



# **R320**

## **AT Command**

### **Online Reference**

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## 1 Introduction

This Manual describes the operation of the AT commands supported by the R320 Telephone. The information here is not relevant for day-to-day operation of the Telephone, which is described in the User Manual supplied with the R320 Telephone.

The On-line Reference Manual is for advanced users who require detailed information in order to:

- develop new communications software;
- add the R320 to an application's list of compatible modems;
- adjust the settings of their mobile telephone.

### 1.1 About this manual

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This manual is designed to supplement the Ericsson R320 Telephone User Manual.

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## 1.2 Using this manual

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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 dialog. The distinctions are as follows:

- 1) Typed commands and option values are written in bold text.

For example:    **S2=<esc>**    Options:    <esc>    **0 - 127**

- 2) Any key strokes are written in bold text in brackets.

For example:    **<CR>**

- 3) Examples of command dialogue, including keyboard entries and on-screen responses, are written in Courier text.

For example:

```
AT+CBC=?  
  
+CBC:(0,1),(0-100)  
  
OK
```

- 4) The default setting used by a command is indicated by **bold** text.

For example:    **Default = 0**

## 1.3 Using the Infrared Modem in the Telephone

---

The infrared modem consists of two parts, integrated in the Ericsson R320: the infrared link to establish connection with other IrDA devices, and the GSM modem, which provides full modem functionality to a connected PC/PDA.

Alternatively, if no infrared eye is available, RS-232 cable connection is supported.

### Standards

IrDA DATA with secondary implementation of IrLAP 1.0 and IrDA-Ultra, IRMC 1.1., ETSI 07.05 and 07.07.

Fax specifications Group III, class 1 and 2. Class 2 is recommended.

### Data rates (up to)

115,200 bps between phone and IrDA device (e.g. PC, another phone),  
38,400 bps for GSM data communication with V.42bis compression, 9,600  
bps for GSM data communication, no compression, 9,600 bps in fax  
communication.

AT modem V.25ter command set supported

### Power consumption

Slightly increased depending on type of communication.

## 1.4 Communications programs

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Please refer to the User Manual for instructions on the installation and use of the Ericsson Infrared Modem software drivers.

### Configuring third party communication programs

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

#### Configure for V.25ter

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

#### Locate a Mobile Phone Modem driver

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

#### Configure the data communications program manually

To configure your data 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 `ATZ^M`.
3. Set the optional setup string to Asynchronous RLP:

`AT+CBST=0,0,1`



### **Configure your facsimile communications program manually**

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

# 2 Result and Error Codes

## 2.1 Result codes

---

When you send a command from your PC or PDA to the Infrared Modem, the response is terminated by a result code which is shown on the computer screen. You use this code to confirm correct operation or to identify any problem with the command.

There are two types of result codes:

- final result codes related to the operation of AT commands;
- result codes associated with call connections.

### Final result codes from AT commands

The Infrared 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.

### **Note**

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

## ERROR

An error has occurred during the command processing.

This could arise because:

- there is a fault in the command syntax;
- one or more parameters are outside the permitted range;
- the command you issued is not implemented on the Infrared Modem;
- the command is not appropriate to the service;
- class the Infrared Modem is operating.

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

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

## Result codes from call connections

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

<b>CONNECT</b>	<speed>	A connection has been established and the data rate <speed> is shown.
<b>BUSY</b>		The number you called is engaged.
<b>NO DIALTONE</b>		Unable to establish the initial connection.
<b>NO CARRIER</b>		Either a connection could not be established or an existing connection has been lost.
<b>RING</b>		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 Infrared Modem to display result codes in verbose or numeric format or you can switch them off completely.

To switch between verbose and numeric format, please refer to the use of the ATV command on [page 51](#) and [page 51](#).

To switch the display of result codes on or off, please refer to the use of the ATQ command on [page 50](#).

## 2.2 Error codes

---

The `+CME ERROR` result codes indicate an error relating to the functionality of the Infrared Modem or Mobile Phone and replaces the final result code `ERROR` when first enabled with the `AT+CME` command.

### Report mobile phone failure (+CME)

<code>+CME ERROR: 0</code>	Phone failure.
<code>+CME ERROR: 1</code>	No connection to phone.
<code>+CME ERROR: 2</code>	Phone modem link reserved.
<code>+CME ERROR: 3</code>	Operation not permitted.
<code>+CME ERROR: 4</code>	Operation not supported.
<code>+CME ERROR: 5</code>	PH-SIM card PIN required.
<code>+CME ERROR: 10</code>	SIM card not inserted.
<code>+CME ERROR: 11</code>	SIM card PIN required.
<code>+CME ERROR: 12</code>	SIM card PUK required.
<code>+CME ERROR: 13</code>	SIM card failure.
<code>+CME ERROR: 14</code>	SIM card busy.
<code>+CME ERROR: 15</code>	SIM card wrong.
<code>+CME ERROR: 16</code>	Incorrect password.
<code>+CME ERROR: 20</code>	Memory full.
<code>+CME ERROR: 21</code>	Invalid index.
<code>+CME ERROR: 22</code>	Not found.
<code>+CME ERROR: 23</code>	Memory failure.

+CME ERROR: 24	Text string too long.
+CME ERROR: 25	Invalid character in text string.
+CME ERROR: 26	Dial string too long.
+CME ERROR: 27	Invalid character in dial string.
+CME ERROR: 100	Unknown.

### Report operational/access failure (+CMS)

The +CMS ERROR result codes indicate an error relating to the Infrared Modem, Mobile Phone or Network relating to the Short Message Service (SMS) and replaces the final result code ERROR.

+CMS ERROR: 0	GSM 04.11 Annex E-2 values.
to	
+CMS ERROR: 127	
+CMS ERROR: 128	GSM 03.40 Section 9.2.3.22 values.
to	
+CMS ERROR: 255	
+CMS ERROR: 300	Mobile phone failure.
+CMS ERROR: 301	Short message service of mobile phone reserved.
+CMS ERROR: 302	Operation not allowed.
+CMS ERROR: 303	Operation not supported.
+CMS ERROR: 304	Invalid PDU mode parameter.

+CMS ERROR: 305	Invalid text mode parameter.
+CMS ERROR: 310	SIM card not inserted.
+CMS ERROR: 311	SIM card PIN necessary.
+CMS ERROR: 312	SIM card PIN necessary for PH-SIM.
+CMS ERROR: 313	SIM card failure.
+CMS ERROR: 314	SIM card busy.
+CMS ERROR: 315	SIM card wrong.
+CMS ERROR: 316	SIM PUK required
+CMS ERROR: 317	SIM PIN2 required
+CMS ERROR: 318	SIM PUK2 required
+CMS ERROR: 320	Memory failure.
+CMS ERROR: 321	Invalid memory index.
+CMS ERROR: 322	Memory full.
+CMS ERROR: 330	SMSC address unknown.
+CMS ERROR: 331	No network service.
+CMS ERROR: 332	Network timeout.
+CMS ERROR: 340	no +CNMA acknowledgement expected
+CMS ERROR: 500	Unknown error.
+CMS ERROR: ...511	range 256...511 reserved
+CMS ERROR: 512...	manufacturer specific

## Service Report (+CR)

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

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

## Cellular Result Codes (+CRC)

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

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



## 3 AT Commands

### 3.1 Introduction to AT commands

---

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

You use AT commands to:

- configure the phone by connection via infrared or the system bus;
- configure the modem by connection via infrared 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 request the range of valid parameters, when applicable, for an AT command.

### 3.2 Built-in Modem operating modes

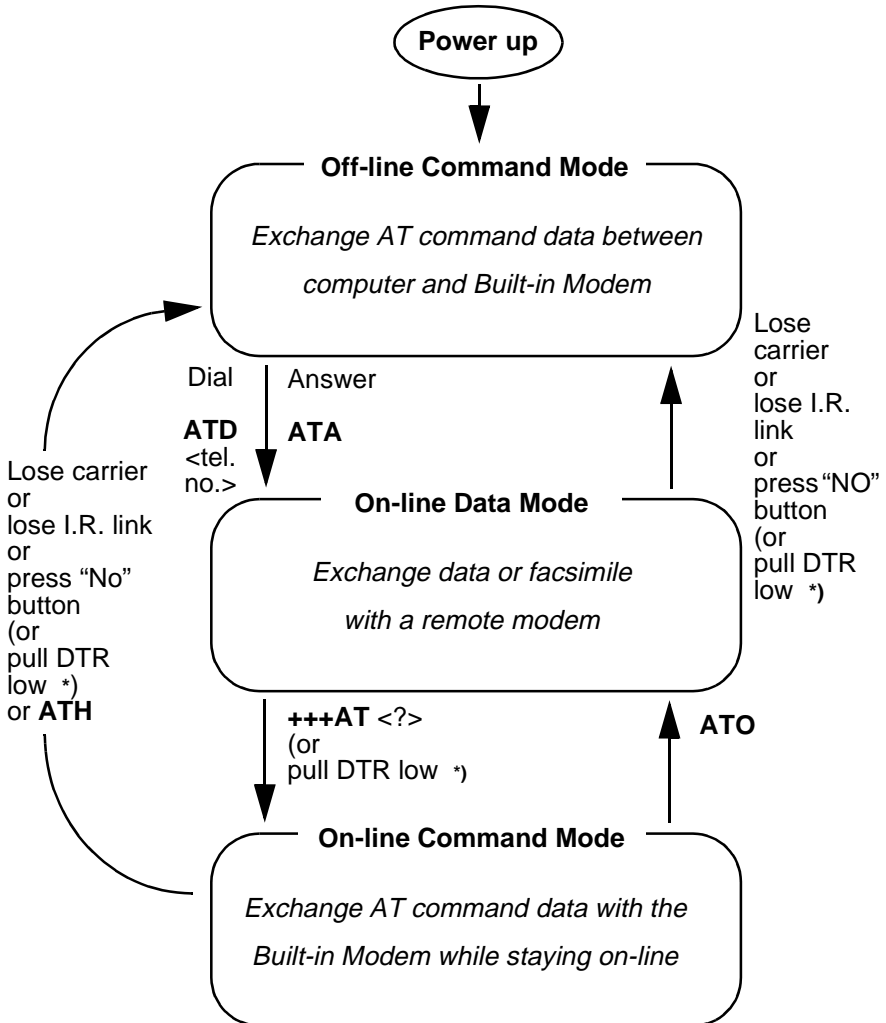
---

The built-in modem can be set in any one of three modes of operation. These are:

- off-line command mode** the built-in modem is placed in off-line command mode when first powered up and is ready for entry of AT commands.
- on-line data mode** allows “normal” operation of the built-in modem, exchanging data or facsimile with the remote modem.
- on-line command mode** you can switch to on-line command mode when you want to send AT commands to the built-in modem while still remaining connected to the remote modem.

## 3.3 Changing the Built-in Modem operating mode

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



\* Pull DTR not available when using cable.

## Operating in off-line command mode

In 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 on-line data mode

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

## Switching back to off-line command mode

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

- loss of the connection (**NO CARRIER** error);
- loss of the I.R. 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).

---

**Note:**    *The &D command is described on [page 272](#). The setting of &D determines the action taken when DTR is pulled low while you are in on-line data mode*

*&D set to 1 - Infrared Modem switches to on-line command mode*

*&D set to 2 - Infrared Modem switches to off-line command mode.*

---

## Using AT commands during a data connection

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

There are two ways you can switch from on-line data mode to 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**, **ATL**, **ATM**, **ATQ**, **ATV** and **ATX**. Using this method you can perform an AT function as you move in to on-line command mode. For example, if you switch using:

**+++ATH<CR>**

the built-in modem is switched to on-line command mode and the AT command is executed, causing the connection to be terminated (hang-up). If you type the escape sequence “+++” without any following command, the system waits one second, switches to on-line command mode and responds OK;

- Pull DTR low after previously setting &D to 1.

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

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

**ATO<CR>**

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

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

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

## 3.4 Operating the AT commands

---

In command mode, there are four types of command you can issue:

- a set command to adjust the built-in modem's operating parameters;
- an execute command which directs action without the need of any 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 four functions. The descriptions in Chapters 4, 5 and 6 list the functions available for each AT command.

### Entering a set command

The standard format for entering a set command is:

**AT<command>=<parameters> <CR>**

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

---

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

---

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

**AT+CBST=0,0,1**

However, the commands also have default settings. These are values which are assumed to have been entered when no actual value is placed in the command line.

For example, the above command can be entered as:

**AT+CBST=,,1**

The default values used by the commands are indicated in the following descriptions by bold text.

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>].

## Entering an execute command

Execute commands are very similar to set commands. They usually do not require any parameters and are used to obtain information about the mobile phone or built-in modem or to execute an event.

For example, to find out information about the mobile phone battery, enter the +CBC command:

**AT+CBC**

The built-in modem responds:

**+CBC: 0,60**

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

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

**ATA**

## 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**

## Using test command to request command help

To test the availability of a command and the range of parameters, use the '=' option with the command.

For example, to check the parameters available to the command line in the example above, enter:

**AT+CBST=?**

The line:

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

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

## 3.5 AT command list

### AT Commands Phone Terminal Terminated 37

#### Ensemble C2/C/E : Control and Identification

AT	Attention Command.....	37
Z	Reset To User Defined Configuration.....	37
&F	Set To Factory Configuration.....	38
+CGMI	Request Mobile Phone Manufacturer Identification.....	39
+CGMM	Request Mobile Phone Model Identification .....	39
+CGMR	Request Mobile Phone Revision Identification .....	40
+CGSN	Request ME Product Serial No Identification .....	41
*	List All Supported Commands .....	41

#### Ensemble C3/E : Call Control

A	Answer.....	42
H	Hook Control.....	42
D	Dial .....	43
+CFUN	Set Mobile Phone Functionality .....	44
L	Monitor Speaker Loudness Control .....	45
RING	Incoming Call Indication .....	45

#### Ensemble C4/E : Interface Commands

S3	Command Line Termination Character .....	46
S4	Response Formatting Character .....	47
S5	Command Line Editing Character .....	48
E	Command Echo.....	49
Q	Result Code Suppression.....	50
V	Result Code Format .....	51

#### Ensemble C9/C/E : Multi Mode Phones

+WS46	Mode Selection.....	52
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## Ensemble C20/C/E : Audio Control

*EALR	Audio Line Request .....	55
*EARS	Analog Ring Signal Request.....	56
*EMIR	Mute Indication Request.....	57
*ELAM	Ericsson Local Audio Mode .....	58
*EAMS	Audio Mode Selection.....	59
*EPHD	Portable Hands Free Detection .....	62
*ECBP	CHF Button Pushed.....	63
*EALV	Audio Line Response .....	64
*EMIV	Music Mute Indication Response.....	64

## Ensemble C21/C/E : Accessory Menus

*EAM	Ericsson Add Accessory Menu Item.....	65
*EAST	Ericsson Accessory Status Text.....	66
*EASM	Ericsson Accessory Sub Menu .....	67
*EAID	Ericsson Accessory Input Dialog .....	69
*EAAI	Ericsson Accessory Additional Indication .....	73
*EAMI	Ericsson Accessory Menu Indication .....	73
*EAll	Ericsson Accessory Input Dialog Indication.....	74

## Ensemble C22/C/E : Accessory Authentication

+CSCC	Secure Control Command .....	76
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## Ensemble C24/C/E : Voice Call Control

*EVA	Answer Incoming Call Command .....	78
*EVD	Voice Dial Command.....	78
*EVH	Voice Hook Command.....	78

## Ensemble C26/C/E : Accessory Identification

*EACS	Ericsson Accessory Status .....	79
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## Ensemble C30/C/E : VAD Support for Vehicle HF 3V

*EYRR	Recording Result .....	82
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*EYRE	Recognised Entry .....	84
*EYDO	Done .....	85
*EYRV	Registered VAD .....	85
*EYPI	Phone Info .....	86
*EYPE	Play Entry .....	87
*EYPP	Play Prompt .....	87
*EYRE	Recognise .....	87
*EYTN	Train Name .....	88
*EYPT	Play Training Recording .....	88
*EYDE	Delete Entry .....	88
*EYSR	Save Recording .....	89
*EYAB	Abort .....	89
*EYGP	Get Phones .....	89
*EYDP	Delete Phone .....	90
*EYRP	Register Phone .....	90
*EYSS	Start Synchronise .....	90

## Ensemble C31/C/E : Quick Menu

*ECMW	Ericsson Customized Menu Write .....	91
*EMLR	Ericsson Menu List Read .....	92

## Ensemble S1/B/E : GSM DTE-DCE Interface commands

+CSCS	Select Terminal Character Set .....	93
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## Ensemble S2/E : GSM Call Control

+CMOD	Set Call Mode .....	94
+CHUP	Call Hang-up .....	95
+CRC	Cellular Result Codes .....	96
+VTS	DTMF And Tone Generation .....	97
+CRING	Call Mode Indication .....	98

## Ensemble S6/C/E : GSM Network Services

+CAOC	Advice Of Charge .....	99
+CNUM	Subscriber Number.....	100
+CREG	Set Network Registration.....	101
+COPS	Set Operator Selection .....	103
+CLIP	Calling Line Identification Presentation .....	105
+CLIR	Calling Line Identification Restriction.....	106
+CCFC	Call Forwarding .....	108
+CCWA	Call Waiting .....	110
+CHLD	Call Related Supplementary Services .....	112
+CSSN	Supplementary Service Notifications.....	114
+CACM	Accumulated Call Meter .....	116
+CAMP	Accumulated Call Meter Maximum.....	117
*EALS	Ericsson Request ALS Status .....	118
*ECSP	Ericsson Customer Service Profile .....	119
*ELIN	Ericsson Line Set.....	120
*EPNR	Ericsson Read SIM Preferred Network.....	121
*EPNW	Ericsson Write SIM Preferred Network.....	123
*ESLN	Ericsson Set Line Name .....	124
*ESCN	Ericsson Set Credit Card Number .....	125
+CPUC	Price Per Unit And Currency Table .....	127
*ESVM	Ericsson Set Voice Mail Number .....	128
*EDIF	Ericsson Divert Function.....	130
*EDIS	Ericsson Divert Set .....	131
+CREG	Network Registration .....	132
+CLIP	Calling Line Identification Presentation .....	132
+CCWA	Call Waiting .....	133
+CSSU	Supplementary Service Notification.....	134
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## 4 AT Commands Phone Terminal Terminated

### 4.1 Ensemble C2/C/E : Control and Identification

---

#### **AT**      *Attention Command*

---

Description:                Determines the presence of an MS.

Execute command:    **AT**

Example:                AT

OK

#### **Z**            *Reset To User Defined Configuration*

---

Description:                Perform a 'soft reset', i.e. terminate any ongoing operation and connection and restore one of the configurations stored in nonvolatile memory as the active profile.

Set command:         **Z**

Example 1:             ATZ

OK

Test command:        **Z=?**

Example:                ATZ=?

OK

# AT Commands Phone Terminal Terminated

## **&F**      ***Set To Factory Configuration***

---

Description:                Resets the settings to the predefined factory configurations. Configurations which would adversely effect an open connection or a current data transmission are not loaded until the connection ceases.

Command:            **&F=[<pr>]** or **&F[<pr>]**

Options:            <pr>            **0**                Reset all the settings to the factory defaults.

Example:            AT&F  
OK

Test command:      **&F=?**                Always returns (0).

Example:            AT&F=?  
&F: ( 0 )  
OK

# AT Commands Phone Terminal Terminated

## **+CGMI**      *Request Mobile Phone Manufacturer Identification*

---

Description:              Returns the manufacturer identification for the mobile phone.

Execute command:      **+CGMI**

Example:                  AT+CGMI  
ERICSSON  
OK

Test command:          **+CGMI=?**

Example:                  AT+CGMI=?  
OK

## **+CGMM**      *Request Mobile Phone Model Identification*

---

Description:              Returns the model identification of the mobile phone.

Execute command:      **+CGMM**

Response:                <model type> <model name>  
  
                              <model type>              10 char ASCII string. Padded with space if needed.  
  
                              <model name>             Model name for transceiver unit.

Example:                  AT+CGMM  
1050501S  
1018  
OK

Test command:          **+CGMM=?**

Example:                  AT+CGMM=?  
OK



# AT Commands Phone Terminal Terminated

---

## **+CGSN**     *Request ME Product Serial No Identification*

---

Description:                Returns a string containing the IMEI number of the MS.

Execute command:        **+CGSN**

Returns:                    <imei>                    A string containing the IMEI number of the MS.

Example:                  AT+CGSN  
                                 10110100101  
                                 OK

Test command:            **+CGSN=?**

Example:                  AT+CGSN=?  
                                 OK

---

## **\***                *List All Supported Commands*

---

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

Execute command:        \*

Example:                  AT\*  
                                 AT+CGMI  
                                 AT+CGMM  
                                 AT+CGMR  
                                 AT+CGSN  
                                 OK



## 4.2 Ensemble C3/E : Call Control

---

### **A**            *Answer*

---

Description:            Answer and initiate connection to an incoming call.

Execute command:    **A**

Example:            ATA

OK

### **H**            *Hook Control*

---

Description:            Terminates a connection.

Execute command:    **H**

Example:            ATH

OK

# AT Commands Phone Terminal Terminated

## **D**      *Dial*

Description:      Initiate a phone voice connection (phone number terminated by semicolon). The phone number used to establish the connection will consist of digits and modifiers or a stored number specification.

Execute command:      **D<n>**      Dial the phone number specified in the command as <n>.

Modifiers:      ;      Informs the Infrared Modem that the number is a voice rather than a fax or data number.

Dial examples:      ATD046193000 ;      Voice dial, immediately returns OK.

Responses:      ERROR      An unexpected error occurred while trying to establish the connection.

NO DIALTONE      The line is busy.

NO CARRIER      The mobile phone is not registered.

# AT Commands Phone Terminal Terminated

## **+CFUN**     *Set Mobile Phone Functionality*

---

Description:                Sets the power status of the mobile phone to either on or off.

Set command:     **+CFUN=[<fun>]**

Options:	<fun>	<b>0</b>	Switch off the mobile phone.
		<b>1</b>	Switch on the mobile phone.
			<b>Default = 0.</b>

Example:     AT+CFUN=0  
                  OK

Read command:     **+CFUN?**                        Returns the current setting.

Example:     AT+CFUN?  
                  +CFUN: 1  
                  OK

Test command:     **+CFUN=?**

Example:     AT+CFUN=?  
                  +CFUN: (0-1)  
                  OK

Note that when the keylock is activated on the phone, you cannot turn it off by means of the +CFUN command.

# AT Commands Phone Terminal Terminated

---

## **L**      *Monitor Speaker Loudness Control*

---

Description:              Set the volume of the speaker.

Set command:      **L[=][<vol>]**

Options:              <vol>      0-8              0 is off, 8 is loudest.

**Default = 2.**

Examples:              ATL=4

OK

Read command:      **L?**

Example:              ATL?

L: 0

OK

Test command:      **L=?**              Always returns (0-8).

Example:              ATL=?

L: (0-8)

OK

## Unsolicited Result Codes

---

### **RING**      *Incoming Call Indication*

---

Description:              Indicates that the MS is being asked to accept a call.

Unsolicited Result

code:              **RING**

Produced when an accessory is connected to the MS (i.e. DTMS is asserted).

## 4.3 Ensemble C4/E : Interface Commands

### **S3** *Command Line Termination Character*

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

Set command: **S3**=[<value>]

Options: <value> **0..127** The ASCII value of an end of Command Line termination character.

Default = **13**.

Example: `ATS3=13`

`OK`

Read command: **S3?** Returns the current setting.

Example: `ATS3?`

`013`

`OK`

Test command: **S3=?**

Example: `ATS3=?`

`S3: (0-127)`

`OK`

# AT Commands Phone Terminal Terminated

## **S4**      *Response Formatting Character*

---

Description:            Defines the character to be used as the line formatting character. The response to the command is modified to reflect the change.

Set command:        **S4**=[<value>]

Options:            <value>    **0..127**    The ASCII value of formatting character.  
Default = **10**.

Example:            AT**S4**=10  
OK

Read command:      **S4?**                    Returns the current setting.

Example:            AT**S4**?  
010  
OK

Test command:      **S4=?**

Example:            AT**S4**=?  
S4: (0-127)  
OK

# AT Commands Phone Terminal Terminated

## **S5**      *Command Line Editing Character*

---

Description:            Defines the character to use as command line editing character.

Set command:      **S5**=[<value>]

Options:      <value>    **0..127**      The default ASCII value of the Line Editing Character.  
Default = **8**.

Example:      `ATS5=8`  
                  `OK`

Read command:    **S5?**                    Returns the current setting.

Example:      `ATS5?`  
                  `008`  
                  `OK`

Test command:    **S5=?**

Example:      `ATS5=?`  
                  `S5: (0-127)`  
                  `OK`









## 4.4 Ensemble C9/C/E : Multi Mode Phones

### **+WS46**      *Mode Selection*

Description:            Allows an accessory to query and control the cellular protocol mode of the phone.

Set command:	<b>+WS46=[n]</b>	
<b>&lt;n&gt;</b>	<b>0</b>	All systems. No wireless stack is active and the phone is not connected to a charger.
	<b>1</b>	GSTN (telephone), analog. Enables standard voice / data / fax modem behavior.
	<b>2</b>	Mobitex. Used by Ericsson Mobitex wireless packet data adapters.
	<b>4</b>	Cellular Digital Packet Data.
	<b>7</b>	AMPS Analog Cellular - Data Mode. Causes the MS to set a number of parameters to enable a AMPS analog cellular data call to be made.
	<b>12</b>	GSM Digital Cellular. Used for GSM at 900 Mhz, DCS-1800, and PCS-1900 phones.
	<b>13</b>	CDMA Digital Cellular. Used by the WCS phones.
	<b>14</b>	TDMA Digital Cellular (DAMPS) Mode. For IS-135 asynchronous data/ fax and voice services.
	<b>15</b>	Concurrent access to multiple wireless data services. Used to invoke an IP modem interface along with AT +WS45.

