

# White Paper

February 2006

## Z530

---

*A classic appeal*



Sony Ericsson

# Preface

## Purpose of this document

---

This White Paper will be published in several revisions as the phone is developed. Therefore, some of the headings and tables in this document contain limited information. Additional information and facts will be forthcoming in later revisions.

The aim of this White Paper is to give the reader an understanding of the main functions and features of this phone.

People who can benefit from this document include:

- Operators
- Service providers
- Software developers
- Support engineers
- Application developers

This White Paper is published by:

Sony Ericsson Mobile Communications AB,  
SE-221 88 Lund, Sweden

Phone: +46 46 19 40 00

Fax: +46 46 19 41 00

[www.sonyericsson.com/](http://www.sonyericsson.com/)

© Sony Ericsson Mobile Communications AB,  
2005. All rights reserved. You are hereby granted  
a license to download and/or print a copy of this  
document.

Any rights not expressly granted herein are  
reserved.

Publication number: EN/LZT 108 8159 R2A

This document is published by Sony Ericsson Mobile Communications AB, without any warranty\*. Improvements and changes to this text necessitated by typographical errors, inaccuracies of current information or improvements to programs and/or equipment, may be made by Sony Ericsson Mobile Communications AB at any time and without notice. Such changes will, however, be incorporated into new editions of this document. Printed versions are to be regarded as temporary reference copies only.

\*All implied warranties, including without limitation the implied warranties of merchantability or fitness for a particular purpose, are excluded. In no event shall Sony Ericsson or its licensors be liable for incidental or consequential damages of any nature, including but not limited to lost profits or commercial loss, arising out of the use of the information in this document.

# Sony Ericsson Developer World

---

On [www.sonyericsson.com/developer](http://www.sonyericsson.com/developer), developers will find documentation and tools such as phone White Papers, Developers Guidelines for different technologies, SDKs and relevant APIs. The website also contains discussion forums monitored by the Sony Ericsson Developer Support team, an extensive Knowledge Base, Tips & Tricks, example code and news.

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

## Document history

---

---

### Change history

2006-02-23	Version R1A	First edition.
2006-02-27	Version R2A	Second edition.

# Contents

<b>Product overview .....</b>	<b>5</b>
Images .....	6
Key features .....	7
<b>Technologies in detail .....</b>	<b>9</b>
Functions and features .....	10
<b>Facts and figures .....</b>	<b>21</b>
Technical specifications .....	22
General technical data .....	22
Performance and technical characteristics .....	22
USSD technical data .....	23
GPRS technical data .....	23
SIM AT services supported .....	24
Media player .....	28
VGA camera .....	29
Pictures and animations .....	30
Image decoders .....	30
Image encoders .....	30
Short Messaging Service .....	31
Enhanced Messaging Service .....	32
Multimedia Messaging Service .....	34
Email client technical data .....	35
Bluetooth™ technical data .....	36
OMA Data Synchronization (SyncML) technical data .....	37
Browser technical data .....	38
Operator technical data .....	40
Java™ .....	44
<b>Abbreviations .....</b>	<b>46</b>
<b>Related information .....</b>	<b>50</b>
Documents .....	50
Links .....	50
Trademarks and acknowledgements .....	50

# Product overview

---

Mulan is a balanced feature clamshell phone and has everything the target user needs. The right balanced feature set provides a real benefit to the target users.

- The combination of the best in class Ultra Bright Colour (UBC) 65k colours main screen and the large & visible monochrome 1.0 inch sub display give users the impression of stepping up "one class".
- An easy to use VGA camera for snap-shot pictures and video recording and direct access to camera application with a dedicated camera button.
- Innovative and easy to press circle keys that make up the large keypad.
- As the only phone in its class on the market Mulan has an expandable memory slot up to 1 GB (Memory Stick Micro™ (M2™)).
- With MP3 and the expandable memory slot, the user can enjoy Mulan as a digital music player.
- Bluetooth, IrDA, USB 2.0 connectivity, Push email and full HTML browser energizes mobile business life.










Mulan has a nice and simple design in proven clamshell form factor. Users feel the "premium" of Mulan with its fine quality finish and soft touch Style-Up™ covers.







# Images

---



# Key features

 	<p><b>VGA camera</b></p> <p>With the VGA camera which includes 4x digital zoom and many user friendly features, taking pictures becomes easy and fun. Taking a picture or recording a video clip and sending it as part of a multimedia message or as an email attachment is just a few clicks away. The camera also features mirror functionality.</p>
	<p><b>Video recording</b></p> <p>By using the built in video recorder, a video clip can be captured and stored in the phone. A video clip can easily be sent off in a picture message for example to friends or family to share experiences with instantly.</p>
 	<p><b>Dual LCD with the Ultra Bright Colour (UBC) screen and the monochrome sub display</b></p> <p>The 1.8 inch UBC (128x160 pixels), full graphic 65k colour screen, enhances viewing of high-quality content in the phone.</p> <p>The 1.0 inch (101x80 pixels) monochrome sub display on the front is intended to use as a status screen presenting network status, battery status, caller info, time, calendar and media player info.</p>
	<p><b>Media player</b></p> <p>The Media player converts the phone into a portable MP3 player. Play music and video clips streamed or downloaded. Information such as artist and song title will show in the external display during playing. The folder system enables you, for example, to create play lists and organize your favourite songs into groups.</p>
	<p><b>Disc2Phone</b></p> <p>Create your own playlists and albums and transfer them to the phone. Music files can be transferred from a computer to the phone by using Disc2Phone software. Search and select music on your computer or audio CDs and convert your existing audio tracks to MP3 format. The Disc2Phone software is available for downloading at <a href="http://www.sonyericsson.com">www.sonyericsson.com</a></p>
	<p><b>Style-Up™ covers</b></p> <p>Change the look of the phone by switching covers to different styles and colours.</p>
	<p><b>Gaming</b></p> <p>Gaming is already a very popular feature in mobile phones, and with Advanced Java, users can add new games and skill levels to further enhance the entertainment value of Sony Ericsson phones. There are several embedded games included in the phone at purchase.</p>

