Yes	Yes

<rate> (bps)	Autodetect possible	Manual setting possible
115200	Yes	Yes
230400	Yes	Yes
460800	Yes	Yes

## 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 (negotiated or renegotiated) 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.

The DTE-DCE port rate will change only if neither buffered mode nor error controlled means are enabled (+ES=x,0) and if the negotiated carrier rate (+MRR) does not match the current DTE-DCE port rate (set by +IPR command or autodetected from the previous command line).

- 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) <b>Default setting</b>
1	Enables reporting of local port-rate. (+ILRR: is transmitted)

## Intermediate result codes

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### +ILRR +ILRR Result Code

**Description:** Reports cable interface speed and represents the current DTE-DCE rate. This response is enabled by **AT+ILRR**.

**Intermediate result code:** +ILRR: <rate>[,rx\_rate>]

**Parameter:** <rate>

<rate>	Description
Numeric	See command AT+IPR for possible values of <rate>

<rx\_rate>

<rx_rate>	Description
<b>Numeric</b>	Same coding as <rate>, used in case RX rate is different from TX rate,

## Ensemble C6: Data Compression

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### Commands

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#### AT+DS Data Compression (ver. 3)

**Description:** Controls the V.42 bis data compression function, if provided in the phone.  
**Note:** This command is only applicable to CS (Circuit Switched) data calls.

**Set command:** **AT+DS**=[<direction>[,<compression\_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),(list of supported <compression\_negotiation>s),(list of supported <max\_dict>s),(list of supported <max\_string>s)

**Parameters:**

<direction>: Specifies the desired direction(s) of operation of the data compression function from the TE point of view.

<direction>	Description
<b>0</b>	Disable V.42 bis.
<b>1</b>	Enable V.42 bis in transmit direction only.
<b>2</b>	Enable V.42 bis in receive direction only.
<b>3</b>	Enable V.42 bis compression in both directions. <b>Default setting</b>

<compression\_negotiation>: Specifies if the phone should continue to operate if the desired result is not obtained.

<compression_negotiation>	Description
<b>0</b>	Do not disconnect if compression is not negotiated according to direction. <b>Default setting</b>
<b>1</b>	Disconnect if compression is not negotiated according to direction.

<max\_dict>: Maximum number of dictionary entries to be negotiated.

<max_dict>	Description
512 to 2048	Maximum dictionary size <b>Note:</b> Must be given in multiples of 512.
1024	<b>Default setting</b>

<max\_string>: Maximum string length to be negotiated.

<max_string>	Description
6 to 250	Maximum string length
32	<b>Default setting</b>

## AT+DR Data Compression Reporting

**Description:** Controls whether or not the extended-format **+DR** intermediate result code is transmitted from the phone to the terminal equipment. The +DR: <type> reported represents the current (negotiated or renegotiated) TAE-TE data compression type.

If enabled, the intermediate result code is transmitted after error control negotiation (handshaking), when the TAE has determined which data compression technique will be used (if any) and the direction of operation.

**Note:** This command is only applicable to CS (Circuit Switched) data calls.

**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. <b>Default setting</b>
1	Intermediate compression mode reporting enabled.

## 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
<b>NONE</b>	No data compression negotiated.
<b>V42B</b>	V.42 bis data compression negotiated.
<b>V42B RD</b>	V.42 bis half duplex compression negotiated on received data.
<b>V42B TD</b>	V.42 bis half duplex compression negotiated on transmitted data.

## Ensemble C9: Mode Management

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### Commands

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#### AT+WS46 Mode Selection

**Description:**

Allows an accessory to query and control the cellular protocol mode of a multi-mode phone.

AT+WS46=<n> allows an accessory to set the cellular protocol mode of a multi-mode phone. The setting remains in effect until another AT+WS46=<n> command is issued, the phone is reset, a call is terminated, or the phone itself makes a mode change.

**Note:** Not all cellular protocol modes are settable via AT+WS46=<n>. ERROR is returned if an attempt is made to set an MS into a mode that is not settable via the system bus.

Supported values of <n> are unique for every Ericsson phone product. Any procedures needed to change from the old to the new mode must complete prior to generation of the OK result code.

**Set command:**

**AT+WS46=<n>**

**Read command:**

**AT+WS46?** Displays the current <n> setting.

**Test command:**

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

**Test command response:**

WS46: (list of supported <n>s)

**Parameter:**

<n>:

Supported values differ between phone models.

<n>	Description
<b>12</b>	GSM Digital Cellular. This value is used for GSM at 900 Mhz, DCS-1800, and PCS-1900 phones.
<b>22</b>	Wideband CDMA. This parameter is used by 3G phones.

# Ensemble C18: Fax Class 1

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## Commands

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### AT+FCLASS      Select Mode

**Description:** This command puts the TA into a particular mode of operation (data, fax, voice, and so on). This causes the TAE to process information in a manner suitable for that type of information.

Reset + hang-up on failed ATA sets mode to class 0, data mode.

**Execution command:**      **AT+FCLASS=<n>**

**Read command:**          **AT+FCLASS?**

**Read command response:**      <n>      Show list of supported services

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

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

**Parameter:**

<n>:

<n>	Description
0	Data modem

# Ensemble C20: Audio Control

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## Commands

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### AT\*ECBP      CHF Button Pushed (ver. 2)

**Description:** This command is used by the cordless handsfree (CHF) to indicate to the phone that a button on the CHF has been pushed.

**Action command:**      **AT\*ECBP[=<button>[,<time>]]**

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

**Test command response:**      \*ECBP: (list of supported <button>s),(list of supported <time>s)

**Parameters:**

<button>:

<button>	Description
1	Button pressed on HBH-10 handsfree. <b>Default setting</b>
2	First (“YES”) button pressed on HBH-20 handsfree.
3	Second (“NO”) button pressed on HBH-20 handsfree.

<time>:

<time>	Description
1	Short press. <b>Default setting</b>
2	Long press.

## Ensemble C25: GSM 07.10

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### Commands

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#### AT+CMUX      Switch to 07.10 Multiplexer (ver. 2)

**Description:** Turns on the 07.10 multiplexer.

**Set command:** **AT+CMUX=<transparency>[,<subset>[,<port\_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]]**

**Read command:** **AT+CMUX?** Displays the current <transparency>, <subset>, <port\_speed>, <N1>, <T1>, <N2>, <T2>,<T3> and [<k>] settings.

**Read command response** +CMUX:<transparency>,<subset>,<port\_speed>,<N1>,<T1>,<N2>,<T2>,<T3>[,<k>]

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

**Test command response:** +CMUX: (list of supported <transparency>s),(list of supported <subset>s),(list of supported <port\_speed>s),(list of supported <N1>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <T2>s),(list of supported <T3>s), (list of supported <k>)

**Parameters:**

<transparency>:

<transparency>	Description
0	No transparency <b>Default setting</b>

<subset>:

<subset>	Description
0	Only UIH frames used. <b>Default setting</b>

<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
6	230400 bit/s
7	460800 bit/s

<N1>:

<N1>	Description
31	Maximum frame size. <b>Default setting</b>

<T1>:

<T1>	Description
10	100 ms acknowledgement timer. <b>Default setting</b>

<N2>:

<N2>	Description
3	Maximum number of retransmissions. <b>Default setting</b>

<T2>:

<T2>	Description
30	300 ms control channel response timer. <b>Default setting</b>

<T3>:

<T3>	Description
10	10 s wake-up response timer. <b>Default setting</b>

<k>:

This parameter is not used

# Ensemble C27: Accessory UI

## Commands

### AT\*SEAM Add menu item

**Description:** This command adds the persistent menu item to the phone menu structure and assigns a category to this menu item. The menu is placed in one of the categories specified by <category>. It is possible for an accessory to add a persistent menu item to more than one category; this command should then be called once for every new menu item. When the phone receives this AT command, it must:

- Create the additional menu if it is not already present.
- Add an item with the text specified in <persistent menu item text>.
- Upon successful request, the phone answers with a <menu\_ID>. This ID is being used when sending unsolicited \*SEAAI to the accessory.
- When the user selects the menu an unsolicited result code \*SEAAI sent.
- If the phone receives a new persistent menu item when there already exist a persistent menu the old menu item is deleted and a new created.
- If the accessory is disconnected, the corresponding accessory menu item is deleted. If there are no items in the additional menu the additional menu is deleted.

**Execution command:** AT\*SEAM=<persistent menu item text>[,<category>]

**Execution command response:** \*SEAM:<menu\_id>

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

**Parameters:**

<persistent\_menu\_item\_text>:

<persistent_menu_item_text>	Description
String type	The menu item text in the additional menu.

<category>:

<category>	Description
Integer type	
0	Connectivity (placed directly under Connectivity)
1	Bluetooth
2	Entertainment
3	Messaging
4	Organizer
5	Settings - General

<category>	Description
6	Settings - Sounds and alarms
7	Settings - Display
8	Settings - Calls
9	Multimedia
10	Imaging
11	Phonebook
12	Applications (downloaded applications)
13	Accessories. <b>Default setting.</b>
14-256	Reserved for further use

<menu\_id>:

<menu_id>	Description
Integer type	The menu id sent to the accessory.

## AT\*SESAF

## SEMC Show and Focus

**Description:**

This command demands focus for a specific object with object index <object\_index>.

**Execution command:**

**AT\*SESAF**=<object\_index>[,<form>]

**Test command:**

**AT\*SESAF=?** Shows if the command is supported.

**Test command response:**

\*SESAF: (list of supported <form>s)

**Parameters:**

<object\_index>:

<object_index>	Description
Integer type	Index of the object for which focus is wanted.

<form>:

<form>	Description
Integer type	The object id for the form in which the object is placed.
0	The object is not placed in a form. <b>Default value</b>
1-255	The object id for the form.

**AT\*SELERT SEMC Create Alert (information text)**

**Description:**

This command displays an alert dialog via the phone UI. An alert is a dialog that shows data to the user and waits for the user to respond to the information. An alert can contain text (string) and an icon. Alerts inform the user about errors and other exceptional conditions.

When calling AT\*SELERT with a timeout (<alert\_type> = 6) and the given amount of time has elapsed, an unsolicited result code \*SEGUII is sent to the accessory.

The dialog is **not** be removed when the timeout has been reached. It is the callers responsibility to listen to the unsolicited result code and act upon it. If a user presses the left softkey (OK), \*SEGUII is also sent.

To be able to use this command, an UI-session has to be established. That is, the AT-command AT\*SEUIS=1 has to be called before calling AT\*SELERT. An alert dialog is deleted if AT\*SEDEL=<object\_index> is called or the UI-session connected to the object is destroyed (AT\*SEUIS=0).

**Set command:**

**With <alert\_type> <= 5:**

AT\*SELERT=<alert\_text>,<alert\_type>,<show>[,<title>][,<time\_out>][,<image>]

**With <alert\_type> = 6:**

AT\*SELERT=<alert\_text>[,<alert\_type>][,<show>][,<timeout>]]

**Set command response:**

\*SELERT:<object\_index>

**Test command:**

AT\*SELERT=? Shows if the command is supported.

**Test command response:**

Range of general parameters:

\*SELERT: ((list of supported <alert\_type>s),(list of supported <show>s),(list of supported <timeout>s),(list of supported <icon\_id>s)

**Parameters:**

<title>:

<title>	Description
String	Title of the alert. <b>Note:</b> Not valid for <alert_type> = 6 (Text feedback).

<alert\_text>:

<alert_text>	Description
String	Text to be included in the alert.

<alert\_type>:

<alert_type>	Description
0	NONE
1	ALARM An ALARM AlertType alerts the user to an event for which the user has previously requested to be notified. For example, the message might say, "Staff meeting in five minutes".

<alert_type>	Description
<b>2</b>	CONFIRMATION A CONFIRMATION AlertType confirms user actions. For example, “Saved!” might be shown to indicate that a Save operation has completed.
<b>3</b>	ERROR An ERROR AlertType alerts the user to an erroneous operation. For example, an error alert might show the message, “There is not enough room to install the application”.
<b>4</b>	INFO An INFO AlertType provides information to the user. For example, a simple splash screen might be an INFO AlertType.
<b>5</b>	WARNING A WARNING AlertType warns the user of a potentially dangerous operation. For example, the warning message may contain the text, “Warning: this operation will erase your data”.
<b>6</b>	TEXT FEEDBACK A text feedback is a pop-up box with a message to the user. <b>Note:</b> No <title> should be given! It is possible to set a timeout in the <timeout> parameter.

<image>:

<icon_id>	Description
<b>Integer</b>	The specific ID number of the icon that should be displayed.

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the alert.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall <b>not</b> be displayed when created.
<b>1</b>	Object shall be displayed when created.

<timeout>:

<timeout>	Description
<b>Integer type</b>	Timeout telling how long the text feedback should be displayed. Value given in ms. 0 (zero) value gives infinite time. <b>Note:</b> Only valid for <alert_type> = 6 (Text feedback).

## AT\*SESTRI SEMC Create String Input

**Description:** This command displays a string input dialogue via the phone UI. The contents in the dialogue can be changed by the user. The accessory will be notified when a user action has occurred and the unsolicited result code **\*SEGUI** is then sent.

To be able to use this command, an UI-session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before calling AT\*SESTRI.

A string input dialog is deleted if **AT\*SEDEL=<object\_index>** is called.

**Execution command:** **AT\*SESTRI=<title>,<prompt\_text>,<default\_text>,<predictive>,<input\_mode>,<show>[,<form>]**

**Execution command response:** **\*SESTRI:<object\_index>**

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

**Test command response:** Range of general parameters:  
**\*SESTRI:** <maxsize>,(list of supported <input\_mode>s),(list of supported <show>s), (list of supported <form>s)

### Parameters:

<title>:

<title>	Description
<b>String</b>	Title of the dialogue.

<prompt\_text>:

<prompt_text>	Description
<b>String</b>	The text string to be put as prompt text in front of the text editing area of the dialogue.

<default\_text>:

<default_text>	Description
<b>String</b>	The text string to be put in the text editing area of the dialogue. The type of text input is determined by the value of the <predictive> parameter.

<predictive>:

<predictive>	Description
<b>Bitflags</b>	Flags used to control the behaviour of a String object.

<b>&lt;predictive&gt;</b>	<b>Description</b>
<b>Bit 1 (LSB)</b>	Password - Entered text is confidential data. Content must never be divulged to the user.
<b>Bit 2</b>	Edit disallowed - User must not edit the text.
<b>Bit 3</b>	Sensitive data - Entered text is sensitive data. Must never be stored (for example credit card number).
<b>Bit 4</b>	Non-predictive - Predictive input facilities are disallowed.
<b>Bit 5</b>	Initial CAPS word - Initial letter of each word should be capitalized.
<b>Bit 6</b>	Initial CAPS sentence - Initial letter of each sentence should be capitalized.

<input\_mode>:

<b>&lt;input_mode&gt;</b>	<b>Description</b>
<b>Integer</b>	Constraints that are put on the <text> parameter - what type of text shall be entered in the dialogue.
<b>0</b>	Any
<b>1</b>	Real input
<b>2</b>	Integer input
<b>3</b>	Phone number input
<b>4</b>	URL input
<b>5</b>	Email input

<maxsize>:

<b>&lt;maxsize&gt;</b>	<b>Description</b>
<b>Integer</b>	The maximum number of characters in <text>.

<object\_index>:

<b>&lt;object_index&gt;</b>	<b>Description</b>
<b>Integer type</b>	Index of the dialogue.

<show>:

<b>&lt;show&gt;</b>	<b>Description</b>
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

<form>:

<b>&lt;form&gt;</b>	<b>Description</b>
<b>Integer type</b>	Tells whether the GUI object shall be placed in a form or not.

<form>	Description
0	The object shall not be placed in a form. <b>Default value.</b>
1	The object shall be placed in a form.

## AT\*SELIST

## SEMC Create List

### Description:

This command implements a List object and it can be used to create a submenu.

A List can consist of many items. Each item is composed of a text string and an optional image. If the item does not have an image connected to it the user must specify "" for the <item\_image>. If an image is provided, the implementation may choose to ignore the image if it exceeds the capacity of the device to display it. If the implementation displays the image, it will be displayed adjacent to the text string and the pair will be treated as a unit.

Images within any particular List object should all be of the same size, because the implementation is allowed to allocate the same amount of vertical space for every element.

When creating a new List object, the user has to select which type of List, <list\_type>, that should be implemented; 1-of-many, data list type or Nbr-of-many list type.

When the user has made a selection in the list, the indexes of the selected menu items are returned with the unsolicited result code **\*SEGUII**. The index is one-based (the first item has index 1). Other user actions such as rejecting the list are also sent in the unsolicited **\*SEGUII**.

To be able to use this command, an UI-session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before calling AT\*SELIST.

A list object dialog is deleted if **AT\*SEDEL=<object\_index>** is called.

### Execution command:

**AT\*SELIST=<title>,<list\_type>,<item\_to\_focus>,<number\_of\_items>,<overlay\_style>,<show>,<item\_string1>,<item\_image1>,<dimmed1>,<selected1>,<delete1>[,<item\_string2>,<item\_image2>,<dimmed2>,<selected2>,<delete2>..]**

### Execution command response:

\*SELIST: <object\_index>

### Test command:

**AT\*SELIST=?** Shows if the command is supported.

### Test command response:

\*SELIST: (list of supported <list\_type>s),(list of supported <overlay\_style>s),(list of supported <show>s)

### Parameters:

<title>:

<title>	Description
String	Title of the list.

<list\_type>:

<list_type>	Description
1	1-of-many. The user must select one and only one item.
2	Nbr-of-many The user can select many items in the list.
3	Data list This list can be used as a menu.

<selected>:

<selected>	Description
<b>Integer type</b>	Tells if the item is selected or not. <b>Note:</b> For a 1-of-many list only one item can be selected.
0	Item is not selected.
1	Item is selected.

<item\_to\_focus>:

<item_to_focus>	Description
<b>Integer type</b>	The item in the list that shall be in focus when the list is shown.

<number\_of\_items>:

<number_of_items>	Description
<b>Integer type</b>	Number of list items.

<item\_string>:

<item_string>	Description
<b>String</b>	Name of an item in the list.

<item\_image>:

<item_image>	Description
<b>Integer type</b>	ID of the image to be displayed with the list item.

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the list.

<dimmed>:

<dimmed>	Description
<b>Integer type</b>	Tells whether the list item shall be dimmed (grey-colored, not accessible) or not.
0	List item shall not be dimmed.
1	List item shall be dimmed.

<delete>:

<delete>	Description
<b>Integer type</b>	Tells whether a specific list item in the list shall be possible for the user to delete.
<b>0</b>	List item not possible to delete by the user.
<b>1</b>	List item possible to delete by the user.

<overlay\_style>:

<overlay_style>	Description
<b>Integer type</b>	Tells how the GUI object should be presented.
<b>0</b>	Overlay style not defined.
<b>1</b>	Overlay style default. Use original frame settings.
<b>2</b>	No frame
<b>3</b>	Frame
<b>4</b>	Fullscreen with frame.
<b>5</b>	Fullscreen without frame.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

## AT\*SEFORM

### SEMC Create Form

#### Description:

This command creates a form consisting of items. The user must create the different items that shall be included in the form before this command is executed. The specific items shall be created with the use of other commands in this ensemble, AT\*SELERT, AT\*SESTRI, AT\*SELIST, AT\*SETICK, AT\*SEONO, AT\*SEYNQ, AT\*SEDATE and AT\*SEGAUGE. When executing the AT\*SEFORM command the new items are automatically inserted into the new form.

The different items are added to the form in the same order as they were created. When the user has updated the form and accepted it (that is when the user leaves the form) the unsolicited result code **\*SEGUI** is sent to the accessory.

#### Execution command:

**AT\*SEFORM**=<title>,<number\_of\_items>,<show>[,<item\_id1>,<alignment1>[,<item\_id2>,<alignment2>...]]

**Execution command** \*SEFORM:<object\_index>

**response:**

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

**Test command response:** Range of general parameters:

\*SEFORM:(list of supported <item>s), (list of supported <alignment>s), (list of supported <show>s)

**Parameters:**

<title>:

<title>	Description
String	Title of the form.

<number\_of\_items>:

<number_of_items>	Description
Integer type	Number of items to be added to the form. The user must select one and only one item.

<item\_id>:

<item_id>	Description
Integer type	The id of an item to be included in the form.

<alignment>:

<alignment>	Description
Integer type	The horizontal alignment of the object in the container.
0	Left
1	Centre
2	Right

<show>:

<show>	Description
Integer type	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
0	Object shall not be displayed when created.
1	Object shall be displayed when created.

<item>:

<item>	Description
1	Item of type Alert
2	Item of type String input.
3	Item of type List
4	Item of type Ticker
5	Item of type Date input.

<item>	Description
6	Item of type Gauge.
7	Item of type Image.
8	Item of type On/Off input
9	Item of type Yes/No question

<object\_index>:

<object_index>	Description
Integer type	Index of the form.

## AT\*SETICK

## SEMC Create Ticker

### Description:

This command implements a “ticker tape”, a piece of text that runs continuously on the display of the ME.

To be able to use this command an UI-session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before running this command. A Ticker object is deleted if **AT\*SEDEL=<object\_index>** is called.

**Note:** Creating a ticker locks the UI until **AT\*SEUIS=0** has been called.

### Execution command:

**AT\*SETICK=<text>,<show>**

Execution command **\*SETICK:<object\_index>**

### response:

### Test command:

**AT\*SETICK=?** Shows if the command is supported.

### Test command response:

**\*SETICK:(list of supported <show>s)**

### Parameters:

<text>:

<text>	Description
String	Text to be included in the ticker.

<object\_index>:

<object_index>	Description
Integer type	Index of the ticker.

<show>:

<show>	Description
Integer type	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
0	Object shall not be displayed when created.
1	Object shall be displayed when created.

## AT\*SEDATE SEMC Create Date Field

**Description:**

A Date field is an editable component for presenting date and time (calendar) information. Value for this field can be initially set. If value is not set then the UI for the field shows this clearly.

An instance of a Date field can be configured to accept date or time information. This mode is set by the <mode> parameter. The DATE input mode allows only date information (year, month, day) to be set, and the TIME mode allows only time information (hours, minutes, seconds) to be set. When the user has modified the contents of the date field and accepts it, the unsolicited result code **\*SEGUI** is sent.

To be able to use this command, a UI session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before calling AT\*SEDATE.

A Date field object is deleted if **AT\*SEDEL=<object\_index>** is called.

**Note** that it is not possible to call AT\*SEDATE with <mode> == 2 and then include <date> first and <time> after that in the command parameter string. Doing so results in an error. The correct usage of the SET command is shown in the two examples below:

AT\*SEDATE="Set the date",1,1,0,"2005/05/29"

AT\*SEDATE="Set the time",2,1,0,"12:30:00"

**Execution command:**

**AT\*SEDATE=<title>,<mode>,<show>[,<form> [,<date>][,<time>]]**

**Execution command** \*SEDATE:<object\_index>

**response:**

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

**Test command** Range of general parameters:

**response:** \*SEDATE:(list of supported <mode>s), (list of supported <show>s), (list of supported <form>s)

**Parameters:**

<title>:

<title>	Description
String	Item title.

<mode>:

<mode>	Description
1	DATE mode. Possible to set and display the date (year, month, day).
2	TIME mode. Possible to set and display the time (hours, minutes, seconds).

<date>:

<date>	Description
Integer type	Format is "yy/MM/dd" or "yyyy/MM/dd", where characters indicate year (two last digits or four digits, depending on the <b>AT+CSDf</b> setting), month and day.

<time>:

<time>	Description
<b>String type</b>	Format is “hh:mm:ss”, where characters indicate hour, minutes and seconds.

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the date field.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

<form>:

<form>	Description
<b>Integer type</b>	Tells whether the GUI object shall be placed in a form or not.
<b>0</b>	The object shall not be placed in a form.
<b>1</b>	The object shall be placed in a form.

## AT\*SEGAUGE SEMC Create Gauge (Bar graph/ Progress Feedback)

### Description:

This command creates a gauge (progress feedback).  
 If the gauge is interactive with <interactive>=1 and the user has changed the value of the gauge, the unsolicited result code **\*SEGUI** is sent. This also happens if the user cancels the gauge.  
 If <interactive> = 2 then the user (accessory) has the possibility to update the gauge via the **AT\*SEGUP** command.  
 To be able to use this command, a UI session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before calling AT\*SEGAUGE.  
 A gauge object is deleted if **AT\*SEDEL=<object\_index>** is called.

### Execution command:

**AT\*SEGAUGE**=<label>,<interactive>,<show>[,<form>[,<initial\_value>[,<maxvalue>]]]

**Execution command** \*SEGAUGE:<object\_index>

**response:**

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

**Test command response:** Range of general parameters:

\*SEGAUGE: 0, (list of supported <show>s), (list of supported <form>s)

\*SEGAUGE: 1, (list of supported <show>s),(list of supported <form>s),(list of supported <initial\_value>s)

\*SEGAUGE: 2, (list of supported <show>s),(list of supported <form>s),(list of supported <initial\_value>s),(list of supported maxvalues)

**Parameters:**

<label>:

<label>	Description
String	Item label.

<interactive>:

<interactive>	Description
0	Non-interactive mode. The user cannot change the value of the bar graph. The gauge is used as a “progress feedback”. Initial_value and maxvalue ignored.
1	Interactive mode - to update the value of the gauge use the AT command <b>AT*SEGUP</b> . Used by for example accessories that want to control a progress feedback by themselves. Maxvalue ignored.
2	Interactive mode - the user is allowed to modify the value of the gauge by using the keyboard. The accessory will be notified when the gauge has been updated via <b>*SEGUII</b> .

<maxvalue>:

<maxvalue>	Description
Integer	The maximum value of the gauge. In range [1; 28]

<initial\_value>:

<initial_value>	Description
Integer	The initial value of the gauge. <ul style="list-style-type: none"> <li>In range [0; 100] for interactive=1</li> <li>In range [0; 28] for interactive=2.</li> </ul>

<object\_index>:

<object_index>	Description
Integer type	Index of the object.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

<form>:

<form>	Description
<b>Integer type</b>	Tells whether the GUI object shall be placed in a form or not.
<b>0</b>	The object shall not be placed in a form.
<b>1</b>	The object shall be placed in a form.

## AT\*SEGUP

### SEMC Update Gauge (Bar graph/ Progress Feedback)

**Description:**

This command updates an existing bar graph (progress feedback) with a new value. The object id of the bar graph must be given together with the new bar graph value. That is, an object created by AT\*SEGAUGE has to be created with parameter <interactive> = 1.

**Execution command:**

**AT\*SEGUP**=<object\_index>,<new\_value>[,<form>]

**Test command:**

**AT\*SEGUP=?** Shows if the command is supported.

**Parameters:**

<new\_value>:

<new_value>	Description
<b>Integer</b>	The new value of the bar graph.

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the bar graph to be updated.

<form>:

<form>	Description
<b>Integer type</b>	The object id for the form in which the object is placed. 0 means that the object is stand-alone.
<b>0</b>	The object is not placed in a form. <b>Default value</b>
<b>1-255</b>	The object id for the form.

## AT\*SEIMAGE SEMC Create Image Item

**Description:** This command adds an image item (located in the file system and with search path <image>) to a form.

**Note:** The set command cannot be executed on a stand-alone basis; it can only be executed as a part of the process to create a form.

The parameter <layout> describes where on the screen the image will appear. The value of the layout field is merely a hint.

If the image item exceeds the capacity of the screen the optional text string in <alt\_text> appears instead.

**Set command:** **AT\*SEIMAGE=<object\_index\_of\_form>,<label>,<image>,<layout>,<show> [<alt\_text>]**

**Set command response:** \*SEIMAGE:<object\_index>

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

**Test command response:** Range of general parameters:

\*SEIMAGE:(list of supported <layout>s), (list of supported <show>s)

**Parameters:**

<label>:

<label>	Description
String	Item label.

<image>:

<image>	Description
String	Path to an image item placed in the file system.

<layout>:

<layout>	Description
0	Layout_Default - Use the default formatting of the "container" of the image.
1	Layout_Left - Image should be close to the left edge of the drawing area.
2	Layout_Right - Image should be close to the right edge of the drawing area.
3	Layout_centre - Image should be horizontally centred.

<alt\_text>:

<alt_text>	Description
String	The optional text string that will be displayed when the image exceeds the capacity of the screen.

<object\_index>:

<object_index>	Description
Integer type	Index of the image item.

<object\_index\_of\_form>:

<object_index_of_form>	Description
<b>Integer type</b>	Index of the form to which the image will be added.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

## AT\*SEONO SEMC Create On/Off input

**Description:** This command displays an On/Off input screen with two radio buttons showing “on” and “off”. A value could be accepted by the user or cancelled. The unsolicited result code **\*SEGUI** is sent to the accessory when the user has accepted or cancelled the On/Off input.

To be able to use this command, a UI session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before calling AT\*SEONO.

An ON/Off object is deleted if **AT\*SEDEL=<object\_index>** is called.

**Execution command:** **AT\*SEONO=<title>,<default\_value>,<show>**

**Execution command response:** **\*SEONO:<object\_index>**

**Test command:**

**AT\*SEONO=?** Shows if the command is supported.

**Test command response:** Range of general parameters:

**\*SEONO:** (list of supported <default\_value>s), (list of supported <show>s)

**Parameters:**

<title>:

<title>	Description
<b>String</b>	Title of the On/Off input.

