888 AT Telephone Online Reference

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1 Introduction

This Manual describes the operation of the AT commands supported by the 888 AT Telephone. The information here is not relevant for day-to-day operation of theTelephone, which is described in the User Manual supplied with the Ericsson Mobile Office 888.

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

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

1.1 About this manual

This manual is designed to supplement the Ericsson 888 AT Telephone User Manual.

1.2 Using this manual

The standard text in this manual is modified to distinguish between the text displayed on the screen, typed instructions and examples of command 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 Ericsson Mobile Office 888 AT Telephone

The telephone connects to your computer via the Infrared Modem by means of a digital infrared link.

Data functions

Transmission speed conforms to the ITU-T standard V.22bis which facilitates data transfer at 2,400, 4,800 and 9,600 bits/s. By implementing data compression the transmission speed can be increased to a theoretical maximum data throughput of 38,400 bits/s. between computers.

Facsimile functions

Facsimile operation, at 2,400, 4,800, 7,200 and 9,600 bits/s. conforms to Service Class 1 and the proposed Service Class 2 standards.

Short Message Service

The telephone supports the short message service (SMS) with messages up to 160 characters long, according to ETSI (GSM) 07.05 using the GSM character set.

Mobile Phone Manager

The Infrared Modem supports commands for access of the mobile phone book and short message service according to ETSI (GSM) 07.05 and 07.07.

1.4 Communications programs

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.

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 1 driver. The Infrared Modem supports Fax Class 2 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 1.

2 Result and Error Codes

2.1 Result codes

When you send a command from your PC 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, 5 and 6.*

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 preceeded 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:(0,1),(0-100)`
	`OK`
Invalid command	`AT+CBC=?;+FCLASS=3`
Response	`+CBC:(0,1),(0-100)`
	`ERROR`

Result codes from call connections

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

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

Format of the result codes

The result codes described above are in verbose format. You can command the 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 AT V command on page 95 and page 164.

To switch the display of result codes on or off, please refer to the use of the AT Q command on page 163.

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+CMEE command.

Report mobile phone failure (+CMEE)

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

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

Report operational/access failure (+CMS)

The +CMS ERROR result codes indicate an error relating to the 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: 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: 500	Unknown error.

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 your mobile telephone and Infrared 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 your mobile telephone and Infrared Modem;
- request information about the current configuration or operational status of your mobile phone/modem;
- test availability and request the range of valid parameters, when applicable, for an AT command.

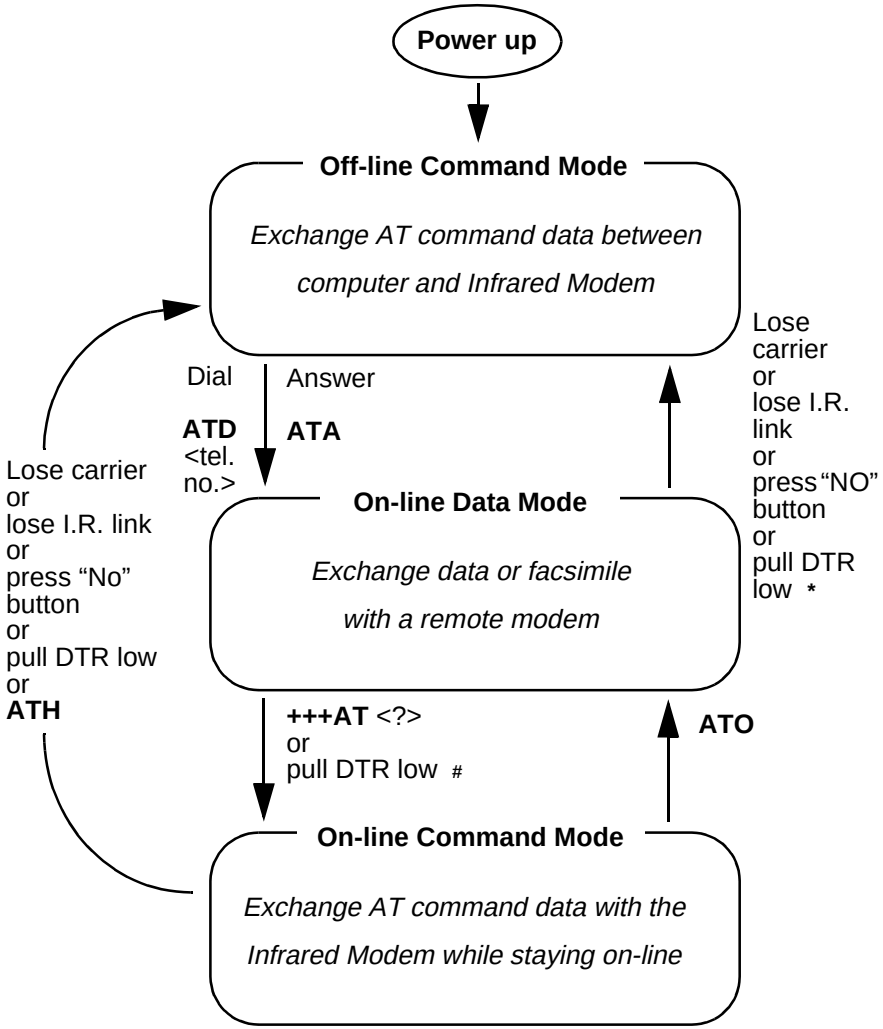
3.2 Infrared Modem operating modes

The Infrared Modem can be set in any one of three modes of operation. These are:

off-line command mode	the Infrared 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 Infrared 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 Infrared Modem while still remaining connected to the remote modem.

3.3 Changing the Infrared Modem operating mode

The following illustration summarises the methods that are used to switch between the three Infrared Modem operating modes:



&D previously set to 1.
* &D previously set to 2.

Operating in off-line command mode

In off-line command mode, the Infrared Modem accepts data as commands and not as normal communications traffic. You enter commands by typing at the PC 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 Infrared Modem in on-line mode.

Switching back to off-line command mode

Any of the following will return the Infrared 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 Infrared Modem and your computer;
- pressing the “NO” button on your mobile phone;
- pulling DTR low provided &D has previously been set to 2.

Note: *The &D command is described on page 165. 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 Infrared 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 Infrared 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 Infrared 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 to 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 Infrared 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 Infrared 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 Infrared Modem or to execute an event.

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

AT+CBC

The Infrared 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

General AT commands

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

Ensemble C12/E : IrDirect

Ensemble S16/B/E : GSM Phonebook Commands

Ensemble S20 : Ericsson Specific AT Commands for GSM

Unsolicited Result Codes

AT Commands Modem Inactive

Ensemble C2/C/E : Control and Identification

Ensemble S2/E : GSM Call Control

Unsolicited Result Codes

Ensemble C3/E : Call Control

Unsolicited Result Codes

Ensemble C4/E : Interface Commands

Ensemble S6/E : GSM Network Services

Unsolicited Result Codes

Ensemble S8/E : GSM Facility Lock

AT Commands Modem Active

Ensemble S2/B : GSM Call Control

Unsolicited Result Codes

Ensemble C2/B : Identification and Control

Ensemble C3/B : Call Control

Ensemble S3/B : GSM Data/Fax

Ensemble C4/B : Interface Commands

Ensemble S4/B : GSM Extended Error Reporting

Ensemble S9/B : GSM Mobile Equipment, Control and Status

Ensemble S10/B : GSM Mobile Equipment Error Control

Ensemble S11/B : GSM SMS and CBS PDU Mode

Unsolicited Result Codes

Ensemble C18/B : Fax Class 1

Ensemble C19/B : Fax Class 2

4 General AT Commands

4.1 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`	

4.2 Ensemble C12/E : IrDirect

**IRDIRECT Switch to IRDIRECT protocol*

Description: Defines the character set to be used.

Set command: ***IRDIRECT=**<primary device address>, <channel number>,<baud>,<primary_rx_size>

Options:

<primary device address>		The IrDirect address of the IrDirect primary device.
<channel number>		0-3
<baud>	**0**	2400 bps.
	1	9600 bps.
	2	19200 bps.
	3	38400 bps.
	4	57600
	5	115200
<primary_rx_size>		Size of receive buffer of the IrDirect primary device.

Example:

```
AT*IRDIRECT=8,0,1,512
*IRDIRECT: CONNECT 0,0,1,24
OK
```

Read command: ***IRDIRECT?**

Example:

```
AT*IRDIRECT?
*IRDIRECT: 0,0,1,24
OK
```

Test command: ***IRDIRECT=?**

Example:

```
AT*IRDIRECT=?
*IRDIRECT: (0-15),(0-3),1,24
OK
```

4.3 Ensemble S16/B/E : GSM Phonebook Commands

+CPBS Select mobile phone phonebook memory storage

Description: Define the location of the phonebook memory storage used by the phonebook commands.