	<p><b>JAVA™ applications including Face Warping</b></p> <p>Face Warping transforms any face in a picture into a funny face, and the resulting image can be sent to friends in a message. Download additional information- and entertainment- based applications, for example ringtones, wallpapers and games. This gives users a chance to personalize the functions and features in their phones, and developers the opportunity to create new applications.</p>
	<p><b>HTML web browser support</b></p> <p>Browse the Internet and look at the web sites in a different way with Access NetFront 3.3 – An HTML browser which supports a complete web standard suite.</p>
	<p><b>Push email</b></p> <p>Z530 supports push email, a method of pushing new emails automatically to mobile devices. Push email gives a high usability to mobile email, with email being delivered in the background (similar to SMS/MMS).</p>
	<p><b>Memory Stick Micro™ (M2™)</b></p> <p>Z530 supports Memory Stick Micro™ (M2™) up to 1 GB, which provides a new, versatile IC recording media, designed to meet the growing storage needs of highly compact, multifunctional mobile phones. Different kinds of content (pictures, audio, video clips etc.) can be stored on the Memory Stick Micro™ (M2™) and transferred to other Memory Stick Micro™ (M2™) compatible products, such as cameras, music players, and computers.</p>
	<p><b>Personal Information Management (PIM)</b></p> <p>Stay up to date with everyday events by synchronizing phone contacts, calendar appointments and tasks in the phone with similar programs in a computer. Synchronize via Bluetooth, IR or USB using software which can be downloaded from <a href="http://www.sonyericsson.com/support">www.sonyericsson.com/support</a>.</p>
	<p><b>Bluetooth™ wireless technology</b></p> <p>Several devices can be connected to Z530 simultaneously using Bluetooth wireless technology within a range up to 10 meters. For example, the user can answer a call using a Bluetooth headset and send images to another phone at the same time. Several mobile phones can take part in a Bluetooth game while the phone and a computer exchange data such as images, video clips, business e-cards, music files and calendar data.</p>
	<p><b>IrDA (Infrared Data Association)</b></p> <p>IrDA which is a point-to-point communication link between two infrared ports enables the user to connect the phone to a computer or other infrared device in order to share pictures, synchronize or use the phone as a modem. Key benefits of using the Z530 with its built-in infrared transceiver are true wireless communication and low power consumption.</p>
	<p><b>Activity menu</b></p> <p>Get direct access to new events, bookmarks and shortcuts. By using the activity menu the user can easily handle missed calls, new text and picture messages, task reminders, shortcuts and get quick access to favourite Internet bookmarks. It is also possible to get a direct overview of applications that are running in the background, for example the media player.</p>



# Technologies in detail

---

This chapter offers a detailed description of the technologies available in this product.

# Functions and features

The following table is a complete description of the features in this product. It also compares this product to another Sony Ericsson product.

Feature	Z530	Z520
<b>3D games</b>	X	X
<b>Access NetFront™ Web browser</b>	X	
<b>Activity menu button</b> Get direct access to new events, bookmarks and shortcuts by using the activity menu button.	X	X (Navigation key Up)
<b>Alarm clock</b> Set a time and your phone will ring at that time.	X	X
<b>Antenna</b> Built-in.	X	X
<b>Backlight display/screen</b> Blue or other coloured backlight to illuminate your phone screen.	X White colour for main screen. Orange colour for sub display.	X
<b>Battery</b>	3.6V, 900 mAh, Lithium Polymer	3.6V, 900 mAh, Lithium Polymer
<b>Battery charging time</b>	At least 90% charged within 2 hours.	At least 90% charged within 2 hours.
<b>Bluetooth™ wireless technology</b> Wireless connectivity between devices within a range of up to 10 metres.	X	X
<b>Business card exchange</b> Exchange contact information.	X	X
<b>Calculator</b>	X	X
<b>Calendar</b> Fully functional calendar with day, week and month views and reminders.	X	X
<b>Call list</b> View calls made and calls received.	X	X

Feature	Z530	Z520
<b>Camera button</b>  A dedicated camera button. Press once and the integrated camera activates.	X Navigation key Up is used as a dedicated camera button.	X
<b>Camera VGA</b>  VGA standard camera.	X	X
<b>Chinese input method</b>  Text input methods based on Simplified or Traditional Chinese, Bopomofo, Pinyin or Stroke.	X	X
<b>cHTML</b>  A mobile device adapted version of the standard Internet communications protocol HTML.	X	X
<b>Clock</b>  Onscreen clock that keeps time even when the phone is off.	X	X
<b>Co-branding area</b>	Outside: 22 x 7 mm Inside: 31.5 x 8.3 mm	Outside: 5.5 x 16 mm Inside: 7.6 x 22 mm
<b>Code memo</b>  A safe place to store all your PIN codes and other information. To access Code memo, you only need one PIN code.	X	X
<b>Colour</b>	Soft Black Chromic Grey Elegant Red	Sandy Grey Chalky White
<b>Contacts</b>  Phone book with fields for name, phone and fax numbers, email address, company and title.	X Up to 1000 contacts in the phone. Up to 2500 phone numbers in total.	X
<b>Conference calls</b>  Support for multi-party calling.	X	X
<b>Content online</b>  Downloadable pictures, games, themes, ringtones available online.	X	X

Feature	Z530	Z520
<b>Copyright protection - DRM</b>  DRM (Digital Rights Management) features the rights and copy protection of downloaded content (audio, pictures, music tones, video, entertainment features such as games, java applications etc.).	X	X
<b>CSS</b>  Cascading Style Sheets, the de facto standard style sheet language on the Web, specified by W3C.	X	X
<b>Design</b>	Clamshell phone, internal and external display, exchangeable front and battery cover.	Clamshell phone, internal and external display, exchangeable front and battery cover.
<b>Device Management (DM)</b>  DM utilizes GPRS as bearer of the provisioning data (basic network connectivity needs to be in place) and allows the operator to access the phone and check and set different settings such as Network connectivity (GPRS), email, MMS, WAP and Java™. Device Management is achieved by supporting Over The Air provisioning 7.1 (OTA), OMA Client Provisioning 1.1 (CP) and OMA Device Management (DM) 1.1.2.	X	X
<b>Digital camera menu</b>	X	X
<b>Digital zoom</b>	4x	4x
<b>Display</b>  <b>Main screen</b>  Type: Size: Resolution: Technology: Colours displayed together: Backlight colour:	Full graphical 1.8 inch 128x160 pixels UBC 65,000 (16 bit) White	Full graphical 1.8 inch 128x160 pixels TFT 65,000 (16 bit) White
<b>Sub display</b>  Type: Size: Resolution: Technology: Colours displayed together: Backlight colour:	Graphical 1.0 inch 101x80 pixels Monochrome STN Black and White Orange	