<default\_value>:

<default_value>	Description
<b>0</b>	Off
<b>1</b>	On

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the On/Off input.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

## AT\*SEYNQ SEMC Create Yes/No question

**Description:** This command creates a Yes/No question GUI object with an image and a question to be answered Yes or No. When the user presses a relevant key, the unsolicited **\*SEGUII** is sent to the accessory. To be able to use this command, a UI session has to be established. That is, the AT-command **AT\*SEUIS=1** has to be called before calling AT\*SEYNQ. A Yes/No question object is deleted if **AT\*SEDEL=<object\_index>** is called.

**Execution command:** **AT\*SEYNQ=<title>,<question>,<show>[,<image\_id>]**

**Execution command response:** **\*SEYNQ:<object\_index>**

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

**Test command response:** Range of general parameters:  
**\*SEYNQ:** (list of supported <show>s)

**Parameters:**

<title>:

<title>	Description
<b>String</b>	Title of the Yes/No question.

<question>:

<question>	Description
<b>String</b>	The question to be answered by the user.

<image\_id>:

<image_id>	Description
<b>Integer type</b>	Id of the image (icon) to be used in the question box. Valid range [0, 65535]

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Object index of the Yes/No question.

<show>:

<show>	Description
<b>Integer type</b>	Tells whether the GUI object shall be visible on the screen directly when created. If <show> = 0 then it is possible to use the <b>AT*SESAF</b> command to display the object later.
<b>0</b>	Object shall not be displayed when created.
<b>1</b>	Object shall be displayed when created.

## AT\*SEDEL

## SEMC GUI Delete

**Description:**

This command deletes a GUI object specified with <object\_index>.

**Execution command:**

**AT\*SEDEL=<object\_index>**

**Test command:**

**AT\*SEDEL=?** Shows if the command is supported.

**Parameter:**

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the object that shall be deleted.

## AT\*SESLE

## SEMC Soft Key Label (ver. 1)

**Description:**

The command defines the labels to be used for the soft keys. Parameter <object\_id> verifies to which GUI object the soft key(s) will be added.

**If <nbr\_of\_actions> = 0:** The user can add a new soft key label for the right soft key specified in the <short\_text>.

**If <nbr\_of\_actions> > 0:** Right soft key is named "More". <short\_text> is added as first element in the "More" menu followed by the <long\_textX> parameters.

The new soft key IDs are sent to the user in the <softkey\_idX> parameters.

**Set command:**

**AT\*SESLE=<object\_id>,<nbr\_of\_actions>,<icons\_or\_texts>,<show>,<short\_text>[,<long\_text1>[,<long\_text2>...]]]**

**Set command response:**

**\*SESLE: <softkey\_id1>[,<softkey\_id2>[<softkey\_id3>[...]]]**

**Test command:**

**AT\*SESLE=?** Shows if the command is supported.

**Parameters:**

<object\_id>:

<object_id>	Description
<b>Integer</b>	The id of the GUI object with the soft keys.

<nbr\_of\_actions>:

<nbr_of_actions>	Description
<b>Integer</b>	Defines the number of <long_textX> soft key(s) to be added to the gui object in the "More" menu.

<short\_text>:

<short_text>	Description
<b>String</b> if <icons_or_texts> = 0	Text label for the right soft key or the first element in "More" menu (see description).
<b>Integer</b> if <icons_or_texts> = 1	Icon ID for the icon to be used instead of the text.

<long\_text>:

<long_text>	Description
<b>String – if</b> <icons_or_texts> = 0	Text label(s) for the text to be used in the "More" menu.
<b>Integer – if</b> <icons_or_texts> = 1	Icon ID for the icon to be used instead of the text.

<action>:

<action>	Description
<b>Integer value</b>	Reference value for soft key action.

<icons\_or\_texts>:

<icons_or_texts>	Description
<b>Integer</b>	
<b>0</b>	The new soft key labels to be placed in the right or the "More" menu, are text strings. This implies that the parameters <short_text> and <long_textX> contains ordinary text strings.
<b>1</b>	The new soft key labels to be placed in the right or the "More" menu are icons. This implies that the parameters <short_text> and <long_text> contains icon IDs to the icons to be displayed.

<show>:

<show>	Description
<b>0</b>	Do not display the soft key.
<b>1</b>	Display the soft key directly. <b>Default setting</b>

<softkey\_id>:

<softkey_id>	Description
<b>Integer</b>	Reference value for AT soft key ID.

**AT\*SERSK SEMC Remove Soft Key**

**Description:** The command removes a soft key action defined with command **AT\*SESLE**.  
**Note:** This command has to be entered after AT\*SESLE. When the GUI object is removed the soft keys are also removed.

**Execution command:** **AT\*SERSK=<object\_id>,<softkey\_id>**

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

**Parameter:**  
 <object\_id>:

<object_id>	Description
Integer value	ID number for the object.

<softkey\_id>:

<softkey_id>	Description
Integer value	Reference value for soft key.

**AT\*SEUIS SEMC UI Session Establish/Terminate**

**Description:** This command is used by the accessory to establish or to terminate a UI session.  
 If the UI session was established/terminated, OK will be returned.  
 When an accessory wants to show something on the display, it must request a UI session. Also, if an accessory wants to remove all of its objects then it just ends a UI session. Within a UI session an accessory has freedom to create new, modify and/or remove objects.  
 When the UI session has gained or lost focus the unsolicited result code **\*SESFI** are returned.

**Execution command:** **AT\*SEUIS=<action>**

**Read command:** **AT\*SEUIS?**

**Read command response:** \*SEUIS:<action>

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

**Parameter:**  
 <action>:

<action>	Description
0	terminate session
1	establish session

## Unsolicited Result Codes

### \*SEGUI SEMC GUI Indication

**Description:** This unsolicited result code is sent when an action on a GUI object has occurred. The action is related to the type of the GUI object. The object specific information that can be included in <object\_specific\_info> is dependent on the action as well as the type of GUI object.

**Note:** The GUI object can create own actions by using the command **AT\*SESLE**. (creating softkey actions). These new actions are given an action ID according to the specification **AT\*SESLE**.

This result code is activated by **AT\*SELERT**, **AT\*SESTRI**, **AT\*SELIST**, **AT\*SEFORM**, **AT\*SETICK**, **AT\*SEDATE**, **AT\*SEGAUGE**, **AT\*SEONO**, **AT\*SEYNQ** or **AT\*SESLE**

**Unsolicited result code:** \*SEGUI: <object\_index>,<action>[,<object\_specific\_info1>[,<object\_specific\_info2>..]] When a GUI action has occurred.

**Parameters:**

<object\_index>:

<object_index>	Description
<b>Integer type</b>	Index of the object for which the action has occurred. <b>Note:</b> A stand-alone object and a form can have the same object_index.

<action>:

<action>	Description	GUI object	<object_specific_info>
<b>0</b>	CANCEL action	All	-
<b>1</b>	PREVIOUS action	All	-
<b>2</b>	NO action	Yes/no question	-
<b>3</b>	YES action	Yes/no question	-
<b>4</b>	ACCEPT action, the user has accepted a form.	Form	-
<b>5</b>	ACCEPT INDEX action, the user has selected an item in a list.	List (exclusive or implicit)	Integer; index of the selected list item.
<b>6</b>	DELETE INDEX action, the user has selected an item to be deleted in a list.	List	Integer; index of the selected list item

<action>	Description	GUI object	<object_specific_info>
<b>7</b>	ACCEPT N_OF_MANY action, the user has selected one or many item(s) in a list.	List (multiple)	Integer; index(es) of the selected list item(s): <object_specific_info1>[, <object_specific_info2>...]
<b>8</b>	ACCEPT DATE action; the user has accepted a date value in a GUI object.	Date input	String; date, format is depending on the <b>AT+CSDF</b> setting.
<b>9</b>	ACCEPT TIME action, the user has accepted a time value in a GUI object.	Time input	String; time, format is depending on the <b>AT+CSDF</b> setting.
<b>10</b>	ACCEPT BOOLEAN action, the user has accepted a Boolean value in a GUI object.	On/off question	Boolean; True - On, False - Off
<b>11</b>	ACCEPT STRING action, the user has accepted a string in a GUI object.	String input dialogue	String; the text string in the GUI object.
<b>12</b>	ACCEPT INTEGER action, the user has entered a new value in the progress feedback.	Gauge (progress feedback)	Integer; the new value.
<b>13</b>	SOFT KEY ACTION	Softkey	Integer; The actionid of the softkey that has been pressed.
<b>108</b>	FORM ACCEPT DATE	Date input placed in a form.	String; date, format is depending on the <b>AT+CSDF</b> setting.
<b>109</b>	FORM ACCEPT TIME	Time input placed in a form.	String; time, format is depending on the <b>AT+CSDF</b> setting.
<b>111</b>	FORM ACCEPT STRING	String input dialogue placed in a form.	String; the text string in the GUI object.
<b>112</b>	FORM ACCEPT INTEGER	Gauge (progress feedback) placed in a form.	Integer; the new value.

**\*SESFI**      **SEMC Session Focus Indication**

**Description:** This unsolicited result code is sent when the session has got focus or when focus for the session has been lost. This result code is activated by **AT\*SEUIS**.

**Unsolicited result code:** \*SESFI:<focus>  
When focus for the session is obtained or lost.

**Parameter:**

<focus>:

<focus>	Description
0	Focus is lost.
1	Focus is obtained

**\*SEAAI**      **SEMC Menu Item Indication**

**Description:** This indication is sent to the accessory when the menu item with id <menu\_id> is activated by the user. This result code is activated by **AT\*SEAM**.

**Unsolicited result code:** \*SEAAI:<menu\_id>  
When menu item is activated.

**Parameter:**

<menu\_id>:

<menu_id>	Description
<b>Integer type</b>	The menu id for the item activated.

# Ensemble C38: Bluetooth Commands

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## Commands

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**AT\*EIBA**      **Ericsson Internal Bluetooth Address**

**Description:** Command that is generated internally in the platform. It forwards the Bluetooth address of a connected Bluetooth device.

**Execution command:** **AT\*EIBA=<bt\_address>**

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

**Parameter:**

<bt\_address>:

<bt_address>	Description
String	The Bluetooth address given in hexadecimal format.

## AT+BINP Bluetooth Input

**Description:** This command requests some specific data input from the phone. On reception of this command the phone performs the proper actions such that the requested information is sent back to the HF using the **+BINP** response.  
The type of data the HF shall expect in the <dataresp> parameter returned by the phone depends on the information requested in each case.

**Execution command:** **AT+BINP=<datarequest>**

**Execution command response:** **AT+BINP:<dataresp>1...<dataresp>n**

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

**Test command response:** +BINP: (list of supported <datarequest>s)

**Parameters:**  
<datarequest>:

<datarequest>	Description
1	Request phone number corresponding to the last voice tag recorded in the HF.

<dataresp>:

<dataresp>	Description
<dataresp>1..<dataresp>n	Data parameters returned by the phone. Their contents depends on the value of the <datarequest> parameter.

Supported values on <dataresp> depending on <datarequest>:

<datarequest>	Description
1	<Phone number>; Phone number string (max. 32 digits). The format (type of address) of the phone number string shall conform with the rules stated in <i>Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms</i> , subclause 10.5.4.7, for a value (in integer format) of the type of address octet of 145, if dialling string includes international access code character "+", and for a value of 129 otherwise.

## AT+BLDN Bluetooth Last Dialed Number

**Description:** Command that calls the last phone number dialed. On reception of this command, the phone sets up a voice call to the last phone number dialed.

**Execution command:** **AT+BLDN**

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

## AT+BVRA Bluetooth Voice Recognition Activation

**Description:** Enables/disables the voice recognition function in the phone. This command activates the result code **+BVRA**

**Note:** This command gives an error if the request is not made from a bluetooth handsfree device. That is, it is not possible to connect to a bluetooth handsfree device and then in parallel connect to the ME with a terminal program (hyperterminal and substitutes) and try sending the AT command, this also results in an error.

**Note:** A voice message has to be recorded to make it possible to use this command. If no such message exist, then the command gives an error in the response.

**Execution command:** **AT+BVRA=<vrec>**

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

**Test command response:** +BVRA: (list of supported <vrec>s)

**Parameter:**  
<vrec>:

<vrec>	Description
0	Disable Voice recognition in the phone.
1	Enable Voice recognition in the phone.

## AT+NREC Noise Reduction and Echo Cancelling

**Description:** Enables/disables any Echo Cancelling and Noise Reduction functions embedded in the phone.

**Note:** This command only works over Bluetooth wireless technology. This is because all AT commands for audio preferences are deleted and replaced with an audio class and id. However, the command is standard for the BTHF profile and is therefore used in this context.

**Execution command:** **AT+NREC=<nrec>**

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

**Test command response:** +NREC: (list of supported <nrec>s)

**Parameter:**  
<nrec>:

<nrec>	Description
0	Disables EC/NR in the phone.
1	Enables EC/NR in the phone.

## AT+VGM Gain of Microphone

**Description:** Command issued by the HF to report its current microphone gain level setting to the phone. <gain> is a decimal numeric constant, relating to a particular (implementation dependent) volume level controlled by the HF. This command does not change the microphone gain of the phone, it simply indicates the current value of the microphone gain in the HF. This command activates the result code **+VGM**

**Execution command:** **AT+VGM=<gain>**

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

**Test command response:** +VGM: (list of supported <gain>s)

**Parameter:**

<gain>:

<gain>	Description
0-15	0 - Minimum gain 15 - Maximum gain

## AT+VGS Gain of Speaker

**Description:** Command issued by the HF to report its current speaker gain level setting to the phone. <gain> is a decimal numeric constant, relating to a particular (implementation dependent) volume level controlled by the HF. This command does not change the speaker gain of the phone, it simply indicates the current value of the speaker gain in the HF.

**Note:** This command returns an error if the request is not made from a bluetooth handsfree device.

This command activates the result code **+VGS**

**Execution command:** **AT+VGS=<gain>**

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

**Test command response:** +VGS: (list of supported <gain>s)

**Parameter:**

<gain>:

<gain>	Description
0-15	0 - Minimum gain 15 - Maximum gain

## AT+BRSF Bluetooth Retrieve Supported

**Description:** Notifies the ME of the supported features available in the HF, and requests information about the supported features in the ME. The supported features shall be represented as a decimal value.  
 <HF supported bitmap> is a 32 bit unsigned integer representing a bitmap of the supported features in the HF according to table 1. The unused bits shall be initialized to zero.  
 <ME supported bitmap> is a 32 bit unsigned integer representing a bitmap of the supported features in the ME according to table 2. The unused bits shall be initialized to zero.

**Execution command:** **AT+BRSF=<HF supported features bitmap>**

**Execution command response:** +BRSF: <ME supported features bitmap>

**Test command:** **AT+BRSF=?** Shows if the command is supported

**Parameter:**  
 <HF supported features bitmap>

bit	Description
0	EC and/or NR function.
1	Call waiting and 3-way calling.
2	CLI presentation capability.
3	Voice recognition activation (enables unsolicited +BVRA).
4	Remote volume control. (enables unsolicited +VGS).
5-31	Unused

<ME supported features bitmap>

bit	Description
0	Three-way calling (AT+CHLD supported).
1	AC and/or NR function (AT+NREC supported).
2	Voice recognition function (AT+BVRA supported).
3	In-band ring tone capability (not supported).
4	Attach a number to a voice tag (AT+BINP supported).
5	Ability to reject call (AT+CHUP supported).
6-31	Unused

## Unsolicited Result Codes

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### +BVRA Bluetooth Voice Recognition Activation Indication

**Description:** Unsolicited result code used to notify the HF when the voice recognition function in the phone has been terminated autonomously. This result code is activated by **AT+BVRA**.

**Unsolicited result code:** **+BVRA:** <vrect>

**Parameter:**

<vrect>:

<vrect>	Description
0	Voice recognition is disabled in the phone.
1	Voice recognition is enabled in the phone.

### +VGM Gain of Microphone Indication

**Description:** Unsolicited result code issued by the phone to set the microphone gain of the HF. <gain> is a decimal numeric constant, relating to a particular (implementation dependent) volume level controlled by the HF. This result code is activated by **AT+VGM**.

**Unsolicited result code:** **+VGM:** <gain>

**Note:** Due to the small inconsistency between the GSM 07.07 standard and the current Headset specification (*Specification of the Bluetooth System; Profiles, v1.1, Part K:6, Headset Profile.*), the HF shall also accept the “=” symbol in place of “.” as a valid separator for this unsolicited result code.

**Parameter:**

<gain>:

<gain>	Description
0-15	0 - Minimum gain 15 - Maximum gain

### +VGS Gain of Speaker Indication

**Description:** Unsolicited result code issued by the phone to set the speaker gain of the HF. Parameter <gain> is a decimal numeric constant, relating to a particular (implementation dependent) volume level controlled by the HF. This result code is activated by **AT+VGS**.

**Unsolicited result code:** **+VGS:** <gain>

**Note:** Due to the small inconsistency between the GSM 07.07 standard and the current Headset specification (*Specification of the Bluetooth System; Profiles, v1.1, Part K:6, Headset Profile.*), the HF shall also accept the “=” symbol in place of “:” as a valid separator for this unsolicited result code.

**Parameter:**

<gain>:

<gain>	Description
0-15	0 - Minimum gain 15 - Maximum gain

**+BSIR Bluetooth Setting of In-band Ring tone Indication**

**Description:** Unsolicited result code issued by the phone to indicate to the HF that the in-band ring tone setting has been locally changed. The HF may react accordingly by changing its own alert method.

**Unsolicited result code:** **+BSIR:** <bsir>

**Parameter:**

<bsir>	Description
0	The phone provides no in-band ring tone.
1	The phone provides an in-band ring tone.

**+BINP Bluetooth Input Indication**

**Description:** Unsolicited result code issued by the phone in response to a request from the terminal equipment to provide information of a specified type.

**Unsolicited result code:** **+BINP:** <dataresp1>[,...,<datarespn>]

**Parameter:**

<datarespn> type is dependent on the <datarequest> parameter. See [AT+BINP](#)

# Ensemble S1: GSM DTE-DCE Interface

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## Commands

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### AT+CSCS      **Select TE Character Set (ver. 3)**

**Description:** Set command informs TA which character set <chset> is used by the TE. TA is then able to convert character strings correctly between TE and ME character sets.

When TA-TE interface is set to 8-bit operation and the used TE alphabet is 7-bit, the highest bit is set to zero.

**Note:** It is manufacturer specific how the internal alphabet of ME is converted to/from the TE alphabet.

**Set command:**      **AT+CSCS=<chset>**

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

**Read command response:**  
+CSCS: <chset>

**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 (GSM 03.38 subclause 6.2.1); this setting causes easily software flow control(XON/XOFF) problems. <b>Default setting.</b>
"IRA"	International reference alphabet (ITU-T T.50) <b>Note:</b> Recommended default setting by GSM 07.07.
"8859-n"	ISO 8859 Latin <i>n</i> (1-6) character set. Only number 1.
"UTF-8"	Universal Text Format, 8 bits.

# Ensemble S2: Call Control

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## Commands

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### AT+CHUP Hang Up Call

**Description:** Requests hang up.

**Execution command:** **AT+CHUP**

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

### AT+CRC Cellular Result Codes (ver. 2)

**Description:** Set command controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation or notification for VBS/VGCS calls is used. When enabled, an incoming call is indicated to the TE with unsolicited result code **+CRING:** <type> instead of the normal **RING**.

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

**Read command:** **AT+CRC?** Displays the current setting.

**Read command response:** +CRC: <mode>

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

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

**Parameter:**  
<mode>:

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

### AT+CR Service Reporting Control

**Description:** Enables or disables display of intermediate **+CR:<serv>** result code to be returned during the call setup phase. The code is returned before the intermediate result code CONNECT is returned.

**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. <b>Default setting</b>
1	Enable reporting.

## AT+CSTA Select Type of Address

**Description:** This command selects the type of number for further dialling commands (D) according to GSM/UMTS specifications. Test command returns values supported by the TA as a compound value

**Execution command:** **AT+CSTA=[<type>]**

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

**Read command response:** +CSTA: <type>

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

**Test command response:** +CSTA: (list of supported <type>s)

**Parameter:** <type>:

<type>	Description
<b>Integer format</b>	Type of address octet (refer to GSM 04.08 section 10.5.4.7)
<b>128</b>	Unknown numbering plan, unknown number type.
<b>129</b>	ISDN / telephony numbering plan, unknown number type. <b>Default value if '+' is not in dialling string</b>
<b>145</b>	ISDN / telephony numbering plan, international number <b>Default value if '+' is in dialling string</b>
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128 - 255</b>	Other values refer to GSM 04.08 section 10.5.4.7

## AT+CV120 V.120 Rate Adaption Protocol

**Description:** Sets the values of the V.120 protocol parameters (defined in CCITT V.120) that are carried in the GSM BC and/or LLC information elements. Test command returns values supported by the TA as a compound value.

**Set command:** **AT+CV120**=[<rah>[,<mfm>[,<mode>[,<llineg>[,<assign>[,<negtype>]]]]]]

**Read command:** **AT+CV120?** Displays the current <n> and <m> settings.

**Read command response:** +CV120: <rah>,<mfm>,<mode>,<llineg>,<assign>,<negtype>

**Test command:** **AT+CV120=?** Shows if the command is supported.

**Test command response:** +CV120: (list of supported <rah>s),(list of supported <mfm>s),(list of supported <mode>s),(list of supported <llineg>s),(list of supported <assign>s),(list of supported <negtype>s)

**Parameters:**

<rah>:

<rah>	Description
0	Rate adaption header not included.
1	Rate adaption header included (mandatory for protocol sensitive modes).

<mfm>:

<mfm>	Description
0	Multiple frame establishment not supported, only UI frames allowed.
1	Multiple frame establishment supported, both I and UI frames allowed.

<mode>:

<mode>	Description
0	Bit transparent mode of operation.
1	Protocol sensitive mode of operation.

<llineg>:

<llineg>	Description
0	No negotiation, LLI = 256 only
1	Negotiation allowed. <b>Note:</b> <negtype> indicates the connection over which the negotiation is performed

<assign>:

<assign>	Description
0	Message originator is “default assignee”.
1	Message originator is “assignor only”.

<negtype>:

<negtype>	Description
0	Negotiation is done using logical link zero.
1	Negotiation is done with USER INFORMATION messages on a temporary signalling connection.

**AT+VTS****DTMF and Tone Generation****Description:**

Allows the transmission of DTMF tones. These tones may be used (for example) when announcing the start of a recording period. The command is write-only. The command is used only during voice calls.

**Note:** The ATD command is used only for dialling. It is not possible to generate arbitrary DTMF tones using the ATD command.

**Set command:**

**AT+VTS=<DTMF>**

**Test command:**

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

**Parameter:**

<DTMF>:

An ASCII character string with entries in the set '0-9, #, \*, A-D' separated by commas. Each entry is interpreted as a single DTMF tone.

*Example:* The string "8,9" sends two DTMF tones, "8" followed by "9".

## Unsolicited result codes

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**+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 phone 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
<b>ASYNC</b>	Asynchronous transparent
<b>SYNC</b>	Synchronous transparent
<b>REL ASYNC</b>	Asynchronous non-transparent
<b>REL SYNC</b>	Synchronous non-transparent

## +CRING

### Call Mode Indication

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

**Unsolicited result code:** **+CRING:** <type>

**Parameter:**

<type>:

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

# Ensemble S3: GSM Data/Fax

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## Commands

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### AT+CBST Select Bearer Service Type (ver. 3)

**Description:** Set command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated. 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 setting.

**Read command response:** +CBST: <speed>,<name>,<ce>

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

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

**Parameter:**

<speed>:

<speed>	Description
0	Auto selection of baud setting. <b>Default setting</b>
7	9600bps V.32
12	9600bps V.34
14	14400bps V.34
15	19200bps V.34
16	28800bps V.34
39	9600bps V.120
43	14400bps V.120
47	19200bps V.120
48	28800bps V.120
71	9600bps V.110 (ISDN)
75	14400bps V.110 (ISDN)
79	19200bps V.110 (ISDN)
80	28800bps V.110 (ISDN)

<name>:

<name>	Description
0	Asynchronous connection (UDI or 3.1kHz modem). <b>Default setting.</b>
4	Data circuit asynchronous (RDI)

<ce>:

<ce>	Description
1	Non transparent <b>Default setting</b>

## AT+CRLP Radio Link Protocol (ver. 2)

**Description:** Radio Link Protocol (RLP) parameters used when non-transparent data calls are originated, may be altered with the set command. Available command subparameters depend on the RLP versions implemented by the device (for example, <ver> may not be available if the device supports only versions 0 and 1).

**Note:** If radio link protocol is not used, but some other error correcting protocol (for transparent data calls), V.25ter Error Control Selection test command +ES=? may be used to indicate the presence of the protocol. The test command returns values supported by the TA as a compound value. If the ME/TA supports several RLP versions <verx>, the RLP parameter value ranges for each <verx> are returned in a separate line.

**Set command:** **AT+CRLP=**[<iws>,<mws>,<T1>,<N2>,<ver>,<T4>]]]]]]

**Read command:** **AT+CRLP?** Displays the current parameter settings for each supported RLP version. Only RLP parameters applicable to the corresponding <verx> are returned.

**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),(list of supported <mws>s),(list of supported <T1>s),(list of supported <N2>s)[,<ver1>,(list of supported <T4>s)]]<CR><LF>

[+CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <T1>s),(list of supported <N2>s)[,<ver2>,(list of supported <T4>s)]]<CR><LF>

[...]]

**Parameters:** Default values and value ranges depend on RLP version; refer GSM 04.22 subclause 5.4

<iws>:

<iws>	Description
0-61	IWF to phone window size
61	<b>Default setting</b>

<mws>:

<mws>	Description
0-61	MS to IWF window size
61	<b>Default setting</b>

<T1>:

<b>&lt;T1&gt;</b>	<b>Description</b>
<b>38-100</b>	Acknowledgement timer T1 setting, in 10 ms steps
<b>48</b>	T1=480 ms <b>Default setting</b>

<N2>:

<b>&lt;N2&gt;</b>	<b>Description</b>
<b>0-255</b>	Number of retransmission attempts, N2
<b>6</b>	<b>Default setting.</b>

<ver>:

<b>&lt;ver&gt;</b>	<b>Description</b>
<b>Integer</b>	RLP version - When version indication is not present, <ver>=0 is assumed

<T4>:

<b>&lt;T4&gt;</b>	<b>Description</b>
<b>3-255</b>	Resequencing period T4, in 10ms steps
<b>5</b>	<b>Default setting</b>

# Ensemble S4: Extended Error Reporting

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## Commands

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### AT+CEER Extended Error Report (ver. 2)

**Description:** Execution command causes the TA to return one or more lines of information text <report>, determined by the ME manufacturer, which offer the user of the TA an extended report of the reason for:

- the failure in the last unsuccessful call setup (originating or answering) or in-call modification
- the reason for last call release
- the last unsuccessful GPRS attach or unsuccessful PDP context activation
- the last GPRS detach or PDP context deactivation.

Typically, the text consists of a single line containing the failure information given by GSM/UMTS network in textual format.

**Execution command:**

**AT+CEER**

**Execution command response:** +CEER: <report>

**Test command:**

**AT+CEER=?** Shows if the command is supported.

**Parameter:**

<report>:

<report>	Description
<b>Characters</b>	The total number of characters, including line terminators, in the information text shall not exceed 2041 characters. Text shall not contain the sequence 0<CR> or OK<CR>.

# Ensemble S5: GSM HSCSD

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## Commands

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### AT+CHSD HSCSD Device Parameters (ver. 2)

**Description:** The execution command returns information about HSCSD features (refer to GSM 02.34) supported by the ME.  
The test command does not return any values, only OK to show that the command is supported.

**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
8	Multislot class 8.

<maxRx>:

<maxRx>	Description
4	Maximum number of receive timeslots that is supported by the MS.

<maxTx>:

<maxTx>	Description
1	Maximum number of transmit timeslots that is supported by the MS.

<sum>:

<sum>	Description
5	Total number of receive and transmit timeslots that ME can support at the same time is 5 (that is, 4+1). The following applies in a HSCSD call: 2 ≤ (receive slots) + (transmit slots) ≤ <sum>

<codings>: This is a sum of integers each representing a supported channel coding (For example, value 12 indicates that 9,6 kbits/s and 14.4 kbits/s are supported)

<codings>	Description
4	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 9.6 kbit/s.
8	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 14.4 kbit/s.
12	Indicates that the accepted channel codings for the next established non-transparent HSCSD call are both 9.6 kbit/s and 14.4 kbit/s. <b>Default</b>

## AT+CHSN

## HSCSD Non-Transparent call Configuration (ver. 2)

### Description:

The set command controls parameters for non-transparent HSCSD calls. Changing <topRx> or <codings> during a call does not affect the current call. Changing <wAiuR> or <wRx> affects the current call only if <topRx> was non-zero when the call was established. (When using the command in this way it comes in the “action” command category). This is what is referred to as User initiated modification in GSM 22.034 and User initiated up- and downgrading in GSM 23.034.