Set command:	**+CPBS=**<storage>	
Options:	<storage> **“ME”**	Mobile phone phonebook.
	“SM”	SIM card phonebook.
		Default = “SM”.
Example:	`AT+CPBS="SM"`	
	`OK`	
Read command:	**+CPBS?**	Returns the current setting.
Example:	`AT+CPBS?`	
	`+CPBS: "SM"`	
	`OK`	
Test command:	**+CPBS=?**	Always returns (“ME”,“SM”).
Example:	`AT+CPBS=?`	
	`+CPBS: ("ME","SM")`	
	`OK`	

+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 next 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
```

Test command:	**+CPBR=?**	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>	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`	

+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.

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.

Example:	`AT+CPBW=?`
	`+CPBW: (1-100),20,(128-255),20`
	`OK`	

4.4 Ensemble S20 : Ericsson Specific AT Commands for GSM

*EAUM Ericsson accumulated call meter max

Description: Sets the audio mode which determines the path of audio signals to and from the MS.

Set command: ***EAUM**=<audio mode>

Options: <audio mode>

0	Phone, hand held.
1	Phone, hands free.
2-6	Reserved.

Example:
```
AT*EAUM=0
OK
```

Read command: ***EAUM?**

Example:
```
AT*EAUM?
*EAUM: 0
OK
```

Test command: ***EAUM=?**

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

*ECAM Ericsson call monitoring

Description: Activates or deactivates call monitoring. When the log function is activated in the ME, the ME informs about call events, such as incoming call, connected, hang up, etc..

Set command: ***ECAM**=<onoff>

Options: <onoff> **0** Activated.

1 Deactivated.

Example:
```
AT*ECAM=1
OK
```

Read command: ***ECAM?**

Example:
```
AT*ECAM?
*ECAM: 1
OK
```

Test command: ***ECAM=?**

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

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

Refer to *ECAV for a description.

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`

EDME** ***Ericsson enable data menus

Description: Enables or disables data menus on the phone.

Set command:	***EDME=**<onoff>		
Options:	<onoff>	**0**	Disable call data menus.
		1	Enable call data menus.
			Default 0.
Example:	`AT*EDME=0`		
	`OK`		
Read command:	***EDME?**		
Example:	`AT*EDME?`		
	`*EDME: 0`		
	`OK`		
Test command:	***EDME=?**		
Example:	`AT*EDME=?`		
	`*EDME: (0-1)`		
	`OK`		

*EERS Ericsson external ring signal setting

Description: This command sets the ring signal to the 'external ring signal' mode, where it is up to the mobile station to decide how the ring signal shall be handled.

Set command: ***EERS**[=<mode>]

Options:

<mode>	**0**	Reset ring signal volume to that before the state before the *EERS command was issued to turn the volume off.
	1	Ericsson external ring signal on.

Example:

```
AT*EERS=0
OK
```

Read command: ***EERS?**

Example:

```
AT*EERS?
*EERS: 0
OK
```

Test command: ***EERS=?**

Example:

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

*EICO Ericsson icon

Description: Sets or removes an icon in the display in the MS from TAE.

Set command: ***EICO=**<icon type>,<onoff>

Options:

<icon type>	**2**	Mail icon.
	4	Mail overflow icon.
	5	Silence icon.
<onoff>	**0**	Icon off.
	1	Icon on.

Example:

```
AT*EICO=2,1
OK
```

Read command: ***EICO?**

Example:

```
AT*EICO?
*EICO: 2,1
*EICO: 4,0
*EICO: 5,1
OK
```

Test command: ***EICO=?**

Example:

```
AT*EICO=?
*EICO: (2,4-5),(0-1)
OK
```

*EKEB Ericsson keyboard buffer

Description: Used to "synchronise" digits which have been inputted by the user, when the user opens or closes the LID. E.g. if the user has keyed in "234" on the phone and then opens the LID, the phone application on the PDA will indicate "234" and the user can continue to key in digits.

Set command: ***EKEB=**<digits>

Options: <digits> **string** Supported digits.

Example:
```
AT*EKEB= "1234"
OK
```

Read command: ***EKEB?**

Example:
```
AT*EKEB?
*EKEB: "1234"
OK
```

Test command: ***EKEB=?**

Returns: <dlength> **integer** Maximum length of digits.

Example:
```
AT*EKEB=?
*EKEB: (80)
OK
```

*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.
		“sv”	Swedish.
		“fi”	Finnish.
		“da”	Danish.
		“no”	Norwegian.
		“de”	German.
		“fr”	French.
		“es”	Spanish.
		“it”	Italian.
		“en”	English.
		“en”	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)
OK
```

ELIN** ***Ericsson line set

Description: This requests the ME to set the current line to <line>.

Set command: ***ELIN**=<line>

Options: <line> **1** L1

2 L2

Example:
```
AT*ELIN=1
OK
```

Read command: ***ELIN?**

Example:
```
AT*ELIN?
*ELIN: 1
OK
```

Test command: ***ELIN=?**

Example:
```
AT*ELIN=?
*ELIN: (1-2)
OK
```

EMAR** ***Ericsson master reset

Description: Requests the ME to reset user data.

Set command: ***EMAR**

Example:
```
AT*EMAR
OK
```

Read command: ***EMAR=?**

Example:
```
AT*EMAR=?
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
```

*EMMI Ericsson man-machine-interface mode

Description: Enables or disables MMI mode for the MS.

Set command: ***EMMI**=<display mode>,<keypad mode>,
<back light mode>

Options:			
	<display mode>	**0**	Disable display.
		1	Enable display.
	<keypad mode>	**0**	Disable keypad.
		1	Enable keypad.
	<back light mode>	**0**	Disable back light.
		1	Enable back light.

Example:
```
AT*EMMI=1,1,1
OK
```

Read command: ***EMMI?**

Example:
```
AT*EMMI?
*EMMI: 1,1,1
OK
```

Test command: ***EMMI=?**

Example:
```
AT*EMMI=?
*EMMI: (0-1),(0-1),(0-1)
OK
```

EPEE** ***Ericsson pin event

Description: Requests the MS to report when the pin code has been inserted and accepted.

Set command: ***EPEE**=<onoff>

Options: <onoff> **0** Request not activated.

1 Request activated.

Example:
```
AT*EPEE=1
OK
```

Read command: ***EPEE?**

Example:
```
AT*EPEE?
*EPEE: 1
OK
```

Test command: ***EPEE=?**

Example:
```
AT*EPEE
*EPEE: (0-1)
OK
```

Unsolicited Result code: ***EPEV:**

ERIL** ***Ericsson ring level set

Description: Sets the ring volume level.

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

Options:

<volume>	**0**	Off.
	1	Step.
	2-7	Volume setting.
<call type>	**1**	Line 1.
	2	Line 2.
	3	Fax.
	4	Data.

Example:

```
AT*ERIL=3,1
OK
```

Read command: ***ERIL?**

Example:

```
AT*ERIL?
*ERIL: 3,1
*ERIL: 3,2
*ERIL: 4,3
*ERIL: 6,4
OK
```

Test command: ***ERIL=?**

Example:

```
AT*ERIL
*ERIL: (0-7),(1-4)
OK
```

ERIN** **Ericsson ring set

Description: Sets the ring type for incoming calls.

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

Options:			
	<sound type>	**1**	Low ring signal.
		2	Medium ring signal.
		3	High ring signal.
		4	Mixed ring signal.
		11	Melody 1.
		12-20	Melody 2-20 - preset.
		31	Own melody 1.
	<call type>	**1**	Line 1.
		2	Line 2.
		3	Fax.
		4	Data.

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),(1-4)
OK
```

*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>	**0**	Off.
		1	Step.
		2-7	Volume setting.
	<sound type>	**1**	Low ring signal.
		2	Medium ring signal.
		3	High ring signal.
		4	Mixed ring signal.
		11	Melody 1.
		12-20	Melody 2-20 - preset.
		31	Own melody.

Example:

```
AT*ERIP=3,3
OK
```

Test command: ***ERIP=?**

Example:

```
AT*ERIP=?
*ERIP: (0-7),(1-4,11-20,31)
OK
```

*ESAM Ericsson settings answer mode

Description: Sets the answer mode settings in the MS.

Set command:	***ESAM**=<mode>		
Options:	<mode>	**0**	Off.
		1	Any Key Mode on.
		2	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		

*ESBL Ericsson settings back light mode

Description: Sets the back light mode of the MS.

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

Options:	<place>	**0**	Handheld.
		1	Car mounted.
	<mode>	**0**	Always off.
		1	Always on.
		2	Auto.

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
```

ESDF** **Ericsson settings date format

Description: Sets the date information format in the MS.

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

Options:

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

Example:
```
AT*ESDF=1
OK
```

Read command: ***ESDF?**

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

Test command: ***ESDF=?**

Example:
```
AT*ESDF=?
*ESDF: (0-6)
OK
```

ESIL** ***Ericsson silence command

Description: Sets silent mode on the phone. An icon will be displayed when the phone is in silent mode.

Set command: ***ESIL**=<mode>

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

1 On.

Example:
```
AT*ESIL=0
OK
```

Read command: ***ESIL?**

Example:
```
AT*ESIL?
*ESIL: 0
OK
```

Test command: ***ESIL=?**

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

*ESKL Ericsson settings key lock mode

Description: Sets the key lock mode of the MS.

Set command:	***ESKL**=<mode>		
Options:	<mode>	**0**	Manual.
		1	Automatic.
Example:	AT*ESKL=1		
	OK		
Read command:	***ESKL?**		
Example:	AT*ESKL?		
	*ESKL: 1		
	OK		
Test command:	***ESKL=?**		
Example:	AT*ESKL=?		
	*ESKL: (0-1)		
	OK		

*ESKS Ericsson settings key sound

Description: Sets the key sound mode of the MS.

Set command:	***ESKS**=<mode>		
Options:	<mode>	**0**	Silent.
		1	Click.
		2	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		

ESMA** **Ericsson set message alert sound

Description: Sets the message alert sound of the MS.

Set command: ***ESMA**=<mode>

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

1 Click.

2 Tone.

Example:
```
AT*ESMA=1
OK
```

Read command: ***ESMA?**

Example:
```
AT*ESMA?
*ESMA: 1
OK
```

Test command: ***ESMA=?**

Example:
```
AT*ESMA=?
*ESMA: (0-2)
OK
```

ESMM** **Ericsson settings minute minder

Description: Sets the minute minder on or off in the MS.