Feature	Z530	Z520
<b>DOM2</b>  Document Object Model (DOM) Level 2 HTML Specification, specified by W3C.	X	
<b>Dual LCD</b>  Two displays – one main screen and an outside display that shows network status, time, and, who is calling.	X	X
<b>Email</b>  Built-in email client with inbox, outbox, compose, send and other functions.	X	X
<b>EMS (Enhanced Messaging Service)</b>  Text messaging with pictures and sounds.	X	X
<b>Exteriour description</b>  Length: Width: Thickness:	90.1 47.1 mm 24.2 mm	93.5 mm 45.7 mm 23.9 mm
<b>Fast port</b>  A system connector which enables faster data transfer from phone to PC and PC to phone.	X	X
<b>File manager</b>  Folder structure storage to help you store and organize pictures, sounds and other phone content.	X	X
<b>Frames</b>  Before you take a picture, you can decide to have a frame surrounding picture and view your subject and the frame.	X	X
<b>Games download</b>  Replace your in-phone games with new ones.	X	X
<b>Games embedded</b>	X	X
<b>GPRS</b>  General Packet Radio Services - a communications standard enabling packet data transfer similar to Internet - 28.8 kbps - 58.6 kbps. It is recommended that you have GPRS to use MMS and content download services.	X	X

Feature	Z530	Z520
<b>High Speed Data</b>  HSCSD - a communications standard enabling GSM data transfer 14.4 - 28.8 kbps.	X	X
<b>HTML</b>  HyperText Markup Language, the the standard Internet communications protocol.	X	X
<b>Icon Desktop</b>  A graphic icon desktop with interactive icons.	X	X
<b>IMAP Idle</b>	X	
<b>Infrared port</b>  A wireless connector enabling you to connect your phone to a laptop or other infrared device in order to share pictures, synchronize or use the phone as a modem.	X	X
<b>Instant messaging</b>  Chat - several people can take part in a mobile messaging session where everyone sees what the other is writing.	X	X
<b>Internet key</b>  A dedicated internet button. Press once and the phone connects to the Internet at your pre-set home page.		X
<b>Java™</b>  Support for Java™ technology.	Java 2, Micro Edition (J2ME™), Java 3D	Java 2, Micro Edition (J2ME™), Java 3D
<b>Keypad</b>	Keypad with 12 keys, 2 selection keys, clear and back keys, 4+1 way navigation key, volume side keys, separate on/off, up navigation key as shortcut to camera in standby mode and activity menu key.	Keypad with 12 keys, 2 selection keys, clear and back keys, 4+1 way navigation key, volume side keys, separate on/off, camera key, operator key.
<b>Light effects</b>		X
<b>Long SMS (Text Messaging)</b>  Concatenated SMS text messaging of up to 1530 characters.	X	X

Feature	Z530	Z520
<b>Lunar calendar</b>  A calendar system used in China and other parts of Asia. A lunar month is determined by the period required for the moon to complete its full cycle of 29.5 days.	X	X
<b>Media player</b>  Store and play digital music and video.	X	X
<b>Memory (built-in)</b>  Phone memory that is free for the user to use as you please, for pictures, sounds, and more.	Up to 28 MB	Up to 16 MB
<b>Memory Stick Micro™ (M2™)</b>  A mini peripheral storage device capable of storing pictures, music, applications and more. Compatible with many cameras, PCs and other devices.	X	
<b>Menu shortcuts</b>  A function making it possible for you to dedicate shortcuts to your most used phone functions.	X	X
<b>MMS (Multimedia Messaging Service)</b>  Picture messaging with text and sound.	X	X
<b>MMS video</b>  Support in the phone for sending video using MMS.	X	X
<b>Modem</b>  GSM Internet dial-up support.	X	X
<b>Music tones</b>  Music tones, also called master tones, are DRM protected music by original artists. Various digital audio formats are supported.	X	X
<b>MusicDJ™</b>  A music tool with MIDI drum, guitar/bass, keyboard and brass loops in different music styles, which can be combined to create polyphonic ringtones.	X	X
<b>Navigation key</b>  A four-directional navigation control with press function.	X	X

Feature	Z530	Z520
<b>Networks</b>	GSM (R99) Tri-band, e-GSM 900, 1800, 1900	GSM (R99) Quad- band, e-GSM 850, 900, 1800, 1900
<b>OMA Data Synchronization (Sync ML)</b>  A device communications standard that enables remote synchronization between devices.	Sync ML 1.2/ Sync ML 1.1	Sync ML 1.1
<b>OTA settings</b>  WAP, email and other settings can be sent Over-The-Air to your phone.	X	X
<b>Phone book</b>  Store names and phone numbers.	X	X
<b>PhotoDJ™</b>  A drawing tool in your phone that lets you alter existing pictures.	X	X
<b>Picture effects</b>  Add picture effects as fun layers on a picture.	X	X
<b>Picture gallery</b>  A thumbnail image gallery where you can see sections of several pictures in your screen at the same time.	X	X
<b>Picture phonebook</b>  Add a picture to a stored contact. The picture appears on the screen when the stored contact calls.	X	X
<b>Picture wallpaper</b>  Background picture on the screen when the phone is in standby mode.	X	X
<b>PIM sync (Personal Information Management)</b>  Synchronize the phone Organizer with a PC.	X	X
<b>PlayNow™</b>  Download and pre-listen to music ringtones straight from the phone desktop in three clicks.	X	X
<b>Polyphonic ringtones</b>	40	40