**Note:** Recommended value for parameter <speed> in **AT+CBST** is 0.

### Set command:

**AT+CHSN**=[<wAiuR>[,<wRx>[,<topRx>[,<codings>]]]]

### Read command:

**AT+CHSN?** Displays the current setting.

### Read command response:

+CHSN: <wAiuR>, <wRx>, <topRx>, <codings>

### Test command:

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

### Test command response:

+CHSN: (list of supported <wAiuR>s), (list of supported <wRx>s), (list of supported <topRx>s), (list of supported <codings>s)

### Parameters:

<wAiuR>:

<wAiuR>	Description
0	TA/ME calculates a proper number of receive time slots from currently selected fixed network user rate (<speed> parameter from <b>AT+CBST</b> command, ref and <codings>, and <wRx> (or <maxRx> from <b>AT+CHSD</b> command if <wRx>=0). See note below. <b>Default setting</b>
1	Wanted air interface user rate is 9.6 Kbps.
2	Wanted air interface user rate is 14.4 Kbps.
3	Wanted air interface user rate is 19.2 Kbps.
4	Wanted air interface user rate is 28.8 Kbps.
6	Wanted air interface user rate is 43.2 Kbps, UMTS only.
7	Wanted air interface user rate is 57.6 Kbps, UMTS only.

<wRx>:

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

**Note:**

The Description text above is copied from GSM 27.007 and should be interpreted as follows:  
 If the <wAiur> and <wRx> are both set to '0', the number of receive time slots shall be calculated from <speed> and <codings>. Furthermore, if <speed> is '0' (autobauding), then the number of receive time slots shall be mapped from <maxRx> from **AT+CHSD** command.

<topRx>:

<topRx>	Description
0	Indicates that the user is not going to change <wAiur> and/or <wRx> during the next call. <b>Default</b>
1	Top value for <wRx> that user is going to request during the next established non-transparent HSCSD call is 1.
2	Top value for <wRx> that user is going to request during the next established non-transparent HSCSD call is 2.

<codings>:

This is a sum of integers each representing a supported channel coding (for example, value 12 (4+8) indicates that 9.6 and 14.4 kbits/s are supported).

<codings>	Description
0	Indicates that all codings are accepted.
4	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 9.6 Kbps only.
8	Indicates that the accepted channel coding for the next established non-transparent HSCSD call is 14.4 Kbps only.
12	Indicates that the accepted channel codings for the next established non-transparent HSCSD call are both 9.6 Kbps and 14.4 Kbps. <b>Default</b>

**AT+CHSC HSCSD Current Call Parameters (ver. 2)**

**Description:** This execution command returns information about the current HSCSD call parameters, that is the current number of receive and transmit time slots, air interface user rate and channel coding.

**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 also note below.
1	The number of receive time slots currently in use is 1.
2	The number of receive time slots currently in use is 2.
3	The number of receive time slots currently in use is 3.
4	The number of receive time slots currently in use is 4.

<tx>:

<tx>	Description
0	No HSCSD call is active. See also note below.
1	The number of transmit time slots currently in use is 1.

<aiur>:

<aiur>	Description
0	No HSCSD call is active. See also note below.
1	Current air interface user rate is 9.6 Kbps.
2	Current air interface user rate is 14.4 Kbps.
3	Current air interface user rate is 19.2 Kbps.
4	Current air interface user rate is 28.8 Kbps.
5	Current air interface user rate is 38.4 Kbps.
6	Current air interface user rate is 43.2 Kbps.
7	Current air interface user rate is 57.6 Kbps.

<coding>:

<coding>	Description
0	No HSCSD call is active. See also note below.
4	Current channel coding is 9.6 Kbps. (TCH/F9.6)

<coding>	Description
8	Current channel coding is 14.4 Kbps. (TCH/F14.4)

**Note:** The value '0' only applies when no HSCSD call is active (general BS 20 or 30) and in such a case all four parameters will be '0'

## AT+CHSR HSCSD Parameters Report (ver. 2)

**Description:** When this command is enabled the intermediate result code **+CHSR:** <rx>,<tx>,<aiur>, <coding> is returned from the TA to the TE when an HSCSD call is being set up. The result code represents the current (negotiated or renegotiated) HSCSD parameters. If enabled, the intermediate result code is transmitted at the point of the call setup negotiation where the ME/TA has determined what type of an HSCSD connection will be used. Result code transmission is done after possible service (+CR), error control (+ER), and/or compression (+DR) reporting but before possible TE-TA rate (+ILRR) reporting and before the intermediate result code CONNECT is transmitted. The format of the intermediate result code is:  
+CHSR: <rx>,<tx>,<aiur>,<coding>

For the value definitions, see the **AT+CHSC** command. For instance, for a non-transparent HSCSD call, result code '+CHSR: 2, 1, 4, 8' means that the call has two time slots downlink, one time slot uplink, the air interface user rate is 28.8 Kbps and the used channel coding is TCH/F14.4.

**Execution command:** **AT+CHSR**=[<mode>]

**Read command:** **AT+CHSR?**

**Read command response:** +CHSR: <mode>

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

**Test command response:** +CHSR: (list of supported <modes>s)

**Parameter:**

<mode>:

<mode>	Description
0	Disable reporting <b>Default setting</b>
1	Enable reporting

## AT+CHSU HSCSD Automatic User-initiated Upgrade

**Description:** The set command controls whether or not automatic user initiated service level upgrading shall be used for non-transparent HSCSD calls. “Automatic” means that, if enabled, the ME/TA shall use the UP bit in the received RLP frames to determine when to initiate user initiated service level upgrading (that is, when to modify the +CHSN parameters <wAuir> and/or <wRx> for the current call). Refer to GSM 07.01 for details on the interpretation of the UP bit(s).

**Note:** The validity of the UP bit in the RLP frames depends on the result of the RLP negotiations. The UP bit shall only be used if the result of the RLP negotiations were successful with respect to the UP bit.

**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 <b>Default setting</b>

## Intermediate result codes

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### +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 phone has determined what type of HSCSD connection will be used.

**Intermediate result code:** **AT+CHSR:** <rx>, <tx>,<aur>,<coding>

**Parameters:** See **AT+CHSC**.

# Ensemble S6: GSM Network Services

## Commands

### AT+CNUM Subscriber Number (ver. 2)

**Description:** Action command returns the MSISDN related to the subscriber (this information can be stored in the SIM or in the ME). If a subscriber has different MSISDN for different services, each MSISDN is returned in a separate line. **Note:** The implementation of this command is according to Bluetooth HFP 1,5, which deviates somewhat from the 3GPP, and the parameters <alpha> and <itc> are not supported but included to show the full command as specified in 3GPP TS 27.005.

**Action command:** AT+CNUM

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

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

**Parameters:**

<alphax>: **Not supported**

<alphax>	Description
String type	Associated with <numberx>. <b>Not supported</b>

<numberx>:

<numberx>	Description
String type	Phone number of format specified by <typex>

<typex>:

<typex>	Description
Integer format	Type of address, (refer to refer 3GPP 24.008)

<speed>:

**Not supported**

<speed>	Description
Integer	Data rate, as defined in subclause 6.7 3GPP 27.007 (+CBST command). <b>Not supported</b>

<service>: service related to the phone number.

<service>	Description
0	Asynchronous modem
1	Synchronous modem. <b>Not supported</b>
2	PAD Access (asynchronous). <b>Not supported</b>

<service>	Description
3	Packet Access (synchronous). <b>Not supported</b>
4	Voice
5	Fax
6...127	All other values below 128 are reserved by GSM 07.07. <b>Not supported</b>

<itc>:

**Not supported**

<itc>	Description
0	3.1 kHz. <b>Not supported.</b>
1	UDI. <b>Not supported.</b>

## AT+CREG

### Network Registration (ver. 2)

**Description:**

Set command controls the presentation of an unsolicited result code **+CREG**: <stat> when <n>=1 and there is a change in the ME network registration status, or code +CREG: <stat>[,<lac>,<ci>] when <n>=2 and there is a change of the network cell.

Read command returns the status of result code presentation and an integer <stat>, which shows whether the network has currently indicated the registration of the ME. Location information elements <lac> and <ci> are returned only when <n>=2 and ME is registered in the network.

**Set command:**

**AT+CREG=[<n>]**

**Read command:**

**AT+CREG?**

**Read command response:**

+CREG: <n>,<stat>[,<lac>,<ci>]

**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. <b>Default setting</b>
1	Enable network registration unsolicited result code, +CREG: <stat>
2	Enable network registration and location information unsolicited result code, +CREG: <stat>[,<lac>,<ci>]

<stat>:

<stat>	Description
0	Not registered, the phone is not currently searching a new operator to register to.
1	Registered, home network.

<stat>	Description
2	Not registered, but ME is currently searching a new operator to register to.
3	Registration denied.
4	Unknown.
5	Registered, roaming.

<lac>:

<lac>	Description
String type	Two byte location area code in hexadecimal format (for example, "00C3" equals 195 in decimal).

<ci>:

<ci>	Description
String type	Four byte cell ID in hexadecimal format. Four bytes are required for UMTS, whereas only two bytes are applicable for GSM, and the two first bytes are then zeros, for example, 00001A02.

## AT+COPS

### Operator Selection (ver. 2)

#### Description:

Set command forces an attempt to select and register the GSM/UMTS network operator. <mode> is used to select whether the selection is done automatically by the ME or is forced by this command to operator <oper>, given in format <format>. If the selected operator is not available, no other operator shall be selected, except when <mode>=4. The selected operator name format shall apply to further read commands, +COPS? also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration, for example, after <mode>=2, ME will be unregistered until <mode>=0 or 1 is selected. This command is abortable when registration/deregistration attempt is made. Read command returns the current mode and the currently selected operator. If no operator is selected, <format> and <oper> are omitted. Test command returns a list of quadruplets, each representing an operator present in the network. A quadruplet consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM, and other networks. It is recommended (although optional) that after the operator list, TA returns lists of supported <mode>s and <format>s. These lists shall be delimited from the operator list by two commas.

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

**Read command:** **AT+COPS?**

**Read command response:**

+COPS: <mode>[,<format>,<oper>]

**Test command:**

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

**Test command response:**

+COPS: [[list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>)]s][,((list of supported <mode>s),(list of supported <format>s)]

**Parameters:**

<mode>:

<mode>	Description
0	Automatic (<oper> field is ignored.) <b>Default setting</b>
1	Manual (<oper> field shall be present.)
2	De-register from network. <b>Not supported</b>
3	Set only <format> (for read command +COPS?), do not attempt registration/de-registration (<oper> field is ignored); this value is not applicable in read command response.
4	Manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered.

<format>:

<format>	Description
0	Long format alphanumeric <oper>. <b>Default value.</b>
1	Short format alphanumeric <oper>
2	Numeric <oper>

<oper>:

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

<stat>:

<stat>	Description
0	Unknown
1	Available

<stat>	Description
2	Current
3	Forbidden

<AcT>:

<stat>	Description
0	GSM. <b>Default value.</b>
1	GSM Compact. <b>Not supported.</b>
2	UTRAN

## AT+CLIP Calling Line Identification (ver. 2)

**Description:** This command refers to the GSM/UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the Calling Line Identity (CLI) of the calling party when receiving a mobile terminated call. Set command enables or disables the presentation of the CLI at the terminal equipment. It has no effect on the execution of the supplementary service CLIP in the network. Read command gives the status of <n>, and also triggers an interrogation of the provision status of the CLIP service according to 3GPP TS 22.081 (given in <m>). Test command returns values supported by the phone as a compound value. This command activates the result code **+CLIP**.

**Set command:** **AT+CLIP=<n>**  
**Read command:** **AT+CLIP?**  
**Read command response:** +CLIP:<n>,<m>  
**Test command:** **AT+CLIP=?** Shows if the command is supported.  
**Test command response:** + CLIP: (list of supported <n>s)  
**Parameters:**

<n>: Sets/shows the result code representation status in the phone.

<n>	Description
0	Disable. <b>Default</b>
1	Enable

<m>: Shows the subscriber CLIP service status in the network.

<m>	Description
0	CLIP not provisioned
1	CLIP provisioned
2	Unknown (for example, no network)

**Note:** When CLI is not available (<CLI validity>=2), <number> shall be an empty string (“”) and <type> value will not be significant. Nevertheless, the phone may return the recommended value 128 for <type> (TON/NPI unknown in accordance with GSM 04.08 subclause 10.5.4.7). When CLI has been withheld by the originator, (<CLI validity>=1) and the CLIP is provisioned with the “override category” option (refer to 3GPP TS 22.081 and 3GPP TS 23.081), <number> and <type> is provided. Otherwise, the phone shall return the same setting for <number> and <type> as if the CLI was not available.

**AT+CLIR                      Calling Line Identification Restriction**

**Description:** This command refers to CLIR-service according to 3GPP TS 22.081 that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call. Set command overrides the CLIR subscription when temporary mode is provisioned as a default adjustment for all following outgoing calls. Using the opposite command can revoke this adjustment. If this command is used by a subscriber without provision of CLIR in permanent mode the network will act according to 3GPP TS 22.081. Set command writes directly to non-volatile memory so that the setting is preserved also after turning off/on the MS. The &F command does not affect the setting. Read command gives the default adjustment for all outgoing calls (given in <n>), and also triggers an interrogation of the provision status of the CLIR service (given in <m>). Test command returns values supported by the TA as a compound value.

- 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 indicator is used according to the subscription of the CLIR service. <b>Default setting</b>
1	CLIR invocation, that is, number is hidden
2	CLIR suppression, that is, number is shown

<m>:

<m>	Description
0	CLIP not provisioned
1	CLIR provisioned in permanent mode
2	Unknown (for example, no network)
3	CLIR temporary mode presentation restricted
4	CLIR temporary mode presentation allowed

## AT+CCFC Calling Forwarding Number and Conditions (ver. 2)

**Description:** This command allows control of the call forwarding supplementary service according to 3GPP TS 22.082. Registration, erasure, activation, deactivation, and status query are supported. When querying the status of a network service (<mode>=2) the response line for “not active” case (<status>=0) should be returned only if the service is not active for any <class>.

**Execution command:** **AT+CCFC=**<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr> [,<satype> [,<time>]]]]]]]

**Execution command response:** when <mode>=2 and command successful:  
 +CCFC:<status>,<class1>[,<number>,<type>,<subaddr>,<satype>[,<time>]]][<CR><LF>  
 +CCFC:<status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]]  
 [...]]

**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 busy
2	No reply
3	Not reachable
4	All call forwarding (refer 3GPP TS 22.030)
5	All conditional call forwarding (refer 3GPP TS 22.030)

<mode>:

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

<number>:

<number>	Description
<b>String type</b>	Phone number of forwarding address in format specified by <type>

<type>:

<b>&lt;type&gt;</b>	<b>Description</b>
<b>Integer format</b>	Type of address octet in integer format (GSM 04.08); default 145 when dialling string includes international access code character '+', otherwise 129.
<b>129</b>	ISDN / telephony numbering plan, national / international unknown <b>Default setting if '+' is not in &lt;sca&gt;</b>
<b>145</b>	ISDN / telephony numbering plan, international number <b>Default setting if '+' is in &lt;sca&gt;</b>
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128-255</b>	Other values refer GSM 04.08 section 10.5.4.7

<subaddr>:

<b>&lt;subaddr&gt;</b>	<b>Description</b>
<b>string type</b>	String type subaddress of format specified by <satype> <b>Not supported</b>

<satype>:

<b>&lt;satype&gt;</b>	<b>Description</b>
<b>integer type</b>	Type of subaddress octet <b>Not supported</b>

<classx>:

<b>&lt;classx&gt;</b>	<b>Description</b>
<b>Integer</b>	Sum of integers each representing a class of information. <b>Default value = 7</b>
<b>1</b>	voice L1
<b>2</b>	Data
<b>4</b>	Fax
<b>8</b>	short message service
<b>16</b>	data circuit sync
<b>32</b>	data circuit async
<b>64</b>	dedicated packet access
<b>128</b>	dedicated PAD access

<time>:

<b>&lt;time&gt;</b>	<b>Description</b>
<b>1...30</b>	When no reply is enabled or queried, this gives the time in seconds to wait before a call is forwarded, default value is 20. <b>Not supported</b>

<status>:

<status>	Description
0	Not active
1	Active

## AT+CCWA Call Waiting (ver. 2)

**Description:** This command allows control of the Call Waiting supplementary service according to 3GPP TS 22.083. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. Parameter <n> is used to disable/enable the presentation of an unsolicited result code **+CCWA**: <number>,<type>,<class> to the TE when call waiting service is enabled. Command is abortable when network is interrogated. The interaction of this command with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standards.

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

**Execution command when <mode>=2 and command successful:**

**response:** +CCWA:<status>,<class1>[<CR><LF>  
+CCWA: <status>,<class2>  
[...]]

**Read command:** **AT+CCWA?**

**Read command response:** +CCWA: <n>

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

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

**Parameters:**

<n>:

<n>	Description
0	Disable <b>Default setting</b>
1	Enable

<mode>:

<mode>	Description
0	Disable
1	Enable
2	Query status

<classx>:

<class>	Description
<b>Integer</b>	Sum of integers each representing a class of information. <b>Default value=3</b>
<b>1</b>	Voice L1
<b>2</b>	Data
<b>4</b>	Fax
<b>8</b>	Short message serviced
<b>16</b>	Data circuit sync
<b>32</b>	Data circuit async
<b>64</b>	Dedicated packet access
<b>128</b>	Dedicated PAD access

<status>:

<status>	Description
<b>0</b>	Not active
<b>1</b>	Active

## AT+CHLD

### Call Hold and Multiparty (ver. 1)

**Description:**

This command 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 conversation similarly as defined in GSM 02.30.

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

**Note:** Call Hold and MultiParty are only applicable to teleservice 11. It is recommended (although optional) that test command returns a list of operations which are supported. The call number required by some operations shall be denoted by "x" (for example, +CHLD: (0,1,1x,2,2x,3)).

**Set command:**

**AT+CHLD=<n>**

**Test command:**

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

**Test command response:**

+CHLD: (list of supported <n>s)

**Parameter:**

**<n>:**

Integer type. Equals to numbers entered before SEND button in GSM 02.30 subclause 4.5.5.1.

<n>	Description
<b>0</b>	Releases all held calls or sets User Determined User Busy (UDUB) for a waiting call.
<b>1</b>	Releases all active calls and accepts the other (waiting or held) call.

<n>	Description
<b>1X</b>	Releases the specific active call X.
<b>2</b>	Places all active calls on hold and accepts the other (held or waiting) call.
<b>2X</b>	Places all active calls, except call X, on hold.
<b>3</b>	Adds a held call to the conversation.
<b>4</b>	Connects two calls and disconnects the subscriber from both calls.

**Notes**

“X” is the numbering (starting with 1) of the call given by the sequence of setting up or receiving the calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released. New calls take the lowest available number. Where both a held and a waiting call exists, the above procedures shall apply to the waiting call (that is, not to the held call) in conflicting situation.

The “directory number” case shall be handled with dial command D, and the END case with hangup command H (or +CHUP).

## AT+CSSN Supplementary Service Notification (ver. 2)

**Description:** This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, the unsolicited result code **+CSSI**:

<code1>[,<index>] is sent to TE before any other MO call setup result codes presented in this ETS or in V.25ter. When several different <code1>s are received from the network, each of them has its own +CSSI result code.

When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, the unsolicited result code **+CSSU**: <code2>[,<index>] is sent to TE. In case of ME call setup, result code is sent after every **+CLIP** result code and when several different <code2>s are received from the network, each of them has its own +CSSU result code.

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

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

**Read command:** **AT+CSSN?**

**Read command response:** +CSSN: <n>,<m>

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

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

**Parameters:**

<n>:

<n>	Description
0	Disable the <b>+CSSI</b> result code presentation status in the TA. <b>Default setting</b>
1	Enable the <b>+CSSI</b> result code presentation status in the TA.

<m>:

<m>	Description
0	Disable the <b>+CSSU</b> result code presentation status in the TA. <b>Default setting</b>
1	Enable the <b>+CSSU</b> result code presentation status in the TA.

<code1>:

<code1>	Description
0	Unconditional call forwarding is active.
1	Some of the conditional call forwarding are active.
2	Call has been forwarded.
3	Call is waiting.

<code1>	Description
5	Outgoing calls are barred.
6	Incoming calls are barred.
7	CLIR suppression rejected.

<index>:

<index>	Description
0...9	CUG index
10	No index (preferred CUG taken from subscriber data)

<code2>:

<code2>	Description
0	This is a forwarded call (MT call setup).
1	this is a CUG call (also <index> present) (MT call setup)
2	Call has been put on hold (during a voice call).
3	Call has been retrieved (during a voice call).
4	Multiparty call entered (during a voice call).
5	Call on hold has been released (during a voice call). This is not a SS notification.
6	Forward check SS message received (can be received whenever). <b>Not supported</b>

## AT+CAOC

### Advice of Charge

#### Description:

This refers to the Advice of Charge supplementary service (GSM 02.24 and GSM 02.86) that enables a subscriber to get information about the cost of calls. With <mode>=0, the execute command returns the Current Call Meter (CCM) value from the ME. The command also includes the possibility to enable an unsolicited event reporting of the CCM information. The unsolicited result code **+CCCM**: <ccm> is sent when the CCM value changes, but no more than every 10 seconds. Deactivation of the unsolicited event reporting is made with the same command. Read command indicates whether the unsolicited reporting is activated or not. Read command is available when the unsolicited result code is supported.

#### 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. <b>Default value.</b>
1	Deactivate the unsolicited reporting of CCM value.
2	Activate the unsolicited reporting of CCM value.

<ccm>:

<ccm>	Description
<b>String type</b>	Three bytes of the current call meter value in hexadecimal format (for example, "00001E" indicates decimal value 30). The value is in home units and bytes are similarly coded as the ACMmax value in the SIM.

## AT+CACM Accumulated Call Meter (ver. 2)

**Description:** Resets the Advice of Charge related Accumulated Call Meter (ACM) value in SIM file EF<sub>ACM</sub>. ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is usually required to reset the value.

**Note:** This command must take into account what line is chosen via the MMI.

Read command returns the current value of ACM.

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

**Read command:** **AT+CACM?**

**Read command response:** +CACM: <acm>

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

**Parameters:**

<passwd>:

<passwd>	Description
<b>String type</b>	SIM-PIN2

<acm>:

<acm>	Description
<b>String type</b>	Accumulated call meter value. Similarly coded as <ccm> under <b>AT+CAOC</b>

## AT+CAMM Accumulated Call Meter Maximum

**Description:** Sets the maximum Advice-of-Charge related Accumulated Call Meter (ACM) value in the SIM file EF<sub>ACMmax</sub>. ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. When ACM (see **AT+CACM**) reaches ACMmax, calls are prohibited (see also 3GPP 22.024). SIM PIN2 is usually required to set the value.

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

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

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

**Parameters:**

<passwd>:

<passwd>	Description
String	SIM-PIN2

<acmmax>:

<acmmax>	Description
String	Accumulated call meter maximum value. Similarly coded as <ccm> under <b>AT+CAOC</b> . The value "0" disables the ACMmax feature.

## AT+CDIP Called Line Identification Presentation

**Description:** This command relates to a network service that provides "multiple called numbers (called line identifications) service" to an MT. This command enables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call. Set command enables or disables the presentation of the called line identifications at the TE. When the presentation of the called line identification at the TE is enabled, +CDIP:<number>,<type>[,<subaddr>,<satype>] response is returned after every **RING** (or **+CRING**: <type>) result code sent from TA to TE. It is manufacturer specific if this response is used when normal voice call is answered.

Read command gives the status of <n>, and also triggers an interrogation of the provision status of the "multiple called numbers" service.

**Set command:** **AT+CDIP=[<n>]**  
 Enables/disables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call

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

**Read command response:** +CDIP: <n>,<m>

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

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

**Parameters:**

<n>:

<n>	Description
0	Disable presentation of +CDIP result code. <b>Default.</b>
1	Enable presentation of +CDIP result code.

<m>:

<m>	Description
0	"Multiple called numbers service" is not provisioned.
1	"Multiple called numbers service" is provisioned.
2	Unknown (no network, and so on)

## AT+COLP Connected line identification presentation

**Description:** This command refers to the GSM/UMTS supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the terminal equipment. It has no effect on the execution of the supplementary service COLR in the network. When enabled (and called subscriber allows), +COLP: <number>,<type>[,<subaddr>,<satype> [,<alpha>]] intermediate result code is returned from the phone to terminal equipment before any +CR or V.25ter responses.

**Execution command:** AT+COLP=[<n>]

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

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

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

**Parameters:**

<n>: Sets/shows the result code presentation status in the phone.

<n>	Description
0	Enable result code presentation status. <b>Default</b>
1	Disable result code presentation status.

<m>: Shows the subscriber COLP service status in the network.

<m>	Description
0	COLP not provisioned
1	COLP provisioned
2	Unknown (for example, no network)

## AT+CPOL Preferred Operator List

**Description:**

This command edits the user preferred list of networks in the active application on the UICC (GSM or USIM) or preferred list of networks in the SIM card. Execute command writes an entry in the SIM list of preferred operators (EFPLMN<sub>se</sub>), when the SIM card is present or when the UICC is present with an active GSM application. When UICC is present with an active USIM application, execute commands writes an entry in the User controlled PLMN selector with Access Technology list (EFPLMNwAcT), only the PLMN field could be entered, the Access Technologies for each PLMN in this list is not accessible with this command (New command for accessing the Access Technologies for each PLMN in this list is FFS). If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. **Note:** ME may also update this list automatically when new networks are selected.

Read command returns all used entries from the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card list of preferred operators.

Test command returns the whole index range supported by the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card.

**Execution command:**

**AT+CPOL=[<index>][, <format>[,<oper>]]**

**Read command:**

**AT+CPOL?**

**Read command response:**

+CPOL: <index1>,<format>,<oper1>[<CR><LF>  
+CPOL: <index2>,<format>,<oper2>  
[...]]

**Test command:**

**AT+CPOL=?** Shows if the command is supported.

**Test command response:**

+CPOL: (list of supported <index>s),(list of supported <format>s)

**Parameters:**

<indexn>:

<indexn>	Description
<b>Integer</b>	The order number of operator in the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card preferred operator list.

<format>:

<format>	Description
<b>0</b>	Long format alphanumeric <oper>
<b>1</b>	Short format alphanumeric <oper>
<b>2</b>	Numeric <oper>. <b>Default value.</b>

<opern>:

<opern>	Description
<b>string type</b>	<format> indicates if the format is alphanumeric or numeric (see <a href="#">AT+COPS</a> )

## 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
<b>0</b>	Disable notification with the unsolicited result code *EDIF.
<b>1</b>	Enable notification with the unsolicited result code *EDIF.

## 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 terminal equipment 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>,<alphanag\_mode>**

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

**Read command response:** \*EIPS: <ID1>,<alphanag\_mode1><CR><LF>

\*EIPS: <ID2>,<alphanag\_mode2>

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

**Test command response:** \*EIPS: (List of supported <ID>s),(list of supported <alphanag\_mode>s)

**Parameters:**

<ID>:

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

<alphanag\_mode>:

<alphanag_mode>	Description
<b>0</b>	Off

<alphatag_mode>	Description
1	First name and last name displayed

## Unsolicited result codes

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### +CREG Network Registration

**Description:** Indicates that there is a change in the phone 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 phone is currently not searching for a new operator to register to
1	Registered; home network
2	Not registered - The phone is currently searching for a new operator to register to
3	Registration denied
4	Unknown
5	Registered; roaming

### +CLIP Calling Line Identification Indication (ver. 2)

**Description:** This command enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. This result code is activated by [AT+CLIP](#).

**Unsolicited result code:** +CLIP:<number>,<type>[,<subaddr>,<satype>[,<alpha>][,<CLI validity>]]

**Parameters:**

<number>:

<number>	Description
<b>String type</b>	Phone number of format specified by <type>

<type>:

<type>	Description
<b>Integer format</b>	Type of address octet Refer to <i>Digital cellular telecommunications system (Phase 2) (GSM); Mobile radio interface; Layer 3, section 10.5.4.7</i> .

<type>	Description
<b>129</b>	ISDN / telephony numbering plan, national / international unknown. <b>Default setting if '+' is not in &lt;sca&gt;</b>
<b>145</b>	ISDN / telephony numbering plan, international number. Default setting if '+' is in <sca>
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128 - 255</b>	Other values, refer to ( <i>Digital cellular telecommunications system (Phase 2) (GSM); Mobile radio interface; Layer 3, section 10.5.4.7</i> )

<subaddr>:

<subaddr>	Description
<b>String type</b>	String type subaddress of format specified by <satype>. As described in ITU_T I.330: “The subaddress is a sequence of digits, the maximum length of which shall be 20 octets (40 digits). All ISDNs shall be capable of conveying the ISDN subaddress transparently and shall not be required to examine or operate on any of the subaddress information. Special attention is drawn to the fact that subaddressing is not to be considered as part of the numbering plan, but constitutes an intrinsic part of ISDN addressing capabilities. The subaddress shall be conveyed in a transparent way as a separate entity from both ISDN number and user-to-user information. See also Recommendation I.334”

<satype>:

<satype>	Description
<b>Integer format</b>	Type of subaddress octet
<b>128</b>	NSAP (X.213/ISO 8348 AD2), even number of address signals
<b>136</b>	NSAP (X.213/ISO 8348 AD2), odd number of address signals
<b>160</b>	User defined, even number of address signals
<b>168</b>	User defined, odd number of address signals
<b>128 - 255</b>	Other values reserved

<alpha>:

<alpha>	Description
<b>String type</b>	Optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command <b>AT+CSCS</b> .