Set command:	***ESMM**=<mode>		
Options:	<mode>	**0**	Minute minder Off.
		1	Minute minder On.
Example:	AT*ESMM=0		
	OK		
Read command:	***ESMM?**		
Example:	AT*ESMM?		
	*ESMM: 0		
	OK		
Test command:	***ESMM=?**		
Example:	AT*ESMM=?		
	*ESMM: (0-1)		
	OK		

*ESNU Ericsson settings number

Description: Sets a number in the MS according to <type>.

Set command: ***ESNU**=<type>,<number>[,<number type>]

Options:

<type>	**0**	Voice L1.
	1	Voice L2.
	2	Fax.
	3	Data.
<number>	**0-9,+**	Number.
<number type>	**145**	International Dialling including “+”.
	129	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
```

*ESOM Ericsson settings own melody

Description: Sets the user defined own melody in the MS.

Set command:	***ESOM**=<melody index>,<melody string>		
Options:	<melody index>	**1**	Melody 1.
	<melody string>	**string**	Melody characteristics.
Melody characteristics:	<p>	**p**	Pause.
	<prefix>	**#**	Half tone higher.
		b	Half tone lower.
		+	One octave higher.
	<tones>	**c,d,e,f,g,a,h,c**	Short tones.
		C,D,E,F,G,A,H,C	Long tones.

Example:

```
AT*ESOM=1,"aAffFgaAgfEpgGefgeafDC"
OK
```

(The Swedish national anthem).

Read command: ***ESOM?**

Example:
```
AT*ESOM?

*ESOM: 1,"aAffFgaAgfEpgGefgeafDC"

OK
```

Test command: ***ESOM=?**

Response:

<mtones>	**integer**	Maximum number of tones in the melody.
<mlength>	**integer**	Maximum length of the melody string.

Example:
```
AT*ESOM=?

*ESOM: (1),('p'),('#','b','+'),
       ('c','d',.....,'A','H'),120,40

OK
```

*ESTF Ericsson settings time format

Description: Sets the time format of the time information in the MS.

Set command: ***ESTF**=<mode>

Options:

<mode>	**0**	Off.
	1	HH:MM.
	2	HH:MM a.m./p.m.

Example:
```
AT*ESTF=1
OK
```

Read command: ***ESTF?**

Example:
```
AT*ESTF?
*ESTF: 1
OK
```

Test command: ***ESTF=?**

Example:
```
AT*ESTF=?
*ESTF: (0-2)
OK
```

ESVM** **Ericsson set voice mail number command

Description: Sets the voice mail number.

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

Options:			
	<onoff>	**0**	Disable.
		1	Enable.
	<number>	**string**	<0..9,+>
	<type>	**integer**	Type of address octet.
		129	ISDN, unknown international.
		145	ISDN, International.
		161	ISDN, national.

Example:
```
AT*ESVM=1,"90823677",129
OK
```

Read command: ***ESVM?**

Example:
```
AT*ESVM?
*ESVM: 1,"90823672",129
OK
```

Test command: ***ESVM=?**

Example:
```
AT*ESVM=?
*ESVM:(0-1),20
OK
```
20 - maximum length of voice mail number.

ETXT** ***Ericsson text command

Description: Sets and activates the greetings text in the MS.

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

Options:

<onoff>	**0**	Set text off.
	1	Set text on.
<text>	**string**	Free text to display.

Example:

```
AT*ETXT=1,"Hello"
OK
```

Read command: ***ETXT?**

Example:

```
AT*ETXT?
*ETXT: 1,"Hello"
OK
```

Test command: ***ETXT=?**

Response:

<ltext>	**integer**	Maximum length of characters in <text>.

Example:

```
AT*ETXT=?
*ETXT: (0-1),24
OK
```

*EWEE Ericsson Wake Me Up event command

Description: Enables or disables the Wake Me Up function.

Set command:	***EWEE=**<onoff>		
Options:	<onoff>	**0**	Disable.
		1	Enable.
Example:	`AT*EWEE=0`		
	`OK`		
Read command:	***EWEE?**		
Example:	`AT*EWEE?`		
	`*EWEE: 0`		
	`OK`		
Test command:	***EWEE?**		
Example:	`AT*EWEE`		
	`*EWEE: (0-1)`		
	`OK`		
Unsolicited Result code:	***EWEV**		
	Refer to *EWEV for a description.		

Unsolicited Result Codes

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

	<exitcause> **integer**	Exit cause according to GSM 04.08. Reports return to IDLE (<ccstatus>=0).
	<number> **string**	String type phone number as specified by <type>. Valid only for <ccstatus>=1,5,6.
	<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>=1,5,6.

Example:	`ATD08044864;`	Dial number.
	`OK`	
	`*ECAV: 1,1,1,,,08404486 4,129`	CALLING
	`*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: 1,0,1,8,16`	IDLE. Call Control (CC) exit cause 16 (normal clearing)
Example:	`RING`	Incoming call
	`*ECAV: 1,6,128,,`	ALERTING (VOICE2)
	`RING`	
	`RING`	
	`ATA`	Answer call
	`OK`	
	`*ECAV: 1,3,1,,`	ACTIVE call indication.
	`*ECAV: 1,0,1,8,16`	Remote party hangs up. IDLE call state entered. Call Control (CC) exit cause 16 (normal clearing).

EPEV** ***Ericsson Pin Code event

Description: Reports that the user has entered the PIN Code and it has been accepted. ME is not pending for any password

Unsolicited Result code:	***EPEV:**	Unsolicited status is enabled with AR*EPEE command.

*ESSV Ericsson Store Scratch Pad event

Description: The number included in the unsolicited event can be used on the Olga side. The event reporting is activated with the command AT*ESSE=<onoff>.

Unsolicited Result code:	***ESSV:**<number>	The user stores a number from the scratch pad to the re-dial list.
Defined values:	<number> **string**	Number on the scratch pad stored to the re-dial list.

*EWEV Ericsson Wake Me Up event

Description: Wakes up the peer entity of the communication via the serial system bus.

Unsolicited Result code:	***EWEV:**	Sent to the PDA side of the system bus.

5 AT Commands Modem Inactive

5.1 Ensemble C2/C/E : Control and Identification

AT ***Attention Command***

Description: Determines the presence of a MS.

Execute command: **AT**

Example: AT

0K

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
```

&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		

+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**

Example:
```
AT+CGMM
1050501
OK
```

Test command: **+CGMM=?**

Example:
```
AT+CGMM=?
OK
```

+CGMR Request mobile phone revision identification

Description: Returns the revision identification of the mobile phone.

Execute command:	**+CGMR**	
Response:	<revision>	String date in YYMMDDHHMM format.
Example:	`AT+CGMR`	
	`9710051610`	Type numbering structure
	`OK`	
Test command:	**+CGMR=?**	
Example:	`AT+CGMR=?`	
	`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
1100801
OK
```

Test command: **+GMM=?**

Example:
```
AT+GMM=?
OK
```

+GMR Request Mobile Phone revision identification

Description: Returns the revision identification of the Mobile Phone.

Execute command: **+GMR**

Example:
```
AT+GMR
9710051610
OK
```
Type numbering structure

Test command: **+GMR=?**

Example:
```
AT+GMR=?
OK
```

+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
```

5.2 Ensemble S2/E : GSM Call Control

+CMOD ***Set call mode***

Description: Sets the call mode for further dialling commands or the next answering command.

Set command:	**+CMOD=**<mode>		
Options:	<mode>	**0**	Single mode.
		1	Alternating voice/fax.
Example:	`AT+CMOD=1`		Change to voice/fax mode.
	`OK`		
Read command:	**+CMOD?**		Returns the current setting.
Example:	`AT+CMOD?`		
	`+CMOD: 1`		
	`OK`		
Test command:	**+CMOD=?**		Always returns (0-1).
Example:	`AT+CMOD=?`		
	`+CMOD: (0-1)`		
	`OK`		