Feature	Z530	Z520
<b>Predictive text input</b>  When you write text, predictive text input software predicts what word you are writing and finishes it for you. The prediction is based on previous words used and a customizable dictionary.	X	X
<b>Push email</b>  X OMA email notification IMAP Idle		X
<b>QuickShare™</b>	X	X
<b>Redial</b>  Identify and redial the most recent caller.	X	X
<b>RSS Feeds</b>  Use your phone to view up-to-the-minute news and other content from selected websites and blogs.	X	
<b>Screensaver</b>  When the phone has not been used for a while, a screensaver activates and the phone goes into 'sleep mode'.	X	X
<b>Selection keys</b>  Also called softkeys.	X	X
<b>Side volume keys</b>  Controls on the side of the phone that regulate the volume of incoming sound.	X	X
<b>SIM card lock</b>  The possibility to protect your SIM card with a four-digit PIN code.	X	X
<b>Sleep mode</b>  A power saving feature that minimizes battery power consumed when the phone is in standby.	X	X
<b>Sony Ericsson Remote Update Service</b>  Download the latest operator approved version of the mobile phone software over the air.	X	

Feature	Z530	Z520
<b>Sony Ericsson Update Service</b>  Connect the phone to an Internet-connected computer, download the latest operator-approved version of the mobile phone software from the web, <a href="http://www.sonyericsson.com/support">www.sonyericsson.com/support</a> and update the mobile phone.	X	X
<b>Sound recorder</b>  A mini recording device in your phone that lets you record voice messages or other sounds.	X	X
<b>Speakerphone</b>  Loudspeaker suitable for using the phone as an office handsfree.	X	X
<b>Speed dialling</b>  Allocating contacts in your phone book to specific keys on the keypad.	X	X
<b>Standby time</b>	Up to 400 hours	Up to 400 hours
<b>Status view</b>  The display shows the network being used, time and other status information.	X	X
<b>Stopwatch</b>	X	X
<b>Style-Up™ Covers</b>  Exchangeable covers to alternate the look of your phone.	X	X
<b>SVG Tiny 1.1</b>  Scalable Vector Graphics for impressive animated wallpapers, menus and other graphic elements.	X	X
<b>Synchronization PC</b>  Synchronize and share phone content with a computer.	X	X
<b>Talk time</b>	Up to 9 hours	Up to 9 hours
<b>Tasks</b>  Keeps track of important things to do.	X	X
<b>Themes display</b>  Phone menu texts and background graphics.	X	X

Feature	Z530	Z520
<b>Timer</b>  Set your phone to alert after a specific time lapse.	X	X
<b>USB connectivity support</b>  Connect the phone to a computer using a USB cable. The expandable memory in the phone appears on the computer screen as a mass storage device.	X	X
<b>Vibrating alert</b>  The phone vibrates and you feel when a call comes in.	X	X
<b>Video player</b>  Record, play and transfer video clips to another phone or a computer via available transfer methods. File format – video: .3gp or .mp4 with video codec MPEG4 and H263.	X	X
<b>Video streaming</b>  Real time streaming of video, for example, live cam.	X	X
<b>VideoDJ™</b>  Create video sequences by combining different clips and adding music and images.	X	X
<b>Viewfinder display</b>  When using an in-phone camera or snap-on accessory camera, the picture can be previewed before it is captured.	X	X
<b>Voice control</b>  Voice answer, reject and call. Assign voice commands to items in your phone book.	X	X
<b>Voicemail</b>  Support for voicemail operator service including automatic answering and message recording.	X	X
<b>Volume control</b>	X	X
<b>WAP 1.3</b>  A mobile Internet standard enabling you to access specially designed Internet sites.	X	X
<b>WAP 2.0 XHTML</b>  A mobile Internet standard enabling you to access specially designed Internet sites. WAP 2.0 supports colour and interactive lists.	X	X

Feature	Z530	Z520
Weight	93 g	96 g
<b>WTLS</b>  Wireless Layer Transmission Security – encrypts confidential information such as credit card and bank account numbers. Necessary for mobile banking and shopping.	X	X

# Facts and figures

---

This chapter offers readers a detailed listing of all the technical data relating to the product. Comprehensive descriptions of performance and technical characteristics are presented in table format for quick and easy access.

# Technical specifications

## General technical data

System	Tri-band GSM phase 2 recommendations. GSM (R99) 900 (CTR 19 and CTR 20), GSM 1800 (CTR 31 and CTR 32), GSM 1900 and e-GSM mode supported.
Speech coding	HR, FR, EFR, AMR supported where available, for high speech quality.
GSM SIM/ UMTS USIM card	GSM SIM - GSM 11.11, small plug-in card, 1,8 V and 3 V.
Memory (user free)	Up to 28 MB
Data transfer speeds	Up to 85,6 kbps (downlink) Up to 42,8 kbps (uplink)

## Performance and technical characteristics

Dimension	GSM 900/ E-GSM 900	GSM 1800	GSM 1900
Frequency range (MHz)	TX: 880 – 915 RX: 925 – 960	TX: 1710 – 1785 RX: 1805 – 1880	TX:1850 –1910 RX:1930 – 1990
Channel spacing	200 kHz	200 kHz	200 kHz
Number of channels	174 Carriers *8 (TDMA)	374 Carriers *8 (TDMA)	299 Carriers *8 (TDMA)
Modulation	GMSK	GMSK	GMSK
TX Phase Accuracy	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)
Duplex spacing	45 MHz	95 MHz	80 MHz
Frequency stability	+/- 0.1ppm	+/- 0.1ppm	+/- 0.1ppm
Voltage operation (nominal)	3.6 V	3.6 V	3.6 V
Transmitter RF power output	33 dBm Class 4 (2 W peak)	30 dBm Class 1 (1 W peak)	30 dBm Class 1 (1 W peak)
Transmitter Output impedance	50 ohm	50 ohm	50 ohm
Transmitter Spurious emission (according to specification)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz	< - 30 dBm	< - 30 dBm
Receiver RF sensitivity	Better than – 102 dBm	– 102 dBm	– 102 dBm
Receiver RX Bit error rate	< 2.4%	< 2.4%	< 2.4%