<CLI\_validity>:

<CLI_validity>	Description
0	CLI valid
1	CLI has been withheld by the originator
2	CLI is not available due to interworking problems or limitations of originating network

### \*ELIP Calling Line Alpha Tag

**Description:** This result code is returned after every **RING** (or **+CRING**) result code sent from phone to terminal equipment. 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>

**Parameter:**

<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 phone to terminal equipment. 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
3	Not reachable

<status>:

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

<classx>:

<classx>	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 '+'

## +COLP Connected Line Identification Indication

**Description:** This command enables a calling subscriber to get the connected line identity (COL) of the called party when setting up a mobile originated call. This result code is activated by **AT+BVRA**.

**Unsolicited result code:** **+COLP:** <number>,<type>[,<subaddr>,<satype> [,<alpha>]]

**Parameters:** See the **+CLIP** result code.

## +CDIP Called Line Identification Presentation

**Description:** Returned after every **RING** (or **+CRING:** <type>) result code sent from TA to TE. This result code is activated by the **AT+CDIP** command.

**Unsolicited result code:** **+CDIP:**<number>,<type>[,<subaddr>,<satype>]

**Parameters:** See the **+CLIP** (version 2) result code.

# Use scenarios

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## 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
<b>AT+CLIP=1</b>		Enable calling line identification.
	OK	
	<b>+CRING: VOICE</b> <b>+CLIP:</b> "0706123456", 129	After every CRING, the calling line identity is presented.
		Reject call.
<b>AT+CLIP?</b>		
	<b>+CLIP: 1,1</b> OK	CLIP enabled and provisioned.
<b>AT+CLIP=0</b>		Disable calling line identification.

AT command	Response	Comment
	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	

# Ensemble S7: GSM USSD

## Commands

### AT+CUSD Unstructured Supplementary Service Data (ver. 2)

**Description:** This command allows control of the Unstructured Supplementary Service Data (USSD) according to 3GPP TS 22.090. Both network and mobile initiated operations are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code (USSD response from the network, or network initiated operation) **+CUSD**: <m>[,<str>] to the TE. In addition, value <n>=2 cancels an ongoing USSD session. When <str> is given, a mobile initiated USSD-string or a response USSD-string to a network initiated operation is sent to the network. The response USSD-string from the network is returned in a subsequent unsolicited +CUSD: result code. The interaction of this command with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standards. Test command returns values supported by the TA as a compound value. In one session only the ME or the accessory can be active and send USSD-strings.

**Execution command:** **AT+CUSD**=[<n>[,<str>[,<dcs>]]]

**Read command:** **AT+CUSD?**

**Read command response:** +CUSD: <n>

**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 in the TA. <b>Default setting</b>
1	Enable result code presentation in the TA.
2	Terminate (abort) USSD dialogue. This value is not applicable to the read command response. <b>Not supported</b>

<str>:

<str>	Description
string	USSD-string (when <str> parameter is not given, network is not interrogated).

<str>	Description
<b>If &lt;dc&gt; indicates that 3GPP TS 23.038 7 bit default alphabet is used:</b>	<ul style="list-style-type: none"> <li>if TE character set other than "HEX" (refer command Select TE Character Set +CSCS): ME/TA converts GSM alphabet into current TE character set according to rules of 3GPP TS 27.005 Annex A.</li> <li>if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character P (GSM 23) is presented as 17 (IRA 49 and 55))</li> </ul>
<b>If &lt;dc&gt; indicates that 8-bit data coding scheme is used:</b>	ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<dc>:

<dc>	Description
<b>Integer</b>	3GPP TS 23.038 Cell Broadcast Data Coding Scheme in integer format (default 0)

**Scenarios:**

- 1a** An incoming network initiated USSD-Notify should be presented on the display of the ME.
- 1b** An incoming network initiated USSD-Notify should also be presented to the accessory as a unsolicited result code +CUSD: if the accessory has Enabled result code presentation.
- 2** An incoming USSD-request asking for a reply should be presented both on the display of the ME and to the accessory as a unsolicited result code +CUSD: if the accessory has Result code enabled.
- 2a** If the ME answer to the request then the accessory should get a +CUSD: telling the accessory that Other I/O client has responded.
- 2b** If the accessory answer to the request with the command AT+CUSD then the ME is notified of the answer but there should be no presentation of the reply on the display of the ME. The display should be cleared.
- 3a** An USSD-request initiated and sent from the ME should not be presented to the accessory.
- 3b** An USSD-request sent with the command AT+CUSD from the accessory should not be presented on the display of the ME.

	Network	Mobile Equipment	Mobile Accessory
<b>1a</b>	Signal ->	Show in display	Result code presentation disabled, Not presented to accessory
<b>1b</b>			Result code presentation enabled, Presented to accessory
<b>2</b>	Signal asking for reply ->	Show in display	Result code presentation disabled, Not presented to accessory
			Result code presentation enabled, Presented to accessory
<b>2a</b>		Answer	
		Other I/O client has responded	

	Network	Mobile Equipment	Mobile Accessory
<b>2b</b>		Answer from accessory not shown in display. Display cleared.	Answer
<b>3a</b>		Edit in display and send to network	
<b>3b</b>		Signal from accessory not shown in display	Signal

## 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>,<dc>]

**Parameters:**

<m>:

<m>	Description
<b>0</b>	No further user action needed. (Network-initiated USSD notify, or no further information needed after mobile-initiated operation).
<b>1</b>	Further user action needed. (Network-initiated USSD request, or further information needed after mobile-initiated operation).
<b>2</b>	USSD dialogue terminated.
<b>3</b>	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.
<b>4</b>	Operation not supported.
<b>5</b>	Network time out.

<str>: String; USSD string.

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

# Ensemble S8: GSM Facility Lock

## Commands

### AT+CLCK Facility lock (ver. 4)

**Description:** Execute command is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated

Call barring facilities are based on GSM/UMTS supplementary services (refer to 3GPP TS 22.088). The interaction of these with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standard.

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

**Notes:**

- “PS” and <mode>=1 correspond to Auto Lock
- Which <passwd> (PIN-code) that will be used for authentication is manufacturer specific.

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

**Execution command** When <mode>=2 and command successful:

**response:** +CLCK: <status>[,<class1>[<CR><LF>  
+CLCK: <status>,<class2>  
[...]]

**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 phone keyboard.
“PS”	PH-SIM (lock PHone to SIM card) Phone asks for password when other than current SIM card is inserted.
“PF”	Lock Phone to the very First inserted SIM/UICC card (also referred to as PH-FSIM) Phone asks for password when other than the first SIM/UICC card is inserted. <b>Not supported</b>

<fac>	Description
"SC"	SIM (lock SIM card) SIM asks for password when the phone is powered-up and when this lock command is issued.
"P2"	SIM PIN 2.
"AO"	BAOC (Barr All Outgoing Calls), refer to 3GPP TS 22.088 clause 1.
"OI"	BOIC (Barr Outgoing International Calls). refer to 3GPP TS 22.088 clause 1.
"AI"	BAIC (Barr All Incoming Calls), refer to 3GPP TS 22.088 clause 2.
"IR"	BIC-Roam (Barr Incoming Calls when Roaming outside the home country), refer to 3GPP TS 22.088 clause 2.
"OX"	BOIC-exHC (Barr Outgoing International Calls except to Home Country), refer to 3GPP TS 22.088 clause 1.
"NT"	Barr incoming calls from numbers that are not stored in TA memory. <b>Not supported</b>
"NM"	Barr incoming calls from numbers that are not stored in phone memory. <b>Not supported</b>
"NS"	Barr incoming calls from numbers that are not stored in SIM memory. <b>Not supported</b>
"NA"	Barr incoming calls from numbers that are not stored in any memory. <b>Not supported</b>
"AB"	All barring services, refer to 3GPP TS 22.030 (applicable only for <mode>=0)
"AG"	All outgoing barring services, refer to 3GPP TS 22.030 (applicable only for <mode>=0)
"AC"	All incoming barring services, refer to 3GPP TS 22.030 (applicable only for <mode>=0)
"FD"	SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature. If PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>.
"PN"	Network personalization, refer to 3GPP TS 22.022.
"PU"	Network subset personalization, refer to 3GPP TS 22.022.
"PP"	Service provider personalization, refer to 3GPP TS 22.022.
"PC"	Corporate personalization, refer to 3GPP TS 22.022.

<mode>:

<mode>	Description
0	Unlock
1	Lock

<mode>	Description
2	Query status

<status>:

<status>	Description
0	Not active
1	Active
2	Not available

<passwd>:

<passwd>	Description
string type	Shall be the same as password specified for the facility from the phone user interface or with command <b>AT+CPWD</b> .

<classx>:

A sum of integers each representing a class of information. Default=7.

<classx>	Description
1	Voice
2	Data (refers to all bearer services; with <mode>=2 this may only refer to some bearer service if the phone does not support values 16, 32, 64 and 128.)
4	Fax
8	Short message service
16	Data circuit sync
32	Data circuit async
64	Dedicated packet access
128	Dedicated PAD access

## AT+CPWD

### Change password (Ver. 3)

**Description:**

Action command sets a new password for the facility lock function defined by command Facility Lock **AT+CLCK**.

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

**Action command:**

**AT+CPWD=<fac>,<oldpwd>,<newpwd>**

**Test command:**

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

**Test command response:**

+CPWD: list of supported (<fac>,<pwdlength>)s

**Parameters:**

<fac>:

<fac>	Description
"CS"	CNTRL, lock control surface, for example, phone keyboard. <b>Not supported</b>

<fac>	Description
“PS”	PH-SIM, lock phone to SIM card. Phone asks for password when other than current SIM card is inserted.
“SC”	SIM. Lock SIM card. SIM asks for password when the phone is powered-up and when this lock command is issued
“P2”	SIM PIN2
“AO”	BAOC, Barr All Outgoing Calls. Refer to GSM 02.88 clause 1.
“OI”	BOIC, Barr Outgoing International Calls. Refer to GSM 02.88 clause 1.
“AI”	BAIC, Barr All Incoming Calls. Refer to GSM 02.88 clause 2
“IR”	BIC-Roam, Barr Incoming Calls when Roaming outside the home country. Refer to GSM 02.88 clause 2.
“OX”	BOIC-exHC, Barr Outgoing International Calls except to Home Country. Refer to GSM 02.88 clause 1.
“NT”	Barr incoming calls from numbers that are not stored in TA memory. <b>Not supported</b>
“NM”	Barr incoming calls from numbers that are not stored in phone memory. <b>Not supported</b>
“NS”	Barr incoming calls from numbers that are not stored in SIM memory. <b>Not supported</b>
“NA”	Barr incoming calls from numbers that are not stored in any memory. <b>Not supported</b>
“AB”	All Barring services. Refer to GSM 02.30.
“AG”	All outgoing barring services. Refer to GSM 02.30.
“AC”	All incoming barring services. Refer to GSM 02.30.
“FD”	SIM fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>). <b>Not supported</b>

<oldpwd>:

<oldpwd>	Description
<b>String type</b>	<oldpwd> shall be the same as password specified for the facility from the ME user interface or with command Change Password <b>AT+CPWD</b>

<newpwd>:

<newpwd>	Description
<b>String type</b>	<newpwd> is the new password, maximum length of password can be determined with <pwdlength>.

<pwdlength>:

<pwdlength>	Description
Integer type	Maximum length of the password for the facility.

## Use scenarios

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### 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	

# Ensemble S9: Mobile Equipment, Control and Status

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## Commands

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### AT+CFUN Set Phone Functionality (ver. 3)

**Description:** Set command selects the level of functionality <fun> in the MS. Level “full functionality” is where the highest level of power is drawn. “Minimum functionality” is where minimum power is drawn, that is, the ME is switched off and only the RTC clock is running.

**Note:** ME resetting with <rst> parameter is not supported.

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

**Note:** 'AT+CFUN=' is interpreted as 'AT+CFUN=0'

**Set command:** **AT+CFUN=[<fun>]**

**Read command:** **AT+CFUN?** Shows the current setting.

**Read command response:** +CFUN: <fun>

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

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

**Parameters:**

<fun>:

<fun>	Description
0	Minimum functionality, that is, the phone is turned off. <b>Default setting</b>
1	Full functionality, that is, the phone is in “switched on” condition.
2	Disable the phone's transmit RF circuits only. <b>Not supported</b>
3	Disable the phone's receive RF circuits only. <b>Not supported</b>
4	Disable the phone's transmit and receive RF circuits. <b>Note:</b> This is often referred to as “flight mode”.
5	GSM only (WCDMA radio off).
6	WCDMA only (GSM radio off).

## AT+CPAS Phone Activity Status (ver. 3)

**Description:** Execution command returns the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone. When the command is executed without the <mode> argument, the command returns <pas> values from 0 to 128. When, on the other hand, the command is executed with the <mode>-argument set to 1, the command may return <pas>-values from 129 to 255. Test command returns values supported by the ME as a compound value.

**Execute command:** AT+CPAS

**Execute command response:** +CPAS: <pas>

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

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

**Parameters:**

<pas>:

<pas>	Description
0	Ready (ME allows commands from TA/TE)
1	Unavailable (ME does not allow commands from TA/TE). <b>Not supported</b>
2	Unknown (ME is not guaranteed to respond to instructions). <b>Not supported</b>
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.)
5	Asleep (ME is unable to process commands from TA/TE because it is in a low functionality state). <b>Not supported</b>

## AT+CPIN PIN CONTROL (ver. 2)

**Description:** The set command sends the password to the ME, which is necessary to make the ME operational (SIM PIN, SIM PUK or PH-SIM). If the PIN is to be entered twice, the TA shall autonomously repeat the PIN. If no PIN request is pending, no action is taken towards the ME and an error message is returned to the TE. If the PIN required is PUK, the second pin is required. This second PIN, <newpin>, replaces the old PIN in the SIM.

**Set command:** AT+CPIN=<pin>[,<newpin>]

**Read command:** AT+CPIN?

**Read command response**

+CPIN: <code>

**Test command:**

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

**Test command response:**

+CPIN: (supported <code>s)

**Parameters:**

<pin><newpin>:

<pin><newpin>	Description
string	The range for the SIM PIN and the PH- SIM PIN is 4 - 8 digits. The SIM PUK consists of 8 digits. PH-NET PIN, PH-NETSUB PIN, PH-SP PIN, PH-CORP PIN, PH-ESL PIN and PH-SIMLOCK PIN are 8-16 digits.

<code>:

<code>	Description
<b>READY</b>	ME is not pending for any password.
<b>SIM PIN</b>	ME is waiting for SIM PIN to be given.
<b>SIM PUK</b>	ME is waiting for SIM PUK to be given.
<b>PH-SIM PIN</b>	ME is waiting for Phone lock password to be given .
<b>SIM PIN2</b>	ME is waiting for SIM PIN2 to be given (this <code> is returned only when the last executed command resulted in PIN2 authentication failure; if PIN2 is not entered right after the failure, ME does not block its operation).
<b>SIM PUK2</b>	ME is waiting for SIM PUK2 to be given (this <code> is returned only when the last executed command resulted in PUK2 authentication failure; if PUK2 and new PIN2 are not entered right after the failure, ME does not block its operation).
<b>PH-NET PIN</b>	ME is waiting for network personalization password to be given.
<b>PH-NETSUB PIN</b>	ME is waiting for network subset personalization password to be given.
<b>PH-SP PIN</b>	ME is waiting for service provider personalization password to be given.
<b>PH-CORP PIN</b>	ME is waiting for corporate personalization password to be given.
<b>PH-ESL PIN</b>	Extended SIM lock.
<b>BLOCKED</b>	The SIM card is blocked for the user.

## AT+CBC Battery Charge (ver. 2)

**Description:** Execution and read command returns battery connection status <bc> and battery level <bcl> of the phone.

**Note:** Even when a charger is connected, the parameter <bcl> still shall give the status of the battery capacity in percent.

**Execution command:** **AT+CBC**

**Execution command response:** +CBC: <bc>,<bcl>

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

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

**Test command response:** +CBC: (list of supported <bc>s),(list of supported <bcl>s)

**Parameters:**

<bc>:

<bc>	Description
0	Phone powered by the battery. No charger connected.
1	Phone has a battery connected, but it is powered by the charger.
2	Phone 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 (ver.1)

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

**Execution command:** **AT+CSQ**

**Execution command response:** +CSQ: <rs>,<ber>

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

**Test command response:** +CSQ: (list of supported <rs>s),(list of supported <ber>s)

**Parameters:**

<rs>:

<rsssi>	Description
0	-113 dBm or less
1	-111 dBm
2-30	-109 dBm to -53 dBm
31	-51 dBm or greater
99	Not known or not detectable.

<ber>:

<ber>	Description
0-7	As RXQUAL values in the table in GSM 05.08 sub-clause 8.2.4
99	Not known or not detectable.

## AT+CKPD

### Keypad Control (ver. 6)

#### Description:

Execution command emulates ME keypad by giving each keystroke as a character in a string <keys>. <time>\*0.1 seconds is the time to strike each key, and <pause>\*0.1 seconds is the length of pause between two strokes. This command should be accepted (OK returned) before actually starting to press the keys. Thus unsolicited result codes of keys that have been pressed and display events can be returned (see [AT+CMER](#)).

The physical keypad shall always have higher priority than emulation of keystrokes via AT+CKPD. That is, if the physical keypad is operated during execution of a series of keystrokes generated by AT+CKPD the emulated keypad operation is terminated immediately.

**Note:** The default GSM character set does not contain the “[” and “]” characters used to emulate the left and right selection keys. Before sending any of these keys with AT+CKPD, the character set needs to be changed, for example to 8859-1 by sending the command AT+CSCS="8859-1".

#### Execution command:

**AT+CKPD**=<keys>[,<time>[,<pause>]]

#### Test command:

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

#### Parameters:

<keys>:

String of characters representing keys as listed in the following table (based on PCCA STD-101 Annex table I-3). Colon character (IRA 58) followed by one character can be used to indicate a manufacturer specific key not listed here. All characters from a semicolon character (IRA 59) to the next single semicolon characters are treated as alpha entries and are not converted to key equivalents. All semicolon characters inside alpha entries should be duplicated in the TE and stripped to one before entering to the ME. All IRA values not listed here are reserved.

**Note:** The SEND and END keypad values should be mapped to appropriate keys.

Char	IRA (dec)	Comment (+ some known key symbols)
#	35	Hash (number sign)
*	42	Star (*)

Char	IRA (dec)	Comment (+ some known key symbols)
<b>0... 9</b>	48... 57	Number keys
<b>:</b>	58	Escape character for manufacturer specific keys
<b>&lt;</b>	60	Left arrow
<b>&gt;</b>	62	Right arrow
<b>C/c</b>	67/99	Clear display (C/CLR)
<b>D/d</b>	68/100	Volume down
<b>L/l</b>	76/108	phone lock (LOCK) <b>If supported by ME</b>
<b>P/p</b>	80/112	Power (PWR)
<b>U/u</b>	85/117	Volume up
<b>V/v</b>	86/118	Down arrow
<b>[</b>	91	Soft key 1
<b>]</b>	93	Soft key 2
<b>^</b>	94	Up arrow
<b>:J</b>	58+74	Joystick button pressed
<b>:C</b>	58+99	Camera button
<b>:O</b>	58+79	Operator button
<b>:R</b>	58+82	Return button
<b>H/h</b>	200	Button pushed on the MC link (Blue-tooth) headset
<b>:M</b>	58+77	video call <b>If supported by ME</b>
<b>:F</b>	58+70	camera focus (camera key half press) <b>If supported by ME</b>
<b>:(</b>	58+40	flip closed <b>If supported by ME</b>
<b>:)</b>	58+41	flip opened <b>If supported by ME</b>
<b>:{</b>	58+123	camera lens cover closed <b>If supported by ME</b>
<b>:}</b>	58+125	camera lens cover opened <b>If supported by ME</b>
<b>:[</b>	58+91	Jack knife closed <b>If supported by ME</b>
<b>:]</b>	58+93	Jack knife closed <b>If supported by ME</b>
<b>:D</b>	58+68	multi task button (shortcut to desktop) <b>If supported by ME</b>
<b>:L</b>	58+76	flash lamp button <b>If supported by ME</b>
<b>:P</b>	58+80	"Push to talk" button <b>If supported by ME</b>

Char	IRA (dec)	Comment (+ some known key symbols)
:S	58+83	media player button <b>If supported by ME</b>
:=	58+61	fire (gamepad)
:<	58+60	up left (gamepad)
:	58+124	up right (gamepad)
:V	58+86	down left (gamepad)
:>	58+62	down right (gamepad)
:1	58+49	Game A (gamepad)
:2	58+50	Game B (gamepad)
:3	58+51	Game C (gamepad)
:4	58+51	Game D (gamepad)

<time>:

<time>	Description
0..255	0... 25.5 seconds (default values are manufacturer specific, but should be so long that a normal ME can handle keystrokes correctly).

<pause>:

<pause>	Description
0..255	0... 25.5 seconds (default values are manufacturer specific, but should be so long that a normal ME can handle keystrokes correctly).

## AT+CIND

### Indicator Control (ver. 4)

#### Description:

This command sets the values of phone indicators. <ind> value 0 means that the indicator is off (or in state which can be identified as “off”-state), 1 means that indicator is on (or in a state which is more substantial than “off”-state), 2 is more substantial than 1, and so on. If the indicator is a simple on/off style element, it has values 0 and 1. The number of elements is phone specific. If the phone does not allow setting of indicators or phone is not currently reachable, **+CME ERROR: <err>** is returned. If a certain indicator is not writable, setting of it should be ignored. If parameter is empty field, indicator shall remain in the previous value. Test command returns pairs, where string value <descr> is a maximum 16 character description of the indicator and compound value is the allowed values for the indicator. If phone is not currently reachable, **+CME ERROR: <err>** is returned.

#### Set command:

**AT+CIND=[<ind>[,<ind>[,...]]]**

**Read command:** **AT+CIND?** Displays the current [*<ind>*[,*<ind>*[,...]]] settings.  
**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)),...

**Parameters:**

*<ind>*:

<i>&lt;ind&gt;</i>	Description
<b>Integer type</b>	Value shall be in range of corresponding <i>&lt;descr&gt;</i> .

*<descr>*:

<i>&lt;descr&gt;</i>	Description
<b>"battchg"</b>	Battery charge level (0-5)
<b>"signal"</b>	Signal quality (0-5)
<b>"batterywarning"</b>	Battery warning (0-1)
<b>"chargerconnected"</b>	Charger connected (0-1)
<b>"service"</b>	Service availability (0-1) (Net contact status, 1 = Net contact)
<b>"sounder"</b>	Sounder activity (0-1) (Phone silent status, 1 = phone silent)
<b>"message"</b>	Message received (0-1)
<b>"call"</b>	Call in progress (0-1)
<b>"roam"</b>	Roaming indicator (0-1) (Home net status, 0 = Home Net)
<b>"smsfull"</b>	1: a short message memory storage in the MT has become full 0: Memory locations are available
<b>"callsetup"</b>	Bluetooth proprietary call set up status indicator. Possible values are as follows:  0: Not currently in call set up 1: Incoming call process ongoing 2: Outgoing call set up is ongoing 3: Remote party being alerted in an outgoing call
<b>"callheld"</b>	Indicator that indicates the status of any held calls on the AG. 0 = No held calls. 1 = Call on hold. <b>If supported by ME.</b>

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+CMAR Master Reset

**Description:** This command requests the phone to reset user data (factory reset). The user data in the phone will be reset to default values. If the phone is locked and this command is used, then the phone is unlocked after the master reset. The parameter <option> is not in the 3GPP standard. This is an extension of the command for Sony Ericsson.

**Execution command:** **AT+CMAR=<phone\_lock\_code>[,<option>]**

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

**Parameter:**

<phone\_lock\_code>:

<phone_lock_code>	Description
String	Security code (Phone Lock code) must be verified before performing the master reset, see also <a href="#">AT+CLCK</a> .

<option>:

<option>	Description
0	Initiates a "Master Reset". All settings in the phone are restored to the factory settings. All user data such as contacts in phonebook, downloaded files, WAP settings, and so on, are also erased.
1	Initiates a "Reset Settings". Settings in the phone will be restored to the factory settings. User data such as contacts in phonebook, downloaded files, WAP settings, and so on, are kept.

## AT+CMER Mobile Equipment Event Reporting

**Description:** Set command enables or disables sending of unsolicited result codes from ME to TE in the case of key pressings, display changes, and indicator state changes. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1, 2 or 3 is entered. If the ME does not support a setting, +CME ERROR: <err> is returned.

**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),(list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s)

**Parameters:**

<mode>:

<mode>	Description
0	Buffer unsolicited result codes in the phone. If the phone 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. <b>Default setting</b>
3	Forward the unsolicited result codes directly to the terminal equipment; phone - terminal equipment link-specific in-band technique used to embed result codes and data when phone is in on-line data mode.

<key>:

<key>	Description
0	No keypad event reporting. <b>Default setting</b>
2	Keypad event reporting using <b>+CKEV</b> :<key>,<press>. Enables keypad event reporting of all key pressing. <b>Note:</b> When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

<disp>:

<disp>	Description
0	No display event reporting. <b>Default setting</b>

<ind>:

<ind>	Description
0	No indicator event reporting <b>Default setting</b>
1	Indicator event reporting using <b>+CIEV</b> : <ind>,<value>. <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +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> 1...3 is entered. <b>Default setting</b>

## AT\*ECAM Ericsson Call Monitoring (ver. 2)

**Description:** This command activates or deactivates the call monitoring function in the ME. When this log function is activated in the ME, the ME informs about call events, such as incoming call, connected, hang up etc. It is preferable that the current status shall always be sent with result code **\*ECAV**:<ccid>,<ccstatus>,<calltype>, <processid> , <exitcause> ,<number>,<type> when activating the log function. The purpose of this is:

- to gather relevant information for the call log in a TE.
- to make it possible for the TE to display call state information for an ongoing call.

**Set command:** **AT\*ECAM=<onoff>**

**Read command:** **AT\*ECAM?** Read the current status for "Call Monitoring.

**Read command response:** \*ECAM: <onoff>

**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 (off). <b>Default setting</b>
1	The call log function is enabled (on).

<ccid>:

<ccid>	Description
<b>Integer (1-7)</b>	A number which uniquely defines a call in the phone (= number of call control process). There cannot be two call IDs with the same number simultaneously. 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 (MO)
2	CONNECTING (MO)
3	ACTIVE (connection between A and B)
4	HOLD
5	WAITING (MT)
6	ALERTING (MT)
7	BUSY

<calltype>:

<calltype>	Description
1	VOICE
2	DATA
4	FAX <b>Not supported</b>
128	VOICE2

<processid>:

<processid>	Description
Integer	Reported when returning to the IDLE state (<ccstatus> = 0). 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>:

<exit cause>	Description
Integer	Exit cause according to GSM 04.08. Reported when returning to IDLE state (<ccstatus> = 0).

<number>:

<number>	Description
String	String type phone number of format specified by <type>. Only valid for <ccstatus> = 1 (CALLING).

<type>:

<type>	Description
Integer	Type of address octet in integer format (refer to GSM 04.08 subclause 10.5.4.7); default 145 when dialling string includes international access code character "+", otherwise 129. Only valid for: <ul style="list-style-type: none"> <li>• &lt;ccstatus&gt; = 1 (CALLING)</li> <li>• &lt;ccstatus&gt; = 5 (WAITING)</li> <li>• &lt;ccstatus&gt; = 6 (ALERTING)</li> </ul>

## AT+CLAN

### Language

**Description:** Sets the language in the phone. 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\*EJAVA Ericsson Java Application function

**Description:** The set command requests the MT to perform a Java application function specified by <application> and <action>.

**Notes:**

- There is no guarantee that the application will execute. The command will return OK if the command, including parameters, is supported. This also means that there is no correlation between the OK response and the time the application function is performed by the MT.
- If the AT\*EJAVA command is issued and the <application> parameter references an application that is already running, a second instance of this application shall **not** be started. The application already running should however perform the action indicated with the <action> parameter.

**Set command:** AT\*EJAVA=<action>[,<application>]

**Set command response:** If <action>=1 (list applications):

\*EJAVA:[<application\_name1>,<object\_id1>]

\*EJAVA:[,<application\_name2>,<object\_id2>...]

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

**Test command response:** \*EJAVA: List of supported <action>s[, (list of <application\_id>s)]

**Parameters:**

<action>:

<action>	Description
0	Run a java application. The search path to the application must be provided in <application>. <b>Not supported (obsolete)</b>
1	List installed java applications. No value on <application> needed.
2	Delete a java application. The <suite_id> of the application must be provided in <application>.
3	Install a java application. The search path to the application must be provided in <application>. <b>Note:</b> This parameter can use two application variables for the support of JAD and JAR installation. (for example: at*ejava=3,"/tpa/user/other/XYZ.jad","/tpa/user/other/XYZ.jar")
4	Run an installed java application. The <application_id> of the application must be provided in <application>.

<action>	Description
5	List all running JAVA applications in ME.
6	Terminate a MIDlet. (for example: "at*ejava=6,XYZ-APP-SUITE-ID". The application instance with id XYZ-APP-SUITE-ID should be stopped.