+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
```

+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>		

+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.
	0K	
Test command:	**+VTS=?**	
Example:	AT+VTS=?	
	0K	

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

5.3 Ensemble C3/E : Call Control

A *Answer*

Description: Answer and initiate connection to an incoming call.

Execute command: **A**

Example: ATA

0K

H *Hook control*

Description: Terminates a connection.

Execute command: **H**

Example: ATH

0K

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.

+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> **0** Switch off the mobile phone.

1 Switch on the mobile phone.

Default = 0.

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.

L ***Monitor speaker loudness control***

Description: Set the volume of the speaker.

Set command:	**L[=]**[<vol>]		
Options:	<vol>	0-4	0 is off, 4 is loudest. **Default = 2**.
Examples:	ATL=4 OK		
Read command:	**L?**		
Example:	ATL? L: 0 OK		
Test command:	**L=?**		Always returns (0-4).
Example:	ATL=? L: (0-4) 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).

5.4 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> **13**	The default ASCII value of the Command Line termination character. Default = **13**.
Example:	ATS3=13 OK	
Read command:	**S3?**	Returns the current setting.
Example:	ATS3? 013 OK	
Test command:	**S3=?**	Always returns (13).
Example:	ATS3=? S3: (13) OK	

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. Default = **10**.
Example:	`ATS4=10` `OK`	
Read command:	**S4?**	Returns the current setting.

Example:	`ATS4?`
	`010`
	`OK`	

Test command:	**S4=?**	Always returns (10).

Example:	`ATS4=?`
	`S4: (10)`
	`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. Default = **8**.
Example:	ATS5=8 OK	
Read command:	**S5?**	Returns the current setting.
Example:	ATS5? 008 OK	
Test command:	**S5=?**	Always returns (8).
Example:	ATS5=? S5: (8) OK	

V *Result code format*

Description: Select either verbose or numeric response codes.

Set command: **V=**[<value>] or **V**[<value>]

Options: <value> **0** Display numeric result codes.

1 Display verbose result codes.

Default = **1**.

Example:
```
ATV=1
OK
```

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

Example:
```
ATV?
V: 1
OK
```

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

Example:
```
ATV=?
V: (0-1)
OK
```

5.5 Ensemble S6/E : GSM Network Services

+CAOC Advice of charge

Description: Returns the current call meter value in hexadecimal format. Must be supported on SIM-card.

Execute command:	**+CAOC**[**=** < mode >]		
Options:	<mode>	**0**	Query CCM Value.
		1	Deactivated the unsolicited reporting of CCM value.
		2	Activated the unsolicited reporting of CCM value.
			Default = **previous value**.
Returns:	<ccm>		Three byte Hex value of current call meter value.
Example:	`+CAOC=[<mode>]`		
	`+CAOC:<ccm>`		
	OK		
Read Command:	**+CAOC?**		
	`+CAOC:<mode>`		
	OK		
Test command:	**+CAOC=?**		
Example:	`AT+CAOC=?`		
	OK		
Unsolicited Result code:	**+CCCM:** < ccm >		

+CNUM Subscriber number

Description: Command returns MSISDN information relating to the subscriber.

Execute command: **+CNUM**

Returns: +CNUM: [<alphax>],<numberx>,<typex>

[,speed>,<service>[,<itc>]]

<alphax>		Optional alphanumeric string associated with <numberx>.
<numberx>		String type phone number of format specified by <typex>.
<typex>		Type of octet address in integer format.
<speed>	**8**	No speed specification needed.
<service>	**0**	Asychronous modem.
	4	Voice.
	5	Fax.
<itc>	**0**	3.1 kHz.
	1	UDI.

Example:

```
AT+CNUM
+CNUM: "VOICE","0706410741",128,8,4
OK
```

Test command: **+CNUM=?**

Example:

```
AT+CNUM=?
OK
```

+CREG Set network registration

Description: Allows network registration of an unsolicited result code.

Set command:	**+CREG=**[< n >]		
Options:	<n>	**0**	Disable network registration of unsolicited result code.
		1	Enable network registration of unsolicited result code. That is, it sends an unsolicited result code for every change in the status.
Example:	AT+CREG=1		Activate.
	0K		
Read Command:	**+CREG?**		Returns the current setting.
Returns:	+CREG:<n>,<stat>		
	<n>	**0**	Disable network registration code.
		1	Enable network registration code.
	<stat>	**0**	Not registered.
		1	Registered, home network.
		2	Not registered, currently searching for a new operator to register to.
		3	Registration denied.
		4	Unknown.
		5	Registered, roaming

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>]	

+COPS ***Set operator selection***

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

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

Options:			
	<mode>	**0**	Automatic (<oper> field is ignored).
		1	Manual (<oper> field is present).
		4	Manual/automatic (<oper> field is present).
	<format>	**0**	Long alphanumeric format 16 characters.
		1	Short alphanumeric format. 8 characters.
		2	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
```

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.

+CLIP ***Calling line identification presentation***

Description: Calling line identification presentation allows the subscriber to get the calling line identity of the calling party when receiving a mobile terminated call.

Set command:	**+CLIP=** [< n >]		
Options:	<n>	**0**	Disable.
		1	Enable.
			Default = **0**.
Example:	`AT+CLIP=1`		
	OK		
Read command:	**+CLIP?**		Returns the current setting.
Returns:	+CLIP: <n>, <m>		
	<m>	**0**	CLIP not provisioned.
		1	CLIP provisioned.
		2	Unknown, e.g. no network.
Example:	`AT+CLIP?`		
	`+CLIP: 1,1`		
	OK		
Test command:	**+CLIP=?**		Returns (0-1).
Example:	`AT+CLIP=?`		
	`+CLIP: (0-1)`		
	OK		
Unsolicited Result code:	**+CLIP:** <number>,<type>		

+CLIR Calling line identification restriction

Description: Calling line identification restriction allows the calling subscriber to enable or disable the presentation of the calling line identity to the called party.

Set command:	**+CLIR=**[<n>]		
Options:	<n>	**0**	Presentation according to the subscription of the CLIR service.
		1	CLIR invocation.
		2	CLIR suppression.
			Default = **0**.
Example:	`AT+CLIR=1`		
	OK		
Read command:	**+CLIR?**		Returns the current setting.
Returns:	+CLIR: <n>,<m>		
	<m>		CLIR service status in the network.
		0	CLIR not provisioned.
		1	CLIR provisioned in permanent mode.
		2	Unknown, e.g. no network.
		3	CLIR temporary mode, presentation restricted.
		4	CLIR temporary mode, presentation allowed.

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	

+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>[,<subaddr>[,<satype>[,<time>]]]]]]

Options:

<reason>	**0**	Unconditional.
	1	Mobile busy.
	2	No reply.
	3	Not reachable.
	4	All call forwarding.
	5	All conditional call forwarding.
<mode>	**0**	Disable.
	1	Enable.
	2	Query status.
	3	Registration.
	4	Erasure.
<number>		String type phone number of forwarding address in format specified by <type>.
<type>		Type of octet address in integer format. Default 145 when international code included, otherwise 128. **Not supported**.

<classx>	**1**	Voice L1.
	2	Data.
	4	Fax.
	128	Voice L2.
<subaddr>		String type subaddress of format specified by <satype>. **Not supported**.
<satype>		Type of octet subaddressing integer format. **Not supported**.
<time>		If no reply is enabled or queried it provides the time in seconds to wait before a call is forwarded. Default value is 20. **Not supported**.

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: **+CCFC=?** Always returns (0-5).

Example:
```
AT+CCFC=?
+CCFC: (0-5)
OK
```

+CCWA Call waiting

Description: Allows control of the call waiting supplementary service.

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

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

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>	

+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>		
	0	Releases all held calls or sets User Determined User Busy (UDUB) for a waiting call.
	1	Releases all active calls (if any exist) and accepts the other (held or waiting) call.
	1X	Release a specific active call X.
	2	Places all active calls (if any exist) on hold and accepts the other (held or waiting) call.
	2X	Places all active calls on hold except call X with which communication is supported.
	3	Adds a held call to the conversation.
	4	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.

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.

+CSSN Supplementary service notifications

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

Set command:	**+CSSN=**[<n>[,<m>]]		
Options:	<n>	**0**	Disable +CSSI result code presentation.
		1	Enable +CSSI result code presentation.
	<m>	**0**	Disable +CSSU result code presentation.
		1	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>]		

Intermediate Result codes: **+CSSI:**<code1>[,<index>]

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

Unsolicited Result code: **+CSSI:**<code2>

Unsolicited Result Codes

+CCCM CCM Indication

Description: Indicates that the CCM value has changed.

Unsolicited Result code:	**+CCCM:**<ccm>		Produced when an accessory is connected to the MS (i.e. DTMS is asserted).
Defined values:	<ccm>	**string**	Three bytes of the current call value in hex format. Value in home units, bytes coded as ACMmax value in the SIM.

+CREG Network Registration

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

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

+CLIP Calling Line Identification Presentation

Please refer to AT command +CLIP.

+CCWA Call Waiting

Description: Allows control of the Call Waiting supplementary service.

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

Defined values:

<number>	**string**	Phone number of format specified by <type>.
<type>	**integer**	Address octet in integer format (see GSM 04.08 [4] subclause 10.5.4.7)
<class>	**integer**	Sum of integers each representing a class of information.
	1	voice L1.
	128	Voice L2.

+CSSU Supplementary service notification

Description: Refers to supplementary service related network initiated notifications.

Unsolicited Result code: **+CSSU:** <code2>

Defined values:	<code2>	**0**	This is a forwarded call (MT call setup).
		2	Call has been put on hold (during a voice call).
		3	Call has been retrieved (during a voice call).
		5	Call on hold has been released (this is not a SS notification) during a voice call.

+CSSI ***Supplementary service notification***

Description: Refers to supplementary service related network initiated notifications.

Unsolicited Result code: **+CSSI:** <code2>

Defined values:

<code2>	**0**	This is a forwarded call.
	1	CUG call. Not supported.
	2	Call has been put on hold.
	3	Call has been retrieved.
	4	CUG call. Not supported.
	5	The call on hold has been released. (Not a SS Notification).
	6	Forward check SS message. Not supported.

5.6 Ensemble S8/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.
		“OX”	Bar Outgoing international calls eXcept to home country.
		“AI”	Bar All Incoming calls.
		“IR”	Bar Incoming calls when Roaming outside the home country.
		“AB”	All Barring services.
		“AG”	All outgoing barring services.
		“AC”	All incoming barring services.

	<mode>	**0**	Unlock.
		1	Lock.
		2	Query status.
	<passwd>		String type password defined in +CPWD command.
	<class>	**1**	Voice L1.
		2	Data.
		4	Fax.
		8..127	Reserved.
		129	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”, “OI”,“OX”,“AI”,“IR”,“AB”, “AG”,“AC”).

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

Example: `AT+CLCK=?`

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

`OK`

+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.
		"OX"	bar Outgoing international calls eXcept to home country.
		"AI"	bar All Incoming calls.
		"IR"	bar Incoming calls when Roaming outside the 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>.