## USSD technical data

Feature	Support
USSD support	GSM Phase 1/2 (Cross-phase compatibility). GPRS behaviour according to class B.
Mode support mode	UI-mode supported. SAT initiated USSD supported.
UI-mode details	<ul style="list-style-type: none"> <li>It is possible to scroll up and down in USSD messages.</li> <li>It is possible to highlight embedded numbers and take actions accordingly.</li> </ul>

## GPRS technical data

Dimension	Support
Compatible GPRS and SMG specifications	Release 99 according to ETSI specification.
Data rates	Multislot class 10 supported (4+2). CS-1, CS-2, CS-3, CS-4 9,050 bps, 13,400 bps, 15,600 bps, 21,400 bps supported (network-dependent).
Indicator of attachment to the GPRS service	Yes, an icon in the top left corner, a filled triangle if attached.
Indicator of PDP context activation	Yes, an icon on the right side. Animated globe.
Medium Access Modes	Dynamic allocation
Support of Packet Control Channels (PBCCH/PCCCH)	Yes
Network operation mode	NOM I, II, III
Support of GPRS/CS combined procedures	Yes
Network control mode	NC0 and 2
Support of access in 2 phases	Yes
Support of PRACH on 11 bits	Yes
Support of GPRS re-selection C31/C32	Yes
Support of static and dynamic addressing	Yes
Support of power control Uplink and Downlink	Uplink = yes, Downlink is a network feature.
Support of ciphering algorithms	GEA1, GEA2

<b>Dimension</b>	<b>Support</b>
Support of compression algorithms	Yes, V42bis and IP header compression.
Support of the QoS modification procedure	Yes, when initiated by the network (not by the handset).
Downlink data rate	Up to 85,600 bps for packet data communication, using 4 time slots in coding scheme CS-4.
Uplink data rate	Up to 42,800 bps for packet data communication, using 2 time slot in coding scheme CS-4.
Mode of operation	Class B and Class C modes of operation supported.
R Reference point	Physical layer: Support of RS232. PPP is supported as L2 layer in the R reference point. Authentication algorithms PAP, CHAP supported.
IP connectivity	PDP type IP is supported. IP termination in mobile or TE (laptop, PDA) supported.
Application	WAP over GPRS supported (UDP/IP and GPRS-SMS). SMS over GPRS supported (SMS-MT, SMS-MO).
QoS	QoS negotiation supported. Default requested QoS sent by the handset at PDP context activation is reliability Class 3. Peak/Mean/Delay/Precedence. Class: subscribed. Precedence class supported (1,2,3). Reliability class 1-5 supported. Delay classes supported (1,2,3,4). Mean and peak throughput rate limited by multi slot class 4 and CS-4.
PDP context	10 PDP context descriptions are stored in mobile. PDP context description is edited via application in mobile, AT-command or via OTA. Simultaneous PDP contexts are supported, maximum 2.
SIM	GPRS aware, as well as non-GPRS aware; SIM cards are supported.

## SIM AT services supported

<b>Service</b>	<b>Mode</b>	<b>Support</b>
CALL CONTROL BY SIM		Yes
DATA DOWNLOAD TO SIM	Cell Broadcast SMS	Yes Yes



Service	Mode	Support
DISPLAY TEXT	Text of up to 240 characters (120 UCS2 coded).	Yes
	bit 1: 0 = normal priority	Yes
	1 = high priority	Yes
	bit 8: 0 = clear message after a delay	Yes
	1 = wait for user to clear message	Yes
GET INKEY	General: The GET_INKEY requires that the user confirms his/her choice.	Yes
	bit 1: 0 = digits (0-9, *, # and +) only	Yes
	1 = alphabet set	Yes
	bit 2: 0 = SMS default alphabet	Yes
	1 = UCS2 alphabet	Yes
	bit 3: 0 = character sets defined by bit 1 and bit 2 are enabled.	Yes
	1 = character sets defined by bit 1 and bit 2 are disabled and the Yes/No response is requested.	Yes
GET INPUT	General: No. of hidden input characters	252
	bit 1: 0 = digits (0-9, *, # and +) only	Yes
	1 = alphabet set	Yes
	bit 2: 0 = SMS default alphabet	Yes
	1 = UCS2 alphabet	Yes
	bit 3: 0 = ME may echo user input on the display	Yes
	1 = user input not to be revealed in any way (see note)	Yes
	bit 4: 0 = user input to be in unpacked format	Yes
	1 = user input to be in SMS packed format	Yes
	bit 8: 0 = no help information available	Yes
	1 = help information available	Yes
LAUNCH BROWSER		Yes
MORE TIME		Yes
PLAY TONE		Yes
POLLING OFF		Yes
POLL INTERVAL		Yes

Service	Mode	Support
PROVIDE LOCAL INFORMATION	'00' = Location Information (MCC, MNC, LAC and Cell Identity)	Yes
	'01' = IMEI of the ME	Yes
	'02' = Network Measurement results	Yes
	'03' = Date, time and time zone (DTTinPLI)	Yes
	'04' - Language setting	Yes
	'05' - Timing setting	Yes
REFRESH	General: The reset option requests the user to wait while the phone restarts.	Yes
	'00' =SIM Initialization and Full File Change Notification	Yes
	'01' = File Change Notification	Yes
	'02' = SIM Initialization and File Change Notification	Yes
	'03' = SIM Initialization	Yes
	'04' = SIM Reset	Yes
SELECT ITEM		Yes
SEND DTMF		Yes
SEND SHORT MESSAGE	bit 1: 0 = packing not required	Yes
	1 = SMS packing by the ME required	Yes
SEND SS		Yes
SEND USSD		Yes
SET UP CALL	General: Capability configuration	Yes
	Set-up speech call CallParty	No
	Subaddress DTMF support	Yes
	'00' = set up call, but only if not currently busy on another call	Yes
	'01' = set up call, but only if not currently busy on another call, with re-dial	Yes
	'02' = set up call, putting all other calls (if any) on hold	Yes
	'03' = set up call, putting all other calls (if any) on hold, with re-dial	Yes
	'04' = set up call, disconnecting all other calls (if any)	Yes
	'05' = set up call, disconnecting all other calls (if any), with re-dial	Yes

Service	Mode	Support
SET UP EVENT LIST	'00' = MT call	Yes
	'01' = Call connected	Yes
	'02' = Call disconnected	Yes
	'03' = Location status	Yes
	'04' = User activity	Yes
	'05' = Idle screen available	Yes
	'06' = Card reader status	Not Applicable
	'07' = Language selection	Yes
	'08' = Browser termination	Yes
	'09' = Data available	No
	'OA' = Channel status	No
SET UP IDLE MODE TEXT		Yes, 1 row of text is supported
SET UP MENU		Yes
TIMER MANAGEMENT		Yes
OPEN CHANNEL		No
CLOSE CHANNEL		No
RECEIVE DATA		No
SEND DATA		No
GET CHANNEL STATUS		No

## User Interaction with SIM AT

### Display text

Text of up to 240 characters (120 UCS coded) is supported.