## AT Commands Phone Terminal Terminated

- 17** AMPS Analog Cellular - Voice Mode. Returned in response to AT+WS46? during a call at 800 Mhz. Other multi-mode phone systems (WCS, PCS-1900) support the set command to this value (not DAMPS phones).
- 240** Charge Only Mode. Indicates that no wireless stack is active and the phone is connected to a charger.
- 241** ACES Satellite Mode. Used by Ericsson ACES Satellite phones.
- 242** Reserved
- 243** 800 Mhz. AMPS Only Mode. A phone with AMPS capability is commanded to scan at 800 Mhz. and camp on an 800 Mhz. control channel. The phone requests an AMPS analog voice channel for incoming and outgoing calls. The set command is accepted only when there is no call in progress.
- 244** Reserved
- 245** Multi-scan mode. The phone scans multiple systems for incoming calls according to a prioritized list. Outgoing data calls are attempted according to the same prioritized list.

Example: AT+WS46=12

OK

Read command **+WS46?**

Example: AT+WS46?

+WS46: 12 GSM Digital Cellular.

OK

Test command: **+WS46=?**

---

## AT Commands Phone Terminal Terminated

---

Example: AT+WS46=?  
+WS46: (0,12,240)  
OK

# AT Commands Phone Terminal Terminated

## 4.5 Ensemble C20/C/E : Audio Control

### **\*EALR**      *Audio Line Request*

Description:            The AT\*EALR command is used by accessories to request the ATMS and AFMS.

Set command:        **\*EALR=<mode>[,<activation>[,<aud\_status>]]**

Options            **0**            No request of ATMS nor AFMS  
<mode>:

**1**            Request of ATMS and not AFMS

**2**            Request of AFMS and not ATMS

**3**            Request of ATMS and AFMS.  
Default=**3**

<activation>:      **0**            Not direct activated audio accessory  
(e.g. Cordless Portable Hands Free).  
Default=**0**

**1**            Direct activated audio accessory (e.g.  
Vehicle Hands Free)

<aud\_status>:     **0**            No change of the audio status.  
Default=**0**

**1**            Audio Handover. (Accessory hands  
over control of both the audio lines and  
the call to the phone)

**2**            Audio Demand. (Accessory demands  
control of both the audio lines and the  
call)

Example:            AT\*EALR=0,1

\*EALR: 0,1

OK

Read command      **\*EALR?**

Example:            AT\*EALR?

# AT Commands Phone Terminal Terminated

\*EALR: 3,0,0

OK

Test command: **\*EALR=?**

Example: AT\*EALR=?

\*EALR: (0-3), (0-1), (0-2)

OK

## **\*EARS** *Analog Ring Signal Request*

---

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

Set command: **\*EARS=<mode>**

<mode>:: **0** Disable analog ring signal

**1** Enable analog ring signal.  
Default=1

Example: AT\*EARS=0

OK

Read command **\*EARS?**

Example: AT\*EARS?

\*EARS: 1

OK

Test command: **\*EARS=?**

Example: AT\*EARS=?

\*EARS: (0,1)

OK





# AT Commands Phone Terminal Terminated

## **\*ELAM**      *Ericsson Local Audio Mode*

Description:            Used to route the microphone and/or the loudspeaker signal to the system bus. This function is to be used when the audio information is to be communicated over the system bus rather than the GSM radio. This functionality can be utilized e.g. by an MC-link accessory that communicates with a PSTN adapter.

Set command:          **\*ELAM**=<mic>[,<loudspeaker>]

Options                Sets the local audio mode.  
<mic>:

**0**                      Off. Default=**0**.

**1**                      Microphone Analog.

<loudspeaker>:        Sets the local audio mode.

**0**                      Off. Default=**0**

**1**                      Loudspeaker Analog.

Example:              AT\*ELAM=1,1

OK

Read command        **\*ELAM?**

Example:              AT\*ELAM?

\*ELAM: 0,0

OK

Test command:        **\*ELAM=?**              List of supported <mic>s  
and <loudspeaker>s  
parameters.

Example:              AT\*ELAM=?

\*ELAM: (0-1), (0-1)

OK

# AT Commands Phone Terminal Terminated

## **\*EAMS**      *Audio Mode Selection*

Description:            Used for setting the Audio mode selection. The command has to be sent to the MS at the initialization of an audio accessory, but can also be send later to change the audio mode selection..

Set command:        **\*EAMS=<internal\_voice\_alg>**  
                          [,<noise\_reduction>  
                          [,<side\_tone>  
                          [,<short\_echo\_canceling>  
                          [,<ATMS\_gain>  
                          [,<class>  
                          [,<ATMS\_sensitivity\_deviation\_from\_class>  
                          [,<AFMS\_sensitivity\_deviation\_from\_class>]]]]]]]

Options                Sets the voice-processing mode in the phone.  
<internal\_voice\_alg>:

- 0**            None
- 1**            Semi-duplex
- 2**            Full duplex

<noise\_reduction>:    Sets the noise reduction functionality in the phone.

- 0**            Off. Default=**0**
- 1**            On

<side\_tone>:         Activates the side tone functionality in the phone.

- 0**            Off. Default=**0**
- 1**            On

<short\_echo\_canceling>: Activates the short echo canceling functionality in the phone.

- 0**            Off. Default=**0**
- 1**            On

# AT Commands Phone Terminal Terminated

<ATMS\_gain>: Indicates the gain of the signal that is sent to the phone.

<b>0</b>	Normal (0 dB) (Internal voice processing). Default= <b>0</b>
<b>1</b>	12 dB from accessory (External voice processing)

<class>: Indicates the Hands Free class. The class parameter is used to fine adjust some parameters in the internal voice algorithm.

<b>0</b>	None. Default= <b>0</b>
<b>1</b>	Low end , class reference Vehicle HF
<b>2</b>	Mid End, class reference Vehicle HF
<b>3</b>	High End, class reference Vehicle HF
<b>4</b>	Large room, class reference Office Hands free

<ATMS\_sensitivity\_deviation\_from\_class>: Indicates the ATMS sensitivity deviation from a given class, for example if a HF product has a new microphone that is more sensitive.

<b>0</b>	0 dB. Default= <b>0</b>
<b>1</b>	2,5 dB.
<b>2</b>	-2,5 dB.
<b>3</b>	5,0 dB.
<b>4</b>	-5,0 dB.

Example: AT\*EAMS=0,0,0,1,0,0,0,1  
OK

Read command **\*EAMS?**

Example: AT\*EAMS?  
\*EAMS: 0,0,0,1,0,0,0,1  
OK

---

# AT Commands Phone Terminal Terminated

---

Test command: **\*EAMS=?**

Example: AT\*EAMS=?

```
*EAMS: (0-2), (0-1), (0-1), (0-1),  
(0-1), (0-4), (0-4), (0-4)
```

OK

# AT Commands Phone Terminal Terminated

## **\*EPHD**      *Portable Hands Free Detection*

Description:            Used by Cascade Accessories to indicate to the MS that the voltage level of CFMS on the downstream side is constantly low (i.e. a Portable Hands Free is connected).

Set command:        **\*EPHD=<mode>[,<phf\_level>[,<button>]]**

Options            **0**            No Portable Hands Free attached.  
<mode>:

**1**            Portable Hands Free attached.  
                         Default=1

<phf\_level>:        **0**            Internal Mic gain. Default=0  
                         **1**            External Mic gain.

<button>:            **0**            No Button pushed.  
                         **1**            Button pushed on Portable Hands  
                         Free. Default=1

Example:            AT\*EPHD=0,0,0  
                         OK

Read command        **\*EPHD?**

Example:            AT\*EPHD?  
                         \*EPHD: 0,0,0  
                         OK

Test command:        **\*EPHD=?**

Example:            AT\*EPHD=?  
                         \*EPHD: (0-1), (0-1), (0-1)  
                         OK

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## **\*ECBP**      *CHF Button Pushed*

---

Description:            This command is used by the Cordless Hands Free (CHF) to indicate the MS that the button of the CHF has been pushed.

Execute command:    **\*ECBP**

Example:            AT\*ECBP

OK

Test command:      **\*ECBP=?**

Example:            AT\*ECBP=?

OK

# AT Commands Phone Terminal Terminated

## Unsolicited Result Codes

---

### **\*EALV**      *Audio Line Response*

---

Description:            This unsolicited result code is sent to the accessory when the phone wants that accessory to change audio state. Use the AT\*EALR command to enable the response.

Unsolicited Result code:      **\*EALV:**<mode>,<activation>,<resp>

Defined values:      <mode>      See AT\*EALR command  
                         <activation>      See AT\*EALR command  
                         <resp>      **0**            Disable ATMS and AFMS  
                                            **1**            Enable ATMS and Disable AFMS  
                                            **2**            Disable ATMS and Enable AFMS  
                                            **3**            Enable ATMS and AFMS

### **\*EMIV**      *Music Mute Indication Response*

---

Description:            This Music Mute indication shall be sent out from the phone every time a parameter change occurs. Use the AT\*EMIR command to enable the response.

Unsolicited Result code:      **\*EMIV:**<resp>

Defined values:      <resp>      **0**            Music Mute inactive  
                                            **1**            Music Mute active

## 4.6 Ensemble C21/C/E : Accessory Menu

### **\*EAM**      *Ericsson Add Accessory Menu Item*

Description:            Used to add the persistent menu item to the phone menu structure. A new menu item overwrites any existing menu item for the accessory. If the accessory disconnects, the menu item is deleted.

Set command:        **\*EAM=<persistent menu item text>**

This creates the additional menu if it is not already present, and then adds an item with the text specified in <persistent menu item text>.

Example:            AT**\*EAM=<start>**

OK

Test command:      **\*EAM=?**

Example:            AT**\*EAM=?**

OK



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## **\*EAST**      *Ericsson Accessory Status Text*

---

Description:            An accessory can request that the phone display a text string on the standby screen. This text may for example be shown beside the operator name or it may replace the time. The request may be denied, for example if the phone is not capable of displaying the text. Another request will overwrite the previous text.

Set command:        **\*EAST=<area>,<status text>**

Options:	<area>	<b>0</b>	Very important status text.
		<b>1</b>	More important than time information.
		<b>2</b>	Display if you can.
	<status text>		String of text.

Example:            AT\*EAST=0,"World"

OK

Test command:      **\*EAST=?**

Example:            AT\*EAST=?

OK

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## **\*EASM**      *Ericsson Accessory Sub Menu*

Description:            Used to add a submenu to a menu item. If the accessory is disconnected all corresponding accessory submenus items are deleted.

Set command:        **\*EASM**=<title>,<next state>,<selected item>,<number of menu items>[,<menu item>[,<menu item>,...]]

Options            **String**      The menu title.  
<title>:

<next state>:        Specifies what happens when the user Accepts (Yes/Send) or Rejects (No/End) the input dialog or submenu.

**0**            Accept:    Go to persistent.

                  Reject:    Go to persistent.

**1**            Accept:    Wait.

                  Reject:    Go to persistent.

**2**            Accept:    Wait.

                  Reject:    Wait.

**3**            Accept:    Go to persistent.

                  Reject:    Wait.

**4**            Accept:    Go to standby.

                  Reject:    Go to persistent.

**5**            Accept:    Go to standby.

                  Reject:    Wait.

**6**            Accept:    Go to standby.

                  Reject:    Go to standby.

**7**            Accept:    Go to persistent.

                  Reject:    Go to standby.

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**8** Accept: Wait.

Reject: Go to standby.

<selected item>: **Integer 1..** Index of the selected item starting at 1

<number of menu items>: **Integer 1..** Number of menu items

<menu item>: **String** Text for menu items in the accessory menu

Example: AT\*EASM=size,0,1,2,big,small

OK

Test command: **\*EASM=?**

Example: AT\*EASM=?

\*EASM: (0-8), (0-12)

OK

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## **\*EAID**      *Ericsson Accessory Input Dialog*

Description:            Used to request the phone to add an input dialog. The dialog is dynamic. A request can be denied, for example if the phone is already displaying a dialog box on the standby screen.

Set command:        **\*EAID**=<type>, <next state>, <title>, [, <para 1>[, <para 2>[, <para 3> ]]]

Options            Type of input            Command syntax.  
<type>:

- |          |                     |  |
|----------|---------------------|--|
| <b>0</b> | No dialog           | 0  |
| <b>1</b> | Message box.        | <b>*EAID</b> =1, <next state>, <title>, <message text>[, <timeout>]  |
| <b>2</b> | Yes-No Input.       | <b>*EAID</b> =2, <next state>, <title>, <question text>[, <timeout>]   |
| <b>3</b> | On-Off Input        | <b>*EAID</b> =3, <next state>, <title>, <default on/off>   |
| <b>4</b> | Percent Input       | <b>*EAID</b> =4, <next state>, <title>, <percent steps>, <default percent step>  |
| <b>5</b> | 1-of-many selection | <b>*EAID</b> =5, <next state>, <title>, <default selected>, <number of list items> [, <list item> [, <list item> [, ...]]] |
| <b>6</b> | Real Input          | <b>*EAID</b> =6, <next state>, <title>, <prompt>, <max real value> [, <default real value>]                                |

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7	Integer Input	*EAID=7,<next state>,<title>,<prompt>,<min value>,<max value> [,<default value>]
8	Phone number Input	*EAID=8,<next state>,<title>,<prompt> [,<default number>]
9	Date Input	*EAID=9,<next state>,<title> [,<default date>]
10	Time Input	*EAID=10,<next state>,<title> [,<time>]
11	String Input	*EAID=11,<next state>,<title>,<prompt>,<max length> [,<default text>]
12	Numeric Authentication Input	*EAID=12,<next state>,<title>,<prompt>,<max length>
13	Timed Feedback	*EAID=13,<next state>,<title>
14	Information	*EAID=14,<next state>,<title>,<text>
<title>:	<b>String</b>	The header for the input, or the question.
<prompt>:	<b>String</b>	Text before the input.
<next state>:		(please refer to description under command *EASM)
<message text>:	<b>String</b>	Text in the message box.
<timeout>:	<b>Integer 0-100</b>	Timeout in tens of seconds, 0-100s, until the information dialog disappears. If no timeout is given the dialog stays up until the user interaction.

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<question text>:	<b>String</b>	Text for the question.
<default selected>:	<b>Integer</b>	Default selected, 0 if no default selected.
<number of list items>:	<b>Integer</b>	Number of items in the list.
	<b>String</b>	Item in a list.
<list item>:		
<default on/off>:	<b>0=off, 1=on</b>	Default selected in an on-off dialog.
<default text>:	<b>String</b>	Text to edit.
<max real value>:	<b>String</b>	Maximum real value allowed to enter.
<default real value>:	<b>String</b>	Default real value to be changed.
<min value>:	<b>Integer</b>	Minimum value accepted.
<max value>:	<b>Integer</b>	Maximum value accepted.
<default value>:	<b>Integer</b>	Integer to edit.
<default text>:	<b>String</b>	Text to edit.
<default number>:	<b>String</b>	Phone number to edit.
<percent steps>:	<b>1..10</b>	Number of steps in the input dialog.
<default percent steps>:	<b>0..10</b>	Default percent step selected, if <percent step>=5 and <default percent step>=1, then 20% is default selected.
<default date>:	<b>String</b>	"yy/MM/dd".
<default time>:	<b>String</b>	"hh:mm".
<text>:	<b>String</b>	Information text
Example:	AT*EAID=1,0,Info,Hello world	
	OK	
Test command:	<b>*EAID=?</b>	
Example:	AT*EAID=?	

---

# AT Commands Phone Terminal Terminated

---

OK

## Unsolicited Result Codes

---

### **\*EAAI**      *Ericsson Accessory Additional Indication*

---

Description:            The unsolicited result code is sent to the accessory when the user selects the persistent menu item from the additional menu related to the accessory. See also the AT\*EAM command.

Unsolicited Result      **\*EAAI**  
code:

### **\*EAMI**      *Ericsson Accessory Menu Indication*

---

Description:            This unsolicited result code is sent when the user selects an alternative in the accessory menu. The index of the selected menu item is returned. The index is one based (the first item has index 1). If the user rejects the submenu \*EAMI:0 is sent to the accessory. See also the AT\*EASM command.

Unsolicited Result      **\*EAAI:<menu item index>**  
code:

Defined values:      <menu      Index of selected menu item. First  
item            menu item has index 1. 0 means that  
index>            the user rejected the submenu.

**Integer      0=rejected submenu  
1.. index of menu item**



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## **\*EAll**      *Ericsson Accessory Input Dialog Indication*

Description:      This unsolicited result code is sent by the phone when the user has accepted (pressed Yes) a dynamic input dialog. It may also be sent if the user rejected the dialog (pressed No), depending on the <next state> parameter. See also the AT\*EAID command.

Unsolicited Result code:      **\*EAll**[: <type>, <input 1>, ...] (If CLR or NO was pressed, no string is appended to this unsolicited result code)

<type>      Dialog type.      Unsolicited Result Code Syntax.

	Aborted	<b>*EAll</b>
	Rejected	<b>*EAll:0</b>
<b>1</b>	Message box	<b>*EAll:1,1</b>
<b>2</b>	Yes-No	<b>*EAll:2, &lt;yes-no&gt;</b>
<b>3</b>	On-Off	<b>*EAll:3, &lt;on-off&gt;</b>
<b>4</b>	Percent	<b>*EAll:4, &lt;percent&gt;</b>
<b>5</b>	1-of-many selection	<b>*EAll:5, &lt;selected&gt;</b>
<b>6</b>	Real	<b>*EAll:6, &lt;real value&gt;</b>
<b>7</b>	Integer	<b>*EAll:7, &lt;value&gt;</b>
<b>8</b>	Phone number	<b>*EAll:8, &lt;phone number&gt;</b>
<b>9</b>	Date	<b>*EAll:9, &lt;date&gt;</b>
<b>10</b>	Time	<b>*EAll:10, &lt;time&gt;</b>
<b>11</b>	String	<b>*EAll:11, &lt;text&gt;</b>
<b>12</b>	Authentication (0..9)	<b>*EAll:12, &lt;text&gt;</b>

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	<b>13</b>	Timed Feedback	<b>*EAll:13,1</b>
	<b>14</b>	Information	<b>*EAll:14,1</b>
Options:	<yes-no>	<b>0=no, 1=yes</b>	
	<on-off>	<b>0=off, 1=on</b>	
	<percent>	<b>0..100</b>	
	<selected>	<b>Integer</b>	Selected alternative in list.
	<text>	<b>String</b>	Text entered by user.
	<real value>	<b>String</b>	
	<value>	<b>Integer</b>	
	<phone number>	<b>Phone number</b>	
	<date>	<b>“yy/MM/dd”</b>	
	<time>	<b>“hh:mm”</b>	

## 4.7 Ensemble C22/C/E : Accessory Authentication

### **+CSCC**     *Secure Control Command*

Description:            Used for authentication of accessories.

Set command:        **+CSCC=<mode>,<cmd\_set>[,<token>]**

Options:            **1**            Request challenge token to enable access to specified command set (<token> not used).

**2**            Enable access to specified command set (<token> required).

**3**            Disable access to specified command set (<token> not used).

<cmd\_set>        **0..127**        Reserved by ETSI

**128..198**      Reserved for future use.

**199**            Command set for Ericsson Accessories for 3 volt platform T28.

**200..255**      Reserved for future use.

<token>            **1 byte IRA String**    1 Byte token from the "0110 1100" represented by the IRA string "6C"

Returns:            **1 byte IRA String**    1 Byte to be converted to a token by the authentication algorithm

<challenge>        **"0110 1100"**        represented by the IRA string "6C"

Example:            AT+CSCC=2,199,01101100

                         +CSCC:11001100

                         OK

Read command:     **+CSCC?**

Example:            AT+CSCC?

---

# AT Commands Phone Terminal Terminated

---

CSCC: 2,199

OK

Test command: **+CSCC=?**

Example: AT+CSCC=?

CSCC: (1-2),(199)

OK



## 4.9 Ensemble C26/C/E : Accessory Identification

### **\*EACS**      *Ericsson Accessory Status*

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

Set command:            **\*EACS=<accessory id>,<status value>[,<unique id>]**

Options <accessory_id>:	<b>1</b>	Portable hands free. Presented in TE as: PORTABLE_HF_TXT
	<b>2</b>	Vehicle hands free. Presented in TE as: VEHICLE_HF_TXT
	<b>3</b>	RS232-cord. Presented in TE as: DATA_CABLE_TXT
	<b>4</b>	IR-device. Presented in TE as: INFRARED_MODEM_TXT
	<b>5</b>	Reserved for Vibrator. Not supported
	<b>6</b>	Charger – intelligent. Presented in TE as:DESKTOP_CHARGER_TXT+<nr>
	<b>7</b>	Charger – simple. Presented in TE as: TRAVEL_CHARGER_TXT
	<b>8</b>	Reserved for MC-Link. Not supported
	<b>9</b>	Reserved for FM Radio. Not supported
	<b>10</b>	Reserved for Cordless headset. Not supported
	<b>11</b>	Reserved for PC card. Not supported
	<b>12</b>	External Handset. Presented in TE as: EXTERNAL_HANDSET_TXT

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	<b>13..255</b>	Reserved for future accessories. Presented in TE as: ACCESSORY_TYPE_TXT+<accessory id>
<status value>:	<b>0</b>	Device is not working.
	<b>1</b>	Device is connected and working.
	<b>2</b>	Device is connected and working and is searching for other IrDA-devices. (Only Infrared, accessory id 4)
	<b>3</b>	Device is connected and working and has found another IrDA-device in range. (Only Infrared, accessory id 4) Not supported.
	<b>4</b>	Device is connected and working and is engaged in an IrDA connection. (Only Infrared, accessory id 4)
	<b>5</b>	Device is connected and working and is engaged in an IrDA connection, but the IrDA beam is obstructed. (Only Infrared, accessory id 4)
Returns <unique id>:	<b>0</b>	Request a new unique identifier from the phone.
	<b>1-65534</b>	Unique identifier for a unique accessory.
	<b>65535</b>	Default value used by non-unique accessories.
Example:	AT*EACS=1,1,1 *EACS: 1 OK	
Read command:	<b>*EACS?</b>	
Example:	AT*EACS? *EACS: 1,1,1	

---

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---

\*EACS: 2,1,2

OK

Test command: **\*EACS=?**

Example: AT\*EACS=?

\*EACS: (1-2)

OK



# AT Commands Phone Terminal Terminated

## 4.10 Ensemble C30/C/E : VAD Support for Vehicle HF 3V

### **\*EYRR**      *Recording Result*

Description:                Sent from the external VAD to the MS. VAD returns the result of the recording.

Set command:            **\*EYRR=<result>[,<storage>,<index>]**

Options            **0**            Matched Name or Training Good.  
<result>:            Response for \*EYRE, \*EYTN.

**1**            No Match Detected, or no word  
                         detected. Response for \*EYRE,  
                         \*EYTN.

**2**            To Loud. Response for \*EYRE,  
                         \*EYTN

**3**            To Silent/Quiet. Response for \*EYRE,  
                         \*EYTN

**4**            No User Input Detected. Response for  
                         \*EYRE, \*EYTN

**5**            Two Names Detected as Close.  
                         Response for \*EYRE

**6**            Name close to,. Response for \*EYTN

<storage>:            **String**

**“SM”**        SIM

**“ME”**        Mobile

**“MT”**        (SIM+Mobile) Not  
                         supported (Accessory  
                         Vehicle HF must support  
                         this value)

**“RC”**        ME received calls Not  
                         supported (Accessory  
                         Vehicle HF must support  
                         this value)

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	<b>“DC”</b>	ME dialled calls Not supported (Accessory Vehicle HF must support this value)
	<b>“MC”</b>	ME missed calls Not supported (Accessory Vehicle HF must support this value)
	<b>“EN”</b>	SIM or ME emergency number Not supported (Accessory Vehicle HF must support this value)
	<b>“ON”</b>	SIM or ME own numbers Not supported (Accessory Vehicle HF must support this value)
	<b>“FD”</b>	SIM fixdialling-phonebook Not supported (Accessory Vehicle HF must support this value)
	<b>“LD”</b>	SIM last-dialling-phonebook Not supported (Accessory Vehicle HF must support this value)
	<b>“TA”</b>	TA phonebook Not supported
	<b>“HP”</b>	Hierarchical phonebook (Ericsson specific) Not supported (Accessory Vehicle HF must support this value)
<index>:	<b>Integer</b>	<b>0..255</b> Depending on SIM capacity and ME capacity
Example:	<code>AT*EYRR=0,67</code>	VAD recording matches index 67OK









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---

## **\*EYTN**      *Train Name*

---

Description:              This is sent from the MS to the external VAD. VAD starts recording.

Unsolicited Result      **\*EYTN**  
code:

---

## **\*EYPT**      *Play Training Recording*

---

Description:              This is sent from the MS to the external VAD. VAD starts playback of recording.

Unsolicited Result      **\*EYPT**  
code:

---

## **\*EYDE**      *Delete Entry*

---

Description:              This is sent from the MS to the external VAD. VAD deletes the entry from its list.

Unsolicited Result      **\*EYDE:<storage>,<index>**  
code:

Defined values              See values under command \*EYRR  
<storage>:

<index>:              See values under command \*EYRR

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## **\*EYSR**      **Save Recording**

---

Description:              This is sent from the MS to the external VAD. VAD saves the recording.

Unsolicited Result      **\*EYSR:**<storage>,<index>  
code:

Defined values          See values under command \*EYRR  
<storage>:

<index>:              See values under command \*EYRR

## **\*EYAB**      **Abort**

---

Description:              This is sent from the MS to the external VAD. Aborts playback/recording.

Unsolicited Result      **\*EYAB**  
code:

## **\*EYGP**      **Get Phones**

---

Description:              This is sent from the MS to the external VAD. VAD should supply phone with information about phone entry <entry>. See also command AT\*EYPI.

Unsolicited Result      **\*EYGP:**<entry>  
code:

Defined values          **Integer**      The number for this entry.  
<entry>:



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---

## **\*EYDP**      **Delete Phone**

---

Description:              This is sent from the MS to the external VAD. VAD should delete a phone from VAD.

Unsolicited Result      **\*EYDP:**<entry>  
code:

Defined values      **Integer**      The number for this entry.  
<entry>:

---

## **\*EYRP**      **Register Phone**

---

Description:              This is sent from the MS to the external VAD. User has selected external handsfree, please register phone.

Unsolicited Result      **\*EYRP**  
code:

---

## **\*EYSS**      **Start Synchronise**

---

Description:              This is sent from the MS to the external VAD. Starts the synchronisation.