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+CWPD=?`

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

`OK`

5.7 Ensemble S9/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(*).
	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.
<time>	0..255	0..25.5 seconds.
<pause>	0..255	0..25.5 seconds.

Example:

```
AT+CKPD="C",20
OK
```

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

+CIND Indicator control

Description: Sets or reads the value of ME indicators.

Set command: **+CIND=**[<ind>[,<ind>[,...]]]

<ind> Integer value in the range of <desc>.

<desc> **"battchg"** Battery charge level (0-4). 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.

Example:
```
AT+CIND=,,1
```
Set battery warning indicator.

```
OK
```

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

Example:
```
AT+CIND?
+CIND: 4,2,1,0
OK
```

Test Command: **+CIND=?**

Example:
```
AT+CIND=?
+CIND: ("battchg",4),("signal",2)
       ,("batterywarning",1)
       ,("chargerconnected",0)
OK
```

+CPAS ***Mobile phone activity status***

Description: Returns the activity status of the mobile phone.

Execute command: **+CPAS**

Returns: +CPAS: <pas>

<pas>	**0**	Ready.
	3	Ringing.
	4	Call in progress.
	129	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.
<mode>	**1**	Allows the CPAS to return Ericsson specific <pas> values, such as 129.

Example:

```
AT+CPAS
+CPAS: 0
OK
```

Test command: **+CPAS=?**

Example:

```
AT+CPAS=?
+CPAS:
(0,3,4,129)
OK
```

+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 requires SIM PIN to be entered.
	SIM PUK	ME requires SIM PUK to be entered.
	PH-SIM PIN	ME requires PHone to SIM password to be entered.
	SIM PIN 2	ME requires SIM PIN 2 to be entered.
	SIM PUK 2	ME requires SIM PUK 2 to be entered.
	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
```

+CBC ***Mobile phone battery charge***

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

Execute command:	**+CBC**		
Returns:	+CBC: <bcs>,<bcl>		
	<bcs>	**0**	mobile phone is powered by the battery.
		1	mobile phone has the battery connected but is not powered by it.
	<bcl>	**0**	battery discharged.
		1-100	percentage of charge remaining.
Example:	`AT+CBC`		
	`+CBC: 0,50`		
	`OK`		
Test command:	**+CBC=?**		Returns (0-1),(0-100).
Example:	`AT+CBC=?`		
	`+CBC: (0-1),(0-100)`		
	`OK`		ME powered by battery with 50% capacity remaining.

+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: <rssi>,<ber>

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

+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>]]]]]

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

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

5.8 Ensemble S11/E : GSM SMS and CBS PDU Mode

+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	

+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
OK
```
Accept <mids> messages.

Read command: **+CSCB?**

Example:
```
AT+CSCB?
+CSCB: 0
OK
```

Test command: **+CSCB=?**

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

+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>	**0**	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new indications.
		3	Forward unsolicited result code directly to the TE.
	<mt>	**0**	No SMS-DELIVER indications are forwarded to the TE.
	<bm>	**0**	Store message to “BM”.
		2	NEW CBMs forwarded directly to the TE.
	<ds>	**0**	No SMS-STATUS-REPORTs are forwarded to the TE.
	<bfr>	**1**	TA buffer of unsolicited result codes defined within this command are cleared when <mode> 1...3 is entered.
Example:	`AT+CNMI=3,1,2,0`		Send SM indications to TE.
	`OK`		

Read command:	**+CNMI?**
Example 1:	`AT+CNMI?`
	`+CNMI: 3,1,2,0`
	`OK`
Test command:	**+CNMI=?**
Example:	`AT+CNMI=?`
	`+CNMI: (3),(0,1,3),(0,2),(0)`
	`OK`
Unsolicited Result codes:	**+CBM:** <length><CR><LF><pdu>

Unsolicited Result Codes

+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.

5.9 Ensemble S14/E : GSM Digital Binary Ping Pong Mode

BINARY** **Start binary mode

Description: Sets the AT phone in digital binary mode.

Set command: ***BINARY**

Example:

```
AT*BINARY

CONNECT
```

Set phone in digital binary mode.

5.10 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> Format is: "yy/MM/dd,hh:mm:ss.

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

Read command: **+CCLK?**

Example:
```
AT+CCLK?
+CCLK: 97/09/27,22:10:00
OK
```

Test command: **+CCLK=?**

Example:
```
AT+CCLK=?
OK
```

5.11 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
```

6 AT Commands Modem Active

6.1 Ensemble S2/B : GSM Call Control

+CR ***Service reporting control***

Description: Enables or disables display of intermediate bearer capability reports during the handshake phase.

Set command:	**+CR=**[<mode>]		
Options:	<mode>	**0**	Disable reporting.
		1	Enable reporting.
			Default = 0.
Example 1:	`AT+CR=1`		Enable service reporting.
	`OK`		
Example 2:	`AT+CR=0`		Disable service reporting.
	`OK`		
Read command:	**+CR?**		Returns the current setting.
Example:	`AT+CR?`		
	`+CR: 0`		
	`OK`		
Test command:	**+CR=?**		Always returns (0,1).
Example:	`AT+CR=?`		
	`+CR: (0,1)`		
	`OK`		
Unsolicited Result code:	**+CR ASYNC**		Asynchronous transparent call connection indicated.

+CRC Cellular result codes

Description: Enables or disables extended format of incoming call identification.

Set command:	**+CRC=**[<mode>]		
Options:	<mode>	**0**	Disable extended format.
		1	Enable extended format.
			Default = 0.
Example 1:	`AT+CR=1`		Enable CRC.
	`OK`		
Example 2:	`AT+CRC=0`		Disable CRC.
	`OK`		
Read command:	**+CRC?**		Returns the current setting.
Example:	`AT+CR?`		
	`+CR: 0`		
	`OK`		
Test command:	**+CRC=?**		Always returns (0,1).
Example:	`AT+CR=?`		
	`+CR: (0,1)`		
	`OK`		
Unsolicited Result code:	**+CRING:** <type>		

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:	***CRING:**<type>		When enabled,indicates the incoming call to the TE instead of the normal RING.
Defined values:	<type>	**ASYNC**	Asynchronous transparent.
		SYNC	Synchronous transparent.
		REL ASYNC	Asynchronous non-transparent.
		REL SYNC	Synchronous non-transparent.
		FAX/	Facsimile.
		VOICE	Normal voice (TS 11).

6.2 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
```

&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		

&Y Select power on profile

Description: Selects the User Profile to load settings from, after power-up or software reset.

Set command:	**&Y=**[<pr>] or **&Y**[<pr>]		
Options:	<pr>	**0**	Load settings from User Profile 0.
		1	Load settings from User Profile 1.
Example:	`AT&Y=0`		
	`OK`		
Read command:	**&Y?**		
Example:	`AT&Y?`		
	`&Y: 0`		
	`OK`		
Test command:	**&Y=?**		Always returns (0,1).
Example:	`AT&Y=?`		
	`&Y: (0,1)`		
	`OK`		

I Identification information

Description: Returns information text and final result code. Provides compatibility with Windows 95.

Execute command: **I**[<value>]

Options:

<value>	**0**	As +GMM.
	1	As +GMR.
	5	Userprofile 1 and 2.
		Default = **0**.

Example:

```
ATI0
Ericsson 888 Infrared Modem
OK
```

+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**

Example:
```
AT+CGMM
1050501
OK
```

Test command: **+CGMM=?**

Example:
```
AT+CGMM=?
OK
```

+CGMR Request mobile phone revision identification

Description: Returns the revision identification of the mobile phone.

Execute command: **+CGMR**

Response: <revision> String date in YYMMDDHHMM format with KRC number.

Example:
```
AT+CGMR
9710051610 KRC 114197 R1A
OK
```

Test command: **+CGMR=?**

Example:
```
AT+CGMR=?
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
Ericsson 888 Infrared Modem
OK
```

Test command: **+GMM=?**

Example:
```
AT+GMM=?
OK
```

+GMR ***Request Infrared Modem revision identification***

Description: Returns the revision identification of the Infrared Modem.

Execute command: **+GMR**

Example:
```
AT+GMR
9807021414
OK
```

Test command: **+GMR=?**

Example:
```
AT+GMR=?
OK
```

+GCAP Request Infrared Modem capabilities list

Description: Returns a list of valid Infrared Modem command prefixes.

Execute command: **+GCAP**

Returns:

+FCLASS	Fax class 1 and 2 commands.
+CGSM	GSM commands.