<application>: **Note:** Should not be given for <action> = 1 (list applications).

<application>	Description
String	For <action> = 0, 3: The search path to the application to be run/ installed.
Integer	For <action> = 2: The <suite_id> of the application.
Integer	For <action> = 4: The <application_id> of the application.

<application\_name>:

<application_name>	Description
String	The name of a java application located in the specified directory.

<vendor>:

<vendor>	Description
String	The name of the vendor.

<version>:

<version>	Description
String	The actual version of the application.

<application\_id>:

<application_id>	Description
Integer	The application id for the application.

<suite\_id>:

<suite_id>	Description
Integer	The unique id-number for the suite.

## AT+CSIL

### Silence Command

#### Description:

This command orders the phone to be in silent mode or orders the phone to leave the silent mode. When the phone is in silent mode, all sounds from the phone must be prevented. An icon will show the user that silent mode is active. If no parameter is given to the SET command it will use <mode> = 0 as parameter.

**Execution command:** **AT+CSIL=[<mode>]**

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

**Read command response:** +CSIL: <mode>

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

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

**Parameter:**  
<mode>:

<mode>	Description
0	Silent mode off. <b>Default setting</b>
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. <b>Default setting</b>
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. <b>Default setting</b>
1	CLICK; short click when a key is pressed.
2	TONE, a continuous tone when a key is pressed.

## AT\*EAPP Application Function (ver. 5)

**Description:**

Requests the MT to perform an application function specified by <app> and <subfunc>. The <subfunc> parameter specifies which function within the specified application to call. The <text> parameters can be used to pass data to the application. The use of the <text> parameters are specified with each subfunction.

**Note:** There is no guarantee that the application will execute. The command will return OK if the command, including parameters, is supported. There is no correlation between the OK response and the time the application function is performed by the MT.

**Note:** If the \*EAPP command is issued and the <app> parameter references an application that is already running, a second instance of this application shall not be started. The application already running should however perform the subfunction indicated with the <subfunc> parameter.

**Note:** The syntax for **MMS** (<app>=6) is as follows:

AT\*EAPP=6,<subfunc1>[,<text1>[,<subfunc2>,<text2>[,<subfunc3>,<text3>...]]]

It is thus possible to add different attachments (image, video clips etc.) to a message.

*Example:* Sending a message with text “Look at my new car!” and an image located in “//filesystem/pictures/mycar.jpg”:

AT\*EAPP=6,0,“Look at my new car!” ,4,“//filesystem/pictures/mycar.jpg”

The syntax for **email** (<app>=2) is the same as the syntax for MMS:

AT\*EAPP=2,0,“Look at my new car!” ,4,“//filesystem/pictures/mycar.jpg”

Test command shows which applications and subfunctions are supported by the MT.

AT\*EAPP=?

\*EAPP: 0,(0-5)

\*EAPP: 1,(1,3,4-5)

\*EAPP: 3,(0,4)

\*EAPP: 4,(0-2)

**Set command:**

**AT\*EAPP**=<app>[,<subfunc>[,<text1>[,<text2>]]]

**Test command:**

**AT\*EAPP=?** Shows if the command is supported.

**Test command response:**

\*EAPP: <app>,(list of supported <subfunc>s)[<CR><LF><app>,(list of supported <subfunc>s)[...]]

**Parameters:**

<app>:

<app>	Description
0	Message application

<app>	Description
1	Phonebook application
2	E-mail application
3	WAP application
4	Calendar application
5	<b>Not supported</b>
6	Multimedia messaging application
7	Notes application
8	Image browser
9	Sound browser
10	Camera application
11	Media player application

<subfunc>: Application specific information, see tables below.

<subfunc>, <app=0>	Description
0	Send new SMS message. Pre-entered message text can be provided in <text1>. <b>Default setting</b>
1	Inbox
2	Unsent
3	Add new template. Pre-entered message text can be provided in <text1>.
4	Sent items.
5	Send new message to specific phonebook entry. Pre-entered message text can be provided in <text1>.  The name of the phonebook entry to send message to shall be provided in <text2>.
6	Send new message and include formatting characters and PB entry for Email.  <b>Note:</b> It is up to the MT to insert the formatting characters and the PB entry.
7	Send new message and include formatting characters for www.  <b>Note:</b> It is up to the MT to insert the formatting characters and the PB entry.
8	Add picture
9	Add melody
<subfunc>, <app=1>	Description
0	Add new number. Pre-entered number can be provided in <text1>. <b>Default setting</b>

<subfunc>, <app=1>	Description
1	Find and Call. Pre-entered name can be provided in <text1>. <b>Note:</b> If a name is provided, the search is started without user interaction.
2	Find and Edit. Pre-entered name can be provided in <text1>. <b>Note:</b> If a name is provided, the search is started without user interaction.
3	Add new voice label.
4	Add new group. Pre-entered name can be provided in <text1>.
5	Add new email address. Pre-entered address can be provided in <text1>.
<subfunc>, <app=2>	Description
0	Send new message. Pre-entered message (body) text can be provided in <text1>. <b>Default setting</b>
1	Inbox (read new mail): <ul style="list-style-type: none"> <li>• &lt;text1&gt;='Y' =&gt; check for new mail</li> <li>• &lt;text1&gt;='N' =&gt; do not check for new mail</li> </ul>
2	Outbox
3	Draft
4	Add attachment – image. Search path in the file system to the image will be included in <text>.
5	Add attachment – voice or sound clip. Search path in the file system to the audio file will be included in <text>.
6	Add attachment – motion. Search path in the file system to the video clip will be included in <text>.
7	Add attachment – vCard. Search path in the file system to the vCard object will be included in <text>.
8	Add attachment – vCalender. Search path in the file system to the vCalender object will be included in <text>.
9	Add attachment – URL.
<subfunc>, <app=3>	Description
0	Enter address (URL). Pre-entered URL can be provided in <text1>. <b>Default setting</b>
1	Go to address. Pre-entered URL <b>must be</b> provided in <text1>. The connection is initiated without user interaction
2	Add new bookmark.
3	Edit homepage.
4	Go to homepage.
5	Go to last visited page.

<subfunc>, <app=4>	Description
0	Add new appointment. <b>Default setting</b>
1	Add new ToDo.
2	ToDo view
3	Today view
4	Week view
5	Month view

<subfunc>, <app=6>	Description
0	Send new text message. Text will be included in <text1>.
1	Inbox (read new mail). <text1>="Y" => Check for new mail. <text1>="N" => Do not check for new mail.
2	Outbox
3	Draft
4	Add attachment – image. Search path in the file system to the image will be included in <text>.
5	Add attachment – voice or sound clip. Search path in the file system to the audio file will be included in <text>.
6	Add attachment – motion. Search path in the file system to the video clip will be included in <text>.
7	Add attachment - vCard. Search path in the file system to the vCard object will be included in <text>.
8	Add attachment – vCalender. Search path in the file system to the vCalender object will be included in <text>.
9	Add attachment – vNote. Search path in the file system to the vNote object will be included in <text>.
10	Add attachment – Theme.

<subfunc>, <app=7>	Description
0	Create new note. Pre-entered message text can be provided in <text1>. <b>Default setting</b>
1	Display list of notes. If only notes of a certain class should be shown, its name can be provided in <text1>.

<subfunc>, <app=8>	Description
0	Display an image in fullscreen mode. This is done by choosing a directory that contains only one picture. The directory is specified in <text1>.
1	Display thumbnail images. The command shows thumbnail images of all pictures in the directory specified by <text1>.

<subfunc>, <app=8>	Description
2	Delete one or several image(s). The image name is specified in <text1>. <b>Note:</b> Request from Image handler, not Image browser
255	Close Image browser.

<subfunc>, <app=9>	Description
0	Play a certain sound The search path to the sound-file shall be provided in <text1>.
255	Close sound browser.

<subfunc>, <app=10>	Description
0	Start the camera application

<subfunc>, <app=11>	Description
0	Start the media player application and play the file located in the search path provided in <text1>.

Example:

```
AT+EAPP=?
+EAPP: 0, (0-7)
+EAPP: 1, (0-5)
+EAPP: 2, (0-4)
+EAPP: 3, (0-4)
+EAPP: 4, (0-5)
+EAPP: 7, (0-3)
+EAPP: 8, (0-2, 255)
OK
```

## AT+CMEC

## Mobile Equipment Control Mode

### Description:

Set command selects which equipment operates the ME keypad, writes to the the ME display and sets ME indicators. If operation mode is not allowed by the phone, **+CME ERROR**: <err> is returned.

### Execution command:

**AT+CMEC**=[<keyp>[,<disp>[,<ind>]]]

### Read command:

**AT+CMEC?** Reads the current settings. +CMEC: <keyp>,<disp>,<ind>

### Test command:

**AT+CMEC=?** Tests if the commands is supported.

### Test command response:

+CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s)

### Parameters:

<keyp>:

<keyp>	Description
0	ME can be operated only through its keypad (execute command of AT+CKPD cannot be used).
1	ME keypad can be operated only from TE (with command AT+CKPD)

<keyp>	Description
2	ME keypad can be operated from both ME keypad and TE

<disp>:

<disp>	Description
0	only ME can write to its display (command AT+CDIS can only be used to read the display)
1	only TE can write to ME display (with command AT+CDIS)
2	ME display can be written by both ME and TE

<ind>:

<ind>	Description
0	only ME can set the status of its indicators (command AT+CIND can only be used to read the indicators)
1	only TE can set the status of ME indicators (with command AT+CIND)
2	ME indicators can be set by both ME and TE

## AT+CRSM

### Restricted SIM Access

#### Description:

By using this command instead of Generic SIM Access, +CSIM, TE application has easier but more limited access to the SIM database. Set command transmits the SIM <command> and its required parameters to the ME. ME handles all SIM-ME interface locking and file selection routines internally. As response to the command, ME sends the actual SIM information parameters and response data. ME error result code **+CME ERROR** may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

#### Execution command:

**AT+CRSM**=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]

#### Response:

+CRSM: <sw1>,<sw2>[,<response>]

#### Test command:

**AT+CRSM=?** Test if the command is supported

#### Parameters:

<command>:

<command>	Description
176	READ BINARY
178	READ RECORD
192	GET RESPONSE
214	UPDATE BINARY
220	UPDATE RECORD
242	STATUS. <b>Not supported</b>

<fileid>:

**Note:** The range of valid file identifiers depends on the actual SIM and is defined in 3GPP 51.011. Optional files may not be present at all.

<fileid>	Description
Integer	Parameters passed on by the ME to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP 51.011

<P1>, <P2>, <P3>:

<P1>, <P2>, <P3>	Description
Integer	Parameters passed on by the ME to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP 51.011

<data>:

<data>	Description
String	Information which shall be written to the SIM

<sw1>,<sw2>:

<sw1>,<sw2>	Description
Integer	Information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command.

<response>:

<response>	Description
String	Response of a successful completion of the command previously issued. GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer 3GPP 51.011. After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command.

## AT\*EKSE Ericsson Keystroke Send (ver. 2)

**Description:** The command sends a keystroke identifier to the MT. The MT will make a context sensitive interpretation of the keystroke based upon the state of the MMI (for instance SMS input mode, Standby, Charge-only Mode).  
**Note:** If the value of the keystroke identifier does not correspond to a supported Unicode value, the correct character will not be given. See also [www.unicode.org](http://www.unicode.org).

**Execution command:** AT\*EKSE=<key>

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

**Test command response:** \*EKSE: (list of supported <key> range)

**Parameters:**

<key>:

<key>	Description
0 – 65535	Keystroke identifier given in Unicode.

## AT+CRSL Ringer sound level (ver. 1)

**Description:** This command selects the incoming call ringer sound level of the ME. If <level> is set to 255, the ringer level will be increasing. Line 1 is default for <calltype> if the parameter is not given. All <calltype>s are set to <level>, even if only one unique <calltype> is set in the command.

**Execution command:** AT+CRSL=<level>[,<calltype>]

**Read command:** AT+CRSL? Displays current settings.

**Read command response:** +CRSL: <level1>[,<calltype1> [<CR><LF>...  
+CRSL: <level n>[, <calltype n>]]]

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

**Test command response:** +CRSL: (list of supported <level>s)[,(list of supported <calltype>s)]

**Parameters:**

<level>:

<level>	Description
0	Ringer off <b>Default setting</b>
1	Ringer level 1
2	Ringer level 2
3	Ringer level 3
4	Ringer level 4
5	Ringer level 5
6	Ringer level 6
7	Ringer level 7

<level>	Description
8	Ringer level 8
255	Increasing ringer level

<calltype>:

<calltype>	Description
1	Line 1 <b>Default setting</b>
2	Line 2
3	Fax
4	Data

## AT+CLVL Loudspeaker Volume Level

**Description:** This command selects the volume of the internal loudspeaker (call volume) of the ME.

**Execution command:** **AT+CLVL=<level>**

**Read command:** **AT+CLVL?** Displays current settings.

**Read command response:** +CLVL: <level>

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

**Test command response:** +CLVL: (list of supported <level>s)

**Parameter:**

<level>:

<level>	Description
0	Loudspeaker off <b>Default setting</b>
1	Loudspeaker level 1
2	Loudspeaker level 2
3	Loudspeaker level 3
4	Loudspeaker level 4
5	Loudspeaker level 5
6	Loudspeaker level 6
7	Loudspeaker level 7
8	Loudspeaker level 8

## AT+CMUT Mute Control

**Description:** This command enables and disables the uplink voice muting during a voice call.

**Execution command:** **AT+CMUT=<n>**

**Read command:** **AT+CMUT?** Displays current settings.

**Read command response:**  
+CMUT: <n>

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

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

**Parameter:**

<n>:

<n>	Description
0	Mute off <b>Default setting</b>
1	Mute on

## AT\*EMEM Ericsson Memory Management

**Description:** The action command reports the file system memory usage.

**Action command:** **AT\*EMEM**

**Action command response:**  
\*EMEM:  
<free\_mem>,<tot\_mem>,<image\_mem>,<sound\_mem>,<theme\_mem>

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

**Parameters:**

<free\_mem>:

<free_mem>	Description
Integer	Remaining free memory (in bytes) in the file system.

<tot\_mem>:

<tot_mem>	Description
Integer	Total memory size (in bytes) of the file system.

<image\_mem>:

<image_mem>	Description
Integer	Number of bytes (in the file system) used by images.

<sound\_mem>:

<sound_mem>	Description
Integer	Number of bytes (in the file system) used by sounds.

<theme\_mem>:

<theme_mem>	Description
Integer	Number of bytes (in the file system) used by themes.

## AT+CRMP Ring Melody Playback (ver. 2)

**Description:** The execution command causes the phone to playback a specific ring type.  
 The playback is **not** stopped when keys are pressed on the phone.  
 The playback is stopped when the issuing accessory is disconnected from the phone.

**Execution command:** **AT+CRMP=<call\_type>[,<volume> [<type>]]**

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

**Test command response:** +CRMP: (list of supported <call\_type>s),(list of supported <volume>s),(list of supported <type>s)

**Parameters:**

<call\_type>:

<call_type>	Description
0	Stop playing sound
1	Line 1 <b>Default setting</b>
2	Line 2
3	Fax
4	Data
5	Alarm

<volume>:

<volume>	Description
0-8	Volume level (0 = Off, 8 = maximal volume). <b>Default value = 3</b>
255	Step. <b>Not supported</b>

<type>:

<type>	Description
0	Manufacturer defined
1	User defined. <b>Default setting</b>

## AT\*EKEY

### Keypad/Joystick control (ver. 2)

**Description:**

Execution command emulates ME keypad by giving each keystroke as a character <key>. If emulation fails in an ME, an error, **+CME ERROR:** <err> is returned. This command should be accepted (OK returned) before actually starting to press the keys. Thus unsolicited result codes of key pressings and display events can be returned (see **AT+CMER**). It will also be possible to receive unsolicited event for CKEV when an EKEY is sent to the ME. For example, this makes it possible for a connected Bluetooth device to be controlled by the EKEY command.

The physical keypad always has higher priority than emulation of keystrokes via AT\*EKEY. That is, if the physical keypad is operated during execution of a series of keystrokes generated by AT\*EKEY the emulated keypad operation is terminated immediately.

**Note:** To use some of the keys, a specific character set has to be set via command AT+CSCS=<chset>. For example, the characters “[” and “]” used to emulate the left and right selection keys on the phone are not included in the default GSM character table. To handle this issue, the 8859-1 character table can be set by first sending AT+CSCS=”8859-1” to the phone.

**Note:** This command is an upgrade of AT+CKPD ver. 3 supporting the same keys. The parameters <time> and <pause> have been removed and two new parameters have been added; the <keyfunc> parameter indicating whether the key was pressed or released and the <nr\_of\_keys> parameter telling how many keys that will be sent in the command. Also the returned result for EKEY=? is changed.

**Execution command:**

**AT\*EKEY=<nr\_of\_keys>,<key>,<keyfunc>[,<key>,<keyfunc>]...**

**Test command:**

**AT\*EKEY=?**

**Test command response**

EKEY: supported <nr\_of\_keys>, (list of supported <key>), (list of supported <keyfunc>)

**Parameter:**

<nr\_of\_keys>:

Integer type. The number of <key> characters and corresponding <keyfunc> parameters that will be sent. Maximum value=20.

<key>

Character representing keys as listed in the following table. Colon character (IRA 58) followed by one character can be used to indicate a manufacturer specific key.

Char	IRA (dec)	Comment (+ some known key symbols)
#	35	Hash (number sign)
*	42	Star (*)
0... 9	48... 57	Number keys
:	58	Escape character for manufacturer specific keys
<	60	Left joystick direction
>	62	Right joystick direction
C/c	67/99	Clear display (C/CLR)
D/d	68/100	Volume down
F/f	70/102	Function (FCN) - option key

Char	IRA (dec)	Comment (+ some known key symbols)
G/g	71/103	Voice note
P/p	80/112	Power (PWR)
S/s	83/115	Connection start (SEND)
U/u	85/117	Volume up
V/v	86/118	Down joystick direction
[	91	Soft key 1
]	93	Soft key 2
^	94	Up joystick direction
H/h	200	Button pushed on the MC link (BT) headset
:R	58 + 82	Back
:C	58 + 67	Camera
:G	58 + 71	Go music button. <b>If supported by ME.</b>
:O	58 + 79	Operator
:J	58 + 74	Joystick button pressed
:<	58 + 60	Left Up joystick direction
:l	58 + 73	Right Up joystick direction
:V	58 + 86	Left Down joystick direction
58 + 62	Right Down joystick direction	
:=	58 + 61	Abstract game event FIRE
:1	58 + 1	Abstract game event GAME_A
:2	58 + 2	Abstract game event GAME_B
:3	58 + 3	Abstract game event GAME_C
:4	58 + 4	Abstract game event GAME_D
:M	58 + 77	Video call
:F	58 + 70	Flash button
:(	58 + 40	Flip closed
:)	58 + 41	Flip opened
:{	58 + 123	Camera lens cover closed
:}	58 + 125	Camera lens cover opened
:[	58 + 93	Jack knife closed
:]	58 + 95	Jack knife opened
:D	58 + 63	Multi task button (shortcut to desktop)
:L	58 + 76	Flash light button
:P	58 + 80	"Push to talk" button
:S	58 + 83	Media player button

Char	IRA (dec)	Comment (+ some known key symbols)
<b>Definition of an "abstract game event":</b> An event that is not absolutely mapped to one specific game event and not to a specific input device on the phone. For example, the fire button on the game controller shall be mapped to the fire action in both Mophun games and Java games, even if fire action for Java is mapped to the left soft key and for Mophun to the 5 key.		

<keyfunc>: Parameter used to define whether the key was pressed or released.

<keyfunc>	Action
0	Key pressed
1	Key released
2	Key pressed and released

Example: Joystick is moved in the left direction and at the same time the fire key is released:

```
AT+EKEY=2, "<", 0, " :=", 1
OK
```

The command will send a dispatch each time a key is either pressed or released.

## Unsolicited result codes

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### +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 <ccid>. 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
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 a dialling string includes the international access code character '+'.
129	Default setting when a dialling string does not include the international access code character '+'.

## Use scenarios

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### 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="046193000S",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.

AT command	Response	Comment
	+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	
	+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*ESKS=1		Set 'key pressed' sound to CLICK.
	OK	
AT*ESKL=1		Set key lock mode to AUTOMATIC.
	OK	The phone keyboard will, after a time delay, be locked.

# Ensemble S10: GSM Mobile Equipment Error Control

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## Commands

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### AT+CMEE Report Mobile Equipment Error

**Description:** 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, 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 <b>+CME ERROR</b> result code. Use <b>ERROR</b> instead. <b>Default setting</b>
1	Enable <b>+CME ERROR</b> result code and use numeric <err> values.
2	Enable <b>+CME ERROR</b> result code and use verbose <err> values.

# Ensemble S11: SMS and PDU Mode

## Commands

### AT+CSMS Select Message Service (ver.2)

**Description:** Set command selects messaging service <service>. It returns the types of messages supported by the ME – <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If the chosen service is not supported by the ME, but is supported by the TA, final result code, **+CME ERROR** is returned. The command is aborted when a break command is received by the MS. A break command is sent by setting the DTMS to low, which is obtained when the accessory is detached. It is possible to use ATZ and AT&F to set all parameters to their factory defaults as specified by the manufacturer.

**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
<b>0</b>	GSM 03.40 and 03.41. The syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 version 4.7.0. Phase 2+ features which do not require new command syntax may be supported, for example, correct routing of messages with new Phase 2+ data coding schemes. <b>Default setting</b>
<b>1</b>	GSM 03.40 and 03.41 (The syntax of SMS AT commands is compatible with GSM 07.05 Phase 2+ version). <b>Not supported</b>
<b>2-12</b>	Reserved
<b>128</b>	Manufacturer specific

<mt>:

<mt>	Description
<b>0</b>	Mobile terminated messages not supported.
<b>1</b>	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 (ver. 4)

**Description:** Set command selects memory storage <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned.

**Set command:** **AT+CPMS=**<mem1>[,<mem2>[,<mem3>]]

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

**Read command:** **AT+CPMS?** Displays the current <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> values.

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

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

**Parameters:**

<mem1>:

<mem1>	Description
string type	Memory from which messages are read and deleted (see commands List Messages <b>AT+CMGL</b> , Read Messages <b>AT+CMGR</b> , and Delete Messages <b>AT+CMGD</b> ).
"ME"	Phone message storage.
"SM"	SIM message storage.

<mem2>:

<mem2>	Description
string type	Memory to which writing and sending operations are made see commands Send Message from Storage <b>AT+CMSS</b> and Write Message to Memory <b>AT+CMGW</b> ).
"ME"	Phone message storage.
"SM"	SIM message storage.

<mem3>:

<mem3>	Description
<b>string type</b>	Memory to which received SMS are preferred to be stored (unless forwarded directly to terminal equipment). Received CBMs (Cell Broadcast Messages) are always stored in "BM" (Broadcast Message storage), or some manufacturer specific storage, unless directly forwarded to terminal equipment.
<b>"ME"</b>	Phone message storage.
<b>"SM"</b>	SIM message storage.

<used1>,<used2>,<used3>:

<used1>,<used2>,<used3>	Description
<b>Integer type</b>	Total number of messages currently in <mem1>, <mem2> and <mem3> respectively.

<total1>,<total2>,<total3>:

<total1>,<total2>,<total3>	Description
<b>Integer type</b>	Total number of messages currently in <mem1>, <mem2> and <mem3> respectively.

## AT+CMGF

### Message Format (ver. 1)

**Description:**

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters).

**Set command:**

**AT+CMGF=<mode>**

**Read command:**

**AT+CMGF?** Displays the current <mode> setting.

**Read command response:**

+CMGF: <mode>

**Test command:**

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

**Test command response:**

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

**Parameter:**

<mode>:

<mode>	Description
<b>0</b>	PDU mode

## AT+CSCA Service Centre Address (ver. 2)

**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.

**Note** that a “+” in front of the number in <sca> has precedence over the <tosca> parameter, so that a number starting with “+” will always be treated as an international number.

**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 (or GSM default alphabet characters) 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. <b>Default setting if '+' is not in &lt;sca&gt;</b>
145	ISDN/telephony numbering plan, international number <b>Default setting if '+' is in &lt;sca&gt;</b>
161	ISDN/telephony numbering plan, national number
128-255	Other values, see GSM 04.08 section 10.5.4.7

## AT+CSAS Save Settings

**Description:** Saves the active message service settings to a non-volatile memory. A phone can contain several profiles of settings. The settings specified in **AT+CSCA** 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..255	Manufacturer specific profile number where settings are to be stored. <b>Default value: 0</b>

## AT+CRES Restore Settings

**Description:** Restores the message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. The settings specified in **AT+CSCA** 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..255	Manufacturer specific profile number where settings are to be stored. <b>Default value: 0</b>

## AT+CNMI New Messages Indication to TE (ver. 4)

**Description:** Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, for example DTR signal is ON. If TE is inactive (for example DTR signal is OFF), message receiving should be done as specified in GSM 03.38 (3G TS 23.038).

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

**Read command:** **AT+CNMI?** Displays the current settings.

**Read command response:** +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

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

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

**Parameters:**  
<mode>:

<mode>	Description
2	Buffer unsolicited result code in TA when TA-TE link is reserved (for example in online data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

<mt>:

<mt>	Description
0	No SMS-DELIVER indications are routed to the TE. <b>Default setting</b>

<mt>	Description
1	If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: <b>+CMTI:</b> <mem>, <index>
3	Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes <b>+CMT:</b> <length><CR><LF><pdu>. Messages of other data coding schemes result in indication as defined in <mt>=1.

<bm>:

<bm>	Description
0	Store message to “BM” (or some manufacturer specific memory). No CBM indications are routed to the TE. <b>Default setting</b>
2	New CBMs are routed directly to the TE using unsolicited result code: <b>+CBM:</b> <length><CR><LF><pdu> (PDU mode enabled) or <b>+CBM:</b> <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><d ata> (text mode enabled)

<ds>:

<ds>	Description
0	No SMS-STATUS-REPORTs are routed to the TE. <b>Default setting</b>
1	SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: <b>+CDS:</b> <length><CR><LF><pdu> (PDU mode enabled) or <b>+CDS:</b> <fo>,<mr>,[<ra>],[<tora>],[<scts>,<dt>,<st> (text mode enabled)

<bfr>:

<bfr>	Description
0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes). <b>Default setting</b>

## AT+CMGL List Message (ver. 2)

**Description:** Execution command returns messages with status value <stat> from preferred message storage <mem1> to the TE. Entire data units <pdu> are returned. If status of the message is “received unread”, status in the storage changes to “received read”.

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

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

**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 message, that is, new message. <b>Default setting</b>
1	Received read message.
2	Stored unsent message. (only applicable to SMS)
3	Stored sent message. (only applicable to SMS)
4	All messages. (only applicable to +CMGL command)

<index>:

<index>	Description
<b>Integer type</b>	Value in the range of location numbers supported by the associated memory.

<alpha>:

<alpha>	Description
<b>String type</b>	Manufacturing specific. Should be left empty but not omitted, that is, commas shall mark the place where it should be. Used character set should be the one selected with command <b>AT+CSCS</b> .

<length>:

<length>	Description
<b>Integer type</b>	Value indicating in PDU mode ( <b>AT+CMGF</b> ='0'), the length of the actual TP data unit in octets (that is the RP layer SMSC address octets are not counted in the length).

<pdu>:

<pdu>	Description
...	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: phone converts each octet of TP data unit into two IRA character long hexadecimal number (for instance octet with integer value 42 is presented to terminal equipment as two characters 2A (IRA 50 and 65)).  In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

<mem1>: See [AT+CPMS](#).

## AT+CMGR Read Message (ver. 2)

**Description:** Execution command returns message with location value <index> from preferred message storage <mem1> to the TE. Status of the message and entire message data unit <pdu> is returned. If status of the message is "received unread", status in the storage changes to 'received read'.

**Execution command:** **AT+CMGR=<index>**

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

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

**Parameters:**

<stat>:

<stat>	Description
0	Received unread message (that is, new message).
1	Received read message.
2	Stored unsent message. (only applicable to SMS)
3	Stored sent message. (only applicable to SMS)
16	Template message.

Integer type in PDU mode (default 0), indicates the status of message in memory.

<index>:

<index>	Description
Integer type	Value in the range of location numbers supported by the associated memory.

<alpha>:

<alpha>	Description
String type	Manufacturing specific. Should be left empty but not omitted, that is, commas shall mark the place where it should be. Used character set should be the one selected with command <a href="#">AT+CSCS</a> .

<length>:

<length>	Description
Integer type	Value indicating in PDU mode ( <b>AT+CMGF</b> ='0'), the length of the actual TP data unit in octets (that is, the RP layer SMSC address octets are not counted in the length).

<pdu>:

<pdu>	Description
...	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (for example, octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).  In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

<mem1>:

See **AT+CPMS**

## AT+CMGS

### Send Message (ver. 2)

#### Description:

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when **AT+CSMS** <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code.