Unsolicited Result      **\*EYSS**  
code:

## 4.11 Ensemble C31/C/E : Quick Menu

### **\*ECMW** *Ericsson Customized Menu Write*

Description: Puts a menu item given by <index> from the menu list into the Customized menu in the position given by <pos>. The item on this position and items below this position are shifted down one step. If the parameter <pos> is not given then the item will be placed at the first empty place in the Customized menu list.

Set command: **\*ECMW=<pos>,<index>**

Options **Integer** The position in the Customized Menu.  
<pos>:

<index>: **Integer** Gives the position of a menu item in the menu list

Example: AT\*ECMW=1,1

OK

Delete command: **\*ECMW=<pos>** Deletes item on position.

Example: AT\*ECMW=1

OK

Read command: **\*ECMW?**

Example: AT\*ECMW?

\*ECMW: 1,1

\*ECMW: 2,3

OK

Test command: **\*ECMW=?**

Example: AT\*ECMW=?

\*ECMW: (1-4)

OK

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## **\*EMLR**      *Ericsson Menu List Read*

---

Description:                Lists the menu items that are possible to add to the Customized Menu. The index and the name of the menu items are listed. The name is given in the language of the current setting.

Execute command:        **\*EMLR**

Returns:                    **\*EMLR:<index1>,<name1>[-<CR><LF>  
\*EMLR:<index2>,<name2>[...]]**

Options                    **Integer**      Gives the position of a menu item in  
<index>:                    the menu list.

<name>:                    **String**        The name of the menu item.

Example:                    AT\*EMLR  
  
                              \*bEMLR: 1,open  
  
                              \*bEMLR: 3,close  
  
                              OK

Test command:            **\*EMLR=?**

Example:                    AT\*EMLR=?  
  
                              OK

## 4.12 Ensemble S1/B/E : GSM DTE-DCE Interface commands

### **+CSCS**     *Select Terminal Character Set*

Description:                Defines the character set to be used.

Set command:            **+CSCS=[<chset>]**

Options:                <chset>    "GSM"    Default GSM alphabet.

Example:                AT+CSCS="GSM"

OK

Read command:         **+CSCS?**                        Returns the current setting.

Example:                AT+CSCS?

+CSCS: "GSM"

OK

Test command:         **+CSCS=?**

Example:                AT+CSCS=?

+CSCS: "GSM", "IRA", "88591", "ERICSSON"

OK



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## **+CHUP**     *Call Hang-up*

---

Description:            Terminates the current call. Command is used to provide an assured means of terminating an alternating mode call.

Execute command:     **+CHUP**

Example:                AT+CHUP

OK

Test command:        **+CHUP=?**

Example:                AT+CHUP=?

OK

# AT Commands Phone Terminal Terminated

## **+CRC** Cellular Result Codes

---

Description: Determines whether or not the extended format of report for an incoming call should be used.

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

Options: <mode> **0** Disable extended result codes.

**1** Enable extended result codes.

**Default = 0.**

Example: AT+CRC=0

OK

Read command: **+CRC?** Returns the current setting.

Example: AT+CRC?

+CRC: 0

OK

Test command: **+CRC=?** Always returns (0-1).

Example: AT+CRC=?

+CRC: (0-1)

OK

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

# AT Commands Phone Terminal Terminated

## **+VTS**      *DTMF And Tone Generation*

---

Description:              Allows the transmission of DTMF tones and arbitrary tones.

Execute command:      **+VTS=<DTMF>**

Options:                  <DTMF>                      Single ASCII character in the set 0-9, #, \*, A-D.

Example:                AT+VTS="1"                      Transmit DTMF tone.

OK

Test command:        **+VTS=?**

Example:                AT+VTS=?

OK



# AT Commands Phone Terminal Terminated

## Unsolicited Result Codes

### **+CRING** *Call Mode Indication*

Description: Set command controls whether or not the extended format of incoming call indication is used.

Unsolicited Result code:	<b>*CRING:</b> <type>	When enabled, indicates the incoming call to the TE instead of the normal RING.
Defined values:	<type>	
	<b>ASYNC</b>	Asynchronous transparent.
	<b>FAX</b>	Facsimile (TS 62).
	<b>VOICE</b>	Normal voice (TS 11).
	<b>ALT FAX/ VOICE</b>	Alternating voice/fax, voice first (TS 61).
	<b>ALT VOICE/ FAX/</b>	Alternating voice/fax, fax first (TS 61).







# AT Commands Phone Terminal Terminated

Example: AT+CREG?  
+CREG: 0,1  
OK

Test Command: **+CREG=?** Always returns (0-1).

Example: AT+CREG=?  
+CREG: (0-1)  
OK

Unsolicited Result  
code: **+CREG: <stat> [,<lac>,<ci>]**

# AT Commands Phone Terminal Terminated

## **+COPS**     *Set Operator Selection*

---

Description:            Allows the automatic or manual selection of the GSM network operator.

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

Options:	<mode>	<b>0</b>	Automatic (<oper> field is ignored).
		<b>1</b>	Manual (<oper> field is present).
		<b>4</b>	Manual/automatic (<oper> field is present).
	<format>	<b>0</b>	Long alphanumeric format 16 characters.
		<b>1</b>	Short alphanumeric format. 8 characters.
		<b>2</b>	Numeric. GSM Location Area Identification number which consists of a three BCD digit country code and a two BCD digit network code.
	<oper>		String type as specified by <format>.

Example:            AT+COPS=0  
                          OK

# AT Commands Phone Terminal Terminated

Read command: **+COPS?**

Example: AT+COPS? Returns the current setting.

```
+COPS: 0,0,"RADIOLINJA"
```

```
OK
```

Test command: **+COPS=?**

Returns: +COPS: (<status>,<long>,<short>,<numeric>)

<status> **0** Unknown.

**1** Available.

**2** Current.

**3** Forbidden.

<long> Long alphanumeric format.

<short> Short alphanumeric format.

<numeric> GSM Location Area Identification number which consists of a three BCD digit country code and a two BCD digit network code.

Example: AT+COPS=?

```
+COPS: (2,"RADIOLINJA","RL","24405")
```

```
+COPS: (0,"TELE","TELE","24491")
```

```
OK
```

Two operator networks have been found, the status of TELE is unknown and RADIOLINJA is currently selected.







---

# AT Commands Phone Terminal Terminated

---

Example: AT+CLIR?  
+CLIR: 1,1  
OK

CLIR invoked and permanently provisioned.

Test command: **+CLIR=?** Always returns (0-2).

Example: AT+CLIR=?  
+CLIR: (0-2)  
OK

# AT Commands Phone Terminal Terminated

## **+CCFC**      *Call Forwarding*

---

Description:              Allows control of the call forwarding supplementary service. Registration, erasure, activation, deactivation and status query are all supported.

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

Options:	<reason> <b>0</b>	Unconditional.
	<b>1</b>	Mobile busy.
	<b>2</b>	No reply.
	<b>3</b>	Not reachable.
	<b>4</b>	All call forwarding.
	<b>5</b>	All conditional call forwarding.
	<mode> <b>0</b>	Disable.
	<b>1</b>	Enable.
	<b>2</b>	Query status.
	<b>3</b>	Registration.
	<b>4</b>	Erasure.
	<number> <b>String</b>	String type phone number of forwarding address in format specified by <type>.
	<type> <b>Integer</b>	Type of octet address in integer format (GSM 04.08, [3]). Default 145 when international code included, otherwise 128.

# AT Commands Phone Terminal Terminated

	<b>&lt;class&gt; 1</b>	Voice L1.
	<b>2</b>	Data.
	<b>4</b>	Fax.
	<b>128</b>	Voice L2.
Query (mode=2) returns:	<b>+CCFC:</b> <status>,<class1>[,<number>,<type>][<CR><LF> +CCFC: <status>,<class2>[,<number><type>] [...]]	
Options:	<b>&lt;status&gt; 0</b>	Active voice.
	<b>1</b>	Active.
Example 1:	AT+CCFC=1,1,"931123456" OK	Enable CFB.
Example 2:	AT+CCFC=1,2 +CCFC: "35821654321",145,,,20 OK	Query CFNRy. Forward after 20 seconds.
Example 3:	AT+CCFC=1,3,"931123456" OK	Registration.
Example 4:	AT+CCFC=1,4,"931123456" OK	Erasure.
Test command:	<b>+CCFC=?</b>	Always returns (0-5).
Example:	AT+CCFC=? +CCFC: (0-5) OK	

# AT Commands Phone Terminal Terminated

## **+CCWA**    *Call Waiting*

---

Description:            Allows control of the call waiting supplementary service.

Set command:    **+CCWA=[<n>[,<mode>[,<classx>]]]**

Options:	<n>	<b>0</b>	Disable the result code representation.
		<b>1</b>	Enable the result code representation.
	<mode>	<b>0</b>	Disable.
		<b>1</b>	Enable.
		<b>2</b>	Query status.
	<classx>	<b>1</b>	Voice L1.
		<b>2</b>	Data.
		<b>4</b>	Fax.
		<b>128</b>	Voice L2.

Returns:            When <mode>=2 and command is successful.

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

Example 1:    AT+CCWA=1,1            Enable call waiting.

OK

Example 2:    AT+CCWA=1,2

+CCWA: 1,1

+CCWA: 1,2

+CCWA: 1,4

+CCWA: 0,128

OK

## AT Commands Phone Terminal Terminated

Read command: **+CCWA?** Returns the current setting.

Example: AT+CCWA?

+CCWA: 1

OK

Test command: **+CCWA=?** Always returns (0-1).

Example: AT+CCWA=?

+CCWA: (0-1)

OK

Unsolicited Result code: **+CCWA:** <number>, <type>, <class>

# AT Commands Phone Terminal Terminated

## **+CHLD**      *Call Related Supplementary Services*

---

Description:              Temporarily disconnects a call, but retains the connection to the network and to a service that allows multiparty conversation.

Execute command:      **+CHLD=<n>**

Options:	<n>	<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 (if any exist) and accepts the other (held or waiting) call.
		<b>1X</b>	Release a specific active call X.
		<b>2</b>	Places all active calls (if any exist) on hold and accepts the other (held or waiting) call.
		<b>2X</b>	Places all active calls on hold except call X with which communication is supported.
		<b>3</b>	Adds a held call to the conversation.
		<b>4</b>	Connects the held and waiting call and disconnects the user.

Example 1:      AT+CHLD=1

OK                      Activate call hold and waiting.

Example 2:      AT+CHLD=0

OK                      Deactivate.

---

## AT Commands Phone Terminal Terminated

---

Test command: **+CHLD=?** Always returns  
(0-4,11-16,21-26).

Example: AT+CHLD=?  
+CHLD: (0-4,11-16,21-26)  
OK

Note that X is the numbering (starting with 1 but not greater than 6) of the call given by the sequence of setting up or receiving calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released and new calls take the lowest possible number.

Where both a held call and a waiting call exists, the procedures will apply to the waiting call (not the held call) in a conflicting situation.

Note that the "directory number" case will be handled by the dial command D and the END case with hangup command H or +CHUP.



# AT Commands Phone Terminal Terminated

## **+CSSN**      *Supplementary Service Notifications*

Description:              Allows supplementary service related network initiated notification result codes to be presented.

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

Options:	<n>	<b>0</b>	Disable +CSSI result code presentation.
		<b>1</b>	Enable +CSSI result code presentation.
	<m>	<b>0</b>	Disable +CSSU result code presentation.
		<b>1</b>	Enable +CSSU result code presentation.

Example:                AT+CSSN=1,1

OK                      Enable.

Read command:        **+CSSN?**                      Returns the current setting.

Example:                AT+CSSN?

+CSSN: 1,1

OK

Test command:        **+CSSN=?**                      Always returns (0-1),(0-1).

Example:                AT+CSSN=?

+CSSN: (0-1),(0-1)

OK

Unsolicited Result

code:                    **+CSSU:<code2>[,<index>]**

# AT Commands Phone Terminal Terminated

Intermediate  
Result codes:

**+CSSI:**<code1>[,<index>]

<code1>	<b>0</b>	Unconditional call forwarding active.
	<b>1</b>	Some conditional call forwardings active.
	<b>2</b>	Call has been forwarded.
	<b>3</b>	A call is waiting.
	<b>4</b>	CUG call. Not supported.
	<b>5</b>	Outgoing calls barred.
	<b>6</b>	Incoming calls barred.
	<b>7</b>	CLIR suppression rejected.
<index>	<b>0...9</b>	CUG index.
	<b>10</b>	no index.

Unsolicited Result  
code:

**+CSSI:**<code2>

# AT Commands Phone Terminal Terminated

## **+CACM**     *Accumulated Call Meter*

---

Description:                Resets the Advice of Charge related accumulated call meter value in SIM file EFACM. ACM contains the total number of home units for both the current and preceding calls.

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

Options:                <passwd> **String**     SIM PIN2 password

Example:                AT+CACM=                Resets the ACM value.

OK

Read command:         **+CACM?**                Returns the current value.

Returns:                **+CACM:** <acm>

Options:                <acm>     **String**     Accumulated call meter value similarly coded as <ccm> under +CAOC.

Example:                AT+CACM?

+CACM: 00A41B

OK

Test command:         **+CACM=?**

Example:                AT+CACM=?

OK

# AT Commands Phone Terminal Terminated

## **+CAMM** *Accumulated Call Meter Maximum*

---

Description: Set command sets the Advice of Charge related accumulated call meter maximum value in SIM file EFACMmax.

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

Options: <acmmax> **String** Accumulated call meter maximum value similarly coded as <ccm> under +CAOC; value zero disables ACMmax feature  
>  
<passwd> **String** SIM PIN2 password

Example: AT+CAMM=001000  
OK

Read command: **+CAMM?** Returns the current value.

Example: AT+CAMM?  
+CAMM: 001000  
OK

Test command: **+CAMM=?**

Example: AT+CAMM=?  
OK



# AT Commands Phone Terminal Terminated

## **\*ECSP**      *Ericsson Customer Service Profile*

---

Description:            Used to read the Customer Service Profile (CSP) from the SIM. CSP is a list on the SIM, which indicates the services that are user accessible.

Execute command:      **\*ECSP=<service group>**

Options:                <service **Byte** group>      Each service group has a corresponding number, service group code.

Returns:                **\*ECSP:<service group>,<services>**

Options:                <services>                    Bit mask (8 bits), indicating the services within the service group. Bit=**0**: unused or unavailable service. Bit=**1**: available service.

Test command:        **\*ECSP=?**

Example:                AT\*ECSP=?

OK







---

# AT Commands Phone Terminal Terminated

---

OK

# AT Commands Phone Terminal Terminated

## **\*EPNW**      *Ericsson Write SIM Preferred Network*

---

Description:            Used to edit the SIM preferred list of networks (EFPLMNsel).

Set command:        **\*EPNW**=[<index>] [,<format>,<oper>]

Options:            <index>    **Integer**    Index to entry in SIM preferred list. The SIM preferred list contains at least 8 positions according to GSM 11.11.

                         <format>    **0**            Long format alphanumeric <oper>. Not supported!

**1**            Short format alphanumeric <oper>. Not supported!

**2**            Numeric <oper>. Default=**2**

                         <oper>     **String**     String indicates the code for the operator. E.g. GSM - Sweden - Europolitan: "24008" (3 + 2). PCS: 3 digits for Country and 3 digits for Network.

Example:            AT\*EPNW=1 , , 24008

                         OK

Test command:     **\*EPNW=?**

Example:            AT\*EPNW=?

                         \*EPNW: (1-2) , 2

                         OK



# AT Commands Phone Terminal Terminated

## **\*ESCN**      *Ericsson Set Credit Card Number*

Description:            Used for 1) set up a credit card number in the ME, 2) disable credit card calls, 3) enable one of the credit card call services, 4) query the settings for one of the services, 5) query the active credit call access server.

Set command:        **\*ESCN**=<mode> [,<passwd>][,<indexn>]  
                          [,<asn>,<type>,<name>,  
                          <vercode>[,<send order>]]

Options:	<mode>	<b>0</b>	Settings for a credit card call. The parameters (<passwd>, <indexn>, <asn>, <vercode>) are mandatory when <mode> = 0
		<b>1</b>	Disable credit card calling (<passwd>).
		<b>2</b>	Enable one of the credit card call services (<passwd>, <indexn>).
		<b>3</b>	Query (<passwd>, <indexn>).
		<b>4</b>	Query for the selected credit call access server.
	<passwd>	<b>String</b>	Phone lock code "PS", PH-SIM.
	<indexn>	<b>1</b>	Index number to the 1st Credit Card Call access server.
		<b>2</b>	Index number to the 2nd Credit Card Call access server.

# AT Commands Phone Terminal Terminated

	<asn>	<b>0..9,+</b>	Max. 20 characters Phone number of format specified by <typex>.
	<type>	<b>Integer</b>	Type of address, (refer GSM 04.08 [3] subclause 10.5.4.7).
	<name>	<b>String</b>	Character string of the name tag.
	<vercode>	<b>0..9,A,B,C</b>	Max. 20 characters.
	>	<b>,D,#,*</b>	
	<send order>	<b>1</b>	Verification code 1st Default=1.
		<b>2</b>	Phone number to call 1st.
Query (mode=3) returns:	<b>*ESCN:</b> <indexn>,<asn>,<type>,<name>,<vercode>,<send order>		
Query (mode=4) returns:	<b>*ESCN:</b> <selindexn>		
Options:	<selindex n>	<b>0</b>	Credit card calling disabled. Default= <b>0</b> .
		<b>1</b>	Index number to the 1st Credit Card Call access server.
		<b>2</b>	Index number to the 2nd Credit Card Call access server.
Test command:	<b>*ESCN=?</b>		
Example:	AT*ESCN=?		
	*ESCN: (1-2),(0-4),(1-2)		
	OK		

# AT Commands Phone Terminal Terminated

## **+CPUC**      *Price Per Unit And Currency Table*

---

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

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

Options:                **<currency String >**      Alpha-identifier of the currency code (3 characters, e.g. SEK)

**<ppu>      String**      Price per unit; dot is used as a decimal separator (e.g. "2.66")

**<passwd> String**      SIM PIN2 password.

Example:                AT+CPUC= SEK,2.66  
                             OK

Read command:        **+CPUC?**

Example:                AT+CPUC?  
                             +CPUC: SEK,2.66  
                             OK

Test command:        **+CPUC=?**

Example:                AT+CPUC=?  
                             OK

# AT Commands Phone Terminal Terminated

## **\*ESVM**      *Ericsson Set Voice Mail Number*

Description:            The number to the voice mail server is set with this command. If ALS is active, L1 and L2 has one voice mail number each. The numbers can be different or the same.

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

Options:	<line>	<b>1</b>	Line 1
		<b>2</b>	Line 2
	<onoff>	<b>0</b>	Disable the voice mail number. Shortcut menu on the phone MMI is removed. Not Supported.
		<b>1</b>	Enable the voice mail number.
	<number>	<b>0..9,+</b>	Character string.
	<type>		Type of address octet (refer GSM 04.08 [3] section 10.5.4.7)
		<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 GSM 04.08 [3] section 10.5.4.7.

Example:            AT\*ESVM=1,1,"90823677",129

OK

Read command:     **\*ESVM?**

---

## AT Commands Phone Terminal Terminated

---

Example: AT\*ESVM?

\*ESVM: 1,1,"90823672",129

OK

Test command: **\*ESVM=?**

Example: AT\*ESVM=?

\*ESVM: (1-2),(0- 20 - maximum length of  
1),20 voice mail number.

OK





# AT Commands Phone Terminal Terminated

## **\*EDIS**      *Ericsson Divert Set*

Description:            Enables and disables the divert setting in the currently active profile. The command is also used to set the divert number for the profile. See also the command AT+CCFC.

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

Options:	<onoff>	<b>0</b>	Disable unconditional divert for the profile
		<b>1</b>	Enable unconditional divert for the profile
	<number>	<b>String</b>	String type phone number of forwarding address in format specified by <type>.
	<type>	<b>Integer</b>	Type of octet address in integer format (GSM 04.08, [3]). Default 145 when international code included, otherwise 129.

Example:            AT\*EDIS=1

OK

Read command:     **\*EDIS?**

Example:            AT\*EDIS?

\*EDIS: 1, "358501234567", 145

OK

Test command:     **\*EDIS=?**

Example:            AT\*EDIS=?

\*EDIS: (0-1)

OK

# AT Commands Phone Terminal Terminated

## Unsolicited Result Codes

---

### **+CREG**      *Network Registration*

---

Description:                      Indicates a change in the ME network registration status.

Unsolicited Result code:	<b>+CREG: &lt;stat&gt;</b>	Produced when an accessory is connected to the MS (i.e. DTMS is asserted).
Defined values:	<b>&lt;stat&gt;</b> <b>0</b>	Not registered, ME is not currently searching a new operator to register to.
	<b>1</b>	Registered, home network.
	<b>2</b>	Not registered, but ME is currently searching a new operator to register to.
	<b>3</b>	Registration denied.
	<b>4</b>	Unknown.
	<b>5</b>	Registered, roaming.

### **+CLIP**              *Calling Line Identification Presentation*

---

Please refer to AT command [+CLIP](#).

# AT Commands Phone Terminal Terminated

## **+CCWA** *Call Waiting*

---

Description: Allows control of the Call Waiting supplementary service.

### Unsolicited Result

code: **+CCWA:** <number>, <type>, <class>

Defined values:

<number>	<b>String</b>	Phone number of format specified by <type>.
<type>	<b>Integer</b>	Address octet in integer format (see GSM 04.08 [4] subclause 10.5.4.7)
<class>	<b>Integer</b>	Sum of integers each representing a class of information.
	<b>1</b>	voice L1.
	<b>2</b>	Data. Not supported
	<b>4</b>	Fax. Not supported
	<b>128</b>	Voice L2.

# AT Commands Phone Terminal Terminated

## **+CSSU**      *Supplementary Service Notification*

---

Description:              Refers to supplementary service related network initiated notifications.

### Unsolicited Result

code:            **+CSSU:** <code2>[,<cindex>]

Defined values:	<code2>	<b>0</b>	This is a forwarded call (MT call setup).
		<b>1</b>	This is a CUG call (also <index> present) (MT call setup) Not supported
		<b>2</b>	Call has been put on hold (during a voice call).
		<b>3</b>	Call has been retrieved (during a voice call).
		<b>4</b>	Multiparty call entered (during a voice call).
		<b>5</b>	Call on hold has been released (this is not an SS notification) during a voice call.
		<b>6</b>	Forward check SS message received (can be received whenever)
		<b>16</b>	This is a CUG call (also <cindex> present) (MT call setup)
	<cindex>	<b>0..32767</b>	CUG index

# AT Commands Phone Terminal Terminated

## **+CSSI**      *Supplementary Service Notification*

Description              Refers to supplementary service related network initiated notifications.

### Unsolicited Result

code:      **+CSSI:** <code1>[,<cindex>]

Defined values:

<code1> <b>0</b>	This is a forwarded call.
<b>1</b>	CUG call. Not supported.
<b>2</b>	Call has been put on hold.
<b>3</b>	Call has been retrieved.
<b>4</b>	CUG call. Not supported.
<b>5</b>	The call on hold has been released. (Not a SS Notification).
<b>6</b>	Forward check SS message. Not supported.
<b>7</b>	CLIR suppression rejected
<b>16</b>	This is a CUG call (also <cindex> present)
<cindex> <b>0..32767</b>	CUG index

# AT Commands Phone Terminal Terminated

## **\*EDIF**      *Ericsson Divert Function*

Description      This unsolicited result code is sent whenever the call forwarding information (divert) for the phone is changed. Enable with the AT\*EDIF command.

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

Defined values:

<reason> <b>0</b>	Unconditional.
<b>1</b>	Mobile busy.
<b>2</b>	No reply.
<b>3</b>	Not reachable.
<status> <b>0</b>	Disabled.
<b>1</b>	Enabled, the phone is diverted for the <reason> above.
<classx> <b>Integer</b>	Sum of integers each representing a class of information.
<b>1</b>	Voice L1.
<b>2</b>	Data.
<b>4</b>	Fax.
<b>0..127</b>	Also all other values below 128 are reserved by ETSI.
<b>128</b>	Voice L2.
<number> <b>String</b>	Phone number of format specified by <type>.

---

# AT Commands Phone Terminal Terminated

---

<type>    **Integer**    Address octet in integer format (see GSM 04.08 [4] subclause 10.5.4.7).  
Default 145 when international code included, otherwise 129.



## 4.15 Ensemble S8/C/E : GSM Facility Lock

### **+CLCK**      *Facility Lock*

Description:                Locks or unlocks a ME or network facility. These operations require a password.

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

Options:	<fac>	“CS”	Lock Control Surface, e.g.phone, keyboard.
		“PS”	Lock Phone to SIM card.
		“SC”	Lock SIM Card.
		“P2”	SIM PIN2
		“AO”	Bar All Outgoing calls.
		“OI”	Bar Outgoing International Calls.
		“AI”	Bar All Incoming calls.
		“IR”	Bar Incoming calls when Roaming outside the home country.
		“OX”	Bar Outgoing international calls eXcept to home country.
		“AB”	All Barring services.
		“AG”	All outgoing barring services.
		“AC”	All incoming barring services.

## AT Commands Phone Terminal Terminated

<mode>	<b>0</b>	Unlock.
	<b>1</b>	Lock.
	<b>2</b>	Query status.
	<b>10</b>	Full lock (only valid for <fac>="PS", after power on always ask for password).
<passwd>		String type password defined in +CPWD command.
<class>	<b>1</b>	Voice L1.
	<b>2</b>	Data.
	<b>4</b>	Fax.
	<b>8..127</b>	Reserved.
	<b>128</b>	Voice L2.

Example 1: +CLCK="CS",1,"passwd"  
OK Lock phone keyboard.

Example 2: +CLCK="PS",1,"passwd"  
OK Lock phone to SIM card.

Example 3: +CLCK="CS",2  
+CLCK: 1 Lock phone keyboard is activated.  
OK

Test command: **+CLCK=?** Always returns ("CS","PS","SC","P2","AO","O","OX","AI","IR","AB","AG","AC").

Returns: <status> **0** Not active.  
**1** Active.

Example: AT+CLCK=?