Example:

```
AT+GCAP
+GCAP: +FCLASS,+CGSM
OK
```

Test command: **+GCAP=?**

Example:

```
AT+GCAP=?
OK
```

6.3 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
0K
```

Option:	<n>	**0**	Disconnect data connection.

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**	Dial the phone number entered on the phone display.
Other options:	**D<n>**	Dial the phone number specified in the command as <n>.
	D=ME<i>	Dial the phone number stored in the mobile phone which is located by the index <i>.
	D=SIM<i>	Dial the phone number stored in the SIM card which is located by the index <i>.
	DL	Redial the last phone number dialled.
Modifiers:	**W**	The W modifier is ignored but is included only for compatibility purposes.
	,	The comma modifier is ignored but is included only for compatibility purposes.
	;	Informs the Infrared Modem that the number is a voice rather than a fax or data number.
	T	The T modifier is ignored but is included only for compatibility purposes.

	P	The P modifier is ignored but is included only for compatibility purposes.
Dial examples:	ATD0705862975	
	<response>	See below for possible responses.
	ATD=ME7 <response>	Dial the number stored in index 7 of the mobile phone.
	ATD=SIM5 <response>	Dial the number stored in index 5 of the SIM card.
	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.

L *Monitor speaker loudness control*

Description: Set the volume of the speaker. This command is ignored by the Infrared Modem and is only included for compatibility.

Set command: **L**[=][<vol>]

Options: <vol> **0-3** 0 is off, 3 is loudest.
Default = **2**.

Examples:
```
ATL=3
OK
```

Read command: **L?**

Example:
```
ATL?
L: 3
OK
```

Test command: **L=?** Always returns (0-3).

Example:
```
ATL=?
L: (0-3)
OK
```

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

0K

Test command: **P=?**

Example: ATP=?

0K

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

0K

Test command: **T=?**

Example: ATT=?

0K

6.4 Ensemble S3/B : GSM Data/Fax

+CRLP Radio link protocol

Description: Define the Radio Link Protocol parameters.

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

Options:

<iws>	**0 - 61**	IWF to MS window size. Default = **61**.
<mws>	**0 - 61**	MS to IWF window size. Default = **61**.
<T1>	**38 - 255**	Acknowledgement timer in units of 10ms. Default = **48**.
<N2>	**0 - 255**	Retransmission attempts. Default = **6**.

Example:

```
AT+CRLP=61,61,48,6
OK
```

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

Example:

```
AT+CRLP?
+CRLP: 61,61,48,6
OK
```

Test command: **+CRLP=?** Always returns (0,61), (0,61),(38-255),(0-255).

Example:

```
AT+CRLP=?
+CRLP: (0,61),(0,61),(38-255),(0-255)
OK
```

+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>	**0**	Auto selection of baud setting.
		4	2400bps V22bis.
		6	4800bps V32.
		7	9600bps V32.
		68	2400bps V.110 (ISDN).
		70	4800bps V.110 (ISDN).
		71	9600bps V.110 (ISDN).
			Default = **0**.
	<name>	**0**	Asynchronous connection.
	<ce>	**1**	Non transparent.
Example:	`AT+CBST=0,0,1`		
	`OK`		
Read command:	**+CBST?**		Returns the current setting.
Example:	`AT+CBST?`		
	`+CBST: 0,0,1`		
	`OK`		

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	

6.5 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		

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:	ATS3=13		
	OK		
Read command:	**S3?**		Returns the current setting.
Example:	ATS3?		
	013		
	OK		
Test command:	**S3=?**		Always returns (0-127).
Example:	ATS3=?		
	S3: (0-127)		
	OK		

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:	ATS5=8		
	OK		
Read command:	**S5?**		Returns the current setting.
Example:	ATS5?		
	008		
	OK		
Test command:	**S5=?**		Always returns (0-127).
Example:	ATS5=?		
	S5: (0-127)		
	OK		

E *Command echo*

Description: Enables or disables the command line echo.

Set command:	**E=**[<value>] or **E**[<value>]		
Options:	<value>	**0**	No echo of command mode characters.
		1	Echo command mode characters.
			Default = 1.
Example:	ATE=1		
	OK		
Read command:	**E?**		Returns the current setting.
Example:	ATE?		
	E: 1		
	OK		
Test command:	**E=?**		Always returns (0,1).
Example:	ATE=?		
	E: (0,1)		
	OK		

Q *Result code suppression*

Description: Enables or disables the display of result codes. When the result code is disabled, the Infrared Modem does not issue any final result codes but continues to provide normal text in response to commands.

Set command: **Q=**[<value>] or **Q**[<value>]

Options:

<value>		
	0	Enable result codes.
	1	Disable result codes.
		Default = **0**.

Example:

```
ATQ=1
OK
```

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

Example:

```
ATQ?
Q: 1
OK
```

Test command: **Q=?** Always returns (0,1).

Example:

```
ATQ=?
Q: (0,1)
OK
```

V *Result code format*

Description: Select either verbose or numeric response codes.

Set command: **V=**[<value>] or **V**[<value>]

Options: <value> **0** Display numeric result codes.

1 Display verbose result codes.

Default = **1**.

Example:
```
ATV=1
OK
```

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

Example:
```
ATV?
V: 1
OK
```

Test command: **V=?** Always returns (0,1).

Example:
```
ATV=?
V: (0,1)
OK
```

&C Circuit 109 (DCD) control

Description: Determines the behaviour of the carrier detect.

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

Options: <value> **0** DCD always on.

1 DCD follows the connection.

Default = **1**.

Example:
```
AT&C1
0K
```

&D Circuit 108 (DTR) response

Description: Controls all actions initiated by data terminal ready from DTE.

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

Options: <value> for DTR On to Off transitions:

0 Ignore. Default value.

1 When in on-line data mode then switch to on-line command mode. All other states, as for n = 2.

2 Disconnect and switch to off-line command mode.

Example:
```
AT&D2
0K
```

+IFC DTE-DCE local flow control

Description: Defines the flow control between the Infrared Modem and the computer when in on-line data mode. No flow control is enabled in any of the command modes.

Set command: **+IFC=**[<by_te>,[<by_ta>]]

Options:	<by_te>	**0**	No flow control on DTE.
		1	Xon/Xoff flow control on DCE. Control characters are removed by the DCE interface.
		2	RTS flow control on DCE.
		3	Xon/Xoff flow control on DCE. Control characters are passed to the remote DCE/DTE.
			Default = **2**.
	<by_ta>	**0**	No flow control on DCE.
		1	Xon/Xoff flow control on DTE.
		2	CTS flow control on DCE.
			Default = **2**.

Example:
```
AT+IFC=2,2
OK
```

Read command: **AT+IFC?** Returns the current setting.

Example:
```
AT+IFC?
+IFC: 2,2
OK
```

Test command:	**AT+IFC=?**	Always returns (0-3),(0-2).
Example:	`AT+IFC=?`	
	`+IFC: (0-3),(0-2)`	
	`OK`	

&W Store user profile

Description: Stores the current user profile to non volatile storage.

Execute command:	**&W=**[<pr>] or **&W**[<pr>]		
Options:	<pr>	**0**	Stores current settings in User Profile 0.
		1	Stores current settings in User Profile 1.
Example:	`AT&W`		
	`OK`		
Test command:	**&W=?**		Always returns (0,1).
Example:	`AT&W=?`		
	`&W: (0,1)`		
	`OK`		

S0 Automatic answer control

Description: Defines the automatic answering feature of the Infrared Modem. A non-zero value specifies the number of rings before the call is answered.

Note that the call is always answered in the current Fax Class, regardless of whether the incoming call is voice, data or fax.

Set command:	**S0=**[<rcnt>]		
Options:	<rcnt>	**0**	Disable automatic answer.
		1 - 7	Answer after the specified number of rings.
			Default = **0**.
Example:	`ATS0=0`		
	`OK`		
Read command:	**S0?**		Returns the current setting.
Example:	`ATS0?`		
	`000`		
	`OK`		
Test command:	**S0=?**		Always returns (0-7).
Example:	`ATS0=?`		
	`S0: (0-7)`		
	`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:	ATS6=2	
	OK	
Read command:	**S6?**	Returns the current setting.
Example:	ATS6?	
	002	
	OK	
Test command:	**S6=?**	Always returns (2-255).
Example:	ATS6=?	
	S6: (2-255)	
	OK	

S7 Connection completion timeout

Description: Defines the maximum time allowed between completion of dialling and the connection being established. If this time is exceeded then the connection is aborted.

Set command:	**S7=**[<tmo>]	
Options:	<tmo> **1 - 255**	Timeout value in seconds.
		Default = **50**.
Example:	ATS7=50	
	OK	
Read command:	**S7?**	Returns the current setting.
Example:	ATS7?	
	050	
	OK	
Test command:	**S7=?**	Always returns (1-255).
Example:	ATS7=?	
	S7: (1-255)	
	OK	

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:	ATS8=2 OK		
Read command:	**S8?**		Returns the current setting.
Example:	ATS8? 002 OK		
Test command:	**S8=?**		Always returns (1-255).
Example:	ATS8=? 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:	`ATS10=2`	
	`OK`	
Read command:	**S10?**	
Example:	`ATS10?`	
	`002`	
	`OK`	
Test command:	**S10=?**	Always returns (1-254).
Example:	`ATS10=?`	
	`S10: (1-254)`	
	`OK`	

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`	

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>		
		0	Busy and dial tone detection off. No line speed reported on connection.
		1	Busy and dial tone detection off. Report linespeed on connection.
		2	Busy detection on and dial tone detection off. Report line speed on connection.
		3	Busy detect off and dial tone detection on. Report line speed on connection.
		4	Busy 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
```

6.6 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`	

6.7 Ensemble S9/B : GSM Mobile Equipment, Control and Status

+CPAS ***Mobile phone activity status***

Description: Returns the activity status of the mobile phone.

Execute command: **+CPAS**

Returns: +CPAS: <pas>

<pas>	**0**	Ready.
	3	Ringing.
	4	Call in progress.
	129	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.

Example:

```
AT+CPAS
+CPAS: 4
OK
```

Test command: **+CPAS=?**

Example:

```
AT+CPAS=?
+CPAS:
(0,3,4,129)
OK
```

+CBC Mobile phone battery charge

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

Execute command:	**+CBC**		
Returns:	+CBC: <bcs>,<bcl>		
	<bcs>	**0**	Mobile phone is powered by the battery.
		1	Mobile phone has the battery connected but is not powered by it.
	<bcl>	**0**	Battery discharged.
		1-100	Percentage of charge remaining.
Example:	`AT+CBC`		
	`+CBC: 0,50`		
	`OK`		
Test command:	**+CBC=?**		Returns (0,1),(0-100).
Example:	`AT+CBC=?`		
	`+CBC: 0,50`		
	`OK`		ME powered by battery with 50% capacity remaining.