Text clearing times are 5-20 seconds and a 60-second time-out limit for the user to clear the text.

'Key' responses:

- 'Long Back' – Proactive session terminated by user.
- 'Back' – Backward move in proactive session.

Any other key clears the display if the command is performed successfully.

### Get inkey

Prompt for a one-character input. Pressing 'Ok' without entering a character gives warning message "Minimum 1 character". 'Key' responses:

- 'C' clears current character.
- 'Long Back' terminates the proactive session.
- 'Back' – Backward move in proactive session.
- 'OK' – Command performed successfully.

## Get input

Prompt for character input. The phone will refuse to accept further input when maximum response length is exceeded. UI Maximum Response lengths:

- Digits Only – 160 characters.
- SMS default alphabet characters – 160 characters.
- Hidden Characters (digits only) – 20 characters.

‘Key’ responses:

- ‘C’ clears current character.
- ‘Long Back’ terminates the proactive session.
- ‘Back’ – Backward move in proactive session.
- ‘OK’ – Command performed successfully.

## Select item

Scroll to highlight item for selection. ‘Key’ responses:

- Navigational key press down – Scroll down list.
- Navigational key press up – Scroll up list.
- Long ‘Back’ terminates proactive session.
- ‘Back’ – Backward move in proactive session.
- ‘OK’ – Command performed successfully.

## Send short message

Default message “Sending message, please wait” can be replaced for the Alpha Identifier text, or suppressed completely if a null text is provided. Default responses are “MESSAGE FAILED” or “MESSAGE SENT”. ‘Key’ responses:

- Long ‘Back’ or ‘Back’ ends the proactive session.

## Set up call

If the ME is on a call when the command ‘Set up Call’, ‘putting all other calls on hold’ is sent, the user sees the text ‘Setting up a call current call will be held’. If ‘OK’ is pressed, the current call will be put on hold and the new call set up. If the ME is on a call when the command ‘Set Up Call, disconnecting all other calls’ is sent, the user sees the text ‘Setting up a call current call will be disconnected’. If the ‘OK’ key is pressed, the current call is disconnected and the new call set up.

## Set up menu

Incorporates a SIM Application Toolkit Menu Item into the ME’s main menu structure.

If an Alpha Identifier is supplied in the Set Up Menu command, this is used as the SIM AT entry in the ME’s main menu. If no alpha identifier is supplied and several items are found in the menu, a default title is used. If the SIM AT Menu Item is selected by pressing ‘Select’, all the items sent in the Set Up Menu command are available for selection, in the same way as the Select Item command.

## Media player

File types	Formats	Extensions
Audio	MP3 (192 kbit/s for local playback)	.mp3
	MP4	.mp4
	M4A	.m4a
	3GP	.3gp
	(Audio encoded in AAC or AMR, able to play back AAC+)	
	AMR	.amr
	WAV	.wav
	G-MIDI (level 1 with 40 voices polyphony)	.mid

File types	Formats	Extensions
Video (including audio part)	MP4 (video: MPEG4, audio: AAC or AMR)	.mp4
	3GP (video: MPEG4 or H.263, audio: AAC or AMR, able to play back AAC+)	.3gp
Streaming transport	RTSP according to 3GPP™	
Video coding	MPEG-4 Simple Visual Profile Level 0 H.263 Profile 0 Level 10	
Audio coding	AAC (able to play back AAC+), AMR, MPEG layer 3	
Features	Automatic loop of songs in folder Automatic pause on telephone call	
Ringtone file formats	MIDI (General MIDI 1, SP-MIDI) E-Melody I-Melody AMR-NB MP3 MP4 3GP M4A WAV RHZ XMF	

## VGA camera

Facts and figures	
Picture sizes (resolution)	VGA (640x480) QVGA (320x240) QQVGA (160x120) Extended size (1280x960)
Colour depth	16 bit (8 bit per RGB channel) 65k colours
Camera memory	Using phone memory or Memory Stick Micro™ (M2™); no memory dedicated to the camera only.
Digital zoom	4x zoom
Flash light	No
Auto focus	No
Night mode	Yes
Self-timer	Yes
Effects	Negative/ Solarize/ Sepia/ Black&White/ Off

**Facts and figures**

Picture quality	Choose between Normal and Fine
-----------------	--------------------------------

**Video recorder**

Video sizes	176 x 144 128 x 96
-------------	-----------------------

Shoot mode	For picture message/High quality video
------------	--

## Pictures and animations

Formats	BMP, JPEG, GIF (including animated), PNG, WBMP and SVG
---------	--

Sharing via	MMS, EMS, WAP, IR, Bluetooth™, email or Cable
-------------	---

## Image decoders

Decoder	Details	Size	Colour depth	File format
GIF	87a/89a			
JPEG	ISO/IEC JPEG Baseline DCT Progressive DCT Non-differential Huffman coding Symbol 'SOF2'	VGA		JFIF v1.02 EXIF
BMP	The bitmap image format used by Windows®.	XRAM dependent, default is VGA	24 bit	
WBMP				
PNG				

## Image encoders

Decoder	Details	Size	Colour depth	File format
GIF	89a			
JPEG	ISO/IEC JPEG Baseline DCT Non-differential Huffman coding Symbol 'SOF0'	VGA		JFIF v1.02

BMP	The bitmap image format used by Windows®.	XRAM dependent, 24 bit default is VGA
WBMP		