- <length> must indicate the number of octets coded in the TP layer data unit to be given (SMSC address octets are excluded).
- The TA sends a four character sequence **<CR><LF><greater\_than><space>** (IRA 13, 10, 62, 32) after command line is terminated with **<CR>**; after that PDU can be given from TE to ME/TA.
- The DCD signal shall be in ON state while PDU is given.
- The echoing of given characters back from the TA is controlled by V.25ter echo command E.
- The PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU.
- When the length octet of the SMSC address (given in the <pdu>) equals zero, the SMSC address set with command Service Centre Address +CSCA is used.
- Sending can be cancelled by giving **<ESC>** character (IRA 27).
- **<ctrl-Z>** (IRA 26) must be used to indicate the ending of PDU.

**Execution command:** **AT+CMGS=<length><CR><pdu><ctrl-Z/ESC>**

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

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

**Parameters:**

<mr>:

<mr>	Description
Integer type	GSM 03.40 TP-Message-Reference in integer format.

<length>:

<length>	Description
Integer type	Value indicating in PDU mode ( <b>AT+CMGF='0'</b> ), the length of the actual TP data unit in octets. The RP layer SMSC address octets are not counted in the length.

<ackpdu>:

<ackpdu>	Description
...	GSM 03.40 RP-User Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without GSM 04.11 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter.

## AT+CMSS Send From Storage (ver. 2)

**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.  
**Note:** Parameters <da> and <toda> will be accepted but ignored by ME (that is, ME will not use the parameters).

**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 terminal equipment character set. The type of address is given by <toda>.

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

<tda>	Description
<b>129</b>	ISDN / telephony numbering plan, national/international unknown <b>Default setting if '+' is not in &lt;da&gt;</b>
<b>145</b>	ISDN / telephony numbering plan, international number <b>Default setting if '+' is in &lt;da&gt;</b>
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128-255</b>	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 (ver. 2)

**Description:** Execution command stores a message to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to “stored unsent”, but parameter <stat> allows also other status values to be given. (ME/TA manufacturer may choose to use different default <stat> values for different message types.) The entering of PDU is done in a similar way as with command **AT+CMGS**.

**Execution command:** **AT+CMGW=<length>[,<stat>]<CR><pdu><ctrl-Z/ESC>**

**Execution command response:** +CMGW: <index>

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

**Parameters:**

<stat>:

<stat>	Description
<b>0</b>	Received unread message (new message).
<b>1</b>	Received read message.
<b>2</b>	Stored unsent message. (only applicable to SMS)
<b>3</b>	Stored sent message. (only applicable to SMS)
<b>16</b>	Template message.

<index>:

<index>	Description
<b>Integer type</b>	Value in the range of location numbers supported by the associated memory.

<length>:

<length>	Description
<b>Integer type</b>	Value indicating in PDU mode ( <b>AT+CMGF='0'</b> ), the length of the actual TP data unit in octets. The RP layer SMSC address octets are not counted in the length.

<pdu>:

<pdu>	Description
...	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (for example, octet with integer value 42 is presented to TE as two characters, 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

## AT+CMGD Delete Message

**Description:** Deletes message from preferred message <mem1> (see [AT+CPMS](#)) storage location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below.

**Execution command:** **AT+CMGD=<index>,<delflag>**

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

**Test command response:** +CMGD: <index>, <list of delflags>

**Parameter:**

<index>:

<index>	Description
<b>Integer</b>	Value in the range of location numbers supported by the associated memory.

<delflag>:

<delflag>	Description
<b>Integer</b>	Integer indicating multiple message deletion request.
<b>0</b>	Delete the message specified in <index>.
<b>1</b>	Delete all read messages from preferred message storage leaving unread messages and stored mobile originated messages (whether sent or not) untouched.
<b>2</b>	Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched.
<b>3</b>	Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages untouched.
<b>4</b>	Delete all messages from preferred message storage including unread messages.

## AT+CMGC Send command (ver. 1)

**Description:** Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of PDU is done in a similar way as with command Send Message **AT+CMGS**. Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code.

**Execution command:** **AT+CMGC=<length><CR><pdu><ctrl-Z/ESC>**

**Execution command** if PDU mode (+CMGF=0) and sending successful:

**response:** +CMGC: <mr>[,<ackpdu>]

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

**Parameters:**

<length>:

<length>	Description
Integer type	Value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets. The RP layer SMSC address octets are not counted in the length.

<pdu>:

<pdu>	Description
...	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (for example, octet with integer value 42 is presented to TE as two characters, 2A (IRA 50 and 65)) In the case of CBS: GSM 03.41 TPDU in hexadecimal format

<mr>:

<mr>	Description
Integer type	GSM 03.40 TP-Message-Reference in integer format.

<ackpdu>:

<ackpdu>	Description
...	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, and parameter shall be bounded by double quote characters like a normal string type parameter.

## Unsolicited result codes

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### +CBM Received Cell Broadcast

**Description:** Received CBMs are routed directly to the terminal equipment. 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. phone 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 message memory location is routed to the terminal equipment. Enabled by [AT+CNMI](#).

**Unsolicited result code:** **+CMTI:** <mem>,<index>

**Parameters:**

<mem>:

<mem>	Description
"ME"	Phone 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 terminal equipment. Enabled by [AT+CNMI](#).

**Unsolicited result code:** **+CMT:** <length><CR><LF><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. phone 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 terminal equipment. Enabled by **AT+CNMI**.

**Unsolicited result code:** **+CDS:** <length><CR><LF><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. phone converts each octet of TP data unit into two IRA-character long hexadecimal numbers.  
**In case of CBS:** GSM TPDU in hexadecimal format.

## Use scenarios

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### New Message Indication

This scenario shows how the new message indication result codes are handled.

AT command	Response	Comment
<b>AT+CNMI=?</b>		Query new message unsolicited result code modes.
	<b>+CNMI:</b> (3), (0-1), (0,2), (0), (0) OK	
<b>AT+CNMI=0,1,2,0,0</b>		Send SM indications to terminal equipment. Forward unsolicited CBM result codes directly to the terminal equipment
	OK	
<b>AT+CNMI?</b>		Query current settings.
	<b>+CNMI:</b> 3,1,2,0,0	
		The phone receives and stores incoming SM.
	<b>+CMTI:</b> "ME", 3	New message stores in index 3 of <mem1> storage.
		The phone receives a CBM and routes it directly to the terminal equipment.
	<b>+CBM:</b> 128 <128 byte PDU>	New CBM PDU of 128 byte received at terminal equipment.

# Ensemble S15: GPRS/Packet Domain

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## Locked PDP contexts

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In Sony Ericsson phones every PDP context has a one-to-one relationship with an Internet Account. If a certain Internet account is locked, the corresponding PDP context will also be locked for editing. As a consequence, an attempt to select PDP context parameters with **AT+CGDCONT** may fail even though the cid of the context is within the range reported with the test command. The read and test commands in this ensemble are not affected by these restrictions.

## Commands

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### AT+CGDCONT Define PDP Context (ver. 1)

<b>Description:</b>	Specifies the PDP context parameter values for a PDP context identified by the <cid> parameter. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined. The test command returns values supported as a compound value. Each PDP type will have the parameter value range returned on a separate line. <b>Notes:</b> <ul style="list-style-type: none"> <li>The PDP context, identified by the &lt;cid&gt;, does not have to be earlier defined (using the +CGDCONT command).</li> <li>Letting values for context number &lt;cid&gt; become undefined, means that the values of the &lt;cid&gt; are given the default values.</li> <li>The read command returns the current settings for each context defined by the +CGDCONT set command.</li> </ul>
<b>Set command:</b>	<b>AT+CGDCONT</b> =[<cid>[,<pdp_type>[,<APN>[,<pdp_addr>[,<d_comp>[,<h_comp>[,<pd1>[,...[,<pdN>]]]]]]]]]]]
<b>Read command:</b>	<b>AT+CGDCONT?</b> Displays the current parameter settings.
<b>Read command response:</b>	+CGDCONT: <cid>, <PDP_type>,<APN>, <PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,pdN]]] [ <b>&lt;CR&gt;&lt;LF&gt;</b> +CGDCONT: <cid>,<PDP_type>,<APN>, <PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,pdN]]] [...]]
<b>Test command:</b>	<b>AT+CGDCONT=?</b> Shows if the command is supported.
<b>Test command response:</b>	+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[...[(list of supported <pdN>s)]]] [ <b>&lt;CR&gt;&lt;LF&gt;</b> +CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[...[(list of supported <pdN>s)]]] [...]]
<b>Parameters:</b>	

<cid>: Integer. Specifies the particular PDP context definition. The parameter is local to the TE - MT 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
"IP"	Internet Protocol (IETF STD 5). <b>Default value.</b>
"IPV6"	Internet Protocol, version 6 (IETF RFC 2460).

<APN>: (Access Point Name) a string parameter which is a logical name, used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.

<pdp\_address>: A string parameter that identifies the ME in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. See 3GPP TS 27.007

<d\_comp>:

<d_comp>	Description
0	PDP data compression OFF <b>Default setting</b>
1	PDP data compression ON
2-255	Reserved

<h\_comp>:

<h_comp>	Description
0	PDP header compression OFF <b>Default setting</b>
1	PDP header compression ON
2-255	Reserved

<pdpN>: Zero to N string parameters whose meanings are specific to the <pdp\_type>. **Not supported**

## AT+CGSMS Select Service for MO SMS Messages

**Description:** The command specifies the service or service preference that the MT will use to send MO SMS messages.

**Set command:** **AT+CGSMS=[<service>]**

**Read command:** **AT+CGSMS?** Displays the current <service> setting.

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

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

**Parameter:**

<service>:

<service>	Description
0	GPRS/Packet Domain
1	Circuit switched
2	GPRS/Packet Domain preferred (use circuit-switched if GPRS/Packet Domain not available).
3	Circuit-switched preferred (use GPRS/Packet Domain if circuit-switched not available). <b>Default value.</b>

## AT+CGATT Packet Service Attach or Detach

**Description:** Attaches the ME to, or detaches the ME from, the GPRS/Packet Domain service. After the command has completed, the ME remains in V.25ter command state. If the ME is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

**Note:** This command has the characteristics of both the V.25ter action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

**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.
1	Attached.

## AT+CGACT PDP Context Activate or Deactivate

**Description:** Activates or deactivates the specific PDP context(s). After the command has completed, the ME remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. If the ME is not GPRS/ Packet Domain attached when the activation form of the command is executed, the ME first performs a GPRS/ Packet Domain attach and then attempts to activate the specified contexts. If the attach fails then the ME responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

If no <cid>s are specified the activation/deactivation form of the command activates/deactivates all defined contexts.

**Note:** This command has the characteristics of both the V.25ter action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

**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. See the [AT+CGD-CONT](#) command.

**AT+CGDATA**      **Enter Data State**

**Description:** Causes the ME to perform whatever actions are necessary to establish communication between the TE and the network using one or more GPRS/ Packet Domain PDP types. This may include performing a GPRS/Packet Domain attach and one or more PDP context activations. Commands following +CGDATA command in the AT command line are not processed by the ME.

During each PDP startup procedure the ME may have access to some or all of the following information:

- The command may have provided an <L2P> parameter value.
- The TE may provide a PDP type and/or PDP address to the ME during in the PDP startup procedure.

If any of this information is in conflict, the command will fail.

Any PDP type and/or PDP address present in the above information are compared with the PDP type and/or PDP address in any context definitions specified in the command in the order in which their <cid>s appear.

For a context definition to match:

- The PDP type must match exactly.
- The PDP addresses are considered to match if they are identical or if either or both addresses are unspecified. For example, a PPP NCP request specifying PDP type = IP and no PDP address would cause the ME to search through the specified context definitions for one with PDP type = IP and any PDP address.

The context shall be activated using the matched value for PDP type and a static PDP address if available, together with the other information found in the PDP context definition. If a static PDP address is not available then a dynamic address is requested.

If no <cid> is given or if there is no matching context definition, the ME shall attempt to activate the context with whatever information is available to the ME. The other context parameters shall be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the ME returns the final result code OK.

In the event of an erroneous termination or a failure to start up, the V.25ter command state is re-entered and the ME returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.

**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 for a PDP, such as IP.

<cid>: Integer; specifies the particular PDP context definition. See the **AT+CGD-CONT** command.

## AT+CGEREP Packet Domain Event Reporting (ver. 1)

**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/ Packet Domain ME or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered.

**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),(list of supported <bfr>s)

**Parameters:**

<mode>:

<mode>	Description
0	Buffer unsolicited result codes in the ME. No codes are forwarded to the TE. <b>Default setting</b>
1	Discard unsolicited result codes when MT-TE link is reservedreserved (for example in on-line data mode), otherwise forward them directly to the TE.

<bfr>:

<bfr>	Description
0	MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 is entered. <b>Default setting</b>

## AT+CGREG Packet Domain Network Registration Status

**Description:** Controls the presentation of the unsolicited result code **+CGREG: <stat>** when <n>='1' and there is a change in the ME 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.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the ME. Location information elements <lac> and <ci> are returned only when <n>=2 and ME is registered in the network.

**Set command:** **AT+CGREG**=[<n>]

**Read command:** **AT+CGREG?** Displays the current <n>, <stat>[, <lac>,<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. <b>Default setting</b>
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>: Four byte cell ID in hexadecimal format. Four bytes are required for UMTS, whereas only two bytes are applicable for GSM, and the two first bytes are then zeros, for example, 00001A02

## 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 defined <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>: A string that identifies the ME in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDS-CONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP\_address> is omitted if none is available

## AT+CGDSCONT Define Secondary PDP Context

**Description:** The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the set command, +CGDSCONT= <cid> causes the values for context number <cid> to become undefined. The read command returns the current settings for each defined context. The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP\_type>, the parameter value ranges for each <PDP\_type> are returned on a separate line.

**Note:** If <cid> states an already existing, primary context, this will be converted to a secondary one, provided of course, that stated <p\_cid> is a different and existing primary account defined with +CGDSCONT. Any secondary contexts attached to the converted context disappears.

**Set command:** **AT+CGDSCONT**=[<cid> ,<p\_cid> [,<d\_comp> [,<h\_comp>]]]

**Read command:** **AT+CGDSCONT?** (Read the current general parameter settings)

**Read command response:** +CGDSCONT: <cid>, <p\_cid>, <data\_comp>, <head\_comp>[<CR><LF>  
+CGDSCONT: <cid>, <p\_cid>, <data\_comp>, <head\_comp>  
[...]]

**Test command:** **AT+CGDSCONT=?** (Shows if the command is supported.)

**Test command response:** +CGDSCONT: (range of supported <cid>s), (list of <cid>s for active primary contexts), <PDP\_type>,,,(list of supported <d\_comp>s),(list of supported <h\_comp>s)[<CR><LF>  
+CGDSCONT: (range of supported <cid>s), (list of <cid>s for active primary contexts),<PDP\_type>,,,(list of supported <d\_comp>s), (list of supported <h\_comp>s)  
[...]]

**Parameters:**

<p\_cid>:

<p_cid>	Description
<b>Integer</b>	(Primary PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition which has been specified by use of the <b>AT+CGDCONT</b> command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.

Other parameters: See [AT+CGDCONT](#)

**AT+CGTFT**      **Traffic Flow Template**

- Description:** This command allows the TE to specify a Packet Filter for a Traffic Flow Template (TFT) that is used in the GGSN for routing of down-link packets onto different QoS flows towards the TE. The concept is further described in the 3GPP TS 23.060. A TFT consists of from one and up to eight Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.
- The set command specifies a Packet Filter that is to be added to the TFT stored in the ME and used for the context identified by the (local) context identification parameter, <cid>. The specified TFT will be stored in the GGSN only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the **AT+CGDCONT** and **AT+CGDSCONT** commands, the +CGTFT command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value.
- A special form of the set command, +CGTFT= <cid> causes all of the Packet Filters in the TFT for context number <cid> to become undefined. At any time there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an ERROR or **+CME ERROR** response is returned.
- The read command returns the current settings for all Packet Filters for each defined context. In case no filter is defined the read command will return "OK" only.
- The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be used.
- Set command:** **AT+CGTFT**=[<cid>, [<packet filter identifier>, <evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)> ]]]]]]]]]>
- Read command:** **AT+CGTFT?** (Read the current general parameter settings)

**Read command response:**

+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>[<CR><LF>  
 +CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>  
 [...]]

**Test command:**

**AT+CGTFT=?** (Shows if the command is supported.)

**Test command response:**

+CGTFT: <PDP\_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s)[<CR><LF>  
 +CGTFT: <PDP\_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s)  
 [...]]

**Parameters:**

<cid>: See the **AT+CGDCONT** command. The <cid> may refer to a primary or a secondary account.

<packet filter identifier>:

<packet filter identifier>	Description
1-8	Supported values

<source address and subnet mask>:

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

<protocol number (ipv4) / next header (ipv6)>:

<protocol number (ipv4) / next header (ipv6)>	Description
0–255	Supported values

<destination port range>:

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

<source port range>:

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

<ipsec security parameter index (spi)>:

<ipsec security parameter index (spi)>	Description
00000000–FFFFFFFF	Supported values (hexadecimal)

<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>:

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

<flow label (ipv6)>:

<flow label (ipv6)>	Description
00000–FFFFF	Supported values- <b>Valid for IPv6 only</b>

<evaluation precedence index>:



**Read command response:**

+CGEQREQ: <cid>, <Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>[<CR><LF>  
 +CGEQREQ: <cid>, <Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>  
 [...]]

**Test command:**

**AT+CGEQREQ=?** (Shows if the command is supported.)

**Test command response:**

+CGEQREQ: <PDP\_type>, (list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s)[<CR><LF>  
 +CGEQREQ: <PDP\_type>, (list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s)  
 [...]]

**Parameters:**

<cid>: See the [AT+CGDCONT](#) command

<Traffic class>:

<Traffic class>	Description
0	Conversational
1	Streaming
2	Interactive
3	Background
4	Subscribed value

<Maximum bitrate UL>:

<Maximum bitrate UL>	Description
<b>Integer</b>	The maximum number of Kbps delivered to UMTS (up-link traffic) at a SAP. <b>Note:</b> Not all integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible that reading back this parameter may produce a different value than that used upon setting.
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-128</b> GPRS: <b>0-44</b>	<b>Default setting = 0</b> (Subscribed value will be requested.)

<Maximum bitrate DL>:

<Maximum bitrate DL>	Description
<b>Integer</b>	Maximum number of Kbps delivered by UMTS (down-link traffic) at a SAP. <b>Note:</b> Not all the integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible that reading back this parameter may produce a different value than that used upon setting.
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-256</b> GPRS: <b>0-88</b>	<b>Default setting = 0</b> (Subscribed value will be requested.)

<Guaranteed bitrate UL>:

<Guaranteed bitrate UL>	Description
<b>Integer</b>	Guaranteed number of Kbps delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). <b>Note:</b> Not all the integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible that reading back this parameter may produce a different value than that used upon setting.
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-128</b> GPRS: <b>0-44</b>	<b>Default setting = 0</b> (Subscribed value will be requested.)

<Guaranteed bitrate DL>:

<Guaranteed bitrate DL>	Description
<b>Integer</b>	Guaranteed number of Kbps delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). <b>Note:</b> Not all the integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible that reading back this parameter may produce a different value than that used upon setting.
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-256</b> GPRS: <b>0-88</b>	<b>Default setting = 0</b> (Subscribed value will be requested.)

<Delivery order>:

<Delivery order>	Description
<b>0</b>	UMTS shall not provide in-sequence SDU delivery.
<b>1</b>	UMTS shall provide in-sequence SDU delivery.
<b>2</b>	Subscribed value.

<Maximum SDU size>:

<Maximum SDU size>	Description
<b>Integer</b>	Indicates the maximum allowed SDU size in octets.
<b>0-153</b>	<b>Default setting = 0</b> (Subscribed value will be requested.)

<SDU error ratio>:

<SDU error ratio>	Description
<b>String</b>	Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 510-3 would be specified as '5E3' (for example, AT+CGEQREQ=..., "5E3", ...). '0E0' means subscribed value.

<Residual bit error ratio>:

<Residual bit error ratio>	Description
<b>String</b>	A string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 510-3 would be specified as '5E3'

<Delivery of erroneous SDUs>:

<Delivery of erroneous SDUs>	Description
<b>0</b>	No delivery of erroneous SDUs.
<b>1</b>	Erroneous SDUs delivered.
<b>2</b>	No detection of erroneous SDUs.
<b>3</b>	Subscribed value. <b>Default value.</b>

<Transfer delay>:

<Transfer delay>	Description
<b>Integer</b>	The targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.
<b>0-254</b>	<b>0: Default setting</b> (Subscribed value will be requested.)

<Traffic handling priority>:

<Traffic handling priority>	Description
<b>Integer</b>	Specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers.
<b>0-3</b>	<b>Default setting = 0</b> (Subscribed value will be requested.)

<PDP\_type>: See the [AT+CGDCONT](#) command.



**Read command response:**

+CGEQMIN: <cid>, <Traffic class>,<Maximum bitrate UL>, <Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>, <Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>, <Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>  
 [<CR><LF>  
 +CGEQMIN: <cid>, <Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>, <Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>  
 [...]]

**Test command:**

**AT+CGEQMIN=?** (Shows if the command is supported.)

**Test command response:**

+CGEQMIN: <PDP\_type>, (list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s)  
 [<CR><LF>  
 +CGEQMIN: <PDP\_type>, (list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL >s), (list of supported <Guaranteed bitrate DL >s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s)  
 [...]]

**Parameters:**

<cid>: See the [AT+CGDCONT](#) command

<Traffic class>:

<Traffic class>	Description
0	Conversational
1	Streaming
2	Interactive
3	Background. <b>Default value</b>

<Maximum bitrate UL>:

<Maximum bitrate UL>	Description
Integer	The maximum number of Kbps delivered to UMTS (up-link traffic) at a SAP. <b>Note:</b> Not all the integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible to read out a value other than that given.

<Maximum bitrate UL>	Description
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-128</b> GPRS: <b>0-44</b>	0: <b>Default setting</b> (Subscribed value will be requested.)

<Maximum bitrate DL>:

<Maximum bitrate DL>	Description
<b>Integer</b>	Maximum number of Kbps delivered by UMTS (down-link traffic) at a SAP. <b>Note:</b> Not all the integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible to read out a value other than that given.
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-256</b> GPRS: <b>0-44</b>	0: <b>Default setting</b> (Subscribed value will be requested.)

<Guaranteed bitrate UL>:

<Guaranteed bitrate UL>	Description
<b>Integer</b>	Guaranteed number of Kbps delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver).
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-128</b> GPRS: <b>0-44</b>	0: <b>Default setting</b> (Subscribed value will be requested.)

<Guaranteed bitrate DL>:

<Guaranteed bitrate DL>	Description
<b>Integer</b>	Guaranteed number of Kbps delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver).
UMTS: <b>0-384</b> GPRS/EDGE: <b>0-256</b> GPRS: <b>0-44</b>	0: <b>Default setting</b> (Subscribed value will be requested.)

<Delivery order>:

<Delivery order>	Description
<b>0</b>	UMTS shall not provide in-sequence SDU delivery.
<b>1</b>	UMTS shall provide in-sequence SDU delivery.

<Maximum SDU size>:

<Maximum SDU size>	Description
<b>Integer</b>	Indicates the maximum allowed SDU size in octets <b>Note:</b> Not all the integer values are valid. The general rule is then that the integer will be rounded down to the nearest valid value. It is therefore possible to read out a value other than that given.
<b>0-153</b>	<b>0: Default setting</b> (Subscribed value will be requested.)

<SDU error ratio>:

<SDU error ratio>	Description
<b>String</b>	Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 510-3 would be specified as '5E3' (for example, AT+CGEQREQ=..., "5E3", ...).

<Residual bit error ratio>:

<Residual bit error ratio>	Description
<b>String</b>	String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, <Residual bit error ratio> indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 510-3 would be specified as '5E3' (for example, AT+CGEQREQ=..., "5E3", ...).

<Delivery of erroneous SDUs>:

<Delivery of erroneous SDUs>	Description
<b>0</b>	No delivery of erroneous SDUs.
<b>1</b>	Erroneous SDUs delivered.
<b>2</b>	No detection of erroneous SDUs.

<Transfer delay>:

<Transfer delay>	Description
<b>Integer</b>	The targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.

<Transfer delay>	Description
0-254	0: <b>Default setting</b> (Subscribed value will be requested.)

<Traffic handling priority>:

<Traffic handling priority>	Description
Integer	Specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers.
0-3	0: <b>Default setting</b> (Subscribed value will be requested.)

<PDP\_type>: See the [AT+CGDCONT](#) command.

### AT+CGEQNEG 3G Quality of Service Profile (Negotiated)

**Description:** This command allows the TE to retrieve the negotiated QoS profiles returned in the Activate PDP Context Accept message. The execution command returns the negotiated QoS profile for the specified context identifiers, <cid>s. The QoS profile consists of a number of parameters, each of which may have a separate value. The test command returns a list of <cid>s associated with active contexts.

**Execution command:** **AT+CGEQNEG** = [<cid>[,<cid>[,...]]]

**Execution command response:** +CGEQNEG: <cid>, <Traffic class>,<Maximum bitrate UL>, <Maximum bitrate DL>,<Guaranteed bitrate UL>, <Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>[<CR><LF>  
+CGEQNEG: <cid>, <Traffic class>,<Maximum bitrate UL>, <Maximum bitrate DL>,<Guaranteed bitrate UL>, <Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>  
[...]]

**Test command:** **AT+CGEQREQ=?** (Shows if the command is supported.)

**Test command response:** +CGEQNEG: (list of <cid>s associated with active contexts)

**Parameters:**

<cid>: See the [AT+CGDCONT](#) command

<Traffic class>:

<Traffic class>	Description
0	Conversational
1	Streaming
2	Interactive

<Traffic class>	Description
3	Background

<Maximum bitrate  
UL>:

<Maximum bitrate UL>	Description
Integer	The maximum number of Kbps delivered to UMTS.

<Maximum bitrate  
DL>:

<Maximum bitrate DL>	Description
Integer	Maximum number of Kbps delivered by UMTS (down-link traffic) at a SAP.

<Guaranteed bitrate  
UL>:

<Guaranteed bitrate UL>	Description
Integer	Guaranteed number of Kbps delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver).

<Guaranteed bitrate  
DL>:

<Guaranteed bitrate DL>	Description
Integer	Guaranteed number of Kbps delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver).

<Delivery order>:

<Delivery order>	Description
0	UMTS shall not provide in-sequence SDU delivery.
1	UMTS shall provide in-sequence SDU delivery.

<Maximum SDU  
size>:

<Maximum SDU size>	Description
Integer 0-153	Indicates the maximum allowed SDU size in octets. <b>Default = 0</b> (Subscribed value will be requested).

<SDU error ratio>:

<SDU error ratio>	Description
<b>String</b>	Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 510-3 would be specified as '5E3' (for example, AT+CGEQREQ=..., "5E3", ...).

<Residual bit error ratio>:

<Residual bit error ratio>	Description
<b>String</b>	String parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 510-3 would be specified as '5E3' (for example, AT+CGEQREQ=..., "5E3", ...).

<Delivery of erroneous SDUs>:

<Delivery of erroneous SDUs>	Description
<b>0</b>	No delivery of erroneous SDUs.
<b>1</b>	Erroneous SDUs delivered.
<b>2</b>	No detection of erroneous SDUs.

<Transfer delay>:

<Transfer delay>	Description
<b>Integer</b>	The targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.

<Traffic handling priority>:

<Traffic handling priority>	Description
<b>Integer</b>	Specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers.

## AT+CGCMOD PDP Context Modify

**Description:** The execution command modifies the specified PDP context(s) with respect to QoS profiles and TFTs. After the command has completed, the MT returns to V.25ter online data state.  
If no <cid>s are specified the activation form of the command modifies all active contexts.

**Execution command:** **AT+CGCMOD**=[<cid>[,<cid>[,...]]]

**Test command:** **AT+CGCMOD=?** (Shows if the command is supported.)

**Test command response:** +CGCMOD: (list of <cid>s associated with active contexts)

**Parameter:**  
<cid>: See the [AT+CGDCONT](#) command.

## Extension of ATD - Request GPRS Service

**Description:** The V.25ter ATD command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocol. The MT shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

When the layer 2 protocol has terminated, either as a result of an orderly shut down of the PDP or an error, the MT shall enter V.25ter command state and return the NO CARRIER final result code.

<L2P> and <cid> usage are the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may be used in the modem initialisation AT command string to set values for PDP type, APN, QoS etc. This command may be used in both normal and modem compatibility modes.

**Note:** The dial string conforms to the syntax specified in GSM 02.30.

**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/Packet Domain.

<called\_address>: String; identifies the called party in the address space applicable to the PDP.

<L2p>:

<L2p>	Description
1	PPP
9yyyy	M-xxxx

<cid>: Digit string; specifies a particular PDP context definition.

## Extension of ATD - Request Packet Domain IP Service

**Description:** The V.25ter ATD dial command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocol. The MT shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behaviour after the online data state has been entered is dependent on the PDP type. It is described briefly in clause 9 (for IP) of 3GPP TS 27.060. PS attachment and PDP context activation procedures may take place prior to or during the PDP startup, if they have not already been performed using the +CGATT and +CGACT commands.

When the layer 2 protocol has terminated, either as a result of an orderly shut down of the PDP or an error, the MT shall enter V.25ter command state and return the NO CARRIER final result code. <cid> usage shall be the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may then be used in the modem initialisation AT command string to set values for for PDP type, APN, QoS etc..