+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: <rssi>,<ber>		
	<rssi>	**0**	-113 dBm or less.
		1	-111 dBm.
		2-30	-109 dBm to -53 dBm.
		31	-51 dBm or greater.
	<ber>	**99**	
Example:	`AT+CSQ`		
	`+CSQ: 31,99`		
	`OK`		
Test command:	**+CSQ=?**		Returns (0-31),(99).
Example:	`AT+CSQ=?`		
	`+CSQ: (0-31),(99)`		
	`OK`		

6.8 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`		

6.9 Ensemble S11/B : 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.
		2-127	Reserved. **Not Supported**.
		128	Manufacturer specific. **Not Supported**.
Response:	+CSMS:<mt>,<mo>,<bm>		
	<mt>	**0**	No mobile terminated support.
		1	Mobile terminated support.
	<mo>	**0**	No mobile originated support.
		1	Mobile originated support.
	<bm>	**0**	No broadcast message support.
		1	Broadcast message support.

Example:

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

Read command:	**+CSMS?**	Returns the current setting.
Response:	+CSMS:<service>,<mt>,<mo>,<bm>	
	<service>	Defined service, only returned by read command.
Example:	`AT+CSMS?`	
	`+CSMS: 0,1,1,0`	
	`OK`	
Test command:	**+CSMS=?**	Always returns (0).
Example:	`AT+CSMS=?`	
	`+CSMS: (0)`	
	`OK`	

+CPMS Preferred SMS message storage

Description: Defines the message storage areas and returns the functionality of the message storage in the form.

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

Options: <mem1>,<mem2>

"ME" ME message storage.

"SM" SIM message storage.

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

Where: <used1>,<used2> Total number of messages currently in <mem1> and <mem2> respectively.

<total1>,<total2> Total number of message locations in <mem1> and <mem2> 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"
+CPMS: 3,20,3,20
OK
```

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

Example:
```
AT+CPMS?
+CPMS: "ME",5,10,"SM",3,20
OK
```

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

Example:
```
AT+CPMS=?
+CPMS: ("ME","SM"),("ME","SM")
OK
```

+CMGF SMS Message format

Description: Configure the format to be used to send, list, read and write messages.

Set command:	**+CMGF=**[<mode>]	
Options:	<mode> **0**	PDU mode.
Example:	`AT+CMGF=0`	
	`OK`	
Read command:	**+CMGF?**	Returns the current setting.
Example:	`AT+CMGF?`	
	`+CMGF: 0`	
	`OK`	
Test command:	**+CMGF=?**	Always returns (0).
Example:	`AT+CMGF=?`	
	`+CMGF: (0)`	
	`OK`	

+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>		Telephone number.
<tosca>	**128 - 255**	Type of 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.

Example:

```
AT+CSCA="+358501234589"
OK
```

Change SCA.

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

Example:

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

Test command: **+CSCA=?**

Example:

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

+CNMI New SMS message indicator

Description: Configures the message communication between the Infrared Modem and the computer.

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

Options:			
	<mode>	**0**	Buffer result codes in Infrared Modem.
		1	Discard indication when Infrared Modem-computer link is reserved. Otherwise, forward to the computer.
		2	Buffer result codes when Infrared Modem-computer link is reserved and flush to computer after reservation. Otherwise, forward to the computer.
			Default = **0**.
	<mt>	**0**	No SMS-DELIVER indications are forwarded to the computer.
		1	If SMS-DELIVER is stored in ME/TA, indication of the memory location is forwarded to the computer using unsolicited result codes.
			Default = **0**.
	<bm>	**0**	No Cell Broadcast Message indications are forwarded to the computer.
	<ds>	**0**	No SMS-STATUS-REPORTS are forwarded to the computer.

	<bfr>	**0**	When in mode 1 or 2 the result codes are flushed to the computer.
		1	When in mode 1 or 2 the result codes are cleared.
			Default = **0**.

Example:

```
AT+CNMI=2,0,0,0,1
OK
```

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

Example:

```
AT+CNMI?
+CNMI: 2,0,0,0,1
OK
```

Test command: **+CNMI=?** Always returns (0-2),(0),(0,2),(0),(1).

Example:

```
AT+CNMI=?
+CNMI: (0-2),(0,1),(0),(0),(0,1)
OK
```

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

Refer to +CMTI for a description.

+CMGL List SMS messages

Description: Returns those messages from memory storage 1 which conform to the specified status (stat).

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

Options:	<stat>	**0**	Received unread messages.
		1	Received read messages.
		2	Stored unsent messages.
		3	Stored sent messages.
			Default = **0**.
Returns:	<index>		Integer location number.
	<length>		Length of TP data unit.
	<pdu>		Address of Sc followed by TPDU in hexadecimal.
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:	**+CMGL=?**	
Example:	`AT+CMGL=?`	
	`+CMGL: (0-3)`	
	`OK`	

+CMGR Read SMS messages

Description: Returns the message held in the specified memory location together with the status of the message and entire message data unit <pdu>.

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

Options:	<index>		Memory location.
Returns:	<status>	**0**	Received unread.
		1	Received read.
		2	Stored unsent.
		3	Stored sent.
	<length>		Length of TP data unit.
	<pdu>		The message in pdu format.

Example:

```
AT+CMGR=2
+CMGR: 0,68 <64 byte pdu>
OK
```

Test command: **+CMGR=?**

Example:

```
AT+CMGR=?
OK
```

+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><message><CTRL-Z/ESC>

Options: <length> Length of TP data unit in octets.

Returns: <mr> Message reference.

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

Test command: **+CMGS=?**

Example:
```
AT+CMGS=?
OK
```

+CMSS Send SMS message from storage

Description: Sends a message from the memory storage 2 to the phone network. On successful delivery, a message reference number is returned.

Set command:	**+CMSS=**<index>	
Options:	<index>	Memory location.
Returns:	<mr>	Message reference.
Example:	`AT+CMSS=1`	
	`+CMSS:·12`	
	`OK`	
Test command:	**+CMSS=?**	
Example:	`AT+CMSS=?`	
	`OK`	

+CMGW Write SMS messages to storage

Description: Store a message in the memory store 2. On storing the message the location index number is returned.

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

Options:	<length>		The number of octets coded in the TP layer data unit.
	<stat>	**2**	Stored unsent message.
			Default = **2**.
	<pdu>		The message in PDU format. Terminated by the <CTRL-Z> character.
Returns:	<index>		The memory location of the stored message.

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
```

+CMGD Delete SMS message

Description: Delete the message stored at the memory location index.

Set command:	**+CMGD=**<index>	
Options:	<index>	Integer memory location.
Example:	AT+CMGD=2	
	OK	Delete read message at index 2 in <mem1>.
Test command:	**+CMGD=?**	
Example:	AT+CMGD=?	
	OK	

Unsolicited Result Codes

+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.

6.10 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>	**0**	Data modem.
		1	Service Class 1 fax modem.
		2	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?
Ericsson 888 Infrared Modem
OK
```

+FMR Request version

Description: Request model revision.

Read command: **+FMR?**

Example:
```
AT+FMR?
9712080907
OK
```

+FTS Stop transmission and wait

Description: Stops the transmission for the specified period.

Set command: **+FTS=**<Time>

Options: <Time> **0 - 255** The silence period in units of 10 ms.

Example:
```
AT+FTS=8
OK
```

Test command: **+FTS=?** Always returns (0-255).

Example:
```
AT+FTS=?
(0-255)
OK
```

+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		

+FTM ***Facsimile transmit***

Description: Start transmiting fax data at given speed.

Set command:	**+FTM=**<Mod>		
Options:	<Mod>	**24**	V.27ter 2,400 bps.
		48	V.27ter 4,800 bps.
		72	V.29 7,200 bps.
		96	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`		

+FRM Facsimile receive

Description: Selects facsimile receive mode.

Set command:	**+FRM=**<Mod>		
Options:	<Mod>	**24**	V.27ter 2,400 bps.
		48	V.27ter 4,800 bps.
		72	V.29 7,200 bps.
		96	V.29 9,600 bps.
Example:	`AT+FRM=96`		
	`CONNECT`		
Test command:	**+FRM=?**		Always returns (24,48,72,96).
Example:	`AT+FRM=?`		
	`(24,48,72,96)`		
	`OK`		

+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	

6.11 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>	**0**	Data modem.
		1	Service Class 1 fax modem.
		2	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		

+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	

+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>

<value>	**0**	Normal and proper end of connection **Mandatory value**.
	1	Ring Detect without successful handshake.
	2	Call aborted, from +FK or <CAN>.
	3	No Loop Current.
	10	Unspecified Phase A error **Mandatory value**.
	11	No Answer (T.30 T1 timeout) [2].
	20	Unspecified Transmit Phase B error **Mandatory value**.
	21	Remote cannot receive or send.
	22	COMREC error in transmit Phase B.
	23	COMREC invalid command received.
	24	RSPEC error.
	25	DCS sent three times without response.

26	DIS/DTC received 3 times; DCS not recognized.
27	Failure to train at 2400 bps or FMINSP value.
28	RSPREC invalid response received.
40	Unspecified Transmit Phase C error **Mandatory value**.
43	TE to TAE data underflow.
50	Unspecified Transmit Phase D error **Mandatory value**.
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 **Mandatory value**.
71	RSPREC error.
72	COMREC error.

73	T.30 T2 [2] timeout, expected page not received.
74	T.30 T1 [2] timeout after EOM received.
90	Unspecified Receive Phase C error.
91	Missing EOL after 5 seconds (section 3.2 T.4 [3]).
92	-unused code-.
93	TAE to TE buffer overflow.
94	Bad CRC or frame (ECM or BFT modes).
100	Unspecified Receive Phase D errors.
101	RSPREC invalid response received.
102	COMREC invalid response received.
103	Unable to continue after PIN or PIP.
120-255	-reserved codes-.

Example:
```
AT+FAXERR?
1
OK
```

Test command: **+FAXERR=?** Always returns (0-255).

Example:
```
AT+FAXERR=?
(0-255)
OK
```

+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`	

+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`		

+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
```

+FBUF Buffer size report

Description: Request buffering parameters.