---

## AT Commands Phone Terminal Terminated

---

```
+CLCK: ("CS", "PS", "SC", "P2", "AO",  
"OI", "OX", "AI", "IR", "AB", "AG", "AC")
```

```
OK
```

# AT Commands Phone Terminal Terminated

## **+CPWD**    *Set/change New Password*

Description:                    Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK.

Set command:    **+CPWD**=<fac>,<oldpwd>, <newpwd>

Options:	<fac>	“PS”	lock Phone to SIM card.
		“SC”	lock SIM Card.
		“P2”	SIM PIN2.
		“AO”	bar All Outgoing calls.
		“OI”	bar Outgoing International calls.
		“AI”	bar All Incoming calls.
		“IR”	bar Incoming calls when Roaming outside the home country.
		“OX”	bar Outgoing international calls eXcept to home country.
		“AB”	All Barring services.
		“AG”	All outGoing barring services.
		“AC”	All inComing barring services.
	<oldpwd>		same as password specified for the facility from the ME user interface.
	<newpwd>		create a new password, length determined with <pwdlength>.

# AT Commands Phone Terminal Terminated

Example: AT+CPWD="SC", "4321", "1234"

OK Lock SIM card and change password.

Test Command: **+CPWD=?**

Returns: +CPWD: list of supported (<fac>,<pwdlength>)s  
<pwdlength> Integer type, maximum length of the password.

Example: AT+CWPWD=?

+CPWD: ("PS",8), ("SC",8), ("P2",8),  
("AO",8), ("OI",8), ("OX",8), ("AI",8),  
("IR",8), ("AB",8), ("AG",8), ("AC",8)

OK

## 4.16 Ensemble S9/C/E : GSM Mobile Equipment,Control and Status

### **+CKPD**      *Keypad Control*

Description:                Emulates the ME keypad by giving each character in a string with stroke and pause times \*0.1 seconds.

Execute command:        **+CKPD=<keys>[,<time>[,<pause>]]**

<keys>	#	Hash(number).
	*	Star(*).
	<b>0... 9</b>	Number keys.
	<	Left arrow.
	>	Right arrow.
	<b>C/c</b>	Clear display (C/CLR).
	<b>D/d</b>	Volume down.
	<b>E/e</b>	Connection end.
	<b>S/s</b>	Connection start (SEND).
	<b>U/u</b>	Volume up.
<time>	<b>0..255</b>	0..25.5 seconds.
<pause>	<b>0..255</b>	0..25.5 seconds.

Example:                AT+CKPD=" C " , 20

OK

Clear main display by holding clear button down for two seconds.

Test command:        **+CKPD=?**

Example:                AT+CKPD=?

OK

# AT Commands Phone Terminal Terminated

## **+CIND**      *Indicator Control*

---

Description:              Reads the value of ME indicators.

Set command not supported

Read Command:        **+CIND?**                      Read indicator value.

Returns:                **+CIND:**<ind>,<ind>,...

Options:                <ind>                      Integer value in the range of <descr>.

Example:                AT+CIND?  
                              +CIND: 3,4,0,0,1,0,0,0,0,0,0  
                              OK

Test Command:        **+CIND=?**

Returns:                **+CIND:**(<descr>,(list of supported <ind>s)),  
                              (<descr>,(list of supported <ind>s)),

Options                **“battchg”**                      Battery charge level (0-4).  
<descr>:                Not supported in set command.

**“signal”**                      Signal quality (0-5). Not supported in set command.

**“batterywarning”**        Battery warning (0-1).

**“chargerconnected”**    Charger connected (0-1).  
Not supported in set command.

**“service”**                      Service availability (0-1)  
(Net contact status, 1 = Net contact).

**“sounder”**                      Sounder activity (0-1)  
(Phone silent status, 1 = phone silent).

**“message”**                      Message received (0-1).

**“call”**                              Call in progress (0-1).

## AT Commands Phone Terminal Terminated

<b>“roam”</b>	roaming indicator (0-1) (Home net status, 0 = Home Net).
<b>“smsfull”</b>	a short message memory storage in the MT has become full (1), or memory locations are available (0); i.e. the range is (0-1).

Example: AT+CIND=?  
+CIND: ("battchg", (0-4)), ("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))  
OK



# AT Commands Phone Terminal Terminated

## **+CPAS**     *Mobile Phone Activity Status*

---

Description:                Returns the activity status of the mobile phone.

Execute command:        **+CPAS=<mode>**

Options:                <mode>    **1**                Allows the CPAS to return Ericsson specific <pas> values, such as 129, 130 and 131.

Returns:                +CPAS: <pas>

<pas>	<b>0</b>	Ready.
	<b>3</b>	Ringing.
	<b>4</b>	Call in progress.
	<b>129</b>	MMI in idle state. This is a substate of (0) ready. 1. Operator, clock and date. 2. No conversion or data call in progress. 3. No submenus shown. 4. Only digits clear, *, NO, and # allowed.
	<b>130</b>	Mobile oriented call in progress. This is a substate to 'call in progress' (4).
	<b>131</b>	Mobile terminated call in progress. This is a substate to 'call in progress' (4).

Example:                AT+CPAS=1  
                              +CPAS: 0  
                              OK

Test command:        **+CPAS=?**

Example:                AT+CPAS=?

---

# AT Commands Phone Terminal Terminated

---

+CPAS: (0,3,4,129,130,131)

OK

# AT Commands Phone Terminal Terminated

## **+CPIN**      *Send Password*

---

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

Execute command:        **+CPIN=<pin>[,<newpin>]**

Options:                    <pin>                        Numeric string type values.

                              <newpin>                    The range for SIM PIN and PH-SIM is 4-8 digits. SIM PUK consists of 8 digits.

Example:                  AT+CPIN="1234"

                              OK

Read command:         **+CPIN?**

Returns:                    +CPIN: <code>

<code>    **READY**    ME has no pending request for any password.

**SIM PIN**    ME is waiting SIM PIN to be entered.

**SIM PUK**    ME waiting SIM PUK to be entered.

**PH-SIM PIN** ME waiting PHone to SIM password to be entered.

**SIM PIN 2** ME waiting SIM PIN 2 to be entered. This <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure.

**SIM PUK 2**ME waiting SIM PUK 2 to be entered. (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure.

**BLOCKED**SIM card blocked for user.

Example: AT+CPIN?  
+CPIN: READY  
OK

Test command: **+CPIN=?**

Example: AT+CPIN=?  
+CPIN (READY,SIM PIN,SIM PUK,SIM PIN 2,  
SIM PUK 2,PH-SIM PIN,BLOCKED)  
OK

# AT Commands Phone Terminal Terminated

## **+CBC**      *Mobile Phone Battery Charge*

Description:              Returns the connection status and charge level of the mobile phone battery.

Execute command:      **+CBC**

Returns:                  +CBC: <bc>,<bcl>

<bc>	<b>0</b>	mobile phone is powered by the battery.
	<b>1</b>	mobile phone has the battery connected but is not powered by it.
	<b>2</b>	mobile phone does not have a battery connected.
<bcl>	<b>0</b>	battery discharged.
	<b>1-99</b>	Battery charging level, battery has 1-99 percent of capacity remaining.
	<b>100</b>	Battery fully charged.

Example:                  AT+CBC

+CBC: 0,50

OK

ME powered by battery with 50% capacity remaining.

Read command:        **+CBC?**

Returns (0-1),(0-100).

Returns:                  +CBC: <bc>,<bcl>

Example:                  AT+CBC?

+CBC: 0,50

OK

ME powered by battery with 50% capacity remaining.

Test command:        **+CBC=?**

Returns (0-1),(0-100).

Example:                  AT+CBC=?

---

# AT Commands Phone Terminal Terminated

---

+CBC: (0-2), (0-100)

OK

# AT Commands Phone Terminal Terminated

## **+CSQ**      *Mobile Phone Signal Quality*

Description:                Returns the signal strength and channel bit error rate at the mobile phone. Test command returns values supported by the TA as compound values.

Execute command:    **+CSQ**

Returns:                **+CSQ: <rss>,<ber>**

<rss>	<b>0</b>	-113 dBm or less.
	<b>1</b>	-111 dBm.
	<b>2-30</b>	-109 dBm to -53 dBm.
	<b>31</b>	-51 dBm or greater.
	<b>99</b>	Not known or not detectable.
<ber>	<b>0-7</b>	As RXQUAL values in GSM 05.08.
	<b>99</b>	Not known or not detectable.

Example:                AT+CSQ  
                              +CSQ: 0,0  
                              OK

Test command:        **+CSQ=?**                Returns (0-31),(99).

Example:                AT+CSQ=?  
                              +CSQ: (0-31,99),(0-7,99)  
                              OK

# AT Commands Phone Terminal Terminated

## **+CMER**     *Mobile Equipment Event Reporting*

---

Description:             Set command enables or disables the sending of unsolicited results codes from TA to TE.

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

<b>&lt;mode&gt;</b>	<b>0</b>	Buffer unsolicited result codes in the TA.
	<b>3</b>	Forward unsolicited result codes directly to the TE. Default = <b>0</b> .
<b>&lt;keyp&gt;</b>	<b>0</b>	No keypad even reporting.
	<b>2</b>	Keypad event reporting using result code +CKEV. All key pressings are indicated. Default = <b>0</b> .
<b>&lt;disp&gt;</b>	<b>0</b>	No Display event reporting.
	<b>2</b>	Display event reporting using +CDEV. All events are indicated. Default = <b>0</b> .
<b>&lt;ind&gt;</b>	<b>0</b>	No indicator reporting.
	<b>1</b>	Indicator reporting using +CIEV. Only events not caused by +CIND are indicated. Default = <b>0</b> .
<b>&lt;bfr&gt;</b>	<b>0</b>	When mode (1..3) entered TA buffer is cleared of unsolicited result codes defined within this command.



---

# AT Commands Phone Terminal Terminated

---

Example: AT+CMER=0,0,1,0,0

OK

Read Command: **+CMER?**

Example: AT+CMER?

+CMER: 0,0,1,0,0

OK

Test Command: **+CMER=?**

Example: AT+CMER=?

+CMER: (0,3),(0,2),(0,2),(0-1),(0)

OK

# AT Commands Phone Terminal Terminated

## **+CVIB**      *Vibrator Mode*

---

Description:            used to enable and disable the vibrator alert feature of the ME.

Set command:        **+CVIB=<mode>**  
                          <mode>    **0**            Disable.  
  **1**            Enable.  
  **16**          Enable when silent.

Example:            AT+CVIB=0  
                          OK

Read Command:      **+CVIB?**

Example:            AT+CVIB?  
                          +CVIB: 0  
                          OK

Test Command:      **+CVIB=?**

Example:            AT+CVIB=?  
                          +CMER: (0,1,16)  
                          OK





# AT Commands Phone Terminal Terminated

## **\*ELAN**      *Ericsson Language*

Description:            When the user has selected the language in the interface the command sets the language in the ME.

Set command:        **\*ELAN=<code>**

Options:            <code>    **"AUTO"**    Language is read from SIM card. "AUTO" is never returned by the read-command.

**"sv"**        Swedish.

**"fi"**        Finnish.

**"da"**        Danish.

**"no"**        Norwegian.

**"de"**        German.

**"fr"**        French.

**"es"**        Spanish.

**"it"**        Italian.

**"en"**        English.

**"ae"**        American.

Example:            AT\*ELAN="sv"

                         OK

Read command:     **\*ELAN?**            Current language.

Example:            AT\*ELAN?

                         \*ELAN: "sv"

                         OK

Test command:     **\*ELAN=?**

Example:            AT\*ELAN=?

                         \*ELAN:(list of supported languages)



# AT Commands Phone Terminal Terminated

## **\*ERIL**      *Ericsson Ring Level Set*

Description:            Sets the ring volume level. Note that the <place>-parameter should be ignored for phones with profile features.

Set command:        **\*ERIL=<volume>[,<call type>[,<place>]]**

Options:	<volume> <b>0</b>	Off.
	<b>1-6</b>	Volume setting, not increasing ring.
	<b>129-134</b>	Volume setting, increasing ring.
	<call type> <b>1</b>	Line 1. Default=1.
	<b>2</b>	Line 2.
	<b>3</b>	Fax.
	<b>4</b>	Data.
	<place> <b>0</b>	Hand held. Default=0.
	<b>1</b>	Car mounted.

Example:            AT\*ERIL=3,1,1  
OK

Read command:     **\*ERIL?**

Example:            AT\*ERIL?  
  
\*ERIL: 3,1,1  
\*ERIL: 3,2,1  
\*ERIL: 4,3,0  
\*ERIL: 6,4,0  
  
OK

Test command:     **\*ERIL=?**

Example:            AT\*ERIL

---

## AT Commands Phone Terminal Terminated

---

\*ERIL: (0-6,129-134),(1-4),(0-1)

OK



# AT Commands Phone Terminal Terminated

## **\*ERIN**      *Ericsson Ring Set*

---

Description:                Sets the ring type for incoming calls.

Set command:            **\*ERIN**=<sound type>,[<call type>]

Options:	<sound type>	<b>1</b>	Low ring signal.
		<b>2</b>	Medium ring signal.
		<b>3</b>	High ring signal.
		<b>4</b>	Mixed ring signal.
		<b>11-20</b>	Melody 1-10 - preset.
		<b>31-34</b>	Own melodies 1-4.
	<call type>	<b>1</b>	Line 1. Default=1.
		<b>2</b>	Line 2.
		<b>3</b>	Fax.
		<b>4</b>	Data.
		<b>5</b>	Alarm.

Example:                AT\*ERIN=1,1  
OK

Read command:        **\*ERIN?**

Example:                AT\*ERIN?  
\*ERIN:1,1  
OK

Test command:        **\*ERIN=?**

Example:                AT\*ERIN=?  
\*ERIN:(1-4,11-20,31-34),(1-5)  
OK

# AT Commands Phone Terminal Terminated

## **\*ERIP**      *Ericsson Ring Signal Playback Command*

---

Description:            Used to play one of the sound types that are available as a ring signal on the phone.

Set command:        **\*ERIP**=<volume>,<sound type>

Options:	<volume>	<b>0</b>	Off.
		<b>1</b>	Step.
		<b>2-7</b>	Volume setting.
	<sound type>	<b>1</b>	Low ring signal.
		<b>2</b>	Medium ring signal.
		<b>3</b>	High ring signal.
		<b>4</b>	Mixed ring signal.
		<b>11</b>	Melody 1.
		<b>12-20</b>	Melody 2-20 - preset.
		<b>31-34</b>	Own melodies 1-4.

Example:            AT\*ERIP=3,3

OK

Test command:      **\*ERIP=?**

Example:            AT\*ERIP=?

\*ERIP: (0-7),(1-4,11-20,31-34)

OK





# AT Commands Phone Terminal Terminated

## **\*ESKS**      *Ericsson Settings Key Sound*

---

Description:                Sets the key sound mode of the MS.

Set command:            **\*ESKS=<mode>**

Options:	<mode>	<b>0</b>	Silent.
		<b>1</b>	Click.
		<b>2</b>	Tone.

Example:                AT\*ESKS=2

OK

Read command:        **\*ESKS?**

Example:                AT\*ESKS?

\*ESKS: 2

OK

Test command:        **\*ESKS=?**

Example:                AT\*ESKS=?

\*ESKS: (0-2)

OK





# AT Commands Phone Terminal Terminated

## **\*ESAM**     *Ericsson Settings Answer Mode*

---

Description:                Sets the answer mode settings in the MS.

Set command:            **\*ESAM=<mode>**

Options:	<mode>	<b>0</b>	Answer Mode is neither set to "Any key", nor "Auto" (off).
		<b>1</b>	Any Key Mode on.
		<b>2</b>	Auto Mode on.

Example:                AT\*ESAM=2  
OK

Read command:        **\*ESAM?**

Example:                AT\*ESAM?  
\*ESAM: 2  
OK

Test command:        **\*ESAM=?**

Example:                AT\*ESAM=?  
\*ESAM: (0-2)  
OK



# AT Commands Phone Terminal Terminated

## **\*ESBL**      *Ericsson Settings Back Light Mode*

---

Description:                Sets the back light mode of the MS. Note that the <place>-parameter should be ignored for phones with profile features.

Set command:            **\*ESBL=<place>,<mode>**

Options:	<place>	<b>0</b>	Handheld.
		<b>1</b>	Car mounted.
	<mode>	<b>0</b>	Always off.
		<b>1</b>	Always on.
		<b>2</b>	AUTO, back light is turned on when the ME reacts to a user event or when receiving a call. The light is then turned off after short while.

Example:                AT\*ESBL=0,1  
OK

Read command:        **\*ESBL?**

Example:                AT\*ESBL?  
\*ESBL: 0,1  
\*ESBL: 1,1  
OK

Test command:        **\*ESBL=?**

Example:                AT\*ESBL=?  
\*ESBL: (0-1),(0-2)  
OK

# AT Commands Phone Terminal Terminated

## **\*ESDF**      *Ericsson Settings Date Format*

---

Description:                Sets the date information format in the MS.

Set command:            **\*ESDF=<mode>**

Options:	<mode>	<b>0</b>	Off.
		<b>1</b>	DD-MMM-YY
		<b>2</b>	DD-MM-YY
		<b>3</b>	MM/DD/YY
		<b>4</b>	DD/MM/YY
		<b>5</b>	DD.MM.YY
		<b>6</b>	YYMMDD
		<b>7</b>	YY-MM-DD

Example:                AT\*ESDF=1  
OK

Read command:        **\*ESDF?**

Example:                AT\*ESDF?  
\*ESDF: 1  
OK

Test command:        **\*ESDF=?**

Example:                AT\*ESDF=?  
\*ESDF: (0-7)  
OK



# AT Commands Phone Terminal Terminated

Read command: **\*ESOM?**

Example: AT\*ESOM?

```
*ESOM: 1, "aAffFgaAgfEpgGefgeafDC"
```

OK

Test command: **\*ESOM=?**

Response: (list of supported <melody index>),(list of supported <pause>s),(list of supported <prefix>s),(list of supported <tone>s), <mlength>,<mtones>

where: <mlength> **Integer** maximum length of <melody string>

<mtones> **Integer** maximum number of tones in <melody string>

Example: AT\*ESOM=?

```
*ESOM: (1-4), ('p'), ('#', '(b)', '+'), ('c', 'd', . . . . ., 'A', 'B'), 120, 40
```

OK





# AT Commands Phone Terminal Terminated

## Unsolicited Result Codes

### **+CKEV**     *Keypad Event*

Description:            Is enabled with the AT+CMER command and indicates key press/release.

Unsolicited Result

code:            **+CKEV:** <key>,<press>

Defined values:    <key>     #            Hash(number).  
   \*            Star(\*).  
   **0... 9**        Number keys.  
   <            Left arrow.  
   >            Right arrow.  
   **C/c**        Clear display (C/CLR).  
   **D/d**        Volume down.  
   **E/e**        Connection end.  
   **S/s**        Connection start (SEND).  
   **U/u**        Volume up.  
   <press>    **0**            Key released  
   **1**            Key pressed

Example:            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

# AT Commands Phone Terminal Terminated

## **+CIEV**      *Indicator Event Reporting*

Description:            Is enabled with the AT+CMER command and indicates changes in indicator levels.

### Unsolicited Result

code:            **+CIEV:** <ind>,<value>

Defined values:	<ind>	<b>1</b>	Battery charge level indicator
		<b>2</b>	Signal quality indicator
		<b>3</b>	Battery warning indicator
		<b>4</b>	Charger connected indicator
		<b>5</b>	Service availability indicator
		<b>6</b>	Sounder activity indicator
		<b>7</b>	Message received indicator
		<b>8</b>	Call in progress indicator
		<b>9</b>	Transmit activated by voice activity indicator
		<b>10</b>	Roaming indicator
		<b>11</b>	Short message memory storage indicator in the MS.
	<value>	<b>Integer</b>	New value of the specific indicator.

Example:            AT+CMER= , 2 , , 1 ,      Request unsolicited result codes for keypad- and indicator events.

OK

+CIEV: 2,5            Signal strength indicator changes its state to 5



# AT Commands Phone Terminal Terminated

## **\*ECAV**      *Ericsson Call Monitoring Event*

Description:                Reports changes in call state indicated by <ccid>.

Unsolicited Result

code:            **\*ECAV:** <ccid>,<ccstatus>,<calltype>,  
[<processid>],[<exitcause>],[<number>,<type>]

Defined values:

<ccid>	<b>1..7</b>	Uniquely defines a call.
<ccstatus>	<b>0</b>	IDLE.
	<b>1</b>	CALLING (MO).
	<b>2</b>	CONNECTING (MO).
	<b>3</b>	ACTIVE (connection between A and B).
	<b>4</b>	HOLD.
	<b>5</b>	WAITING (MT).
	<b>6</b>	ALERTING (MT).
	<b>7</b>	BUSY.
<calltype>	<b>1</b>	VOICE.
	<b>2</b>	DATA.
	<b>4</b>	FAX.
	<b>128</b>	VOICE2.
<processid>	<b>Integer</b>	Reports return to IDLE.
	<b>8=H'08</b>	CC (Call Control).
	<b>68=H'44</b>	MM (Mobile Management).
	<b>69=H'45</b>	MS (Mobile station).
	<b>122=H7A</b>	RR (Radio Resources).
<exitcause>	<b>Integer</b>	Exit cause according to GSM 04.08. Reports return to IDLE (<ccstatus>=0).

# AT Commands Phone Terminal Terminated

<number> **String** String type phone number as specified by <type>. Valid only for <ccstatus>=1.

<type> **Integer** Address octet in integer format (see GSM 04.08 subclause 10.5.4.7). Default 145 when dialing string includes "+", otherwise 129. Valid only for <ccstatus>=1.

Example: ATD08044864; Dial number.

OK

\*ECAV: CALLING

1,1,1,,,084044864,129

\*ECAV: 1,2,1,, CONNECTING

\*ECAV: 1,3,1,, ACTIVE CALL

AT+CHLD=2 Put call on hold

OK

\*ECAV: 1,4,1,, HOLD indication

AT+CHLD=2 Retrieve held call

OK

\*ECAV: 1,3,1,, ACTIVE call again

ATH Hang up

OK

\*ECAV: IDLE. Call Control (CC) exit cause 16 (normal clearing)  
1,0,1,8,16

Example: RING Incoming call

\*ECAV: 1,6,128,, ALERTING (VOICE2)

---

# AT Commands Phone Terminal Terminated

---

RING

RING

ATA

Answer call

OK

\*ECAV: 1,3,1,,

ACTIVE call indication.

\*ECAV:

Remote party hangs up.

1,0,1,8,16

IDLE call state entered.

Call Control (CC) exit

cause 16 (normal clearing).

# AT Commands Phone Terminal Terminated

## 4.17 Ensemble S11/C/E : GSM SMS and CBS PDU Mode

### **+CSMS**     *Select SMS Message Service*

Description:                Defines the message service and returns the functionality of the message service in the form:

Set command:     **+CSMS=<service>**

Options:     <service> **0**     GSM 03.40 and 03.41 specific. (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 version 4.7.0; Phase 2+ features which do not require new command syntax may be supported (e.g. correct routing of messages with new Phase 2+ data coding schemes))  
Default=**0**.

**1**     GSM 03.40 and 03.41 specific. (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2+ version; the requirement of <service> setting 1 is mentioned under corresponding command descriptions).

**2-127**     Reserved. **Not Supported.**

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

**<mt>**     **0**     Mobile terminated messages not supported.

**1**     Mobile terminated messages supported.

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<mo>	0	Mobile originated messages not supported.
	1	Mobile originated messages supported.
<bm>	0	Broadcast messages not supported.
	1	Broadcast messages supported.

Example: AT+CSMS=0  
+CSMS: 1,1,0  
OK

Read command: **+CSMS?**

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

Example: AT+CSMS?  
+CSMS: 1,1,0  
OK

Test command: **+CSMS=?**

Response: **+CSMS:**<list of supported services>

Example: AT+CSMS=?  
+CSMS: (0-1)  
OK

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## **+CPMS Preferred SMS Message Storage**

Description: Set command selects memory storage <mem1>, <mem2> and <mem3> to be used for reading, writing, etc..

Set command: **+CPMS=<mem1>,[<mem2>],[<mem3>]**

Options: <mem1> Memory from which messages are read and deleted  
"ME" ME message storage.  
"SM" SIM message storage.  
<mem2> Memory to which writing and sending operations are made  
"ME" ME message storage.  
"SM" SIM message storage.  
Default="SM"  
<mem3> Memory to which received SMS are preferred to be stored  
"ME" ME message storage.

Response: **+CPMS:<used1>,<total1>,<used2>,<total2>,<used3>,<total3>**

Where: <used1>,<used2>,<used3> Total number of messages currently in <mem1>, <mem2> and <mem3> respectively.  
<total1>,<total2>,<total3> Total number of message locations in <mem1>, <mem2> and <mem3> respectively.

Memory 1 storage is used to list, read and delete messages (+CMGL, +CMGR and +CMGD) whilst memory 2 is used to write and send messages (+CMGW and +CMSS).

Example: AT+CPMS="SM", "SM"

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+CPMS: 3,20,3,20

OK

Read command: **+CPMS?** Returns the current setting.

Example: AT+CPMS?

+CPMS: "ME",5,10,"SM",3,20,"ME",5,10

OK

Test command: **+CPMS=?** Always returns  
(ME,SM),(ME,SM),(ME).

Example: AT+CPMS=?

+CPMS: ("ME","SM"),("ME","SM"),  
("ME")

OK

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## **+CMGL**    *List Messages*

---

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

Set command:            **+CMGL=[<stat>]**

Options:	<stat>	<b>0</b>	Received unread messages. Default= <b>0</b> .
		<b>1</b>	Received read messages.
		<b>2</b>	Stored unsent messages. (only applicable to SMS)
		<b>3</b>	Stored sent messages. (only applicable to SMS)
		<b>4</b>	All messages (only applicable to +CMGL command).
		<b>16</b>	Template message.

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

[<alpha>]    **String**    Manufacturing specific. Should be left empty but not omitted.

<length>    **Integer**    Value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets.