If <cid> is omitted, the MT shall attempt to activate the context using one of the following:

- any information provided by the TE during the PDP startup procedure, for example, the TE may provide a PDP type and/or PDP address to the MT
- a priori knowledge, for example the MT may implement only one PDP type
- using the 'Empty PDP type' (GSM 04.08). (No PDP address or APN shall be sent in this case and only one PDP context subscription record shall be present in the HLR for this subscriber.)

This command may be used in both normal and modem compatibility modes.

**Note:** The dial string conforms to the syntax specified in GSM 02.30.

**Execution command:**

**ATD\***<GPRS\_SC\_IP>[\*<cid>]#

**Parameters:**

<GPRS\_SC>: Digit string; a digit string (value='98') which identifies a request to use GPRS/Packet Domain with IP (PDP types IP and PPP).

<cid>: Digit string; specifies a particular PDP context definition.

## Unsolicited result codes

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### +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
<b>REJECT</b> <pdp_type>,<pdp_address>	A network request for PDP context activation occurred when the MT was unable to report it to the terminal equipment with a <b>+CRING</b> unsolicited result code and was automatically rejected.
<b>NW REACT</b> <pdp_type>,<pdp_address>[,<cid>]	The network has forced a network reactivation. The <cid> that was used to reactivate the context is provided, if known to the MT.
<b>NW DEACT</b> <pdp_type>,<pdp_address>[,<cid>]	The network has forced a network deactivation. The <cid> that was used to deactivate the context is provided, if known to the MT.
<b>ME DEACT</b> <pdp_type>,<pdp_address>[,<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.
<b>NW DETACH</b>	The network has forced a GPRS detach. This implies that all active have been deactivated. These are not reported separately.
<b>ME DETACH</b>	The mobile equipment has forced a GPRS detach. This implies that all active have been deactivated. These are not reported separately.
<b>NW CLASS</b> <class>	The network has forced a change of phone class. The highest available class is reported.
<b>ME CLASS</b> <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:** If AT+CGREG <n>='1'  
 +CGREG: <stat>  
 If AT+CGREG <n>='2'  
 +CGREG: <stat>[,<lac>,<ci>]

**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.
3	Registration denied
4	Unknown
5	Registered, roaming

<lac>:

<lac>	Description
<b>String</b>	Two byte location area code in hexadecimal format.

<ci>:

<ci>	Description
<b>String</b>	Two byte cell ID in hexadecimal format.

## Ensemble S16: Phonebook

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### Commands

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#### AT+CPBS Phonebook Storage (ver. 3)

**Description:** Set command selects phonebook memory storage <storage>, which is used by other phonebook commands. If setting fails in a ME error, **+CME ERROR:** <err> is returned.

Read command returns currently selected memory, and when supported by manufacturer, number of used locations and total number of locations in the memory.

Test command returns supported storage as compound value.

**Note:** Each one of the defined profiles corresponds to one (and only one) list of allowed callers.

**Set command:** **AT+CPBS=<storage>[,<password>]**

**Read command:** **AT+CPBS?** Displays the current <name> setting.

**Read command response:** +CPBS: <storage>

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

**Test command response:** +CPBS: (list of supported <storage>s)

**Parameters:**

<storage>:

<storage>	Function
<b>String type value</b>	Storage
<b>FD</b>	SIM fix-dialling-phonebook.
<b>LD</b>	SIM last-dialling-phonebook.
<b>ME</b>	ME phonebook.
<b>MT</b>	Combined ME and SIM phonebook. <b>Not supported</b>

<storage>	Function
<b>SM</b>	SIM phonebook.
<b>TA</b>	TA phonebook.
<b>DC</b>	ME dialled calls list.
<b>RC</b>	ME received calls list.
<b>MC</b>	ME missed calls list.
<b>MV</b>	ME Voice Activated Dialling list
<b>GR</b>	Group list. <b>Ericsson specific, not supported</b>
<b>HP</b>	Hierarchical Phonebook. <b>Ericsson specific</b>
<b>BC</b>	Own Business Card. Protected by phone lock code. <b>Ericsson specific</b>
<b>SM</b>	SIM/UICC phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the EF <sub>ADN</sub> under DF <sub>Telecom</sub> is selected. If a UICC with an active USIM application is present, the global phonebook, DF <sub>PHONEBOOK</sub> under DF <sub>Telecom</sub> is selected. <b>Not supported.</b>
<b>EN</b>	Emergency number. <b>Not supported.</b>
<b>CN</b>	SIM (or ME) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also). When storing information in the SIM/UICC, if a SIM card is present or if a UICC with an active GSM application is present, the information in EF <sub>MSISDN</sub> under DF <sub>Telecom</sub> is selected. If a UICC with an active USIM application is present, the information in EF <sub>MSISDN</sub> under ADF <sub>USIM</sub> is selected. <b>Not supported.</b>
<b>AP</b>	Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, DF <sub>PHONEBOOK</sub> under ADF <sub>USIM</sub> is selected. <b>Not supported.</b>

<password>:

<password>	Function
<b>string type</b>	Value represents the password required when selecting password protected <storage>s, for instance, PIN-2 for storage "FD".

## AT+CPBR Phonebook Read (ver. 2)

**Description:** Returns phonebook entries in location number range <index1>...<index2> from the current phonebook memory storage selected by **AT+CPBS**. If <index2> is left out, only location <index1> is returned. Entry fields returned are location number <index*n*>, phone number <number> (of format <type>) and text <text> associated with the number.

When the Received Calls List (RC), the Missed Calls List (MC) or the Dialed Calls List (DC) is selected, the two additional fields <text\_date> and <text\_time> containing date and time will be returned. In this case the <text> field containing text associated with the number has to be extracted from one of the phonebooks (SIM, ME or TA).

**Note:** Flags are used to indicate the contact field where the number is stored. See <contact\_flag> below.

**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
<b>128</b>	Unknown numbering plan, national / international number unknown
<b>129</b>	ISDN / telephony numbering plan, national/international unknown
<b>145</b>	ISDN / telephony numbering plan, international number
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128-255</b>	Other 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.

<contact\_flag>:

<contact_flag>	Description
<b>"/H"</b>	Home <b>Default setting</b>
<b>"/W"</b>	Work
<b>"/M"</b>	Mobile
<b>"/F"</b>	Fax
<b>"/O"</b>	Other

## AT+CPBF Phonebook Find (ver. 2)

**Description:** Execution command returns phonebook entries (from the current phonebook memory storage selected with **AT+CPBS**) which alphanumeric field start with string <findtext>. Entry fields returned are location number <index*n*>, phone number stored there <number> (of format <type>) and text <text> associated with the number.

**Notes:**

- Searching in DC, RC or MC storage is not supported.
- When searching in the phone, the execution command returns phonebook entries (from the current phonebook memory storage selected with **AT+CPBS**) whose first/last name field start with string <findtext>. If <findtext> is given as “xyz”, entries whose first name and/or last name field begins with “xyz” are displayed. If <findtext> is given as “ xyz” (space followed by characters), only entries whose last name field begins with “xyz” are displayed.

**Execution command:** **AT+CPBF=<findtext>**

**Execution command response:** +CPBF: <index1>,<number>,<type>,<text>[[...]<CR><LF>+CBPF: <index2>,<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
<b>128</b>	Unknown numbering plan, national / international number unknown
<b>129</b>	ISDN / telephony numbering plan, national/international unknown
<b>145</b>	ISDN / telephony numbering plan, international number
<b>161</b>	ISDN / telephony numbering plan, national number
<b>128-255</b>	Valid values, see GSM 04.08 section 10.5.4.7

<text>: String type; Field of maximum length <tlength>; character set as specified by command **AT+CSCS**.

<nlength>: Integer; maximum length of field <number>

<tlength>: Integer; maximum length of <findtext> field.

**AT+CPBW**

**Phonebook Write (ver. 3)**

**Description:**

Writes phonebook entry in location number <index> in the current phonebook memory storage selected with **AT+CPBS**. Entry fields written are phone number <number> (in the format <type>) and text <text> associated with the number. If those fields are omitted the phonebook entry is deleted.

**Notes:**

- If MV, BC or HP is the currently selected phonebook storage, **+CME ERROR: <err>** will be returned.
- DC, RC, and MC storages are not supported.
- Flags may be used to indicate the contact field where the number should be stored. If no flag is used, the phone number will be stored as type "home".
- <index> can only be used to store a new phonebook entry at a certain position if the currently selected phonebook memory is "SM". In all other storages, a new phonebook entry will always use the first free position, independent of what <index> has been set to.
- If phone is the currently selected phonebook storage and AT+CPBW is used with an <index> that is already used by another number, the old number will be overwritten and removed from whatever contact it was previously a part of.

If the phone is the currently selected phonebook storage and the following criteria are met:

- AT+CPBW is used with an <index> that is part of a certain contact, and
- all other parameters except <text> are omitted, and
- the <text> parameter differs from the name of the contact in question, then the name of the contact will be changed.

If:

- <number> parameter differs from the number of the contact in question
  - <text> parameter is the same as the contacts <text> in question
  - all the other parameters are omitted,
- then the <number> of the contact will be changed. (Note that <type> will get default value, 129, if it is omitted).

**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 <b>Default setting if dialling string does not include international access code character "+",</b>

<type>	Description
145	ISDN / telephony numbering plan, international number <b>Default setting if dialling string includes international access code character "+",</b>
161	ISDN / telephony numbering plan, national number.
128-255	Other valid values, see GSM 04.08 section 10.5.4.7

<text>: String; maximum length <tlength>. Character set as specified by **AT+CSCS**.

Flag	Description
"H"	Home <b>Default setting</b>
"W"	Work
"O"	Other
"M"	Mobile
"F"	Fax

<nlength>: Integer; maximum length of <number> field.

<tlength>: Integer; maximum length of <text> field.

## Use scenarios

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### 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.
	+CPBR: 1,"12356", 129,"Klaus" +CPBR: 2,"90510", 129,"Dieter" +CPBR: 4,"54321", 129,"Helmut" OK	Index 1 Index 2 Index 4

# Ensemble S18: GSM Clock, Date and Alarm Handling

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## Commands

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### AT+CCLK      Clock (ver. 4)

**Description:** Sets the real-time clock in the phone.

**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:ss±zz" or "yyyy/MM/dd,hh:mm:ss±zz", where characters indicate year, month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -47...+48). For instance, 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

### AT+CALA      Alarm (ver. 2)

**Description:** Sets an alarm time in the phone. 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.

The alarm time is set in hours and minutes. Date, seconds and time zone are not possible to use.

**Set command:** **AT+CALA=<time>[,<n>[,<type>],[<text>],[<recurr>],[<silent>]]]**

**Read command:** **AT+CALA?** List current active alarm settings in ME.

**Read command response**  
+CALA: [<time1>,<n1>,<type1>,[<text1>],[<recurr1>],[<silent1>]  
[+CALA: <time2>,<n2>,<type2>,[<text2>],[<recurr2>],[<silent2>]

**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 and values for them are left empty between the comma signs.

**Parameters:**

<time>: String; "hh:mm".

<n>: Integer; identifies an active alarm.

<type> **Not supported.** In commands left empty between commas.

<text> **Not supported.** In commands left empty between commas.

<recurr>:

<recurr>	Description
<1-7>[,<1-7>[...]]	For setting an alarm for one or more days in the week. '1'=Monday, '7'=Sunday. <i>Example:</i> The string "1,2,3,4,5" may be used for setting an alarm for all weekdays.
0	Sets the alarm for all days in the week.

<length>: Integer; maximum length of the <text> parameter. Always = 0 since <text> is not supported.

<rlength>: Integer; maximum length of the <recurr> parameter.

Example: `AT+CALA="14:00"`  
 OK  
`AT+CALA=?`  
`+CALA: (1-2), (), (), (13), ()`

## 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 (ver. 2)

**Description:** Controls an active alarm by either postponing or dismissing it. If more than one active alarm occurs, this command influences the last activated alarm.

**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. <b>Default setting</b>
540	Postpones the alarm (snooze) for 540 seconds (9 minutes). This is the <b>only</b> supported value.

## AT\*EDST Ericsson Daylight Saving Time

**Description:** Sets the daylight saving time hours.  
**Note:** This command affects the MS clock set with the AT+CCLK command. To avoid confusion, it is recommended that the daylight saving time (DST) is set with this command before setting the actual local time with AT+CCLK.

**Execution command:** AT\*EDST=<dst>

**Read command:** AT\*EDST? Read current daylight saving time.

**Read command response:** \*EDST: <dst>

**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. <b>Default setting</b>
1	Daylight saving time, +1 hour
2	Daylight saving time, +2 hours

## Unsolicited result codes

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### +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.

## Use scenarios

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### Alarm Functionality

AT command	Response	Comment
<a href="#">AT+CALA=?</a>		Test if the command is supported.

AT command	Response	Comment
	+CALA: 1,,0,13, (0-13) OK	Only one alarm is supported, <type> is not supported.
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+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	

## Ensemble S19: GSM Subscriber Information

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### Commands

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#### 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.

## Ensemble S20: Ericsson specific AT commands for GSM

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### Commands

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#### 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 (off). <b>Default setting</b>
1	Request for report on entered PIN is activated (on).

#### 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 key sound change (**\*EKSC**) via the <report> parameter.

By default, unsolicited key sound change result codes are disabled, <report = 0>. The default value of the <mode> parameter is determined by the phone through MMI 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),(list of supported <mode>s)

**Parameters:**

<report>:

<report>	Description
0	Key sound change report (*EKSC) disabled. <b>Default setting</b>
1	Key sound change report (*EKSC) enabled.

<mode>:

<mode>	Description
0	SILENT; no sound when a key is pressed.
1	CONTINUOUS TONE; a continuous tone while key is pressed.
2	CLICK; a click when a key is pressed.

## 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
<a href="#">AT+CCFC</a>	Call Forwarding Number and Conditions	S6
<a href="#">AT*EDIF</a>	Divert Function and Reporting	S6

**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
Integer	Number of profiles

<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. The number of profiles and the default names of the profiles are depending on the phone MMI.

**Note:** The name of the Normal profile (profile index 1) is read-only.

**Set command:** **AT\*EAPN=<name\_tag>**  
**Read command:** **AT\*EAPN?** Read the name of all the routing profiles in the phone.  
**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
Integer	Index of profile as defined in AT*EAPS.

<name\_tag>: String; name tag for the profile (for example, Home, Office, Meeting, ...).  
<nlength>: Integer; maximum length of field <name\_tag>.

## AT\*EBCA Battery and Charging Algorithm (ver. 4)

**Description:** Test the charging algorithm in the phone and turn on/off unsolicited signal result codes (**\*EBCA**). When turned on the unsolicited result code is given once per second.  
Voltage, current and capacity are physically limited, that is, they are platform dependent.  
**Note:** For batteries without internal intelligence some of the parameters listed below might not be available. In these cases the value "0" (zero) will be returned.  
**Note:** Compared to earlier versions of this command, the name of the parameter <remcapacity> has been changed to <remcapacitypercent>, because there is a new parameter showing the remaining capacity in mAh. This new parameter gets the same name as the old remaining capacity parameter, (that is, <remcapacity>).

**Execution command:** **AT\*EBCA=<onoff>**  
**Execution command response:** \*EBCA: <vbat>,<dcio>,<icharge>,<iphone>,<tempbattery>,<tempphone>,<chargingmethod>,<chargestate>,<remainingcapacity>,<remcapacity>,<powerdissipation>,<nocycles>,<nosostimer>,<suspensioncause>  
**Read command:** **AT\*EBCA?** Displays the current <onoff> setting.  
**Test command:** **AT\*EBCA=?** Shows if the command is supported.  
**Test command response:** \*EBCA: (range of <onoff>)  
**Parameters:**  
<onoff>:

<onoff>	Description
0	Disable unsolicited result code <b>*EBCA</b> . <b>Default setting</b>
1	Enable unsolicited result code <b>*EBCA</b> .

- <vbat> Battery voltage in number of mV. Range 0-65500.
- <dcio>: Battery voltage from the charger in mV. Range 0-65500.
- <icharge>: Current charge in mA. That is, a value of 1A is reported as 1000. Range 0-65500.
- <iphone>: Phone current consumption in mA. That is, a value of 1A is reported as 1000. Range 0-65500.
- <tempbattery> Signed integer. Battery temperature in °C, -20 – +70.
- <tempphone>: Signed integer. Phone temperature in °C, -20 – +70.
- <chargingmethod>: Integer.
- <chargestate>:

<chargestate>	Description
0	Start
2	Charge - Charging the battery until it is fully charged.
3	Await - The battery temperature is outside the limits for normal charging.
4	Await, extended temperature - The battery temperature is outside the limits for maintenance charging.
5	Await, safety timer - The safety timer has expired. Further charging is disabled for as long as the charger is connected.
7	Handheld - No charger is attached.
8	Charge completed - Maintaining the charge of a fully charged battery.
15	Paused - Charging is paused by the user.

- <remcapacity>: Integer. Remaining capacity in mAh.
- <remcapacitypercent>: Integer. Remaining capacity in percents. Range 0-100%.
- <powerdissipation>: Integer. The FET power dissipation in mW.
- <nocycles>: Integer. The number of completed charging cycles.
- <nosostimer>: Integer. The number of seconds on the safety timer.
- <suspensioncause>: Integer. The cause for suspension of charging.

## AT\*ELIB Ericsson List Bluetooth Devices

**Description:** Listing the Bluetooth devices registered in the phone.

**Execution command:** **AT\*ELIB**

**Execution command response:** [\*ELIB: <device1><CR><LF> [\*ELIB: <device2><CR><LF> [...]]]

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

**Parameters:**

<devicex>:

<devicex>	Description
Character string	BT device name.

## Unsolicited result codes

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### \*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

### \*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	CONTINUOUS TONE; a continuous tone while a key is pressed.
2	CLICK; a click when a key is pressed.

### \*EBCA Indication Algorithm Status (ver. 1)

**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: <vbat>,<dcio>,<icharge>,<iphone>,<tempbattery>,<tempphone>,<chargingmethod>,<chargestate>,<remainingcapacity>,<remcapacity>,<powerdissipation>,<nocycles>,<nosostimer>,<suspensioncause>

**Parameters:** See [AT\\*EBCA](#).

## Use scenarios

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### 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*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*EAPS=1		Change profile to "Normal".
	OK	

## Ensemble S26: Voice Control

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### Commands

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#### AT\*EVAA      Voice Answer Active (ver. 1)

**Description:**      Activates and deactivates the voice answering function for the chosen type.

**Note:** If the Voice Answer function is activated and the associated voice tag has not yet been trained, the phone returns ERROR

**Set command:**      **AT\*EVAA=<type>,<onoff>**

**Read command:**    **AT\*EVAA?**

**Read command response:**    EVAA: <type1>,<onoff1>[<CR><LF>  
EVAA: <type2>,<onoff2>[<CR><LF>  
...]]

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

**Test command response:**    \*EVAA: (list of supported <type>s),(list of supported <onoff>s)

**Parameters:**

<type>:

<type>	Description
0	Car handsfree
1	Portable handsfree
2	Speakerphone

<onoff>:

<onoff>	Description
0	Deactivate voice answering function. <b>Default setting</b>
1	Activate voice answering function.

## AT\*EMWS

### Magic Word Set

**Description:**

Activates the Magic Word function. When activated, the voice recognizer continuously listens for the trained magic word. When the magic word is detected, the complete voice control functionality is activated.

**Set command:**

**AT\*EMWS=<type>,<onoff>**

**Read command:**

**AT\*EMWS?**

**Read command response:**

EMWS: <type1>,<onoff1>[<CR><LF>  
EMWS: <type2>,<onoff2>[<CR><LF>  
...]]

**Test command:**

**AT\*EMWS=?** Shows if the command is supported.

**Test command response:**

\*EMWS: (list of supported <type>s),(list of supported <onoff>s)

**Parameters:**

<type>:

<type>	Description
0	Car handsfree
1	Portable handsfree
2	Speakerphone

<onoff>:

<onoff>	Description
0	The magic word function is not activated. <b>Default setting</b>
1	The magic word function is activated.

# Ensemble S27: OBEX

## Commands

### AT+CPROT      Enter protocol mode

**Description:** Set command informs TA that TE wants to establish a peer-to-peer protocol <proto> or upper layer connection (indicated by the <lsap> settings) with the ME on the link from which the command was received. This command can be used in case the link between TE and ME does not provide such a mechanism itself.

If ME has succeeded in establishing a logical link between application protocols and external interface, it will send CONNECT message to the TE. Otherwise, the NO CARRIER response will be returned.

If the CONNECT response is received, TE can start sending <proto> or upper layer frames.

The connection shall always return to <proto> mode when the protocol session is ended. When the ME receives a disconnect request from its peer entity, it will process it and send OK response to the TE indicating its capability for receiving new AT commands. Since <proto> or upper layers can be accessed in other ways, TA must have prior knowledge of the fact that connection is initiated with AT+CPROT command. This means that switch to <proto> mode must include some sort of notification to the protocol entity.

This command can be aborted by sending a <proto> or upper layer disconnection frame. In that case, ME will return into command mode by sending the OK response.

**Set command:**      **AT+CPROT=<proto>[,<version>[,<lsap1>[,...[<lsapN>]]]]**

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

**Test command response:**    +CPROT: <proto1>[(list of supported <version>s)[,(list of supported <lsap1>s)[,...[(list of supported <lsapN>s)]]]]<CR><LF>

+CPROT: <proto2>[(list of supported <version>s)[,(list of supported <lsap1>s)[,...[(list of supported <lsapN>s)]]]]

**Parameters:**

<proto>:

<proto>	Description
0	OBEX

<version>:

<version>	Description
String	Version number of <proto>. <b>Note:</b> The total number of characters, including line terminators, in the information text shall not exceed 16 characters.

<version>	Description
...	Only value supported in 3G1.

<lsap1>:

<lsap1>	Description
<b>Integer type</b>	Defines a level of service or application protocol on the top of <proto> layer. It may refer to services or protocols defined in other standards development organisations (SDOs).
<b>8</b>	IrMC level 1, 2 and 4 (Minimum, Access and Sync Levels) Only-implies unique index support.

<lsap2>...<lsapN>:

<lsap2>...<lsapN>	Description
<b>Integer type</b>	In case <lsapN>, <lsapN+1> received in the +CPROT command identifies protocol layers, the protocol identified by N+1 shall be on the top of the protocol identified by N on a framework point of view.

## Ensemble S29: WAP Browser

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### Commands

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#### 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>:

<sec>	Function
<b>Integer</b>	Number of seconds. Range: 15-300.

**AT\*EWBA WAP Bookmark Add (ver. 2)**

**Description:** Adds or deletes a bookmark in the list of bookmarks. To add a bookmark the <option> parameter is set to 1. To delete a bookmark, <option> is set to 0. If the <title>-parameter is omitted the bookmark title is set to the first <ntitle> number of characters of the <URL>. **Note:** The bookmarks added with this command are added to all WAP-profiles in the phone.

**Set command:** AT\*EWBA=<option>,<URL>[,<title>]

**Read command:** AT\*EWBA? List number of bookmarks.

**Read command response:** \*EWBA: <nBookmarks>

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

**Test command response:** \*EWBA: (list of supported <options>),<nURL>,<ntitle>,<MaxBookmarks>

**Parameters:**

<option>:

<option>	Description
0	Deletes a bookmark
1	Adds a bookmark

<url>:

String; the URL representing the bookmark.

<nurl>:

Integer; maximum length of the <url> parameter.

<title>:

String; The title representing the bookmark. If omitted the bookmark title is set equal to the first <ntitle> number of characters of the <URL>.

<ntitle>:

Integer; Maximum length of the <title> parameter

**AT\*EWCT WAP Connection Timeout**

**Description:** Sets timeout time used when connecting to a WAP supplier, that is 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>:

<sec>	Description
Integer	Number of seconds.
60-300	Valid values.

## Use scenarios

---

### WAP Browser Settings

AT command	Response	Comment
AT*EWDT=10		Set download timeout to 10 seconds.
	OK	
AT*EWCT=10		Set connection timeout to 10 seconds.
	OK	

## Ensemble S35: Sony Ericsson commands

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### Commands

---

#### AT\*SEACC      Accessory Class Report

**Description:** This AT command is used to inform the MS about the attachment of an accessory at its downstream port. The command reports the measured value according to the resistive identification mechanism. The value is the 8 bit number produced by the A/D converter. It is the responsibility of the MS to interpret this value as an accessory category.

**Execute command:** AT\*SEACC=<rid\_value> Report resistive id value.

**Test command:** AT\*SEACC=? Test if command is supported and show supported parameters

**Test command response:** \*SEACC:(range of supported <rid\_value>s)

**Parameter:**

<rid\_value>:

<rid_value>	Description
0-255	The resistive id value measured by the A/D converter in the accessory

## AT\*SEACID      Accessory Identification

**Description:** This command replaces AT\*EACS and is used by an accessory to inform the phone about its exact identity. This id shall be used by the phone to activate specific functionality that is required by the accessory.

**Note:** The audio settings in the phone are made according to the audio identity transmitted from the accessory with AT\*SEAUDIO

**Note:** This command may **not** be used by Bluetooth accessories. The <acc\_id> list contain bluetooth accessories only because AT\*SEACID2 is using the same list.

**Execute command:** AT\*SEACID=<acc\_id>

**Test command:** AT\*SEACID=? Test if command is supported and show supported parameters

**Test command response:** \*SEACID: (Range of accessory id's)

**Parameter:**

<acc\_id>:

<acc_id>	Description
0 - 2 <sup>32</sup>	The unique identity of the accessory
1000-1999	Camera Flashes
2000-2999	Input device
3000-3999	Gaming accessories
4000-4999	Imaging
5000-5999	VHF - Vehicle Handsfree
6000-6999	PHF - Portable Handsfree
7000-7999	Gadget
8000-8999	BVHF
9000-9999	BVHF - Budget Vehicle Hands Free (without accessory mic)
10000-10999	BT - Bluetooth Headset, or Handsfree
11000-11999	BTC - Bluetooth Handsfree for installation in car
12000-12999	BTL - Bluetooth Leisure (BT headset supporting the Advanced Audio Distribution Profile)
13000-13999	BTBTL - A Bluetooth audio device supporting the Headset or the Handsfree profile and the Advanced Audio Distributionprofile.
14000-14999	BTBTLC - A Bluetooth audio device supporting the Headset or the Handsfree profile and the Advanced Audio Distributionprofile for installation in car
15000-15999	DSS - Desk Speaker Stand
16000-16999	BDSS - Budget Desk Speaker Stand
17000-17999	LO - Line out accessory
18000-18999	LI - Line in accessory

## AT\*SEAUDIO Accessory Class Report

**Description:** This command is used to inform the phone about the general audio class and the unique audio id of an accessory. If there is a specific audio settings container available for the unique id, the phone shall use that configuration. If not, the configuration for the general audio class shall be used. When the accessory identifies itself acoustically with AT\*SEAUDIO the phone shall respond with a result code indicating what audio class and what unique audio id have been used when configuring audio. If no specific audio configuration was available for the unique audio id used by the accessory this shall be indicated by setting <unique\_audio\_id>=0 in the result code. If the accessory for some reason do not have audiocapabilities it will send AT\*SEAUDIO=0,0.

**Execute command:** AT\*SEAUDIO=<audio\_class>,<unique\_audio\_id>

**Execute command response** \*SEAUDIO:<audio\_class>,<unique\_audio\_id>

**Read command:** AT\*SEAUDIO? Read current setting

**Test command:** AT\*SEAUDIO=? Test if command is supported and show supported parameters

**Test command response:** \*SEAUDIO:(range of supported <audio\_class>s),(range of supported <unique\_audio\_id>s)

**Parameters:**

<audio\_class>:

<audio_class>	Description
0-255	The default audio class of the accessory
0	The accessory has no audio capabilities
1	PHF - Portable Handsfree
2	VHF - Vehicle Handsfree
3	BVHF - Budget Vehicle Handsfree (without accessory mic)
4	BT - Bluetooth Headset, or Handsfree
5	BTC - Bluetooth Handsfree for installation in car
6	BTL - Bluetooth Leisure (BT headset supporting the Advanced Audio Distribution Profile)
7	BTBTL - A Bluetooth audio device supporting the Headset or the Handsfree profile and the Advanced Audio Distributionprofile
8	BTBTLC - A Bluetooth audio device supporting the Headset or the Handsfree profile and the Advanced Audio Distributionprofile for installation in car
9	DSS - Desk Speaker Stand
10	BDSS - Budget Desk Speaker Stand
11	LO - Line out accessory
12	LI - Line inaccessory

<audio\_id>:

<audio_id>	Description
<b>0-2<sup>32</sup></b>	The unique audio identity of the accessory
<b>0</b>	Used in response codes to indicate that the terminal has not applied a specific audio configuration for the unique audio id of the accessory
<b>1-999</b>	<b>Note:</b> Reserved for internal use in the telephone
<b>1</b>	PHF1 ( <b>Note:</b> Not to be used by any accessory!)
<b>2</b>	PHF2 ( <b>Note:</b> Not to be used by any accessory!)
<b>3</b>	PHF3 ( <b>Note:</b> Not to be used by any accessory!)
<b>4</b>	PHF4 ( <b>Note:</b> Not to be used by any accessory!)
<b>5</b>	Line in ( <b>Note:</b> Not to be used by any accessory!)
<b>6</b>	Line out ( <b>Note:</b> Not to be used by any accessory!)
<b>7</b>	BT Headset ( <b>Note:</b> Not to be used by any accessory!)
<b>8</b>	BT Handsfree ( <b>Note:</b> Not to be used by any accessory!)
<b>1000-1999</b>	PHF - Portable handsfrees
<b>2000-2999</b>	VHF - Vehicle handsfrees
<b>3000-3999</b>	BVHF - Budget Vehicle Handsfree (without accessory mic)
<b>4000-4999</b>	BT - Bluetooth headset or handsfree
<b>5000-5999</b>	BTC - Bluetooth handsfree for installation in car
<b>6000-6999</b>	BTL - Bluetooth Leisure (BT headset supporting the Advanced Audio Distribution Profile)
<b>7000-7999</b>	BTBTL - A Bluetooth audio device supporting the Headset or the Handsfree profile and the Advanced Audio Distribution Profile
<b>8000-8999</b>	BTBTLC - A Bluetooth audio device supporting the Headset or the Handsfree profile and the Advanced Audio Distribution Profile for installation in car
<b>9000-9999</b>	DSS - Desk Speaker Stand
<b>10000-10999</b>	BDSS - Budget Desk Speaker Stand
<b>11000-11999</b>	LO - Line out accessory
<b>12000-12999</b>	LI - Line in accessory

**AT\*SECHA****Charging Control****Description:**

This command is used by the accessory to tell the phone to pause the charging of the battery. During the pause the accessory will perform the measurement according to the AID mechanism to identify the new accessory attached.