## Short Messaging Service

Feature	Support
SMS Centre Number	It is possible to pre-load the SMS Centre Number.
Pictures	It is possible to insert a picture or an icon into the text message. EMS compliant mobile handsets will be able to see the picture correctly.
Input methods	Predictive text input and multitap.
Reply to messages	It is possible to reply to received messages by SMS, MMS, phone call or email.
Message creation methods support:	Predictive writing and multitap.
Copy, cut and paste words	Yes
Teaching of predictive words that are not in the predictive dictionary	Yes
Possibilities when creating a message:	
save a sent message in a "Sent items" folder	Yes
insert a line in the message	Yes
assign a validity period to the message	Yes
use pre-defined messages	Yes
Possibilities when receiving a message:	
reply to the sender	Yes
forward the message	Yes
save the message on SIM	Yes
get delivery time and date	Yes
Possibilities of the previously sent message:	
delivery report of the message	Yes (if delivery report was requested at time of sending).
forward the message	Yes
save the message on SIM	Yes
know the remaining capacity storage	No, but notification when 95% full.
Possibilities of the previously received message:	

Feature	Support
reply to the sender	Yes
save the message in the Inbox	Yes (the message is automatically saved in the inbox).
forward the message	Yes
know the remaining capacity storage	No, but notification when 95% full.
Supported ways of replying to a received SMS message:	
via SMS	Yes
via phone call (set up a call to the number contained in the message body)	Yes
via MMS	Yes
via email	Yes
via WAP call (go to the WAP address contained in the message body)	Yes
via USSD session	No
Possibility to offer the user the ability of sending an SMS message to a list of recipients	Yes
Possibility to write an email address as a recipient address	Yes
SMS storage	On the SIM and in the phone.
Nokia Picture Messaging	Yes

## Enhanced Messaging Service

Feature	Support
Level of compliance supported by the handset regarding the specifications described in release 99.	Enhanced Messaging Service (EMS) according to the standard 3GPP™ TS 23.040 v4.3.0, with the addition of the ODI feature from 3GPP™ TS 23.040 v5.0.0.
Number of messages that the handset is able to handle to generate a concatenated message	20
Capacity storage	200 and the space left on the SIM card.
Outgoing messages	It is possible to: <ul style="list-style-type: none"> <li>• see how many short messages an EMS message consists of before sending.</li> <li>• choose whether to send the message or not after writing.</li> </ul>



Feature	Support
Incoming messages	<ul style="list-style-type: none"> <li>• A signal is heard once all parts of the message have been received or when a timeout occurs.</li> <li>• It is possible to re-use the content of an EMS message. Sounds, pictures, and animations can be inserted in a new message, if the object is not protected using ODI.</li> </ul>
Concatenated messages	A receipt is received in the handset when all parts of a concatenated message have been delivered.
Insert objects	It is possible to add pictures, animations and sounds to an EMS message.
Sounds	Chimes high, chimes low, ding, tada, notify, drum, claps, fanfare, chords high, chords low.
I-melody	Yes, version 1.2.
Melodies	<p>It is possible to:</p> <ul style="list-style-type: none"> <li>• send and receive melodies via EMS, if the melodies are not protected by ODI.</li> <li>• download melodies and commercial tunes from WAP/WAP portals.</li> <li>• create melodies on WAP/WAP portals.</li> </ul>
WBMP	Yes
Picture sizes	16x16 pixels, 32x32 pixels, variable size in black and white.
Pictures	<p>It is possible to:</p> <ul style="list-style-type: none"> <li>• edit pictures by using the phone keypad.</li> <li>• send and receive pictures via EMS, if the pictures are not protected by ODI.</li> <li>• create pictures on WAP/WAP portals.</li> <li>• download pictures from WAP/WAP portals.</li> <li>• receive pictures in enhanced messages originated by service providers.</li> </ul>
Animations	<p>The handset supports the following animations: Angry, Crying, Flirty, Happy, Kiss, Sad, Tongue, Wow, Confused, Devil, Glasses, Indifferent, Laughter, Sceptical and Wink as defined in 3GPP™ TS 23.040 v4.3.0.</p> <p>It is possible to:</p> <ul style="list-style-type: none"> <li>• send and receive animations.</li> </ul>
TP-PID field value given by the handset before sending an EMS message	0x00

# Multimedia Messaging Service

Feature	Support
MMS/CSD parameters and MMS/GPRS parameters placement	MMS is bound to an Internet profile. An Internet profile is bound to a Data Account. A Data Account contains either CSD parameters or GPRS parameters.
Possibility to pre-configure the MMS parameters in factory	<ul style="list-style-type: none"> <li>• MMS/CSD: Yes</li> <li>• MMS/GPRS: Yes</li> </ul>
Possibility to configure the MMS parameters by OTA provisioning	<ul style="list-style-type: none"> <li>• MMS/CSD: Yes</li> <li>• MMS/GPRS: Yes</li> </ul>
Possibility for all the parameters from the parameters set to be OTA provisioned at the same time	<ul style="list-style-type: none"> <li>• MMS/CSD: Yes</li> <li>• MMS/GPRS: Yes</li> </ul>
Possibility for only one parameter from the parameters set to be OTA provisioned	<ul style="list-style-type: none"> <li>• MMS/CSD: No</li> <li>• MMS/GPRS: No</li> </ul>
OTA provisioning solution	OTA Settings Specification v7.1 © Ericsson and Nokia
Supplier indication of realized interoperability tests between its MMS User Agent and MMS Relay/Server from other suppliers	Yes
Support of a standard or a proprietary procedure for OTA provisioning of MMS parameters	Proprietary
Functionalities that the user is able to set during message composition:	<ul style="list-style-type: none"> <li>• message subject</li> <li>• message priority</li> <li>• email recipient address</li> <li>• message Cc recipient(s) address(es)</li> <li>• message Bcc recipient(s) address(es)</li> <li>• MSISDN recipient address</li> <li>• delivery report request</li> <li>• delivery time</li> <li>• read report request</li> <li>• validity period</li> </ul>
The user can insert multimedia elements into multimedia messages from:	<ul style="list-style-type: none"> <li>• File Manager</li> <li>• Camera</li> <li>• Contacts</li> <li>• Calendar</li> <li>• Web browser</li> <li>• Java™ applications</li> </ul>
Possibility for sent messages to be memorized into a folder in the phone memory	Yes
Actions that the user can perform after message notification:	<ul style="list-style-type: none"> <li>• Auto Download</li> <li>• Always Ask</li> <li>• Ask in roaming</li> <li>• Not in roaming</li> <li>• Off</li> </ul>