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	<pdu>	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number. In the case of CBS: GSM 03.41 TPDU in hexadecimal format.
Example 1:	AT+CMGL=0	Messages received and unread.
	+CMGL: 1,0,,128<128 byte pdu>	
	OK	
Example 2:	AT+CMGL=2	
	+CMGL: 2,0,68<68 byte pdu>	
	OK	
Example 3:	AT+CMGL=1	List received messages.
	OK	None received.
Example 4:	AT+CMGL=2	List stored unsent messages. None stored.
Example 5:	AT+CMGL=3	List stored sent messages.
	+CMGL: 1,3,,32<32 byte pdu>	
	OK	Message in index 1 of SM is stored and sent.
Test command:	<b>+CMGL=?</b>	
Example:	AT+CMGL=?	
	+CMGL: (4)	
	OK	

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## **+CMGR**    *Read Message*

---

Description:            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.

Set command:    **+CMGR=<index>**

Options:    <index>    **Integer**    Value in the range of location numbers supported by the associated memory.

Returns:    <stat>    **0**    Received unread.

**1**    Received read.

**2**    Stored unsent (only applicable to SMS).

**3**    Stored sent (only applicable to SMS).

**16**    Template message.

[<alpha>]    **String**    Manufacturing specific. Should be left empty but not omitted.

<length>    **Integer**    Value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets.

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<pdu>

In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number. In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

Example: AT+CMGR=2

+CMGR: 0,,68 <64 byte pdu>

OK

Test command: **+CMGR=?**

Example: AT+CMGR=?

OK

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## **+CMGS**    *Send SMS Messages*

---

Description:            Sends a message to the phone network. On successful delivery a message reference number is returned. Sending can be cancelled by sending the **ESC** character.

Set command:            **+CMGS=<length><CR><pdu is given><CTRL-Z/ESC>**

Options:                <length>    **Integer**    Value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets.

Returns:                <mr>        **Integer**    GSM 03.40 TP-Message-Reference in integer format.

[,<ackpdu>  
]                        GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without GSM 04.11 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter.

Example:                AT+CMGS=35<CR><35 byte pdu><CTRL-Z>  
                          +CMGS: 13  
                          OK

Test command:         **+CMGS=?**

Example:                AT+CMGS=?  
                          OK

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## **+CMSS**      *Send From Storage*

---

Description:                Sends message with location value <index> from message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). Reference value <mr> is returned to the TE on successful message delivery.

Set command:            **+CMSS=<index>**

Options:                <index>      **Integer**      Value in the range of location numbers supported by the associated memory.

Returns:                <mr>            **Integer**      GSM 03.40 TP-Message-Reference in integer format.

Example:                AT+CMSS=1  
                              +CMSS: · 12  
                              OK

Test command:         **+CMSS=?**

Example:                AT+CMSS=?  
                              OK

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## **+CMGW** *Write Message To Memory*

Description: stores a message to memory storage <mem2>. Memory location <index> of the stored message is returned.

Set command: **+CMGW**=<length>[,<stat>],<CR><pdu is given><CTRL-Z/ESC>

Options: <length> **Integer** Value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets.

<stat> **2** Stored unsent message.  
Default = **2**.

<pdu> In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number. In the case of CBS: GSM 03.41 TPDU in hexadecimal format

Returns: <index> **Integer** Value in the range of location numbers supported by the associated memory.

Example: AT+CMGW=128<CR><128 byte pdu><CTRL-Z>  
+CMGW: 2 Message stored at index 2.  
OK

Test command: **+CMGW=?**

Example: AT+CMGW=?  
OK



# AT Commands Phone Terminal Terminated

## **+CMGF**     *Message Format*

---

Description:                Informs the TA which input and output format of messages to use.

Set command:            **+CMGF=<mode>**

Options:                <mode>    **0**                PDU mode.

Example:                AT+CMGF=0                Select PDU mode.

OK

Read command:        **+CMGF?**

Example:                AT+CMGF?

+CMGF: 0                PDU mode.

OK

Test command:        **+CMGF=?**

Example:                AT+CMGF=?

+CMGF: (0)                Only PDU mode available.

OK



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## **+CSCA**      *SMS Service Centre Address*

Description:              Updates the SMSC address which is used to originate mobile Short Message Service transmissions.

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

Options:      <sca>      **String**      GSM 04.11 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set.

<tosca>      **128 - 255**      Other values refer GSM 04.08 section 10.5.4.7

**129**      ISDN / telephony numbering plan, national / international unknown.

**145**      ISDN / telephony numbering plan, international number.

**161**      ISDN / telephony numbering plan, national number.

If a '+' is included in the phone number (number) then a default of 145 is used. In all other cases a default value of 129 is applied.

Example:      AT+CSCA=" +358501234589 "

OK                      Change SCA.

Read command:      **+CSCA?**                      Returns the current setting.

---

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---

Example: AT+CSCA?  
+CSCA: "358501234567",145  
OK

Test command: **+CSCA=?**

Example: AT+CSCA=?  
+CSCA: (128-255)  
OK

# AT Commands Phone Terminal Terminated

## **+CSCB**     *Select Cell Broadcast Message Type*

---

Description:                Selects the type of cell message broadcasts to be received by the ME.

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

Options:                <mode>    **0**                Message types in <mids> accepted.  
                             <mids>    **String**        All possible combinations of message identifiers.  
                             <dcss>    **String**        All possible combinations of coding schemes.

Example:                AT+CSCB=0            Accept <mids> messages.  
                             OK

Read command:        **+CSCB?**

Example:                AT+CSCB?  
                             +CSCB: 0  
                             OK

Test command:        **+CSCB=?**

Example:                AT+CSCB=?  
                             +CSCB: (0)  
                             OK

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## **+CSAS**     *Save Settings*

---

Description:                Saves active message service settings to a non-volatile memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved.

Set command:     **+CSAS**[=<profile>]

Options:            <profile>     **0..255**     Manufacturer specific profile number where settings are to be stored

Example:            AT+CSAS                             Save settings.

OK

Test command:     **+CSAS=?**

Example:            AT+CSAS=?

+CSAS: ( 0 )

OK

# AT Commands Phone Terminal Terminated

## **+CRES**     *Restore Settings*

---

Description:                restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are restored.

Set command:     **+CRES**[=<profile>]

Options:           <profile>     **0..255**     Manufacturer specific profile number where settings are to be stored

Example:           AT+CRES             Restore settings.

OK

Test command:     **+CRES=?**

Example:           AT+CRES=?

+CRES: ( 0 )

OK

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## **+CNMI**      *New Message Indication To TE*

Description:                Selects the procedure that sets how new messages are indicated on the TE.

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

Options:	<mode>	<b>3</b>	Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.
	<mt>	<b>0</b>	No SMS-DELIVER indications are routed to the TE. Default= <b>0</b> .
		<b>1</b>	If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index>
		<b>3</b>	Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes +CMT: <length><CR><LF><pdu>. Messages of other data coding schemes result in indication as defined in <mt>=1.
	<bm>	<b>0</b>	Store message to "BM" (or some manufacturer specific memory). No CBM indications are routed to the TE. Default= <b>0</b> .

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	<b>2</b>	New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled).
	<ds> <b>0</b>	No SMS-STATUS-REPORTs are forwarded to the TE.
	<bfr> <b>1</b>	TA buffer of unsolicited result codes defined within this command are cleared when <mode> 1...2 is entered (OK response shall be given before flushing the codes).
Example:	AT+CNMI=3,1,2,0	Send SM indications to TE.
	OK	
Read command:	<b>+CNMI?</b>	
Example 1:	AT+CNMI?	
	+CNMI: 3,1,2,0	
	OK	
Test command:	<b>+CNMI=?</b>	
Example:	AT+CNMI=?	
	+CNMI: (3),(0-3),(0,2),(0)	
	OK	
Unsolicited Result codes:	<b>+CBM:</b> <length><CR><LF><pdu>	

## Unsolicited Result Codes

# AT Commands Phone Terminal Terminated

## **+CBM**      *New Message Indication*

---

Description:              Cell broadcast message.

Unsolicited Result

code:              **+CBM:** <length> <CR><LF><pdu>

Received when CBMs are routed directly to the TE.

Defined values:      <length>      **Integer**

The length of the actual TP data unit in octets.

<pdu>

For SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hex format.

For CBS: GSM 03.41 TPDU in hex format.

## **+CMTI**      *New Message Indication*

---

Description:              Indicates the memory location where the message routed to the TE is located.

Unsolicited Result

code:              **+CMTI:**<mem>, <index>

When a message has been received and SMS-DELIVER is stored into ME/TA.

Defined values:      <mem>      **ME**

ME message storage.

**SM**

SIM message storage.

<index>      **Integer**

Value in the range of location numbers supported by the associated memory.



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## **+CMT**      *Received Message*

---

Description:            The command AT+CNMI selects the procedure of how the receiving of new messages from the network is indicated to the TE when the TE is active. Received SMS are routed directly to the TE using unsolicited result code.

### Unsolicited Result

code:            **+CMT:**<length>, <pdu>

When a message has been received and SMS-DELIVER is stored into ME/TA.

Defined values:    <length>    **Integer**

Value indicating in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<pdu>

In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into 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))In the case of CBS: GSM 03.41 TPDU in hexadecimal format

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## **+CMS**      *Report Operational/access Failure (+CMS)*

---

The +CMS ERROR result codes indicate an error relating to the Infrared Modem, Mobile Phone or Network relating to the Short Message Service (SMS) and replaces the final result code ERROR.

+CMS ERROR: 0              GSM 04.11 Annex E-2 values.

to

+CMS ERROR: 127

+CMS ERROR: 128              GSM 03.40 Section 9.2.3.22 values.

to

+CMS ERROR: 255

+CMS ERROR: 300              Mobile phone failure.

+CMS ERROR: 301              Short message service of mobile phone reserved.

+CMS ERROR: 302              Operation not allowed.

+CMS ERROR: 303              Operation not supported.

+CMS ERROR: 304              Invalid PDU mode parameter.

+CMS ERROR: 305              Invalid text mode parameter.

+CMS ERROR: 310              SIM card not inserted.

+CMS ERROR: 311              SIM card PIN necessary.

+CMS ERROR: 312              SIM card PIN necessary for PH-SIM.

+CMS ERROR: 313              SIM card failure.

+CMS ERROR: 314              SIM card busy.

+CMS ERROR: 315              SIM card wrong.

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+CMS ERROR: 316	SIM PUK required
+CMS ERROR: 317	SIM PIN2 required
+CMS ERROR: 318	SIM PUK2 required
+CMS ERROR: 320	Memory failure.
+CMS ERROR: 321	Invalid memory index.
+CMS ERROR: 322	Memory full.
+CMS ERROR: 330	SMSC address unknown.
+CMS ERROR: 331	No network service.
+CMS ERROR: 332	Network timeout.
+CMS ERROR: 340	no +CNMA acknowledgement expected
+CMS ERROR: 500	Unknown error.
+CMS ERROR: ...511	range 256...511 reserved
+CMS ERROR: 512...	manufacturer specific

## 4.18 Ensemble S16/C/E : GSM Phonebook Commands

### **+CPBS**      *Select Mobile Phone Phonebook Memory Storage*

Description:              Selects phonebook memory storage <storage>, which is used by other phonebook commands.

Set command:      **+CPBS=<storage>**

Options:	<storage> "FD"	SIM fix-dialing-phonebook. Only in reference point E.
	"LD"	SIM last-dialing-phonebook.
	"ME"	ME phonebook.
	"SM"	SIM phonebook.
	"DC"	ME dialed calls list.
	"RC"	ME received calls list.
	"MC"	ME missed calls list.
	"MV"	ME Voice Activated Dialing list.

Example:      AT+CPBS="SM"  
OK

Read command:      **+CPBS?**              Returns the current setting.

Example:      AT+CPBS?  
+CPBS: "SM"  
OK

Test command:      **+CPBS=?**

Example:      AT+CPBS=?  
+CPBS: ( "LD" , "ME" , "SM" ,  
"DC" , "RC" , "MC" , "MV" )  
OK

# AT Commands Phone Terminal Terminated

## **+CPBR**      *Read Mobile Phone Phonebook Entries*

---

Description:            Returns the phonebook entries from index1 to index2 as stored on the SIM card or in the Mobile Phone memory. Use the AT+CPBS command (see previous page) to select one of these memories. The default is the SIM memory.

Set command:    **+CPBR=<index1>,[<index2>]**

Options:	<index1>	Number location, start.
	<index2>	Number location, end.
Returns:	<indexn>	Integer entry to be read.
	<number>	String number of <type> format.
	<type>	Integer format type of address.
	<text>	Field of <tlength> maximum length.

Example:    AT+CPBR=1,4  
              +CPBR: 1, "931123456",129, "FREDRIK"  
              +CPBR: 2, "9501234567",129, "MAGNUS"  
              +CPBR: 2, "901234567",129, "LARS"  
              OK

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Test command:	<b>+CPBR=?</b>	Returns (1-100),20,18.  The returned values are the number of entries available in the current phone book memory, the maximum length of the phone number and the maximum length of the text. These values can vary between different SIM cards and mobile phones. The result from this test command depends on the phonebook storage chosen with AT+CPBS
Returns:	<nlength>	Integer value of maximum length of field <number>.
	<tlength>	Integer value of maximum length of field <text>.
Example:	AT+CPBR=? +CPBR: (1-100),20,18 OK	

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## **+CPBF**      *Phonebook Find*

---

Description:              Returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field start with string <findtext>.

Set command:      **+CPBF=<findtext>**

Options:      <findtext>      **String**      Field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS.

Returns:      <indexn>              Integer entry to be read.

                 <number>              String number of <type> format.

                 <type>              Integer format type of address.

                 <text>              Field of <tlength> maximum length.

Example:      AT+CPBF="MAGNUS"

                 +CPBF: 2, "9501234567", 129, "MAGNUS"

                 OK

# AT Commands Phone Terminal Terminated

Test command:	<b>+CPBF=?</b>	Returns (1-100),20,18.  The returned values are the number of entries available in the current phone book memory, the maximum length of the phone number and the maximum length of the text. These values can vary between different SIM cards and mobile phones.
Returns:	<nlength>  <tlength>	Integer value of maximum length of field <number>.  Integer value of maximum length of field <text>.
Example:	AT+CPBF=?  +CPBF: 80,20  OK	



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## **+CPBW**     *Write Mobile Phone Phonebook Entries*

---

Description:             Store entries in the phonebook.

Set command:     **+CPBW**=[<index>],[<number>,<type>,<text>]]

Options:     <index>             Location number for the storage of the phone details. If omitted then the first free location is assigned.

                 <number>     **String**     Phone number.

                 <type>     **128-255**     Type of ISDN/Phone numbering plan.

**129**     Nationality unknown.

**145**     International.

**161**     National.

If a '+' is included in the phone number <number> then a default of 145 is used, in all other cases a default value of 129 is applied.

                 <text>     **String**     Name or description of the phone number.

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Example 1: AT+CPBW=3, "921123456" , , "Mikael"  
OK

The new entry overwrites position 3 in the phonebook.

Example 2: AT+CPBW=4  
OK

Clear entry 4 in the phonebook.

Test command: **+CPBW=?**

Returns (1-100),20,(128-255),20.

The returned values are the number of entries available in the current phone book memory, the maximum length of the phone number and the maximum length of the text. These values can vary between different SIM cards and mobile phones. The result from this test command depends on the phonebook storage chosen with AT+CPBS.

Example: AT+CPBW=?

+CPBW: (1-100),20,(128-255),20

OK

# AT Commands Phone Terminal Terminated

## **\*ECAR**      *Ericsson Callers Allowed Read*

Description:            Execution command returns calls allowed index, groupname if applicable, storage and phonebook index.

Set command:        **\*ECAR**=<CAindex1>[, <CAindex2>]  
                  Options    **Integer**    Start value of location number.  
                  <CAindexn>:

                  Response:    <CAindex>,[<groupname>][,<storage>,<PBindex>]

<groupname>:        **String**    Name of callers allowed group.

                  <storage>:    **String**    **"SM"**      SIM phonebook  
  **"ME"**      Mobile phonebook

                  <PBindex>:    **Integer**    Values in the range of location numbers of phonebook memory

Example:            AT\*ECAR=1,5            List callers allowed between index 1 and 5 in the "callers allowed"-list

\*ECAR: 1,, "ME",15

\*ECAR: 4,, "SM",34

\*ECAR: 5, "Work"

OK

Test command:      **\*ECAR=?**

                  Returns:    (list of supported <CAindex>s),<gn\_length>,(list of supported <storage>s)

Example:            AT\*ECAR=?

\*ECAR: (1-10),18, ("SM", "ME")

OK



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## **\*EPRR**      *Ericsson Personal Ringtype Read*

Description:                Returns phone number, phone number type and sound type in location number <indexr>.

Set command:            **\*EPRR=** <indexr>

Options:                <indexr>    **1..10**            Value of location number

Returns:                <indexr>

<number>    **String**            Phone number of format <type>.

<type>        **Integer**            Type of address octet (refer GSM 04.08 [4] section 10.5.4.7)

**128-255**        Other values refer GSM 04.08 [4] section 10.5.4.7.

**129**             ISDN / telephony numbering plan, national / international unknown.

**145**             ISDN / telephony numbering plan, international number.

**161**             ISDN / telephony numbering plan, national number.

If a '+' is included in the phone number <number> then a default of 145 is used, in all other cases a default value of 129 is applied.

<sound type>        **1**                    Low ring signal.

**2**                    Medium ring signal.

## AT Commands Phone Terminal Terminated

- 3** High ring signal.
- 4** Mixed ring signal.
- 11-20** Melody 1-10 - preset.
- 31-34** Own melodies 1-4.

Example: AT\*EPRR=4  
EPRR:  
4,046194533,2

Phone number 046194533  
and ringtype 2 for index 4  
in personal ringtype list.

OK

Test command: \*EPRR=?

Returns: (list of supported  
<index>s)

Example: AT\*EPRR=?  
EPRR: (1-10)  
OK

# AT Commands Phone Terminal Terminated

## **\*EPRW**     *Ericsson Personal Ringtype Write*

Description:            Writes phone number, phone number type and sound type in location number <indexr>. It is possible to use wild cards for phone number.

Set command:        **\*EPRW=** <indexr>,<number>,<type>,<ringtype>

Options:	<indexr>	<b>1..10</b>	Value of location number
	<number>	<b>String</b>	Phone number of format <type>.
	<type>	<b>Integer</b>	Type of address octet (refer GSM 04.08 [4] section 10.5.4.7)
		<b>128-255</b>	Other values refer GSM 04.08 [4] section 10.5.4.7.
		<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.

If a '+' is included in the phone number <number> then a default of 145 is used, in all other cases a default value of 129 is applied.

Example:            AT\*EPRW=4,046194533,2

# AT Commands Phone Terminal Terminated

	OK	Set phone number 046194533 and ringtype 2 for index 4 in the personal ringtype list.
Test command:	<b>*EPRW=?</b>	
Returns:	(list of supported <index>s)	
	<nlength>	Integer value of maximum length of field <number>.
	(list of supported <type>s)	
	(list of supported <sound type>s)	
	<b>1</b>	Low ring signal.
	<b>2</b>	Medium ring signal.
	<b>3</b>	High ring signal.
	<b>4</b>	Mixed ring signal.
	<b>11-20</b>	Melody 1-10 - preset.
	<b>31-34</b>	Own melodies 1-4.
Example:	AT*EPRW=?	
	*EPRW: (1-10), 10, (128-255), (1-4, 11-20, 31-34)	
	OK	List of index and maximum length of number and list of possible ring types.



# AT Commands Phone Terminal Terminated

## **\*ECAS**      *Ericsson Callers Allowed Set*

---

Description:            The command is used to set alternatives for call screening.

Set command:        **\*ECAS=** <callscreen>

Options:	<callscree <b>0</b> n>	No callers allowed.
	<b>1</b>	All callers allowed, normal actions shall be taken on incoming calls. Default= <b>1</b>
	<b>2</b>	Some callers allowed.

Example:            AT\*ECAS=2  
OK

Read command:      **\*ECAS?**

Example:            AT\*ECAS?  
\*ECAS: 2  
OK

Test command:      **\*ECAS=?**

Returns:            (list of supported  
<callscreen>s)

Example:            AT\*ECAS=?  
\*ECAS: (0-2)  
OK

## 4.19 Ensemble S18/E : GSM Clock, Date and Alarm Handling

### **+CCLK**     *Clock*

Description:                Sets the real time clock of the ME.

Set command:     **+CCLK=<time>**

Options:     <time>     **String**     Format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), 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).

Example:     AT+CCLK= "97/09/29,14:25:00+00"

OK

Set correct time to 29th of September 1997, 14:25:00 and no time difference between local time and GMT.

Read command:     **+CCLK?**

Example:     AT+CCLK?

+CCLK: "97/09/27,22:10:00+00"

OK

Test command:     **+CCLK=?**

Example:     AT+CCLK=?

OK

# AT Commands Phone Terminal Terminated

## **+CALA**     *Alarm*

---

Description:                Sets an alarm time in the ME. The alarm time is set in minutes and hours. Date, seconds and time zone are not possible to use.

Set command:            **+CALA=<time>**

Options:                <time>     **String**     Format is "hh:mm", where characters indicate hour, minutes.

Example:                AT+CALA= "14:25"  
OK

Read command:        **+CALA?**

Example:                AT+CALA?  
+CALA: "22:10"  
OK

Test command:        **+CALA=?**

Example:                AT+CALA=?  
OK

## 4.20 Ensemble S19/E : GSM Subscriber Identification

---

### **+CIMI**      *Read International Mobile Subscriber Identity (IMSI)*

---

Description:            Execution command which causes the TA to return <imsi>. This identifies the individual SIM which is attached to the ME.

Execute command:    **+CIMI**

Returns:            <imsi>                            The IMSI, an integer string without double quotes.

Example:            AT+CIMI  
                          931123456  
                          OK

Test command:      **+CIMI=?**

Example:            AT+CIMI=?  
                          OK

## 4.21 Ensemble S20/C/E : Ericsson Specific AT Commands for GSM

---

### **\*ECUR**      *Ericsson Current Report*

---

Description:                Reports the current consumption of the connected device.

Set command:            **\*ECUR=<mamp>**

Options:                <mamp>    **Integer**    Number of milliamps divided by 10.

Example:                AT\*ECUR=12            120 milliamps.

OK

Test command:         **\*ECUR=?**

Example:                AT\*ECUR=?

OK

# AT Commands Phone Terminal Terminated

## **\*EENL**      *Ericsson Environment List*

Description:              Used to list all environments known to the phone.

Execute command:      **\*EENL**

Returns                  **1**              Portable hands free.  
<accessory\_id>:

**2**              Vehicle hands free.

**3**              RS232-cord.

**4**              IR-device.

**5**              Reserved.

**6**              Charger – intelligent.

**7**              Charger – simple.

**8**              Reserved.

**9**              Reserved.

**10**             Reserved.

**11**             Reserved.

**12**             External Handset.

**13..255**       Reserved.

<unique\_id>:            **0**              Request a new unique identifier from  
the phone.

**1-65534**       Unique identifier for a unique  
accessory.

**65535**        Default value used by non-unique  
accessories.

<envname>:            **String**       Name of the environment.

Example:              `AT*EENL`

`*EENL: 1,65535,Portable HF`

`*EENL: 2,65535,Vehicle HF`

`*EENL: 6,5519,Desktop Charger`

---

## AT Commands Phone Terminal Terminated

---

OK

Test command: **\*EENL=?**

Returns **Integer** Maximum number of environments  
<nenvname>: known to the TE.

Example: AT\*EENL=? 14

OK

# AT Commands Phone Terminal Terminated

## **\*EKSP**      *Ericsson Key Sound Playback*

---

Description:            This command generates a Key Playback from the MS. The sound is set up by the Key Sound Setting in the phone. The sound properties (tone, quality and duration) should be exactly the same as if a key is pressed on the MS keypad.

Execute command:      **\*EKSP**

Example:                AT\*EKSP

OK

Test command:         **\*EKSP=?**

Example:                AT\*EKSP=?

OK





# AT Commands Phone Terminal Terminated

Returns: List of supported <mode>s  
List of supported <report>s

Example: AT\*EKSR=?  
\*EKSR: (0-3), (0-1)  
OK

## **\*EMIC** *Ericsson Microphone Mode*

---

Description: Enables or disables the phone microphone. The microphone should be enabled for each new call even if it was disabled for the previous call.

Set command: **\*EMIC=<mode>**

Options: <mode> **0** Disable microphone.  
**1** Enable microphone.

Example: AT\*EMIC=0  
OK

Read command: **\*EMIC?**

Example: AT\*EMIC?  
\*EMIC: 0  
OK

Test command: **\*EMIC=?**

Example: AT\*EMIC=?  
\*EMIC: (0-1)  
OK

# AT Commands Phone Terminal Terminated

## **\*EPEC**      *Ericsson Profile Environment Change*

Description:            Used to enable and disable automatic change of profile when the phone environment is changed..

Set command:        **\*EPEC=<setting>**

Options:            <setting> **0**            Disabled - The phone does not change profile automatically when the phone environment is changed.  
Default=**0**

**1**            Enabled - When the environment changes, the phone automatically changes current profile to the profile associated with the new environment.

Example:            AT\*EPEC=1  
OK

Read command:      **\*EPEC?**

Example:            AT\*EPEC?  
\*EPEC: 0  
OK

Test command:      **\*EPEC=?**

Returns:            List of supported <setting>s

Example:            AT\*EPEC=?  
\*EPEC: (0-1)  
OK



# AT Commands Phone Terminal Terminated

## **\*EPED**      *Ericsson Profile's List Of Environments Delete*

---

Description:              Used to remove an environment from the list of environments associated to the current profile.

Set command:            **\*EPED**=<accessory id>[,<unique\_id>]

Options	<b>1</b>	Portable hands free.
<accessory_id>:	<b>2</b>	Vehicle hands free.
	<b>3</b>	RS232-cord.
	<b>4</b>	IR-device.
	<b>5</b>	Reserved.
	<b>6</b>	Charger – intelligent.
	<b>7</b>	Charger – simple.
	<b>8</b>	Reserved.
	<b>9</b>	Reserved.d
	<b>10</b>	Reserved.
	<b>11</b>	Reserved.
	<b>12</b>	External Handset.
	<b>13..255</b>	Reserved.
<unique_id>:	<b>0</b>	Request a new unique identifier from the phone.
	<b>1-65534</b>	Unique identifier for a unique accessory.
	<b>65535</b>	Default value used by non-unique accessories.