Read command: **+FBUF?**

Returns: <bs>,<xoft>,<xont>,<bc>

Options:

<bs>	= buffer size.
<xoft>	= XOFF threshold.
<xont>	= XON threshold.
<bc>	= current number of characters in buffer.

Example:

```
AT+FBUF?
256,0,0,0
OK
```

+FBUG Session Message Report

Description: Request buffering parameters.

Execute command: **+FBUG=**[<value>]

Options: <value> **0** Disables HDLC frame reporting.

1 Enables reporting.

Default = **0**.

Example:
```
AT+FBUG=1
OK
```

Read command: **+FBUG?**

Example:
```
AT+FBUG?
1
OK
```

Test command: **+FBUG=?**

Example:
```
AT+FBUG=?
(0,1)
OK
```

+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`	

+FCR ***Capability to receive parameter***

Description: Capability to receive.

Set command:	**+FCR=**[<value>]		
Options:	<value>	**0**	Can not receive fax but can be polled.
		1	Can receive fax.
			Default = **1**.
Example:	`AT+FCR=1`		
	`OK`		
Read command:	**+FCR?**		Returns the current setting.
Example:	`AT+FCR?`		
	`1`		
	`OK`		
Test command:	**+FCR=?**		Always returns (0,1).
Example:	`AT+FCR=?`		
	`(0,1)`		
	`OK`		

+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`	

+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`	

+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`	

+FDCC TAE Capability parameters

Description: This command allows the TE to sense and constrain the capabilities of the facsimile TAE.

Set command: **+FDCC=**<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Options:

<vr> = vertical resolution.

- **0** Normal, 98 lpi.
- **1** Fine, 196 lpi.

Default = **1**.

 = 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**.

<ln>		= page length.
	0	A4, 297 mm.
	1	B4, 364, optional.
	2	Unlimited length,optional.
		Default = **2**.
<df>		= data compression format.
	0	1-D modified Huffman.
	1	2-D modified Read, optional.
	2	2-D uncompressed mode, optional.
	3	2-D modified Read, optional.
		Default = **0**.
<ec>		= error correction.
	0	Disable ECM
<bf>		= binary file transfer.
	0	Disable ECM

<st> = scan time per line.

0	0 ms
1	5 ms
2	10 ms
3	10 ms
4	20 ms
5	20 ms
6	40 ms
7	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

+FDCS Session results

Description: Current session results.

Read command: **+FDCS?**

Returns: <vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Options:

<vr>	= vertical resolution.
** **	= 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
```

+FDIS ***Current session negotiation parameters***

Description: Current session negotiation parameters.

Set command: **+FDIS=**<vr>,
,<wd>,<ln>,<df>,<ec>,<bf>,<st>

Options:			
	<vr>	**0**	Normal, 98 dpi.
		1	Fine, 196 dpi.
			Default = **1**.
	 	0	2400 bps.
		1	4800 bps.
		2	7200 bps.
		3	9600 bps.
			Default = **3**.
	<wd>		Page width.
		0	1728 pixels in 215 mm.
		1	2048 pixels in 255 mm.
		2	2432 pixels in 303 mm.
		3	1216 pixels in 151 mm.
		4	364 pixels in 107 mm.
			Default = **0**.
	<ln>		Page length.
		0	A4, 297 mm.
		1	B4, 364 mm.
		2	unlimited.
			Default = **2**.

<df>		Data compression format.
	0	1-D modified huffman.
	1	2-D modified read.
	2	2-D uncompressed mode.
	3	2-D modified modified read.
		Default = **0**.
<ec>		Error correction.
	0	Disable ECM.
<bf>		Binary file transfer.
	0	Disable BFT.
<st>		Scan time per line.
	0-7	0-40 ms depending on <vr> setting.
		Default = **0**.

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
```

+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: <dcs codes>]
CONNECT
<DC2>                    Page data stream.
<DLE><ETX>
+FPTS:1, <1c>
+FET:0 <-
OK
```

```
AT+FDR
CONNECT
<DC2>                Page data stream.
<DLE><ETX>
+FPTS: 1, (1c)
+FET:2 <-
OK
AT+FDR
+FHNG:0
```

+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
```

<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	

+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`	

+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.
		3	PPS-NULL - another partial page next.
		4	[PPS-]PRI-MPS - another page, procedure interrupt.
		5	[PPS-]PRI-EOM - another doc. , procedure interrupt.
		6	[PPS-]PRI-EOP - all done, procedure interrupt.
		7	CTC - continue to correct.
		8-15	EOR-<PPM> - End-of-Retransmission (8) +Post Page Message (ppm code).
	<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=?

(1)

OK

+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
```

+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=1	
	OK	
Read command:	**+FLNFC?**	Returns current settings.
Example:	AT+FLNFC?	
	0	
	OK	
Test command:	**+FLNFC=?**	Always returns (0).
Example:	AT+FLNFC=?	
	(0)	
	OK	

+FLPL ***Document for polling parameter***

Description: Used by the DTE to indicate to the DCE facsimile machine that it has a document ready for polling. This information is forwarded to the remote FAX.

Set command:	**+FLPL=**[<value>]		
Options:	<value>	**0**	No document to poll.
		1	Document available for polling.
			Default = **0**.
Example:	`AT+FLPL=1`		
	`OK`		
Read command:	**+FLPL?**		Returns the current setting.
Example:	`AT+FLPL?`		
	`1`		
	`OK`		
Test command:	**+FLPL=?**		Always returns (0,1).
Example:	`AT+FLPL=?`		
	`(0,1)`		
	`OK`		

+FMDL Request product identification

Description: Returns the product identification of a Class 2 fax machine.

Read command: **+FMDL?**

Example:
```
AT+FMDL?
Ericsson 888 Infrared Modem
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
```

+FMINSP Minimum facsimile page transfer speed parameter

Description: Set the minimum negotiable speed parameter.

Set command:	**+FMINSP=**[ ]		
Options:	 	**0**	2400 bps V.27 ter.
		1	4800 bps V.27 ter.
		2	7200 bps V.29 or V.17.
		3	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`		

+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`		

+FPTS Page transfer status parameter

Description: Set post page transfer response.

Set command:	**+FPTS=**<ppr>		
Options:	<ppr>	**1**	Page good.
		2	Page bad; retrain requested.
		3	Page good; retrain requested.
Example:	AT+FPTS=1		
	OK		
Read command:	**+FPTS?**		Returns current settings.
Example:	AT+FPTS?		
	1		
	OK		
Test command:	**+FPTS=?**		Always returns (1-3).
Example:	AT+FPTS=?		
	(1-3)		
	OK		

+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?
Rev 1.0
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
```

+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`	

+FSPL ***Enable polling parameter***

Description: Used to indicate if the PC wishes or is able to poll a document.

Set command:	**+FSPL=**[<value>]		
Options:	<value>	**0**	Do not want to poll.
		1	Can receive a polled document.
			Default = 0.
Example:	`AT+FSPL=1`		
	`OK`		
Read command:	**+FSPL?**		Returns the current setting.
Example:	`AT+FSPL?`		
	`1`		
	`OK`		
Test command:	**+FSPL=?**		Always returns (0,1).
Example:	`AT+FSPL=?`		
	`(0,1)`		
	`OK`		

+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`	

+FVRFC Vertical resolution conversion parameter

Description: Disables mismatch checking.

Set command:	**+FVRFC=**[<value>]	
Options:	<value> **0**	Disable mismatch checking.
Example:	AT+FVRFC=0	
	OK	
Read command:	**+FVRFC?**	Returns the current setting.
Example:	AT+FVRFC?	
	0	
	OK	
Test command:	**+FVRFC=?**	Always returns (0).
Example:	AT+FVRFC=?	
	(0)	
	OK	

+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`	

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.

Bps

Acronym for bits per second (bits/s). A measure of speed at which bits are transmitted over the telephone lines.

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.

Off-line command mode

The operational state in which the Infrared Modem can accept typed commands.

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.

CTS

Clear To Send. An EIA232 signal sent from a modem to the computer, usually indicating that the modem is ready to receive data.

On-line data mode

The state the Infrared Modem is in when transmitting or receiving data over the telephone line.

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.

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.

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.

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.

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`.

ISDN

The term used to refer to the digital public switched telephone network.

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.

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.

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.

On hook

The Infrared Modem state similar to hanging up a telephone receiver.

PIN

Personal identification number.

PDA

Personal Digital Assistant.

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.

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.

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.

SIM

Subscriber Identity Module.

TA

Terminal Adaptor, which in most cases is a PCMCIA (Personal Computer Memory Card International Association) card.

TAE

Terminal Adaptor Equipment.

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`.

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