If the charging is not switched on again the charging pause will time out and the charging resume anyway.

**Execute command:** **AT\*SECHA=<time>**

**Test command:** **AT\*SECHA=?** Test if command is supported and show supported parameters

**Test command response:** \*SECHA: (range of supported <time>s)

**Parameter:**

<time>:

<time>	Charging mode
0	Charging resumed. <b>Default value.</b>
1-5000	Charging shall be paused for the number of milliseconds stated in this parameter.

## AT\*SELOG SE Read Log

**Description:** This command reads the customisation log file placed in tpa/preset/log.txt  
The result is encoded into a hexadecimal representation.

**Execute command:** **AT\*SELOG**

**Command responses:** \*SELOG:[<data>]  
SELOG:<ecode>,<nr\_of\_bytes>

**Test command:** **AT\*SELOG=?** Shows if the command is supported

**Parameters:**

<data>:

<data>	Description
<b>Character string</b>	Each byte of data is encoded into a hexadecimal number represented by two characters.

<ecode>:

<ecode>	Description
<b>0-63</b>	Valid values
0	No error
1	Operation not permitted
2	No such file or directory
20	Not a directory
28	Not enough space

<nr\_of\_bytes>:

<nr_of_bytes>	Description
<b>Integer number</b>	The number of bytes that was read, that is, the size of the file.

**AT\*SEPING SE Ping command**

**Description:** This command is used to inform accessories if the AT Command Server in the "application" part of the phone is up and running (there are two AT command servers in the phone, one in the "platform" and one into the application part of the phone, this command regards the AT command server in the "application" part)

**Note:** OK response does not necessarily mean that all AT commands are supported. For instance, if the phone is in charging only mode or waiting for pin verification, only a limited set of AT commands are accepted.

**Execute command:** AT\*SEPING

**Test command:** AT\*SEPING=? Test if command is supported.

**AT\*SEAULS SE Audio Line Status**

**Description:** AT\*SEAULS provides information about the audio line status and audio type. With the set command, it is possible to enable the unsolicited \*SEAULSI.

\*SEAULSI is sent each time either the audio channel switches accessory or when some audio starts/stops playing. Audio line status = 1 is sent to the accessory that has the audio authority and 0 to the rest. The audio type value is sent to all accessories that subscribes on \*SEAULSI.

**Set command:** AT\*SEAULS = <activation>

**Set command response:** \*SEAULS:<activation>,<audio\_line>,<audio\_type>

**Read command:** AT\*SEAULS?

**Read command response:** \*SEAULS:<activation>,<audio\_line>,<audio\_type>

**Test command:** AT\*SEAULS=? Test if command is supported and show supported parameters

**Test command response:** \*SEAULS: (list of supported <activation>s)

**Parameter:**  
<activation>:

<activation>	Description
0	Disable audio status indication (*SEAULSI)
1	Enable audio status indication (*SEAULSI)

<audio\_line>:

<audio_line>	Description
0	Audio line inactive
1	Audio line active

<audio\_type>:

<audio_type>	Description
0	No audio

<audio_type>	Description
1	Speech
2	Media

## AT\*SEFUNC SE Functionality status (ver. 1)

**Description:** This command is used to get the mode and different states of the ME. Only one <mode> may be active, but <states> are bit flags so combinations of them are possible. The unsolicited \*SEFNCI is triggered when a <mode> is changed or when a <states> value is changed, and will be sent to subscribing accessories. The different <states> are bitflags, hence more than one state is possible. More parameters for <states> will be supported as phones evolve.

**Set command:** AT\*SEFUNC = <activation>

**Set command response:** \*SEFUNC: <activation>, <mode>, <states>

**Read command:** AT\*SEFUNC?

**Read command response:** \*SEFUNC: <activation>, <mode>, <states>

**Test command:** AT\*SEFUNC=? Test if command is supported and show supported parameters

**Test command response:** \*SEFUNC: (list of supported <activation>), (list of supported <mode>),(list of supported <states>)

**Parameter:**

<activation>:

<activation>	Description
0	Disable functional status indication (*SEFNCI)
1	Enable functional status indication (*SEFNCI)

<mode>:

<mode>	Description
0	Shutdown mode
1	Charging only mode
2	Normal mode

<states>:

<states>	Description	Comments
1	Waiting for pin	Phone is waiting for pin1 confirmation, Note that if pin1 is disabled this flag will never be set
2	Waiting for security code	Phone is waiting for security code confirmation, note that if it's disabled this flag will never be set. <b>NOT SUPPORTED</b>

<states>	Description	Comments
4	Bluetooth	Bluetooth is activated. <b>NOT SUPPORTED</b>
8	GSM	The GSM radio is active. <b>NOT SUPPORTED</b>
16	UMTS	The UMTS radio is active. <b>NOT SUPPORTED</b>
32	WCDMA	The WCDMS radio is active. <b>NOT SUPPORTED</b>
64	WLAN	WLAN is active. <b>NOT SUPPORTED</b>
128	FM Radio	The FM radio is active. <b>NOT SUPPORTED</b>
256	...	...
...	...	...

## AT\*SEFIN SE Flash Information

### Description:

This command informs the ME about:

- Capacity in terms of the standardized photometric term Guide Number.
- Min/max exposure is the minimum and maximum value that the flash can handle. These are the values that are used by AT\*SEFEXP.
- Color Temperature of the flash light given as hundreds of Kelvin.

The ME use this input to make appropriate settings in the camera module.

**Execute command:** AT\*SEFIN=<guide\_number>,<min\_exposure>,<max\_exposure>,<color\_temp>

**Test command:** AT\*SEFIN=? Test if command is supported and show supported parameters

**Test command response:** \*SEFIN=(list of supported <guide\_number>s),(list of supported <min\_exposure>s),(list of supported <max\_exposure>s),(list of supported <color\_temp>s)

### Parameter:

<guide\_number>:

<guide_number>	Description
0-255	The Guide Number of the flash @ ISO100

<min\_exposure>:

<min_exposure>	Description
0-255	Minimum value of exposure that the flash can handle.

<max\_exposure>:

<max_exposure>	Description
0-255	Maximum value of exposure that the flash can handle.

<color\_temp>:

<color_temp>	Description
0-255	The Color Temperature of the flash in hundreds of Kelvin (for example, 6500K gives color_temp=65)

## AT\*SEFEXP Flash auto Exposure setting from ME

**Description:** This command requests informs from the ME about to what level the Flash should make the picture brighter or darker by adjusting its auto exposure control circuit.  
The Flash uses this input to make appropriate settings in its auto exposure control circuit.

**Note:** The unsolicited result code \*SEFEXP shall be sent once when the AT\*SEFEXP is issued (and only if AT\*SEFEXP is called when the flash is plugged in).

**Set command:** AT\*SEFEXP

## AT\*SEMOD Camera mode indicator to the flash

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**Description:** This command request for information from the ME, if it is in a mode were the Flash should be charged up and ready. The Flash uses this input to start or abort charging of its internal capacitor.

**Note:** With this command it is only possible to turn on request for unsolicited result codes.

**Execute command:** AT\*SEMOD

**Response:** Unsolicited result code. \*SEMOD=<action>

**Parameter:**

<action>:

<action>	Description
0	ME is not in a mode were the flash has to be ready to fire. The flash disables its charging.
1	ME is in a mode were the flash has to be ready to fire. The flash starts to charge if not already charged up.

## AT\*SEREDI Red Eye reduction Indicator to the flash

**Description:** This command performs the following:

- Informs the ME that it supports red eye reduction with a certain time out period.
- Requests information from the ME when red eye reduction should start (as an unsolicited event).

**Set command:** AT\*SEREDI=<time\_out>

**Test command:** **AT\*SEREDI=?** Test if command is supported and show supported parameters

**Test command response:** \*SEREDI: (list of supported <time\_out>s)

**Unsolicited result code:** \*SEREDI

**Parameter:**  
<time\_out>:

<time_out>	Description
0...65535	The timeout period in ms between that the red eye reduction flashes has finished to that the picture is about to be taken.

## AT\*SEFRY Ready indicator to the ME

**Description:** This command informs the ME if the camera flash is ready to fire or not.

**Command:** **AT\*SEFRY=<action>** ; the flash informs the ME whether it is ready to fire or not.

**Test command:** **AT\*SEFRY=?** Test if command is supported and show supported parameters

**Test command response:** \*SEFRY=(list of supported <action>s)

**Parameter:**  
<action>:

<action>	Description
0	The flash is not ready to fire by means of a strobe signal through the system connector.
1	The flash is ready to fire on a strobe signal through the system connector.

## Unsolicited result codes

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### \*SEFEXP Flash auto exposure setting Result Code

**Description:** This unsolicited result code is returned when the flash auto exposure circuitry has been set in order to make picture lighter or darker. The result code is activated using **AT\*SEFEXP**.

**Unsolicited result code:** \*SEFEXP=<exposure>

**Parameter:**  
<exposure>:

<exposure>	Description
0-255	New auto exposure amount according to control circuit algorithm.

**\*SEMOD**      **Camera mode indicator Result Code**

**Description:** This unsolicited result code is returned when a user has set the flash in correct mode of operation using **AT\*SEMOD**.

**Unsolicited result code:** **\*SEMOD:** <action>

**Parameter:**  
<action>:

<mode>	Description
0	ME is not in a mode were the flash has to be ready to fire. Flash disables its charging.
1	ME is in a mode were the flash has to be ready to fire. Flash starts its charging if not already charged up.

**\*SEREDI**      **Red-eye reduction Result Code**

**Description:** After \*SEREDI is sent to the flash the HW strobe signal has to come within the time “time\_out” described for the AT command. This is for the red-eye reduction to have effect (fire the flash while the pupils are contracted). If the strobe comes after time out period the flash will fire anyway but the red-eye reduction effect will be less (pupils have started to dilate again). The result code is activated using **AT\*SEREDI**.

**Unsolicited result code:** \*SEREDI

**\*SEAULSI**      **Audio line status Result Code**

**Description:** Unsolicited result code that is sent when mute has been changed or audio line has been lost or received. The result code is activated using **AT\*SEAULS**.

**Unsolicited result code:** \*SEAULSI:<audio\_line>,<audio\_type>

**\*SEFUNCI**      **Functionality status Result Code**

**Description:** Unsolicited result code that is sent when functionality status has been changed. The result code is activated using **AT\*SEFUNC**.

**Unsolicited result code:** \*SEFUNCI: <mode>, <states>

# OBEX Formats

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## OBEX File System Overview

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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.

File name	Description	Supported operations
<b>Device Info</b>		
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
<b>Phonebook</b>		
telecom/pb.vcf	Level 2 access (Access entire phone book 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
<b>Calendar</b>		
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

# eMelody Format

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## 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>
"NAME:"<name><CR><LF>
"COMPOSER:" <composer><CR><LF>
"VERSION:" <version><CR><LF>
"MELODY:"<melody><CR><LF>
"END:EMELODY"
```

**File extension:** emy

**Example file name** mymelody.emy

**Parameters:**

<version>: "1.0"

<name>: Alphanumeric string

<composer>: Alphanumeric string

<melody>: {<pause>|<tone>}

<pause>: "p"

<tone>: {[<octave\_prefix>]<basic\_tone>}

<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"|"(b)B"

<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>: "+"

Maximum number of 40  
tones:

Maximum numbers of 120  
characters in melody:

**Example:**

```
BEGIN:EMELODY
VERSION:1.0
NAME:Test melody 1
COMPOSER:John Smith
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
```

# iMelody Format

---

## iMelody Object

**Description:** This is a definition of the iMelody object. This object is used when a user-defined melody is exchanged

**Syntax:**

```
<imelody-object>
"BEGIN:IMELODY"<CR><LF>
"VERSION:" <version><CR><LF>
"FORMAT:"<format>
["NAME:"<name><CR><LF>]
["COMPOSER:" <composer><CR><LF>]
["BEAT:"<beat>]
["STYLE:"<style>]
["VOLUME:"<volume>]
"MELODY:"<melody><CR><LF>
"END:IMELODY"
```

**File extension:** imy

**Example file name** mymelody.imy

**Parameters:**

**<version>:** "1.0"

**<format>:** "CLASS1.0" | "CLASS2.0"

**<name>:** Alphanumeric string

**<composer>:** Alphanumeric string

**<beat>:** "25" | "26" | "27" | ... | "899" | "900"

**<style>:** "S0" | "S1" | "S2"

**<volume>:** V0" | "V1" | ... | "V15" | "+" | "-"

(+/- indicates volume change relative to current. Default is current)

**<melody>:** {<silence>|<note>|<led>|<vib>|<backlight>|<repeat>}+

**<silence>:** <rest ><duration>[<duration-specifier>]

**<rest>:** "r"

**<duration>:** "0" | "1" | "2" | "3" | "4" | "5"

**<duration-specifier>:** "." | ":" | ";"

**<note>:** [<octave-prefix>]<basic-ess-iss-note><duration>[<duration-specifier>]

**<octave-prefix>:** "\*0" | "\*1" | ... | "\*8"

((A=55Hz) | (A=110Hz) | ... | (A=14080 Hz))

**<basic-ess-iss-note>:** <basic-note> | <ess-note> | <iss-note>

**<basic-note>:** "c" | "d" | "e" | "f" | "g" | "a" | "b"

**<ess-note>:** "&d" | "&e" | "&g" | "&a" | "&b"

(flat notes)

**<iss-note>:** "#c" | "#d" | "#f" | "#g" | "#a"

(sharp notes)

<led>: "ledoff" | "ledon"  
 <vibe>: "vibeon" | "vibedoff"  
 <backlight>: "backon" | "backoff"  
 <repeat>: "(" | ")" | "@<repeat-count>  
  
 (start of repeat block, end of repeat block and repetition count)  
 <repeat-count>: "0" | "1" | "2" | ...  
  
 (0 is repeat forever)

Maximum number of 40

notes:

Maximum numbers of 120  
characters in melody:

*Example:* BEGIN:IMELODY  
 VERSION:1.0  
 NAME:Melody1  
 COMPOSER:Mozart  
 BEAT:120  
 STYLE:1  
 VOLUME:7  
 MELODY:&b2#c3-c2\*4g3d3+#d1r3d2e2:d1+f2f3  
 END:IMELODY

## vCard Format

---

The vCard object 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.irda.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>
"VERSION:"<version><CR><LF>
"N:"<encoding>";<character_set>":"<name><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 file name:** 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
```

## vNote Format

---

**Syntax:**

```
<vnote-object>
"BEGIN:VNOTE<CR><LF>
"VERSION:"<version><CR><LF>
["X-IRMC-LUID:"<x_irmc_local_unique_identifier><CR><LF>]
"N:"<encoding>";<character_set>":"<name><CR><LF>
["FN:"<encoding>";<character_set>":"<formatted_name><CR><LF>]
["TEL:"<telephone_number><CR><LF>]

"END:VCARD"
```

**File extension:** vnt

**Example file name:** scribble.vnt

**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\_ircm\_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
```

## vCalendar Format

---

The vCalendar standard is available from the Infrared Data Association at <http://www.irda.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 file name:** filename.vcs

**VEVENT** See **vEvent** Object.

**Parameters:**

<version>: "1.0"

<prodid>: "Sony Ericsson Calendar 1.0"

*Example*vCalendar vEvent  
object (MEETING):

```

BEGIN:VCALENDAR
VERSION:1.0
PRODID:Sony 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:In 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 leave 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 19960415T083000. 8:30 AM on April 15, 1996 local time.

<date\_and\_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.

# Appendix – W600, W550, W900, W810, K510, K310, Z530, W300, Z550, Z558, K320 and W200 series

This chapter contains information about specific AT commands for the W600, W550, W900, W810, K510, K310, Z530, W300, Z550, Z558, K320 and W200 series. The AT commands in this chapter are new, updated or removed compared to those in the K750 series. See chapter "AT commands" for commands that are not described in this appendix, as they are unchanged from the K750.

# New AT commands

## Ensemble S35: Sony Ericsson commands

### Commands

#### AT\*SEVOL Volume Level

**Description:** This command is used to set the volume for all different sound types in the ME. Each setting is responded with **\*SEVOL** for information to accessories that the volume has changed.

**Set command:** **AT\*SEVOL=<sound type>,<level>**

**Display current settings command** **AT\*SEVOL?**  
**\*SEVOL:1,<level>**  
**\*SEVOL:2,<level>**  
**\*SEVOL:3,<level>**

**Test command:** **AT\*SEVOL=?**

**Test command response** Shows if the command is supported.  
**\*SEVOL:1,(0-8)**  
**\*SEVOL:2,(0-8)**  
**\*SEVOL:3,(0-15)**

**Parameter:**  
 <sound\_type>:

<sound_type>	Description	<level> range
1	Ring volume	0-8
2	Call volume	0-8
3	Media volume	0-15

#### AT\*SEVOLIR Volume Indication Request

**Description:** This command is used to activate or deactivate subscription to volume levels for all different sound types in the ME. Each setting is responded with **\*SEVOL** for information to accessories that the volume has changed.

**Activation command:** **AT\*SEVOLIR=<activation>**  
 Request to subscribe or stop subscribing for volume levels for all sound types in the ME.

**Activation command** \*SEVOLIR:1,<level>  
**response:** \*SEVOLIR:2,<level>  
 \*SEVOLIR:3,<level>

**Read command:** **AT\*SEVOLIR?** Display current settings.  
 \*SEVOLIR:<activation>

**Test command:** **AT\*SEVOLIR=?**

**Test command response** Shows if the command is supported.  
 \*SEVOLIR:(0,1)

**Parameter:**  
 <activation>:

<activation>	Description
0	Deactivate subscription
1	Activate subscription

## AT\*SEBIC Status Bar Icon

**Description:** The AT\*SEBIC command is used to control the status bar images to be shown. The <image> parameter points out the image and the <show> parameter states if the image shall be shown or not.

**Set command:** **AT\*SEBIC=<image>,<show>**

**Test command:** **AT\*SEBIC=?**

**Test command response** Shows if the command is supported.  
 \*SEBIC: (list of supported <image>s)

**Parameter:**  
 <image>:

<image>	Description
1	Radio image in status bar

<show>:

<show>	Description
0	Do not show
1	Show

## Unsolicited result codes

---

### \*SEVOLI Volume Level Result Code

**Description:** This result code is sent every time a change in volume level occurs for any sound type. The result code carries information of the sound type and the volume level. The sound types and their corresponding volume level ranges are listed in the table below.

**Unsolicited result code:** \*SEVOLI<sound type>,<level>  
When the volume level of any sound type has changed.

**Parameter:**  
<sound\_type>:

<sound_type>	Description	<level> range
1	Ring volume	0-8
2	Call volume	0-8
3	Media volume	0-15

# Updated AT commands

## Ensemble S6: GSM Network Services

---

### Commands

---

#### AT\*EDIF Divert Function (VER. 2)

**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.

### Unsolicited result code

---

#### \*EDIF Divert Function (VER. 2)

**Description:** This unsolicited result code will be generated when a divert notification is sent from the network provider. These notifications could be sent when a service is activated, deactivated or interrogated.

If a notification affects more than one class, then the <classx> will be reported as a sum of the affected classes. If for example no bearerservice is activated the unsolicited report code will be:

\*EDIF: 0, 0, 240,"",0

The phonenumber, <number>, will be empty and the <type> will be set to zero if a service is erased. If a service is registered but not activated the response will contain the registered <number> and the <type>.

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

**Parameters:**

<reason>:

<reason>	Description
<b>0</b>	<b>Unconditional</b> (CFU - Call Forwarding Unconditional). This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber directory number to another directory number. CFU forwards all calls without regard to the condition. It does not matter if the phone is switched off or not.
<b>1</b>	<b>Mobile busy subscriber</b> (CFB - Call forwarding on mobile busy subscriber). This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber directory number and which meet mobile subscriber busy to another directory number.
<b>2</b>	<b>No reply</b> (CFNny - Call forwarding on no reply). This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber directory number and which meet no reply to another directory number.
<b>3</b>	<b>Not reachable</b> (CFNrc - Call forwarding on not reachable). This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber directory number, but which is not reachable, to another directory number.
<b>4</b>	<b>All call forwarding.</b> This code describes all call forwarding services and is used in the deactivation command dialogue, that is, if a user disable all services in one action.
<b>5</b>	<b>All conditional call forwarding.</b> This code describes all conditional call forwarding services.

<status>:

<status>	Description
<b>0</b>	Disabled

<status>	Description
1	Enabled. The phone is diverted for the <reason> above.

<classx>: Integer. Bit field representing the affected service.

<classx>	Description
1	Voice L1 (teleservice)
2	Data (teleservice)
4	Fax (teleservice)
8	SMS (teleservice)
16	Data circuit sync (bearerservice)
32	Data circuit async (bearerservice)
64	Dedicated packet access (bearerservice)
128	Dedicated PAD access (bearerservice)

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

<type>: Integer; type of address octet.

<type>	Description
Integer	Type of address octet in integer format. <b>Default</b> is 145 when dialing string includes international access code character '+', otherwise 129. <b>Note:</b> Some network providers force the type of number to international, that is, '+' will always be appended and the <type> will be set to 145, regardless of the format of the input. * Output MSB TypeOfNumber NumberPlanID * 128 0x80 0 (unknown) 0 (unknown) * 129 0x80 0 (unknown) 1 (ISDN/Telephony) * 144 0x80 1 (international) 0 (unknown) * 145 0x80 1 (international) 1 (ISDN/Telephony) * 161 0x80 2 (national) 1 (ISDN/Telephony)

# Ensemble S9: Mobile Equipment, Control and Status

## Commands

### AT+CKPD      Keypad Control (ver. 7)

**Description:** Execution command emulates ME keypad by giving each keystroke as a character in a string <keys>. <time>\*0.1 seconds is the time to strike each key, and <pause>\*0.1 seconds is the length of pause between two strokes. This command should be accepted (OK returned) before actually starting to press the keys. Thus unsolicited result codes of keys that have been pressed and display events can be returned (see [AT+CMER](#)). The physical keypad shall always have higher priority than emulation of keystrokes via AT+CKPD. That is, if the physical keypad is operated during execution of a series of keystrokes generated by AT+CKPD the emulated keypad operation is to be terminated immediately.

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

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

**Parameters:**  
 <keys>: String of characters representing keys as listed in the following table (based on PCCA STD-101 Annex table I-3). Colon character (IRA 58) followed by one character can be used to indicate a manufacturer specific key not listed here. All characters from a semicolon character (IRA 59) to the next single semicolon characters are treated as alpha entries and are not converted to key equivalents. All semicolon characters inside alpha entries should be duplicated in the TE and stripped to one before entering to the ME. All IRA values not listed here are reserved.  
**Note:** The SEND and END keypad values should be mapped to appropriate keys.  
**Note:** The default GSM character set does not contain the “[“ and “]” characters used to emulate the left and right selection keys. Before sending any of these keys with AT+CKPD, the character set needs to be changed, for example to 8859-1 by sending the command AT+CSCS="8859-1".

Char	IRA (dec)	Comment (+ some known key symbols)
#	35	Hash (number sign)
*	42	Star (*)
0... 9	48... 57	Number keys
:	58	Escape character for manufacturer specific keys
<	60	Left arrow
>	62	Right arrow

Char	IRA (dec)	Comment (+ some known key symbols)
<b>C/c</b>	67/99	Clear display (C/CLR)
<b>D/d</b>	68/100	Volume down
<b>L/l</b>	76/108	phone lock (LOCK) <b>If supported by ME</b>
<b>P/p</b>	80/112	Power (PWR)
<b>U/u</b>	85/117	Volume up
<b>V/v</b>	86/118	Down arrow
<b>[</b>	91	Soft key 1
<b>]</b>	93	Soft key 2
<b>^</b>	94	Up arrow
<b>:J</b>	58+74	Joystick button pressed
<b>:C</b>	58+99	Camera button
<b>:O</b>	58+79	Operator button
<b>:R</b>	58+82	Return button
<b>H/h</b>	200	Button pushed on the MC link (Blue-tooth) headset
<b>:M</b>	58+77	video call <b>If supported by ME</b>
<b>:F</b>	58+70	camera focus (camera key half press) <b>If supported by ME</b>
<b>:(</b>	58+40	flip closed <b>If supported by ME</b>
<b>:)</b>	58+41	flip opened <b>If supported by ME</b>
<b>:{</b>	58+123	camera lens cover closed <b>If supported by ME</b>
<b>:}</b>	58+125	camera lens cover opened <b>If supported by ME</b>
<b>:[</b>	58+91	Jack knife closed <b>If supported by ME</b>
<b>:]</b>	58+93	Jack knife closed <b>If supported by ME</b>
<b>:D</b>	58+68	multi task button (shortcut to desktop) <b>If supported by ME</b>
<b>:L</b>	58+76	flash lamp button <b>If supported by ME</b>
<b>:P</b>	58+80	"Push to talk" button <b>If supported by ME</b>
<b>:S</b>	58+83	media player button <b>If supported by ME</b>
<b>:=</b>	58+61	fire (gamepad)
<b>:&lt;</b>	58+60	up left (gamepad)
<b>: </b>	58+124	up right (gamepad)

Char	IRA (dec)	Comment (+ some known key symbols)
:V	58+86	down left (gamepad)
:>	58+62	down right (gamepad)
:1	58+49	Game A (gamepad)
:2	58+50	Game B (gamepad)
:3	58+51	Game C (gamepad)
:4	58+51	Game D (gamepad)
:A	58+65	Game Internal A. <b>If supported by ME.</b>
:B	58+66	Game Internal B. <b>If supported by ME.</b>

<time>:

<time>	Description
<b>0..255</b>	0... 25.5 seconds (default values are manufacturer specific, but should be so long that a normal ME can handle keystrokes correctly).

<pause>:

<pause>	Description
<b>0..255</b>	0... 25.5 seconds (default values are manufacturer specific, but should be so long that a normal ME can handle keystrokes correctly).

# Removed AT commands

## Ensemble C27: Accessory UI

---

### Commands

---

AT command	Version
AT*SEFORM	
AT*SEIMAGE	

# 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 phone 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 modem.

## **Auto-answer mode**

The state in which the 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.

**BTHF**

Bluetooth Handsfree

**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 phone modem to your computer, usually indicating that the modem has detected a carrier signal over the communications line.

**Command line**

A line of alphanumeric characters sent to the modem to instruct the 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 Detect. 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 modem will 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 0 and 1. 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 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 modem to the computer, usually indicating that the modem is ready to establish a connection.

**DTE**

Data Terminal Equipment. The equipment that provides data, such as a computer or terminal.

**DTMF**

Dial Tone Multi-Frequency

**DTR**

Data Terminal Ready. An EIA232 signal sent from the computer to the 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.

**EMAE**

End Mobile Accessory Equipment

**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 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 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 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.

**HF**

Handsfree

**HSCSD**

High Speed Circuit-Switched Data

**IMAE**

Intermediate Mobile Accessory Equipment

**Intermediate result code**

Information sent from the 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 Sony 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**

Mobile Station. This is the Sony Ericsson wireless terminal being controlled through the set of commands described in this document.

**MSISDN**

Mobile Station International Subscriber Directory Number

**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 modem state similar to picking up a telephone receiver. The modem goes off hook to dial or answer, and remains off hook while connected.

**Off-line command mode**

The operational state in which the modem can accept typed commands.

**On hook**

The modem state similar to hanging up a telephone receiver.

**On-line data mode**

The state the 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.

**PDP**

Packet Data Protocol

**PDU**

Packet Data Unit

**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.

**QoS**

Quality of Service

**Reference Point**

Mobile phone and accessory system external and internal reference points.

**Result code**

A message the modem sends to the computer containing information about the state of the 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 modem, usually indicating that the computer is ready to send data to the 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.

**SAP**

Service Access Point

**SC**

Service Centre (for SMS).

**SDU**

Service Data Unit

**Serial port**

The port through which digital signals are exchanged between the 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 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 new context 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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