Example:                AT\*EPED=1 , 65535

OK

Test command:        **\*EPED=?**

---

## AT Commands Phone Terminal Terminated

---

Example: AT\*EPED=? (1-14), (1-65535)  
OK

# AT Commands Phone Terminal Terminated

## **\*EPEW**      *Ericsson Profile's List Of Environments Write*

Description:            The command is used to add an environment to the list of environments associated to the active profile. The command may also be used for listing all environments associated to the active profile. Only one profile may be associated with an environment. However, several environments may be associated with a profile. If trying to associate an environment already associated with another profile, this command should produce an error..

Set command:            **\*EPEW**=<accessory id>[,<unique\_id>]

Options	<b>1</b>	Portable hands free.
<accessory_id>:	<b>2</b>	Vehicle hands free.
	<b>3</b>	RS232-cord.
	<b>4</b>	IR-device.
	<b>5</b>	Reserved.
	<b>6</b>	Charger – intelligent.
	<b>7</b>	Charger – simple.
	<b>8</b>	Reserved.
	<b>9</b>	Reserved.
	<b>10</b>	Reserved.
	<b>11</b>	Reserved.
	<b>12</b>	External Handset.
	<b>13..255</b>	Reserved.
<unique_id>:	<b>0</b>	Request a new unique identifier from the phone.
	<b>1-65534</b>	Unique identifier for a unique accessory.

# AT Commands Phone Terminal Terminated

**65535** Default value used by non-unique accessories.

Example: AT\*EPEW=1,65535

OK

Read command: **\*EPEW?**

Returns  
<accessory\_id>

<unique\_id>

<envname>: **String** Name of the environment.

Example: AT\*EPEW?  
\*EPEW: 1,65535,Vehicle HF

OK

Test command: **\*EPEW=?**

Returns **Integer** Maximum number of environments  
<nenvname>: known to the TE.

Example: AT\*EPEW=? 14

OK



# AT Commands Phone Terminal Terminated

## **\*EAPS**      *Ericsson Active Profile Set*

Description:            There are six (6) profiles predefined in the MS. There is always one profile active. The profiles are identified by an index from 1 to 6 and by a profile name. The name may be changed by using the AT\*EAPN-command. This command is used to select the active profile.

The profile consists of the parameters and settings corresponding to the following commands:

<b>Command</b>	<b>Name</b>
AT+CCFC	Call Forwarding Number and Conditions
AT*EDIF	Divert function and reporting
AT*EDIS	Divert set
AT*ELIN	Set Line
AT*ERIL	Ring Level Set
AT*ECAS	Set Callers Allowed
AT*ESBL	Setting Back Light Mode
AT*ESCN	Set Credit Card Number
AT*ESIL	Silence Command
AT+CVIB	Vibrator Mode
AT*EPEC	Automatic activation
AT*EPEW AT*EPED	List of environments

Set command:      **\*EAPS=<index>**

Options:            <index>    **1..6**            Number of profile.

Example:            AT\*EAPS=1

OK

# AT Commands Phone Terminal Terminated

Read command: **\*EAPS?**

Returns <index>

<tag> **String** Name tag for the profile x  
(e.g. Home, Office,  
Meeting, ...)

Example: AT\*EAPS?

\*EAPS: 1, "Office"

OK

Test command: **\*EAPS=?**

Returns (list of supported  
<index>s) **1..6**

<nlength> **Integer** Integer value of maximum  
length of field <name  
tagx>.

Example: AT\*EAPS=? (1,6), 12

OK

# AT Commands Phone Terminal Terminated

## **\*EAPN**      *Ericsson Active Profile Rename*

---

Description:              This command sets a new name for the active profile.

Set command:            **\*EAPN=<name tag>**

Options:                <name      **String**      Name tag for the active profile (e.g. Home, Office, Meeting, ...)

Example:                AT\*EAPN="Vacation"

OK

Read command:         **\*EAPN?**

Returns                <index>      **1..6**              Number of profile.

<name                **String**              Name tag for the profile x (e.g. Home, Office, Meeting, ...)

Example:                AT\*EAPN?

\*EAPS: 1, "Office"

\*EAPS: 2, "Home"

\*EAPS: 3, "Meeting"

\*EAPS: 4, "Vacation"

OK

Test command:         **\*EAPN=?**

Returns                <nlength> **Integer**      Integer value of maximum length of field <name tag>.

Example:                AT\*EAPN=? 12

OK

# AT Commands Phone Terminal Terminated

## **\*ESNU**      *Ericsson Settings Number*

---

Description:                Sets a number in the MS according to <type>.

Set command:      **\*ESNU=<type>,<number>[,<number type>]**

Options:	<type>	<b>0</b>	Voice L1.
		<b>1</b>	Voice L2.
		<b>2</b>	Fax.
		<b>3</b>	Data.
	<number>	<b>0-9,+</b>	Number.
	<number type>	<b>145</b>	International Dialling including "+".
		<b>129</b>	All other numbers.

Example:      AT\*ESNU=0, "90920465", 129

OK

Read command:      **\*ESNU?**

Example:      AT\*ESNU? : 0,0,129

\*ESNU: 0, "90920465", 129

OK

Test command:      **\*ESNU=?**

Example:      AT\*ESNU=?

\*ESNU: (0-3)

OK

# AT Commands Phone Terminal Terminated

## **\*EBCA**      *Ericsson Battery And Charging Algorithm*

Description:              Used to test charging algorithm in the phone and to turn on/off unsolicited signal result codes.

Set command:	<b>*EBCA=&lt;onoff&gt;</b>
Options	<b>0</b> Disable.
<onoff>:	Default= <b>0</b>
	<b>1</b> Enable.
Returns	<b>Integer</b> Battery voltage. Number of mV,
<vbatx>:	multiplied by 10. I.e. a value of 300 is reported as " 3 V". Range 0 .. 65500
	<vbat1>:TXON high and CHARGING on.
	<vbat2>:TXON high and CHARGING off.
	<vbat3>:TXON low and CHARGING on.
	<vbat4>:TXON low and CHARGING off.
<btype>:	<b>0</b> NiMH
	<b>1</b> Li
	<b>2</b> Unknown battery
<dcio>:	<b>Integer</b> DCIO voltage measurement. Battery voltage. Number of mV, multiplied by 10. I.e. a value of 300 is reported as " 3 V". Range 0 .. 65500.
<icharge>:	<b>Integer</b> Charge current measurement. Current charge, Number of ma. I.e. a value of 1000 is reported as "1A". Range 0 .. 65500.
<iphone>:	<b>Integer</b> Phone current consumption, Number of mA, I.e. a value of 1000 is reported as "1 A". Range 0 .. 65500.

# AT Commands Phone Terminal Terminated

<acapacity>:	<b>Integer</b>	Added capacity during charge, Number of mAh, multiplied by 20 I.e. a value of 100 is reported as "2 Ah". Range 0 .. 65500.
<ccapacity>:	<b>Integer</b>	Consumed capacity during charge, Number of mAh, multiplied by 20 I.e. a value of 100 is reported as "2 Ah". Range 0 .. 65500.
<capacity>:	<b>Integer</b>	Actual capacity, mAh, Number of mAh, multiplied by 20 I.e. a value of 100 is reported as "2 Ah". Range 0 .. 65500.
<ncapacity>:	<b>Integer</b>	Nominal capacity, mAh, Number of mAh, multiplied by 20 I.e. a value of 100 is reported as "2 Ah". Range 0 .. 65500.
<tempbattery>:	<b>Integer</b>	Temperature battery in deg C, -20 deg C .. +70 deg C.
<tempphone>:	<b>Integer</b>	Temperature phone in deg C, -20 deg C .. +70 deg C.
<bcapacity>:	<b>0</b>	slim.
	<b>1</b>	standard.
	<b>2</b>	high capacity.
<chargestate>:	<b>0</b>	Start.
	<b>1</b>	Safe Charge. If NiMH: Charge
	<b>2</b>	Await
	<b>3</b>	Handheld
	<b>4</b>	Charge completed Safety timer.
	<b>5</b>	Change completed Low Current. If NiMH: Change completed dT/dt.
	<b>6</b>	Change Completed. If NiMH: Change Completed d2v/dt2.

## AT Commands Phone Terminal Terminated

**7** Constant Current.  
If NiMH: Charge completed: flat V.

**8** Constant Voltage.  
If NiMH: Value not applicable.

Example: AT\*EBCA=1

```
*EBCA: 300,300,300,300,0,300,1000,100  
0,100,100,100,100,22,21,0,1
```

OK

Read command: **\*EBCA?**

Example: AT\*EBCA?

```
*EBCA: 1
```

OK

Test command: **\*EBCA=?**

Response: List of supported parameters

Example: AT\*EBCA=?

```
*EBCA: <vbat1>, <vbat2>,<vbat3>,  
<vbat4>, <btype>, <dcio>, <icharge>,  
<iphone> <acapacity>, <ccapacity>,  
<pacapacity>, <ncapacity>, <tempbat-  
tery>, <tempphone>, <bcapacity>,  
<chargestate>
```

OK

# AT Commands Phone Terminal Terminated

## **\*EQVL**      *Ericsson External Volume Status*

Description:            Used to turn on/off unsolicited volume level change result codes (\*EVOLC) via the <report> parameter. The command also queries the status of the volume level of the phone.

Set command:        **\*EQVL=<report>**

Options            **0**            Report disabled.  
<report>:            Default=**0**  
  
                      **1**            Report enabled.

Example:            AT\*EQVL=1  
  
                      OK

Read command:      **\*EQVL?**

Returns  
<report>:  
  
<current volume>:    **0**            Low volume  
  
                      **1 .. n-1**      Steps in volume  
  
                      **n**            High volume

Example:            AT\*EQVL?  
  
                      \*EQVL: 1,4  
  
                      OK

Test command:      **\*EQVL=?**

Response:           List of supported <report>s

Example:            AT\*EQVL=?  
  
                      \*EQVL: (0-1)  
  
                      OK







# AT Commands Phone Terminal Terminated

## **\*EKSC**      *Ericsson Key Sound Change Report*

---

Description:                      Indicates changes in the key sound setting made by the user. This result code is also sent by the phone upon successful execution of AT\*EKSR=1.

Unsolicited Result

code:                      **\*EKSC:** <mode>

Defined values:	<mode>	<b>0</b>	SILENT, no sound when a key is pressed
		<b>1</b>	CONTINUOUS TONE, a continuous tone while a key is pressed
		<b>2</b>	CLICK, a click when a key is pressed
		<b>3</b>	QUICK TONE BURST, a quick tone burst while a key is pressed

## 4.22 Ensemble S29 : WAP Browser

### **\*EWIL**      *Ericsson WAP Image Load*

Description:            This command enables and disables image download in the WAP browser.

Set command:        **\*EWIL=<onoff>**

Options            **0**            Disable image download.

<onoff>:

**1**            Enable image download.  
Default = 1.

Example:            AT\*EWIL=1

OK

Read command:     **\*EWIL?**

Example:            AT\*EWIL?

\*EWIL: 1

OK

Test command:     **\*EWIL=?**

Example:            AT\*EWIL=?

\*EWIL: (0,1)

OK

# AT Commands Phone Terminal Terminated

## **\*EWHP**     *Ericsson WAP Homepage*

Description:            This command sets the homepage (i.e. the start page) for the WAP browser.

Set command:        **\*EWHP=<URL>**

Options            **String**     The URL representing the homepage  
<URL>:

Example:            AT\*EWHP=http://mobileinternet.ericsson.se/emi/default.asp <http://mobileinternet.ericsson.se/emi/default.asp>

OK

Read command:     **\*EWHP?**

Example:            AT\*EWHP?

\*EWHP: http://mobileinternet.ericsson.se/emi/default.asp <http://mobileinternet.ericsson.se/emi/default.asp>

OK

Test command:     **\*EWHP=?**            Returns <nURL>, which is the maximum number of characters for the <URL>.

Example:            AT\*EWHP=?

\*EWHP: 120

OK











# AT Commands Phone Terminal Terminated

## **\*EWPB** *Ericsson WAP Preferred Bearer*

Description: This command sets the preferred bearer for WAP. If the <ask>-parameter is set to on (= 1), the WAP-browser will ask for each session which bearer to use. In this case, the <pbearer> will be used as default choice.

Set command: **\*EWPB=<pbearer>[,<ask>]**

Options **1** SMS.  
<pbearer>: Default = **1**.

**2** CSD

<ask>: **0** Do not ask. Use <pbearer> as bearer for all WAP-sessions.  
Default = **0**.

**1** For each WAP-session: ask which bearer to use. The bearer given by the <pbearer>-parameter is used as default choice.

Example: AT\*EWPB= 2,0

OK

Read command: **\*EWPB?** Returns current setting.

Example: AT\*EWPB?

\*EWPB: 2,0

OK

Test command: **\*EWPB=?** Returns list of supported <pbearer>s.

Example: AT\*EWPB=?

\*EWPB: (1-2), (0-1)

OK



# AT Commands Phone Terminal Terminated

## **\*EWIP**      *Ericsson WAP IP-network Phonenumber*

---

Description:            This command sets the phone number for the WAP-connection, i.e. the phone number to dial to reach the IP-network on which the gateways are located.

Set command:        **\*EWIP**=<phone>[,<number type>]

Options            **String**      CSD dial string.  
<phone>:

<number type>:    **Integer**      Type of octet address in integer format (GSM 04.08, [3]). Default 145 when international code included, otherwise 129.

Example:            AT\*EWIP= "+46705960000"  
OK

Read command:     **\*EWIP?**            Returns <phone>,<number type>.

Example:            AT\*EWIP?  
\*EWIP: "46705960000",145  
OK

Test command:     **\*EWIP=?**            Returns <nphone>,(list of supported <number type>s).

Defined values    **Integer**      Maximum length of phone number for the WAP connection.  
<nphone>:

Example:            AT\*EWIP=?  
\*EWIP: 20,(128-255)  
OK

# AT Commands Phone Terminal Terminated

## **\*EWSA**     *Ericsson WAP SMSC Address*

---

Description:            This command sets up the SMSC address to be used for WAP browsing over SMS, i.e. the command sets up the MSISDN or MSID to the SMSC which hosts the connection to the gateway on the network.

Set command:        **\*EWSA=<smcaddr>**  
                          Options     **String**     MSISDN or MSID to the SMSC.  
                          <smcaddr>:

Example:             AT\*EWSA= "+46705960000"  
                          OK

Read command:      **\*EWSA?**                             Returns <smcaddr>.

Example:             AT\*EWSA?  
                          \*EWSA: "46705960000", 145  
                          OK

Test command:      **\*EWSA=?**                             Returns <nsmcaddr>.

Defined values      **Integer**     Maximum length of the <smcaddr>-  
<nsmcaddr>:                             parameter.

Example:             AT\*EWSA=?  
                          \*EWSA: 20, (128-255)  
                          OK

# AT Commands Phone Terminal Terminated

## **\*EWSG**     *Ericsson WAP SMS Gateway*

---

Description:            This command sets up the SME address to be used for WAP browsing over SMS, i.e. the command sets up the MSISDN or MSID to the SME which represents the SMS address of the gateway on the network.

Set command:            **\*EWSG=<smeaddr>**

Options                 **String**     SME address.  
<smeaddr>:

Example:                AT\*EWSG= "+46705960000"

OK

Read command:         **\*EWSG?**                     Returns <smeaddr>.

Example:                AT\*EWSG?  
\*EWSG: "46705960000", 145

OK

Test command:         **\*EWSG=?**                     Returns <nsmeaddr>.

Defined values         **Integer**     Maximum length of the <smeaddr>-  
<nsmcaddr>:             parameter.

Example:                AT\*EWSG=?  
\*EWSG: 20, (128-255)

OK

## 5 AT Commands Modem Terminated

### 5.1 Ensemble C2/B : Identification and Control

---

#### **AT**      *Attention Command*

---

Description:            Determines the presence of a MS.

Execute command:    **AT**

Example:            AT

                          OK

#### **Z**            *Reset To User Defined Configuration*

---

Description:            Perform a 'soft reset', i.e. terminate any ongoing operation and connection and restore one of the configurations stored in nonvolatile memory as the active profile.

Set command:        **Z=[<profile>]**

Options:            <profile>

**0**                    Select the user profile to restore.

Example 1:        ATZ

                          OK

Test command:    **Z=?**

Example:            ATZ=?

                          Z: (0)

                          OK





---

## **+GMI**      *Request Infrared Modem Manufacturer Identification*

---

Description:            Returns the manufacturer identification for the Infrared Modem.

Execute command:    **+GMI**

Example:            AT+GMI  
Ericsson  
OK

Test command:       **+GMI=?**

Example:            AT+GMI=?  
OK

---

## **+GMM**      *Request Infrared Modem Model Identification*

---

Description:            Returns the model identification of the Infrared Modem.

Execute command:    **+GMM**

Example:            AT+GMM  
<TAE Model Identification>  
OK

Test command:       **+GMM=?**

Example:            AT+GMM=?  
OK



## 5.2 Ensemble C3/B : Call Control

---

### **A**            *Answer*

---

Description:            Answer and initiate connection to an incoming call.

Execute command:    **A**

Example:            ATA

CONNECT 9600

### **H**            *Hook Control*

---

Description:            Terminates a connection.

Execute command:    **H[<n>]**

Example:            ATH

OK

Option:            <n>            **0**            Disconnect data connection.

# AT Commands Modem Terminated

## **D**      *Dial*

Description:      Initiate a phone voice connection (phone number terminated by semicolon). The phone number used to establish the connection will consist of digits and modifiers or a stored number specification.

Execute command:	<b>D</b>	Dial the phone number entered on the phone display.
Other options:	<b>D&lt;n&gt;</b>	Dial the phone number specified in the command as <n>.
	<b>D=ME&lt;i&gt;</b>	Dial the phone number stored in the mobile phone which is located by the index <i>.
	<b>D=SIM&lt;i&gt;</b>	Dial the phone number stored in the SIM card which is located by the index <i>.
	<b>DL</b>	Redial the last phone number dialled.
Modifiers:	<b>W</b>	The W modifier is ignored but is included only for compatibility purposes.
	<b>,</b>	The comma modifier is ignored but is included only for compatibility purposes.
	<b>;</b>	Informs the Infrared Modem that the number is a voice rather than a fax or data number.
	<b>T</b>	The T modifier is ignored but is included only for compatibility purposes.

# AT Commands Modem Terminated

	<b>P</b>	The P modifier is ignored but is included only for compatibility purposes.
Dial examples:	ATD0705862975	
	<response>	See below for possible responses.
	ATD=ME7	Dial the number stored in index 7 of the mobile phone.
	<response>	
	ATD=SIM5	Dial the number stored in index 5 of the SIM card.
	<response>	
	ATD046193000;	Voice dial, immediately returns OK.
	ATDL	Redial the last number dialled.
Responses:	CONNECT <speed>	Data or fax connection established at the rate given in <speed>.
	NO CARRIER	Unable to establish a connection or the connection attempt was aborted by the user.
	ERROR	An unexpected error occurred while trying to establish the connection.
	NO DIALTONE	The mobile phone is being used for a voice call or is not within coverage of the network.
	BUSY	The phone number called is engaged, only valid for data and fax connections.

## **O**      ***Return To On-line Data Mode***

---

Description:            Switch to the on-line data mode from the on-line command mode during an active call. Returns `ERROR` when not in on-line command mode.

Execute command:    **O**

Examples:            `ATO`  
`CONNECT 9600`

## **P**      ***Select Pulse Dialling***

---

Description:            Implemented for compatibility only. Would normally cause the next D command to use pulses/tones when dialling the number.

Set command:        **P**

Example:            `ATP`  
`OK`

Test command:      **P=?**

Example:            `ATP=?`  
`OK`

## **T**      ***Select Tone Dialling***

---

Description:            Implemented for compatibility only. Would normally cause the next D command to use pulses/tones when dialling the number.

Set command:        **T**

Example:            `ATT`  
`OK`

---

## AT Commands Modem Terminated

---

Test command: **T=?**

Example: ATT=?

OK

## 5.3 Ensemble C4/B : Interface Commands

### **S2** *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. The response to the command is modified to reflect the change.

Set command: **S2=[<esc>]**

Options: <esc> **43** The ASCII value of the escape sequence character.

**0-255** Escape sequence character.

Default = **43**.

Example: `ATS2=43`  
`OK`

Read command: **S2?** Returns the current setting.

Example: `ATS2?`  
`043`  
`OK`

Test command: **S2=?**

Example: `ATS2=?`  
`S2: (0-255)`  
`OK`



# AT Commands Modem Terminated

## **S3**      *Command Line Termination Character*

---

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

Set command:      **S3**=[<value>]

Options:      <value>      **13**

The default ASCII value of the Command Line termination character.

**0-127**

Command Line termination character.

Default = **13**.

Example:      AT**S3**=13

OK

Read command:      **S3**?

Returns the current setting.

Example:      AT**S3**?

013

OK

Test command:      **S3**=?

Always returns (0-127).

Example:      AT**S3**=?

S3: (0-127)

OK

# AT Commands Modem Terminated

## **S4**      *Response Formatting Character*

Description:            Defines the character to be used as the line formatting character. The response to the command is modified to reflect the change.

Set command:      **S4**=[<value>]

Options:      <value>    **10**            The default ASCII value of formatting character.  
**0-127**            Formatting character.  
Default = **10**.

Example:      `ATS4=10`  
                 `OK`

Read command:    **S4?**                    Returns the current setting.

Example:      `ATS4?`  
                 `010`  
                 `OK`

Test command:    **S4=?**                    Always returns (0-127).

Example:      `ATS4=?`  
                 `S4: (0-127)`  
                 `OK`

## **S5**      *Command Line Editing Character*

---

Description:            Defines the character to use as command line editing character.

Set command:        **S5**=[<value>]

Options:            <value>    **8**

The default ASCII value of the Line Editing Character.

**0-127**

Line editing character.

Default = **8**.

Example:            AT**S5**=8

OK

Read command:     **S5?**

Returns the current setting.

Example:            AT**S5**?

008

OK

Test command:     **S5=?**

Always returns (0-127).

Example:            AT**S5**=?

S5: (0-127)

OK













---

## AT Commands Modem Terminated

---

Test command: **AT+IFC=?** Always returns (0-3),(0-2).

Example: AT+IFC=?  
+IFC: (0-3),(0-2)  
OK



## **S6**      *Blind Dial Delay Control*

---

Description:      Defines the number of seconds to wait before call addressing when a dial-tone is not detected. This command is ignored by the Infrared Modem and is only included for compatibility.

Set command:      **S6**=[<dly>]

Options:      <dly>      **2 - 255**

Default = 2.

Example:      AT S6=2

OK

Read command:      **S6?**

Returns the current setting.

Example:      AT S6?

002

OK

Test command:      **S6=?**

Always returns (2-255).

Example:      AT S6=?

S6: (2-255)

OK



# AT Commands Modem Terminated

## **S8**      *Comma Dial Modifier Delay Control*

---

Description:              Implemented for compatibility only.

Set command:    **S8**=[<dly>]

Options:    <dly>      **1 - 255**      The value of the dial  
modifier delay in seconds.  
Default = **2**.

Example:    AT**S8**=2

OK

Read command:    **S8?**                      Returns the current setting.

Example:    AT**S8**?

002

OK

Test command:    **S8=?**                      Always returns (1-255).

Example:    AT**S8**=?

S8: (1-255)

OK

## **S10**      *Automatic Disconnect Delay Control*

---

Description:            This parameter specifies the amount of time that the DCE will remain connected to the line after the absence of received line signal. This command is ignored by the Infrared Modem and is only included for compatibility.

Set command:    **S10=[<val>]**

Options:        <val>      **1-254**

Example:        AT S10=2

OK

Read command:   **S10?**

Example:        AT S10?

002

OK

Test command:    **S10=?**                    Always returns (1-254).

Example:        AT S10=?

S10: (1-254)

OK

# AT Commands Modem Terminated

## **M**      **Monitor Speaker Control**

---

Description:      Define the activity of the speaker. This command is ignored by the Infrared Modem and is only included for compatibility.

Set command:    **M**=[<speaker>]

Options:        <speaker> **0-3**      0 is off during the entire call.

Examples:      ATM=0

OK

Read command: **M?**

Example:      ATM?

M: 0

OK

Test command: **M=?**      Always returns (0-3).

Example:      ATM=?

M: (0-3)

OK

# AT Commands Modem Terminated

## **X**      *Call Progress Monitoring Control*

---

Description:            Define whether the dial tone detection and busy tone detection are to be used during a call setup.

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

Options:	<n>	<b>0</b>	Busy and dial tone detection off. No line speed reported on connection.
		<b>1</b>	Busy and dial tone detection off. Report linespeed on connection.
		<b>2</b>	Busy detection on and dial tone detection off. Report line speed on connection.
		<b>3</b>	Busy detect off and dial tone detection on. Report line speed on connection.
		<b>4</b>	Busy detect and dial tone detection on. Report line speed on connection.

Default = **4**.

Examples:    **ATX4**

**OK**

Read command: **X?**                    Returns the current setting.

Example:    **ATX?**

**X: 4**

**OK**

Test command: **X=?**                    Always returns (0-4).

Example:    **ATX=?**

**X: (0-4)**

**OK**



# AT Commands Modem Terminated

## **+ICF**      *Cable Interface Character Format*

Description: 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.

Set command: **+ICF**=[<format>][,<parity>]]

Options: <format> Determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.

<b>0</b>	auto detect
<b>1</b>	8 Data 2 Stop
<b>2</b>	8 Data 1 Parity 1 Stop
<b>3</b>	8 Data 1 Stop
<b>4</b>	7 Data 2 Stop
<b>5</b>	7 Data 1 Parity 1 Stop
<b>6</b>	7 Data 1 Stop
	Default = <b>3</b> .

<parity> Determines how the parity bit is generated and checked, if present.

<b>0</b>	Odd
<b>1</b>	Even
<b>2</b>	Mark
<b>3</b>	Space. Default = <b>3</b> .

Example: AT+ICF=3

OK      Format set to 8 databit, 1 stop bit

Read command: **+ICF?**      Returns the current setting.

Example: AT+ICF?

---

## AT Commands Modem Terminated

---

+ICF: 3,3

OK

Test command: **+ICF=?**

List of supported  
<format>s, list of supported  
<parity>s.

Example: AT+ICF=?

+ICF: (0-6),(0-3)

OK

# AT Commands Modem Terminated

## **+IPR**      *Cable Interface Port Rate*

Description:                Specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s. 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.

Set command:    **+IPR=[<rate>]**

<rate>    **0, 300, 600, 1200, 1600, 2400, 3600, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400, 460800**

The rate in bits per second at which the DTE-DCE interface should operate. The rates supported by a particular DCE are manufacturer-specific.

If unspecified or set to 0, automatic detection is selected for the range determined by v25ter [1], subclause 4.3 and the DCE manufacturer, and the character format is also forced to auto detect, +ICF=0.

Example:    **AT+IPR="19200"**

OK                                Port rate set to 19200 bits per second

Read command:    **+IPR?**                                Returns the current setting.

Example:    **AT+IPR?**

+IPR:0                                Auto detect

OK

Test command:    **+IPR=?**                                List of supported autodetectable <rate>s, and possibly list of fixed-only <rate>s.

---

## AT Commands Modem Terminated

---

Example: AT+IPR=?

```
+IPR: (0, 300, 600, 800, 1200, 1600,  
2400, 3600, 4800, 9600, 14400,  
19200, 28800, 38400, 57600, 115200)
```

OK



## Unsolicited Result Codes

---

### ***+ILRR res*** ***+ILRR Result Code***

---

Description: The intermediate result code is transmitted after any modulation, error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted.

Unsolicited Result

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

<rate>, <rx\_rate>: **discrete integer value** Values, see +IPR

## 5.4 Ensemble C6/B : Data Compression

### **+DS**      *Data Compression*

Description:      This extended-format compound parameter controls the V.42 bis data compression function if provided in the TAE. .

Set command:      **+DS**=[<direction>[,<compression\_negotiation>[,<max\_dict>[,<max\_string>]]]]

Options  
<direction>:      specifies the desired direction(s) of operation of the data compression function; from the TE point of view

Value	<b>0</b>	Disable V.42 bis
	<b>1</b>	Enable V.42bis in transmit direction only
	<b>2</b>	Enable V.42bis in receive direction only
	<b>3</b>	Enable V.42bis compression both ways. Default= <b>3</b>

<compression\_negotiation>:      specifies whether or not the TAE should continue to operate if the desired result is not obtained

Value	<b>0</b>	Accept connection if compression is negotiated according to direction. Default= <b>0</b>
	<b>1</b>	Disconnect if compression is not negotiated according to direction

<max\_dict>:      specifies the maximum number of dictionary entries which should be negotiated

Value	<b>512-4096</b>	Maximum dictionary size. Default= <b>4096</b>
-------	-----------------	--

---

## AT Commands Modem Terminated

---

<max\_string>: specifies the maximum string length to be negotiated (V.42bis P2)

Value **6-250** Maximum string length. Default=**32**

Example: AT+DS=0,1,512,6

OK

Read command: **+DS?** Returns the current setting.

Example: AT+DS?

+DS: 3,0,4096,32

OK

Test command: **+DS=?**

Example: AT+DS=?

+DS: (0-3),(0,1),(512-4096),(6-250)

OK





## Unsolicited Result Codes

---

### **+DR**      *Data Compression Indication*

---

Description:      The intermediate result code is issued after the Error Control Report (+ER) and before the final result code (e.g. CONNECT). Use the AT+DR command to enable the indication.

#### Unsolicited Result

code:      **+DR:**<type>

<type>:      **NONE**      No data compression negotiated  
**V42B**      V.42 bis data compression negotiated  
**V42B RD**      V.42 bis half duplex compression negotiated on received data  
**V42B TD**      V.42 bis half duplex compression negotiated on transmitted data

## 5.5 Ensemble C18/B : Fax Class 1

Some fax commands can only be used during connection to a remote facsimile and return `ERROR` otherwise. Most fax commands return `ERROR` when the appropriate Fax Class is not selected beforehand.

### ***+FCLASS Capabilities Identification And Control***

Description: Sets the service class.

Set command: **+FCLASS=<class>**

Options:	<class>	<b>0</b>	Data modem.
		<b>1</b>	Service Class 1 fax modem.
		<b>2</b>	Service Class 2 fax modem.

Example: `AT+FCLASS=1`  
`OK`

Read command: **+FCLASS?** Returns the current service class setting.

Example: `AT+FCLASS?`  
`1`  
`OK`

Test command: **+FCLASS=?** Provides the service classes available as a list of comma separated values.

Example: `AT+FCLASS=?`  
`0,1,2`  
`OK`

---

## **+FMI**      *Manufacturer Identification*

---

Description:              Request manufacturer's identification.

Read command:      **+FMI?**

Example:              AT+FMI?  
Ericsson  
OK

---

## **+FMM**      *Request Product Identification*

---

Description:              Request model identification.

Read command:      **+FMM?**

Example:              AT+FMM?  
<TAE Model Identification>  
OK



# AT Commands Modem Terminated

## **+FRS**      *Receive Silence*

---

Description:              Waits for silence on the line for the specified period.

Set command:      **+FRS=<Time>**

Options:      <Time>      **0 - 255**      The silence period in units of 10 ms. Entering a character will abort the silence period.

Example:      AT+FRS=8

OK

Test command:      **+FRS=?**              Always returns (0-255).

Example:      AT+FRS=?

( 0 - 255 )

OK

# AT Commands Modem Terminated

## **+FTM**      *Facsimile Transmit*

---

Description:            Start transmitting fax data at given speed.

Set command:        **+FTM=<Mod>**

Options:	<Mod>	<b>24</b>	V.27ter 2,400 bps.
		<b>48</b>	V.27ter 4,800 bps.
		<b>72</b>	V.29 7,200 bps.
		<b>96</b>	V.29 9,600 bps.

Example:            AT+FTM=96  
CONNECT  
OK

Test command:        **+FTM=?**                    Always returns  
(24,48,72,96).

Example:            AT+FTM=?  
( 24 , 48 , 72 , 96 )  
OK





# AT Commands Modem Terminated

## **+FTH**      *Transmit HDLC*

---

Description:            HDLC transmit speed.

Set command:    **+FTH=<Mod>**

Options:        <Mod>    **3**            V.21 Ch2 300 bps.

Example:        AT+FTH=3

CONNECT

Test command:    **+FTH=?**            Always returns (3).

Example:        AT+FTH=?

( 3 )

OK

## **+FRH**      *Receive HDLC*

---

Description:            HDLC receive speed.

Set command:    **+FRH=<speed>**

Options:        <speed>    **3**            V.21 Ch2 300 bps.

Example:        AT+FRH=3

CONNECT

Test command:    **+FRH=?**            Always returns 3.

Example:        AT+FRH=?

( 3 )

OK

## 5.6 Ensemble C19/B : Fax Class 2

Some fax commands can only be used during connection to a remote facsimile and return `ERROR` otherwise. Most fax commands return `ERROR` when the appropriate Fax Class is not selected beforehand.

### **+FCLASS** *Capabilities Identification And Control*

Description: Sets the service class.

Set command: **+FCLASS=<class>**

Options:	<class>	<b>0</b>	Data modem.
		<b>1</b>	Service Class 1 fax modem.
		<b>2</b>	Service Class 2 fax modem.

Example: `AT+FCLASS=1`  
`OK`

Read command: **+FCLASS?** Returns the current service class setting.

Example: `AT+FCLASS?`  
`1`  
`OK`

Test command: **+FCLASS=?** Provides the service classes available as a list of comma separated values.

Example: `AT+FCLASS=?`  
`0,1,2`  
`OK`

# AT Commands Modem Terminated

## **+FAA** *Fax Auto Answer Setting*

---

Description: Used to determine if the fax setting is selected by auto answer or by the setting in +FCLASS.

Set command: **+FAA=[<value>]**

Options: <value> **0** Answer according to settings in FCLASS only.

Example: AT+FAA=0  
OK

Read command: **+FAA?** Returns the current setting.

Example: AT+FAA?  
0  
OK

Test command: **+FAA=?** Always returns (0).

Example: AT+FAA=?  
(0)  
OK

# AT Commands Modem Terminated

## **+FAXERR** *Request Hang-up Cause Code*

Description: Returns the code of the error which caused the last hang-up.

Read command: **+FAXERR?**

Response: **+FAXERR=<value>**

<b>&lt;value&gt;</b>	<b>0</b>	Normal and proper end of connection <b>Mandatory value.</b>
	<b>1</b>	Ring Detect without successful handshake.
	<b>2</b>	Call aborted, from +FK or <CAN>.
	<b>3</b>	No Loop Current.
	<b>10</b>	Unspecified Phase A error <b>Mandatory value.</b>
	<b>11</b>	No Answer (T.30 T1 timeout) [2].
	<b>20</b>	Unspecified Transmit Phase B error <b>Mandatory value.</b>
	<b>21</b>	Remote cannot receive or send.
	<b>22</b>	COMREC error in transmit Phase B.
	<b>23</b>	COMREC invalid command received.
	<b>24</b>	RSPEC error.
	<b>25</b>	DCS sent three times without response.

## AT Commands Modem Terminated

26	DIS/DTC received 3 times; DCS not recognized.
27	Failure to train at 2400 bps or FMINSP value.
28	RSPREC invalid response received.
40	Unspecified Transmit Phase C error <b>Mandatory value.</b>
43	TE to TAE data underflow.
50	Unspecified Transmit Phase D error <b>Mandatory value.</b>
51	RSPREC error.
52	No response to MPS repeated 3 times.
53	Invalid response to MPS.
54	No response to EOP repeated 3 times.
55	Invalid response to EOP.
56	No response to EOM repeated 3 times.
57	Invalid response to EOM.
58	Unable to continue after PIN or PIP.
70	Unspecified Receive Phase B error <b>Mandatory value.</b>
71	RSPREC error.
72	COMREC error.

## AT Commands Modem Terminated

<b>73</b>	T.30 T2 [2] timeout, expected page not received.
<b>74</b>	T.30 T1 [2] timeout after EOM received.
<b>90</b>	Unspecified Receive Phase C error.
<b>91</b>	Missing EOL after 5 seconds (section 3.2 T.4 [3]).
<b>92</b>	-unused code-.
<b>93</b>	TAE to TE buffer overflow.
<b>94</b>	Bad CRC or frame (ECM or BFT modes).
<b>100</b>	Unspecified Receive Phase D errors.
<b>101</b>	RSPREC invalid response received.
<b>102</b>	COMREC invalid response received.
<b>103</b>	Unable to continue after PIN or PIP.
<b>120-255</b>	-reserved codes-.

Example: `AT+FAXERR?`

1  
OK

Test command: `+FAXERR=?` Always returns (0-255).

Example: `AT+FAXERR=?`

( 0 - 255 )  
OK

# AT Commands Modem Terminated

## ***+FBADLIN*** *Number Of Consecutive Bad Lines To Accept*

---

Description:                Sets the maximum acceptable number of consecutive bad lines.

Set command:            **+FBADLIN=[<value>]**

Options:                <value>    **0**                Error checking not present or disabled.

Default = **0**.

Example:                AT+FBADLIN=0

OK

Read command:        **+FBADLIN?**                Returns the current setting.

Example:                AT+FBADLIN?

0

OK

Test command:        **+FBADLIN=?**

Example:                AT+FBADLIN=?

( 0 )

OK

# AT Commands Modem Terminated

## ***+FBADMUL Bad Line Multiplier Parameter***

Description: Sets the maximum acceptable percentage of bad lines per page multiplication value.

Set command: **+FBADMUL=[<value>]**

Options: <value> **0** Error checking not present or disabled.

**20** 5% error rate.

**0-255** valid values.

Default = **0**.

Example: AT+FBADMUL=20

OK

Read command: **+FBADMUL?** Returns the current setting.

Example: AT+FBADMUL?

0

OK

Test command: **+FBADMUL=?** Always returns (0).

Example: AT+FBADMUL=?

( 0 )

OK



# AT Commands Modem Terminated

## **+FBOR** *Facsimile Page Transfer Bit Order Parameter*

Description: Set the bit order for negotiation (<bit n>) and facsimile page transfer (<bit f>).

Set command: **+FBOR**=[<value>]

<value> is the sum of <bit f> and <bit n> where:

**<bit f>** 0 = same bit order.  
1 = reverse bit order.

**<bit n>** 0 = same bit order.  
2 = reverse bit order.

Options: <value> **0** bit f + bit n = 0.  
**1** bit f + bit n = 1.  
**2** bit f + bit n = 2.  
**3** bit f + bit n = 3.  
Default = **0**.

Example: AT+FBOR=0  
OK

Read command: **+FBOR?** Returns the current setting.

Example: AT+FBOR?  
3  
OK

Test command: **+FBOR=?** Always returns (0-3).

Example: AT+FBOR=?  
(0-3)  
OK

# AT Commands Modem Terminated

## **+FBUF**     *Buffer Size Report*

---

Description:             Request buffering parameters.

Read command:     **+FBUF?**

Returns:             <bs>,<xoft>,<xont>,<bc>

Options:

<b>&lt;bs&gt;</b>	= buffer size.
<b>&lt;xoft&gt;</b>	= XOFF threshold.
<b>&lt;xont&gt;</b>	= XON threshold.
<b>&lt;bc&gt;</b>	= current number of characters in buffer.

Example:     AT+FBUF?  
               256,0,0,0  
               OK



# AT Commands Modem Terminated

## **+FCQ**      *Copy Quality Checking*

---

Description:              Copy quality checking.

Set command:    **+FCQ=[<value>]**

Options:    <value>    **0**              Do not perform quality checking.

Example:    AT+FCQ=0

OK

Read command:    **+FCQ?**

Returns the current setting.

Example:    AT+FCQ?

0

OK

Test command:    **+FCQ=?**

Always returns (0).

Example:    AT+FCQ=?

( 0 )

OK



# AT Commands Modem Terminated

## **+FCIG**      *Local Polling ID Parameter*

---

Description:            Local polling ID.

Set command:    **+FCIG=<local polling ID string>**

Options:        <local polling ID string>

String of 0 to 20 characters length.

Example:        AT+FCIG="Ericsson Fax"

OK

Read command:    **+FCIG?**

Returns the current polling string.

Example:        AT+FCIG?

Ericsson Fax

OK

Test command:    **+FCIG=?**

Always returns (20)(32-127).

Example:        AT+FCIG=?

( 20 ) ( 32 - 127 )

OK

# AT Commands Modem Terminated

## ***+FCTCRTY Continue To Correct Count During ECM***

---

Description: Continue to correct count during ECM.

Set command: **+FCTCRTY=[<value>]**

Options: <value> **0-255** <value> is in units of 4 retries.

Default = **0**, disabled.

Example: AT+FCTCRTY=1

OK

Read command: **+FCTCRTY?** Returns the current setting.

Example: AT+FCTCRTY?

0

OK

Test command: **+FCTCRTY=?** Always returns (0-255).

Example: AT+FCTCRTY=?

( 0-255 )

OK

# AT Commands Modem Terminated

## **+FDFFC**    *Data Format Failure Check*

---

Description:            Data format failure check.

Set command:    **+FDFFC=[<value>]**

Options:    <value>    **0**            Disable mismatch checking.

Example:    AT+FDFFC=0  
OK

Read command:    **+FDFFC?**            Returns the current setting.

Example:    AT+FDFFC?  
0  
OK

Test command:    **+FDFFC=?**            Always returns (0).

Example:    AT+FDFFC=?  
( 0 )  
OK



# AT Commands Modem Terminated

## **+FDCC**      *TAE Capability Parameters*

Description:              This command allows the TE to sense and constrain the capabilities of the facsimile TAE.

Set command:      **+FDCC=<vr>,<br>,<wd>,<ln>,<df>,<ec>,<bf>,<st>**

Options:      <vr>                      = vertical resolution.

**0**                      Normal, 98 lpi.

**1**                      Fine, 196 lpi.

                                 Default = **1**.

                                 <br>                      = bit rate.

**0**                      2400 bit/s V.27ter.

**1**                      4800 bit/s V.27ter.

**2**                      7200 bit/s V.29 or V.17,  
                                 optional.

**3**                      9600 bit/s V.29 or V.17,  
                                 optional.

                                 Default = **3**.

                                 <wd>                      = page width.

**0**                      1728 pixels in 215 mm.

**1**                      2048 pixels in 255 mm,  
                                 optional.

**2**                      2432 pixels in 303 mm,  
                                 optional.

**3**                      1216 pixels in 151 mm,  
                                 optional.

**4**                      864 pixels in 107 mm,  
                                 optional.

                                 Default = **0**.

## AT Commands Modem Terminated

<ln>		= page length.
	<b>0</b>	A4, 297 mm.
	<b>1</b>	B4, 364, optional.
	<b>2</b>	Unlimited length, optional.
		Default = <b>2</b> .
<df>		= data compression format.
	<b>0</b>	1-D modified Huffman.
	<b>1</b>	2-D modified Read, optional.
	<b>2</b>	2-D uncompressed mode, optional.
	<b>3</b>	2-D modified Read, optional.
		Default = <b>0</b> .
<ec>		= error correction.
	<b>0</b>	Disable ECM
<bf>		= binary file transfer.
	<b>0</b>	Disable ECM

# AT Commands Modem Terminated

<st> = scan time per line.

<b>0</b>	0 ms
<b>1</b>	5 ms
<b>2</b>	10 ms
<b>3</b>	10 ms
<b>4</b>	20 ms
<b>5</b>	20 ms
<b>6</b>	40 ms
<b>7</b>	40 ms

Default = **0**.

Example: AT+FDCC=0,3,0,2,0,0,0,1

OK

Read command: **+FDCC?**

Example: AT+FDCC?

0,3,0,2,0,0,0,1

OK

Test command: **+FDCC=?**

Example: AT+FDCC=?

(0-1),(0-3),(0-4),(0-2),  
(0-3),(0),(0),(0-7)

OK

# AT Commands Modem Terminated

## **+FDCS**      *Session Results*

Description:              Current session results.

Read command:    **+FDCS?**

Returns:            <vr>,<br>,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Options:            **<vr>**            = vertical resolution.  
                         **<br>**            = bit rate.  
                         **<wd>**            = page width.  
                         **<ln>**            = page length.  
                         **<df>**            = data compression format.  
                         **<ec>**            = error correction.  
                         **<bf>**            = binary file transfer.  
                         **<st>**            = scan time per line.

Please refer to the +FDCC command for further information on these parameters.

Example:            AT+FDCS?  
                         0,3,0,2,0,0,0,1  
                         OK

Test command:    **+FDCS=?**              Always returns  
                         (0-1),(0-3),(0-4),(0-2),(0-3),  
                         (0),(0),(0-7).

Example:            AT+FDCS=?  
                         (0-1),(0-3),(0-4),(0-2),  
                         (0-3),(0),(0),(0-7)  
                         OK

# AT Commands Modem Terminated

## **+FDIS**      *Current Session Negotiation Parameters*

---

Description:              Current session negotiation parameters.

Set command:    **+FDIS=<vr>,<br>,<wd>,<ln>,<df>,<ec>,<bf>,<st>**

Options:	<vr>	<b>0</b>	Normal, 98 dpi.
		<b>1</b>	Fine, 196 dpi.
			Default = <b>1</b> .
	 	<b>0</b>	2400 bps.
		<b>1</b>	4800 bps.
		<b>2</b>	7200 bps.
		<b>3</b>	9600 bps.
			Default = <b>3</b> .
	<wd>		Page width.
		<b>0</b>	1728 pixels in 215 mm.
		<b>1</b>	2048 pixels in 255 mm.
		<b>2</b>	2432 pixels in 303 mm.
		<b>3</b>	1216 pixels in 151 mm.
		<b>4</b>	364 pixels in 107 mm.
			Default = <b>0</b> .
	<ln>		Page length.
		<b>0</b>	A4, 297 mm.
		<b>1</b>	B4, 364 mm.
		<b>2</b>	unlimited.
			Default = <b>2</b> .

# AT Commands Modem Terminated

<df>		Data compression format.
	<b>0</b>	1-D modified huffman.
	<b>1</b>	2-D modified read.
	<b>2</b>	2-D uncompressed mode.
	<b>3</b>	2-D modified modified read.
		Default = <b>0</b> .
<ec>		Error correction.
	<b>0</b>	Disable ECM.
<bf>		Binary file transfer.
	<b>0</b>	Disable BFT.
<st>		Scan time per line.
	<b>0-7</b>	0-40 ms depending on <vr> setting.
		Default = <b>0</b> .

Example: AT+FDIS=0,30,2,0,0,0

OK

Read command: **+FDIS?** Returns the current settings.

Example: AT+FDIS?

1,3,0,2,0,0,0,0

OK

Test command: **+FDIS=?** Always returns (0-1),(0-3),(0-4),(0-2), (0-3),(0),(0),(0-7).

Example: AT+FDIS=?

(0-1),(0-3),(0-4),(0-2),  
(0-3),(0),(0),(0-7)

OK

# AT Commands Modem Terminated

## **+FDR**      *Fax Data Receive Command*

---

Description:            The +FDR command initiates transition to Phase C data reception. This can occur after answering, after dialling, after a document received, or after a page is received.

Action command:    **+FDR**

Example:            AT+FCLASS=2  
OK  
AT+FCR=1  
OK  
AT+FLID=<local ID>  
RING <-  
ATA  
+FCON  
[+FTSI : "<discodes>]  
OK  
AT+FDR  
+FCFR  
[+FDCS: <dcx codes>]  
CONNECT  
<DC2>                            Page data stream.  
<DLE><ETX>  
+FPTS:1, <1c>  
+FET:0 <-  
OK

---

# AT Commands Modem Terminated

---

AT+FDR

CONNECT

<DC2>

Page data stream.

<DLE><ETX>

+FPTS: 1, (1c)

+FET: 2 <-

OK

AT+FDR

+FHNG: 0



# AT Commands Modem Terminated

## **+FDT**      *Fax Data Transmission Command*

---

Description:      The FDT command prefixes Phase C data transmission. When the TAE is ready to accept Phase C data, it will issue the negotiation responses and the CONNECT result code to the TAE. The DF, VR, WD, and LN subparameters are optional.

Action command:    **+FDT**[=<df>,<vr>,<wd>,<ln>]

Options:	<df>	Data compression format.
	<vr>	Vertical resolution.
	<wd>	Page width.
	<ln>	Page length.

Example:    AT+FCLASS=2  
OK  
AT+FLID=<local ID>  
OK  
ATD<dial string>  
+FCON  
[+FCSI : "<csi>]  
+FDIS:<dis codes>  
OK  
AT+FDT  
+FDCS<dcs codes>  
CONNECT  
<XON>  
OK

---

# AT Commands Modem Terminated

---

<DLE><ETX>            First page data.

AT+FET=0

+FPTS:1

OK

CONNECT

<XON>

AT+FDT

OK

<DLE><DTX>            Second page data.

AT+FET=2

+FPTS:1

+FHNG:0

OK

# AT Commands Modem Terminated

## **+FECM**      *Error Correction Mode*

---

Description:              Defines error correction mode.

Set command:      **+FECM=<value>**

                         <value>      **0**

                         Error correction disabled or  
                         not supported.

Example:      AT+FECM=0

                         OK

Read command:      **+FECM?**

                         Always returns 0.

Example:      AT+FECM?

                         0

                         OK

Test command:      **+FECM=?**

                         Always returns (0).

Example:      AT+FECM=?

                         ( 0 )

                         OK

# AT Commands Modem Terminated

## **+FET** *Page Punctuation*

Description: This command is used to punctuate page and document transmission, after one or more +FDT commands.

Set command: **+FET**=<ppm>[,<pc>,<bc>, <fc>]

Options: <ppm>

Next page type.

**0** [PPS-]MPS - another page next, same document.

**1** [PPS-]EOM - another document next.

**2** [PPS-]EOP - no more pages or documents.

<pc>

Page Count.

<bc>

Block Count.

<fc>

Frame Count.

Example: AT+FET=0

+FTPS:1

OK

Read command: **+FET?**

Example: AT+FET?

1

OK

Test command: **+FET=?**

Example: AT+FET=?

+FET: (0-2),(0-255),(0-255),(0-255)

OK

# AT Commands Modem Terminated

## **+FK**      *Orderly Fax Abort*

---

Description:      Aborts fax transmission.

Execute command:    **+FK**

Example:      AT+FK

                 +FHNG: 2

                 OK

                 ("2" is a hangup status  
                 code)

## **+FLID**      *Local Polling ID Parameter*

---

Description:      Allows you to define the local ID string.

Set command:      **+FLID=<local ID string>**

Options:      <local ID string>      String of 0 to 20 characters  
                 length.

Example:      AT+FLID="Ericsson"

                 OK

Read command:    **+FLID?**      Returns the current polling  
                 string.

Example:      AT+FLID?

                 "Ericsson"

                 OK

Test command:    **+FLID=?**      Always returns  
                 (20)(32-127).

Example:      AT+FLID=?

                 ( 20 ) ( 32-127 )

                 OK

# AT Commands Modem Terminated

## **+FLNFC** *Page Length Format Conversion Parameter*

---

Description: Defines page length format conversion.

Set command: **+FLNFC**=[<value>]

Options: <value> 0      Disable mismatch checking.

Example: AT+FLNFC=0

OK

Read command: **+FLNFC?**      Returns current settings.

Example: AT+FLNFC?

0

OK

Test command: **+FLNFC=?**      Always returns (0).

Example: AT+FLNFC=?

( 0 )

OK



# AT Commands Modem Terminated

---

## **+FMDL**     *Request Product Identification*

---

Description:                Returns the product identification of a Class 2 fax machine.

Read command:    **+FMDL?**

Example:            AT+FMDL?  
  
                         <TAE Model Identification>  
  
                         OK

---

## **+FMFR**     *Request Manufacturer's Identification*

---

Description:                Returns the manufacturer identification for a Class 2 fax machine.

Read command:    **+FMFR?**

Example:            AT+FMFR?  
  
                         Ericsson  
  
                         OK



# AT Commands Modem Terminated

## **+FMINSP** *Minimum Facsimile Page Transfer Speed Parameter*

---

Description: Set the minimum negotiable speed parameter.

Set command: **+FMINSP**=[<br>]

Options:	 	<b>0</b>	2400 bps V.27 ter.
		<b>1</b>	4800 bps V.27 ter.
		<b>2</b>	7200 bps V.29 or V.17.
		<b>3</b>	9600 bps V.29 or V.17.

Example: AT+FMINSP=3      Set rate to 9600 bps.  
OK

Read command: **+FMINSP?**      Returns the current setting.

Example: AT+FMINSP?  
3  
OK

Test command: **+FMINSP=?**      Always returns (0-3).

Example: AT+FMINSP=?  
( 0-3 )  
OK

# AT Commands Modem Terminated

## ***+FPHCTO Facsimile Page Transfer Timeout Parameter***

---

Description: Sets the period the Infrared Modem waits for another page from the PC before it assumes there are no more pages and aborts.

Set command: **+FPHCTO=[<value>]**

Options: <value> **0 - 255** The timeout period in units of 100ms.

**Default = 30.**

Example: AT+FPHCTO=30

OK

Read command: **+FPHCTO?** Returns the current setting.

Example: AT+FPHCTO?

30

OK

Test command: **+FPHCTO=?** Always returns (0-255).

Example: AT+FPHCTO=?

(0-255)

OK



# AT Commands Modem Terminated

---

## **+FREV**     *Request DCE Revision*

---

Description:            Returns the version, revision level or other information related to a Class 2 device.

Read command:    **+FREV?**

Example:            AT+FREV?  
                          9903020939  
                          OK

---

## **+FRBC**     *Receive Data Block Size*

---

Description:            Receive data block size.

Set command:        **+FRBC=[<value>]**

Options:             <value>    **0**                    Block can only be set to a size of 0 bytes.

Example:             AT+FRBC=0  
                          OK

Read command:      **+FRBC?**                    Returns the current setting.

Example:             AT+FRBC?  
                          0  
                          OK

Test command:        **+FRBC=?**                    Always returns (0).

Example:             AT+FRBC=?  
                          ( 0 )  
                          OK

# AT Commands Modem Terminated

## **+FREL** *Facsimile Page Transfer EOL Alignment Parameter*

---

Description: Received EOL alignment.

Set command: **+FREL**=[<value>]

Options: <value> **0** EOL patterns are bit aligned as received.

Example: AT+FREL=0

OK

Read command: **+FREL?** Returns the current setting.

Example: AT+FREL?

0

OK

Test command: **+FREL=?** Always returns (0).

Example: AT+FREL=?

( 0 )

OK



# AT Commands Modem Terminated

## **+FTBC** *Fax Page Transfer Data Transmit Byte Count Parameter*

---

Description: Sets the size of the transmit data block.

Set command: **+FTBC=[<value>]**

Options: <value> 0      Block can only be set to a size of 0 bytes.

Example: AT+FTBC=0

OK

Read command: **+FTBC?**      Returns the current setting.

Example: AT+FTBC?

0

OK

Test command: **+FTBC=?**      Always returns (0).

Example: AT+FTBC=?

( 0 )

OK

# AT Commands Modem Terminated

## **+FVRF** *Vertical Resolution Conversion Parameter*

---

Description: Disables mismatch checking.

Set command: **+FVRF**=[<value>]

Options: <value> **0** Disable mismatch checking.

Example: AT+FVRF=0  
OK

Read command: **+FVRF?** Returns the current setting.

Example: AT+FVRF?  
0  
OK

Test command: **+FVRF=?** Always returns (0).

Example: AT+FVRF=?  
( 0 )  
OK



# AT Commands Modem Terminated

## **+FWDFC** *Page Width Conversion Parameter*

---

Description: Width format conversion checking.

Set command: **+FWDFC=[<value>]**

Options: <value> 0      Disable mismatch checking.

Example: AT+FWDFC=0

OK

Read command: **+FWDFC?**      Returns the current setting.

Example: AT+FWDFC?

0

OK

Test command: **+FWDFC=?**      Always returns (0).

Example: AT+FWDFC=?

( 0 )

OK

## 5.7 Ensemble S1/B/E : GSM DTE-DCE Interface commands

### **+CSCS**     *Select Terminal Character Set*

Description:                Defines the character set to be used.

Set command:            **+CSCS=[<chset>]**

Options:                <chset>    "GSM"    Default GSM alphabet.

Example:                AT+CSCS="GSM"

OK

Read command:         **+CSCS?**                        Returns the current setting.

Example:                AT+CSCS?

+CSCS: "GSM"

OK

Test command:         **+CSCS=?**

Example:                AT+CSCS=?

+CSCS: "GSM" , "IRA" , "88591" , "ERICSSON"

OK





## Unsolicited Result Codes

### **\*CRING** *Cellular Result Code*

Description Set command controls whether or not the extended format of incoming call indication is used.

Unsolicited Result code:	<b>*CRING:</b> <type>	When enabled, indicates the incoming call to the TE instead of the normal RING.
Defined values:	<type>	
	<b>ASYNC</b>	Asynchronous transparent.
	<b>SYNC</b>	Synchronous transparent.
	<b>REL</b>	Asynchronous non-transparent.
	<b>ASYNC</b>	Asynchronous non-transparent.
	<b>REL</b>	Synchronous non-transparent.
	<b>SYNC</b>	Synchronous non-transparent.
	<b>FAX/</b>	Facsimile.
	<b>VOICE</b>	Normal voice (TS 11).



# AT Commands Modem Terminated

## **+CBST**      *Select Bearer Service Type*

---

Description:            Define the type of bearer service (name), data rate (speed) and connection element (ce) used when initiating a call.

To configure the Infrared Modem to operate with an ISDN connection, the speed value must be 68 or greater.

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

Options:	<speed>	<b>0</b>	Auto selection of baud setting.
		<b>4</b>	2400bps V22bis.
		<b>6</b>	4800bps V32.
		<b>7</b>	9600bps V32.
		<b>68</b>	2400bps V.110 (ISDN).
		<b>70</b>	4800bps V.110 (ISDN).
		<b>71</b>	9600bps V.110 (ISDN).
			Default = <b>0</b> .
	<name>	<b>0</b>	Asynchronous connection.
	<ce>	<b>1</b>	Non transparent.

Example:            AT+CBST=0,0,1  
OK

Read command:      **+CBST?**                      Returns the current setting.

Example:            AT+CBST?  
+CBST: 0,0,1  
OK

---

## AT Commands Modem Terminated

---

Test Command: **+CBST=?** Always returns (0,4,6,7,68,70,71),(0),(1).

Example: AT+CBST=?  
+CBST: (0,4,6,7,68,70,71),(0),(1)  
OK



## 5.10 Ensemble S4/B : GSM Extended Error Reporting

### **+CEER**      *Extended Error Report*

Description:                Returns the text description of the last error encountered in an unsuccessful connection.

Execute command:        **+CEER**

Returns:                    <report>

Text string containing reason of last call clearing or unsuccessful call set-up (originating or answering).

Example:                  AT+CEER  
                              +CEER: failure  
                              OK

Test command:            **+CEER=?**

Example:                  AT+CEER=?  
                              OK

## 5.11 Ensemble S10/B : GSM Mobile Equipment Error Control

### **+CMEE** *Report Mobile Equipment Error*

Description: Enables or disables mobile phone error reporting.

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

Options: <n>      **0**      Disable +CMEE error reporting.  
   **1**      Enable +CMEE error reporting. Use numeric <err> values.  
Default = **0**.

Example: AT+CMEE=1      Enable, error numeric.  
OK

Read command: **+CMEE?**      Returns the current setting.

Example: AT+CMEE?  
+CMEE: 1      Enabled.  
OK

Test command: **+CMEE=?**

Example: AT+CMEE=?  
+CMEE: (0,1)  
OK

## 5.12 Ensemble S27 : OBEX

### **+CPROT** *Enter Protocol Mode*

**Description:** Informs TA that TE wants to establish a peer-to-peer protocol <proto> or upper layer connection (indicating by the <lsap>s setting) 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 itself such a mechanism.

**Set command:** **+CPROT**=<proto>[,<version>[,<lsap1>[,...[<lsapN>]]]]

**Options** **0** OBEX  
**<proto>:**

**<version>** **String** Version number of <proto>. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

**<lsap1>** **Integer** 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).

**8** IrMC level 1, 2 and 4 (Minimum, Access and Sync Levels) Only-implies unique index support.

**<lsap2>...<lsapN>** **Integer** 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.  
No values supported.

**Example:** AT+CPROT=0  
CONNECT

---

## AT Commands Modem Terminated

---

OK

Test command: **+CPROT=?** <proto1>[(list of supported <version>s)[,(list of supported <lsap1>s)[,...[(list of supported <lsapN>s)]]]]

Example: AT+CPROT=?  
+CPROT: 0, "V1.0", (8)  
OK

## 6 OBEX Formats

One of the most basic and desirable uses of the IrDA infrared communication protocols is simply to send an arbitrary “thing”, or data object, from one device to another, and to make it easy for both application developers and users to do so. We refer to this as object exchange (un-capitalized), and it is the subject of this section.

### 6.1 Obex File System Overview

With the exception of Level 1 Information Exchange, whereby the objects are pushed into a device inbox, the object names passed to Obex PUT and GET operations shall always include the path information.

The paths are specified in the IrMC specification from IrDA.

Filename	Description	Supported Operations
----------	-------------	----------------------

#### Device Info

telecom/devinfo.txt	Information hardware version, software version, serial number, etc. Character sets.	GET
---------------------	--	-----

telecom rtc.txt	The Real Time Clock Object contains the current date and time of the device.	GET/PUT
-----------------	--	---------

#### Phone Book

telecom/pb.vcf	Level 2 access (Access entire phonebook database)	GET/PUT
----------------	---	---------

telecom/pb/luid/.vcf	Add new entry	PUT
telecom/pb/0.vcf	Own business card	GET/PUT
telecom/pb/###.vcf	Level 3 static index access	GET/PUT
telecom/pb/luid/*.vcf	Level 4 unique index access	GET/PUT
telecom/pb/info.log	Supported properties and memory info	GET
telecom/pb/luid/###.log	Change log	GET
telecom/pb/luid/cc.log	Change counter	GET

### **Calendar**

telecom/cal.vcs	Level 2 access	GET/PUT
telecom/cal/luid/.vcs	Add new entry	PUT
telecom/cal/###.vcs	Level 3 static index access	GET/PUT
Telecom/cal/luid/*.vcs	Level 4 unique index access	GET/PUT
Telecom/cal/info.log	Supported properties and memory info	GET
Telecom/cal/luid/###.log	Change log	GET
Telecom/cal/luid/cc.log	Change counter	GET

## 6.2 eMelody Format

### *eMelody Object*

Description: This is a definition the eMelody object. This object is used when a user-defined melody is exchanged.

Syntax: <emelody-object>  
 "BEGIN:EMELODY<CR><LF>  
 "VERSION:"<version><CR><LF>  
 "MELODY:"<melody><CR><LF>  
 "END:EMELODY"

File extension: **emy**

Example filename: `mymelody.emy`

Defined values

<version>	"1.0"
<basic_short_tone>	"c" "d" "e" "f" "g" "a" "b"
<ess_short_tone>	"(b)d" "(b)e" "(b)g" "(b)a" "(b)b"
<iss_short_tone>	"#c" "#d" "#f" "#g" "#a"
<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>	"#C" "#D" "#F" "#G" "#A"
<basic_tone>	<basic_short_tone> <ess_short_tone> <iss_short_tone> <basic_long_tone> <ess_long_tone> <iss_long_tone>
<octave_high_prefix>	"+"
<pause>	"p"
<tone>	{[<octave_prefix>]<basic_tone>}
<melody>	{<pause> <tone>}

Maximum number of tones: **40**

Maximum number of characters in melody: **120**

Example  
eMelody object:

```
BEGIN:EMELODY
VERSION:1.0
MELODY:
+f+a+fa(b)bdC+G
A+d+#c+dfg+daea
+d+#c+e+f+e+fa(
b)bdC+EA+d+#c+d
fgba+d+#C
END:EMELODY
```



### 6.3 vCard Format

---

The vCard object in the R320 uses a subset of the properties defined in the vCard specification from the Internet Mail Consortium. The vCard standard is available from the Internet Mail Consortium at <http://www.imc.org>.

#### *vCard Object*

---

**Description:** This is a definition the vCard object. This object is used when a user-defined contact card is exchanged.

**Syntax:** <vcard-object>  
 "BEGIN:VCARD<CR><LF>  
 "N;"<encoding>";"<character\_set>":"<name><C  
 R><LF>  
 "FN;"<encoding>";"<character\_set>":"<formatted  
 \_name><CR><LF>  
 "TEL"<telephone\_number><CR><LF>  
 "X-IRMC-  
 LUID:"<x\_irmc\_local\_unique\_identifiier><CR><L  
 F>  
 "END:VCARD"

**File extension:** **vcf**

**Example filename:** person.vcf

**Defined values**

<version> **"2.1"**

<encoding> **("QUOTED-PRINTABLE" | "BASE-64" | "8BIT")**

<character\_set> **("ISO-8859-1" | "UTF-8")**

<code>&lt;name&gt;</code>	<b>String</b>	Max length 18 bytes. This property is defined to encapsulate 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.
Example <code>&lt;name&gt;</code> for person:		<code>N:Public;John;Quinlan;Mr.;Esq.</code>
Example <code>&lt;name&gt;</code> for resource or place:		<code>N:Veni, Vidi, Vici;The Restaurant.</code>
<code>&lt;formatted_name&gt;</code>	<b>String</b>	Max length 18 bytes. This property specifies the formatted name string associated with the vCard object. This is the way that the name is to be displayed.
Example <code>&lt;formatted_name&gt;</code> :		<code>FN:Mr. John Q. Public, Esq.</code>
<code>&lt;telephone_number&gt;</code>	<b>String</b>	Max length 20 bytes. This property specifies the canonical number string for a telephone number 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 Telephone Number attribute.
<code>&lt;x_ircm_local_unique _identifier&gt;</code>	<b>String</b>	Max length 12 bytes. IrMC Local Unique Identifier field labelLocal Unique identifier 48 bits coded in its hexadecimal representation as 12 ascii characters.

Example  
vCard object:

```
BEGIN:VCARD
VERSION:2.1
N;QUOTED-PRINTABLE;CHARSET=ISO-8859-1:Book;Sven;Ola;Mr.
FN;QUOTED-PRINTABLE;CHARSET=ISO-8859-1:Mr. Sven O. Book
TEL:+4646123123
END:VCARD
```

## 6.4 vCalendar Format

---

The vCalendar standard is available from the Internet Mail Consortium at <http://www.imc.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>  
 "VERSION:"<version><CR>  
 "PRODID:"<prodid><CR><LF>  
 "BEGIN:VEVENT"<CR>  
 "END:VEVENT"<CR>  
 "BEGIN:VEVENT"<CR>  
 "END:VEVENT"<CR>  
 ...  
 "END:VCALENDAR"

**File extension:** **vcs**

**Example filename:** filename.vcs

**VEVENT** see vEvent Object description

**Defined values**

<version> **"1.0"**

<prodid> **"Ericsson Calendar 1.0"**

Example  
vCalendar vEvent  
object (MEETING):

```
BEGIN:VCALENDAR
VERSION:1.0
PRODID:Ericsson Calendar 1.0
BEGIN:VEVENT
DTSTART:19990125T123000
DTEND:19990125T170000
AALARM:19990125T121500
CATEGORIES:MEETING
SUMMARY;QUOTED-PRINTA-
BLE;CHARSET=ISO-8859-1:Meeting with
Lars
LOCATION;QUOTED-PRINTA-
BLE;CHARSET=ISO-8859-1:At my room
X-IRMC-LUID:1E12FF7C01AB
END:VEVENT
END:VCALENDAR
```

## vEvent Object

**Description:** This is a definition of the vEvent object, which is related to the vCalendar object. These objects are used when a user-defined calendar entry is exchanged. The phone supports all day event meetings. The sync engine shall send the vCalendar object with DTSTART set the date (YYYYMMDD), and leaving the time 'THHMMSS' out. The DTSTART is mandatory, as well as the DTEND. The same principles applies for DTEND, that is, 'THHMMSS' is skipped.

**Syntax:** <vevent-object>

```
"BEGIN:VEVENT"<CR>
"DTSTART:"<date_and_time>
"DTEND:"<date_and_time>
"AALARM:"<date_and_time>
"CATEGORIES:"<category>
"SUMMARY;"<encoding>","<character_set>":"<summary>
"LOCATION;"<encoding>","<character_set>":"<location>
"X-IRMC-LUID:" <x_irmc_luid>
"END:VEVENT"
```

### Defined values

<b>&lt;date_and_time&gt;</b>	<b>String</b>	<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

<b>Example</b>	19960415T083000 8:30 AM on April 15, 1996
<b>&lt;date_and_time&gt;:</b>	local time.

<category>	<b>"MEETING"   "PHONE CALL"   "MISCELLANEOUS"</b>
<encoding>	<b>("QUOTED-PRINTABLE"   "BASE-64"   "8BIT")</b>
<character_set>	<b>("ISO-8859-1"   "UTF-8")</b>
<summary>	<b>String</b> Max length 36 bytes
<location>	<b>String</b> Max length 20 bytes
<x_irmc_luid>	<b>String</b> Max 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 + 1999-02-12

# Glossary

## **Analog**

An analog signal can have any value between two limits. Traditional telephone lines, for example, 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. Complex timing circuits are not needed. The serial port and the COM port of a computer are associated with asynchronous communication, as is the RS-232-C interface. Also some end to end modem protocols are asynchronous.

## **AT**

The characters AT stand for Attention and tells the Infrared Modem that a command follows. AT must be used at the beginning of a command line or dial string.

## **AT command set**

The commands used to control the Infrared Modem.

## **Auto-answer mode**

The state in which the Infrared Modem automatically answers the telephone when it rings.



## **Beam**

Sending an item to another phone or a compatible application using the infrared link. This can include ring signals, calendar entries, business cards.

## **Bearer**

The method for accessing WAP from the phone, for example GSM Data (CSD) and SMS.

## **Bps**

Acronym for bits per second (bits/s). A measure of speed at which bits are transmitted over the telephone lines.

## **Card**

A single WML unit of navigation and user interface. May contain information to present to the user, instructions for gathering user input, etc.

## **Carrier**

The frequency used by two connecting modems to transmit and receive data.

## **CCITT**

Consultative Committee for International Telephony and Telegraphy. A European based advisory committee established by the United Nations to recommend international communication protocol standards.

## **CD**

Carrier Detect. An EIA232 signal sent from the Infrared Modem to your computer, usually indicating that your Infrared Modem has detected a carrier signal over the communications line.

## **Command line**

A line of alphanumeric characters sent to the Infrared Modem to instruct the Infrared Modem to perform the commands specified in the line of characters.

## **COM (communications) port**

The name allocated to the serial port through which digital signals are exchanged between the computer and a serial peripheral. For example COM1 and COM2.

## **CSD**

Circuit Switched Data.

## **CTS**

Clear To Send. An EIA232 signal sent from a modem to the computer, usually indicating that the modem is ready to receive data.

## **DCD**

Data Carrier Connect. See the &C command.

## **DCE**

Data Communications Equipment. This term applies to modems and to other equipment that provide communication between data terminal equipment and the telephone line.

## **Deck**

A collection of WML cards.

## **Default setting**

A setting that the Infrared Modem will always use unless specified otherwise.

## **Digital transmission**

A digital signal can have only two values. These can be, for example, ON and OFF, HIGH and LOW or 1 and 2. A digital signal is usually transferred by means of a voltage which is either HIGH or LOW. Conventional modems communicate by means of audio tones which can use the analog telephone network. (See analog) The Infrared Modem links through your mobile telephone to a digital network and therefore has no need to use audio encoding. However, when you use your mobile telephone for a voice call, the analog signal from the microphone must be converted into a digital signal. This is done by a converter which samples the signal voltage several thousand times per second. Each sample is converted into a binary number which represents the voltage at that instant, eg 10011010, and the binary numbers are sent as a serial stream down the digital network.

## **DSR**

Data Set Ready. An EIA232 signal sent from the Infrared Modem to the computer, usually indicating that the Infrared Modem is ready to establish a connection.

## **DTE**

Data Terminal Equipment. The equipment that provides data, such as a computer or terminal.

## **DTR**

Data Terminal Ready. An EIA232 signal sent from the computer to the Infrared Modem, usually indicating that the computer is ready to begin communication.

## **EIA**

Electronics Industries Association. A U.S. based group that forms technical standards and coordinates ITU-TCCITT activities in the United States.

## **eMelody**

This object is used when a melody is exchanged over infrared between two devices. The eMelody specification is available at <http://www.irda.org>.

## **EOL**

End of line.

## **EOP**

End of page.

## **EOM**

End of message.

## **Escape code**

A series of three consecutive characters (default is + + +) sent to the Infrared Modem, causing it to exit on-line data mode and enter on-line command mode.

## **Factory default settings**

The profile configuration that is in effect when the Infrared Modem is shipped from the factory.

## **Fax Class**

Standards for fax transmission are set as classes. Class I and II allow data transfer speeds of between 2400 up to 9600 bps.

## **Final result code**

A message sent from the Infrared Modem to inform the PC that execution of an entered AT command has been completed. Examples are `OK` and `ERROR`.

## **Flow control**

The use of characters or EIA232 signals to start and stop the flow of data to avoid data loss during buffering.

## **Full duplex**

Communication involving data transmitted in two directions simultaneously.

## **Gateway**

A WAP Gateway typically includes the following functionality:

: A Protocol Gateway Ð the protocol gateway translates requests from the WAP protocol stack to the WWW protocol stack (HTTP and TCP/IP).

: Content Encoders and Decoders Ð the content encoders translate Web content into compact encoded formats to reduce the size and number of packets traveling over the wireless data network.

## **GIF**

Graphics Interchange Format.

## **Half duplex**

Communication involving data transmitted in two directions, but not at the same time.

## **Intermediate result code**

Information sent from the Infrared Modem to the PC as a response to an executed AT command. Intermediate result codes are always followed by a final result code. For example +CBC: 0,100.

## **IrMC**

Infrared Mobile Communications standard.

## **IrDA**

Infrared Data Association. <http://www.irda.org>

## **ISDN**

The term used to refer to the digital public switched telephone network.

## **ISP**

Internet Service Provider.

## **ITU-T**

The ITU Telecommunication Standardization Sector (ITU-T), is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunication on a world wide basis.

As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993.

## **MMI**

Man-Machine Interface.

## **ME**

Mobile Equipment. The Ericsson wireless terminal excluding the SIM card, which in most cases is a mobile phone.

## **Micro browser**

Accesses and displays the Internet contents in your mobile phone, just as an ordinary browser does in your computer. The micro browser uses small file sizes and the bandwidth of the wireless-handheld network.

## **Modem**

Modulator-Demodulator. A device that converts digital signals to analog for transmission over telephone lines, then converts them back to digital at the other end of the line.

## **MS**

This is the Ericsson wireless terminal being controlled through the set of commands described in this document.

## **OBEX**

The OBEX specification consists of two major parts: a protocol and an application framework. The OBEX protocol is a session level protocol that specifies the structure for the conversation between devices. It also contains a model for representing objects. The OBEX application framework is built on top of the OBEX protocol. Its main purpose is to facilitate interoperability between devices using the OBEX protocol. Please refer to <http://www.irda.org>.

## **Off hook**

The Infrared Modem state similar to picking up a telephone receiver. The Infrared Modem goes off hook to dial or answer, and remains off hook while connected.

## **Off-line command mode**

The operational state in which the Infrared Modem can accept typed commands.

## **On hook**

The Infrared Modem state similar to hanging up a telephone receiver.

## **On-line data mode**

The state the Infrared Modem is in when transmitting or receiving data over the telephone line.

## **OTA**

Over-the Air Configuration. To provide settings for the phone by way of sending a message, SMS, over the network to the phone. This reduces the need for the user to configure the phone manually.

**PIN**

Personal identification number.

**PDA**

Personal Digital Assistant.

**Phone Book**

A memory in your mobile phone or SIM card where phone numbers can be stored and accessed by name or position.

**Protocols**

The rules or procedures all modems must follow to communicate.

**Result code**

A message the Infrared Modem sends to the computer containing information about the state of the Infrared Modem.

**RLP**

Radio Link Protocol, an error correction protocol used during radio link connections.

**RLSD**

Received Line Signal Detect. See AT command &C.

**RTS**

Request To Send. An EIA232 signal sent from the computer to the Infrared Modem, usually indicating that the computer is ready to send data to the Infrared Modem.



## **RS-232-C interface**

A communication standard established by the Electronics Industry Association (Recommended Standard number 232, revision C). Originally established to standardize communication between computer and modem. It was later adapted to become a popular standard for communication between computer and any other peripheral equipment, including other computers.

## **SC**

Service Center (for SMS).

## **Serial port**

The port through which digital signals are exchanged between the Infrared Modem and the computer.

## **Short message service (SMS)**

A text messaging service permitting the transmission of up to 160 characters to a facsimile, X400, telex and voice services or mobile phone.

## **SIM card**

Subscriber Identity Module card Ð 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.

## 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 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. Require LAPM or MNP2, MNP3 or MNP4 as error correcting.

## TA

Terminal Adaptor, which in most cases is a PCMCIA (Personal Computer Memory Card International Association) card.

## TAE

Terminal Adaptor Equipment.

## TCP/IP

Transmission Control Protocol/Internet Protocol.

## TE

Terminal Equipment, which in most cases is a computer.

## **Unsolicited result code**

A message sent from the Infrared Modem to the PC that is not a response to an executed AT command. For example RING.

## **vCalendar**

vCalendar and vEvent define a transport and platform-independent format for exchanging calendaring and scheduling information for use in PIMs/ PDAs and group schedulers. vCalendar/vEvent are specified by IMC 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 centers, video conferencing, PIMs /PDAs, pagers, fax, office equipment, and smart cards. vCard is specified by IMC at <http://www.imc.org>.

## **vEvent**

See vCalendar.

## **WAP**

Wireless Application Protocol. Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user. A collection of cards is called a deck, which usually constitutes a service.

## **WAP Application**

A collection of WML cards, with the newcontext attribute set in the entry card.

**WAP service**

A WML application residing on a web site.

**WBMP**

WAP Bitmap.

**WML**

Wireless Markup Language. A markup language used for authoring services, fulfilling the same purpose as HyperText Markup Language (HTML) do on the World Wide Web (WWW). In contrast to HTML, WML is designed to fit small handheld devices.

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+FET 325  
+FK 326  
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