Feature	Support
Actions that the user can perform after message retrieval:	<ul style="list-style-type: none"> <li>• reply to the sender of the message SMS/MMS/Voice message</li> <li>• reply to the sender and to Cc people MMS/Voice message</li> <li>• reply to the sender and to Bcc people MMS/Voice message</li> <li>• forward the message MMS</li> <li>• delete the message</li> <li>• save message in the phone memory</li> <li>• call the sender of a message</li> <li>• view details</li> <li>• save items</li> <li>• mark as unread</li> </ul>
Multimedia codecs/formats supported for audio	MP3, MP4, MP4A, 3GP, AMR, (Audio encoded in AAC or AMR, able to play back AAC+), WAV, G-MIDI.
Multimedia codecs/formats supported for video	MPG4, 3GPP™, SDP
Multimedia codecs/formats supported for image	BMP, JPEG, GIF (including animated), PNG, WBMP and SVG
Supported formats for message presentation:	<ul style="list-style-type: none"> <li>• message body + attachments (email presentation)</li> <li>• SMIL version as described in OMA MMS IOP document version 1.2</li> </ul>
Maximum message size that can be handled by the handset for message	Content Class and Creation mode are applied. Also maximum size is possible to customize.
MMS User Agent will report problems to user in case of:	<ul style="list-style-type: none"> <li>• message not sent causes no user subscription to service, if included in ResponseText (please see WAP209).</li> <li>• message not sent causes required functionality not supported by MMS Relay/Server, if included in ResponseText (please see WAP209).</li> <li>• message not sent causes insufficient credit (in case of prepaid charging), if included in ResponseText (please see WAP209).</li> </ul>

## Email client technical data

Feature	Support
Bearer type UTMS (IP)	Yes
Bearer type GSM Data (IP)	Yes, HSCSD, ISDN and analog

Feature	Support
Character sets	ISO: ISO-8859-1, ISO-8859-2, ISO-8859-5, ISO-8859-7, ISO-8859-9, ISO-8859-10 Windows: Windows-1251, Windows-1252, Windows-1254, Windows-1255, Windows-1258 US-ASCII Unicode: UTF-7, UTF-8, UTF-16 Japanese: Shift_JIS Cyrillic: KOI8-R Simplified Chinese: GB2312 Traditional Chinese: BIG5
OTA provisioning solution	Yes
Protocols	POP3 and IMAP4
Push email	IMAP Idle (extension of IMAP4Rev1), OMA Email Notification 1.0 and scheduled checking
Secure email	SSL/TLS, both port methods (POPS/IMAPS) and STARTTLS
Remote configuration	OMA Client Provisioning and Nokia Smart Messaging
HTML mail	Yes (tags removed)
Inline images	No
Message management	Window of 20 latest messages Headers only or size limits
ESMTP	Yes
Background sending	Yes

## Bluetooth™ technical data

Dimension	Support
Bluetooth capability statement	This phone is manufactured to meet Bluetooth™ Specification 2.0
Bluetooth functions	Basic Imaging Profile Dial-up Networking Profile File Transfer Profile Generic Access Profile Generic Object Exchange Profile Handsfree Profile Headset Profile Human Interface Device (HID) Profile Object Push Profile Personal Area Network Profile Serial Port Profile Synchronization Profile SyncML OBEX binding

Dimension	Support
Connectable devices	All products supporting Bluetooth™ spec. 1.1, or higher, and at least one of the profiles above.
Coverage area	Varies due to radio performance on remote device and the occurrence of obstacles. Up to 10 metres (33 feet).
Transmission power	2mW (3 dBm)
Frequency band	2.4 GHz - the unlicensed ISM band.
Power consumption	GSM host processor excluded: <ul style="list-style-type: none"> <li>• Standby, Bluetooth On mode: &lt;0.9mA</li> <li>• Voice mode: 24 mA</li> <li>• Data mode average: 25mA</li> </ul>
Data transmission rate	Up to 600 kbps asynchronous and up to 350 kbps synchronous from an application level.
Specific commands working with the SIM card	No

## OMA Data Synchronization (SyncML) technical data

Feature	Support for Sync ML
SyncML compliance	The handset is fully SyncML compliant, having passed SyncML Conformance testing. SyncML 1.2 or Sync ML 1.1.2 is used depending on configuration and both are supported in Server-alerted synchronization.
Basic data formats	Contacts: vCard 2.1, Calendar: vCalendar 1.0 (vEvent), Tasks: vCalendar 1.0 (vTodo), Notes: text/plain
Possibility for operators to extend SyncML functionality.	The device may be configured to include preset SyncML settings, and to control whether SyncML 1.1 or SyncML 1.2 will be used.
Possibility to synchronize other handsets using SyncML.	No
Transport method for SyncML messages.	HTTP, OBEX (IR, USB, Bluetooth)
Synchronization application placement.	Inside the handset.
Possibility for the user to configure login parameters (e.g. username and password) to access the remote database.	Yes

Feature	Support for Sync ML
Configuration parameters that can be entered/modified by the user.	Server URL, Username, User PWD, Paths to databases (Calendar, Contacts, Tasks and Notes), UserID and PWD for Databases, Databases to be synchronized (on/off), Internet profile, Synchronization interval, Server ID and Server PWD and permission to allow server-alerted synchronization. Can be provisioned with Ericsson Nokia OTA Settings Specification v7.1, OMA Client provisioning v1.1, and OMA Device Management 1.1.2.
Mechanisms used by the handset to capture changes made by the end user (i.e. how does the SyncML client in the handset know which changes were made to the address book).	It uses a change log where it marks the contact as updated.
Ability to deal with multiple servers.	Yes
Ability to perform conflict resolution actions.	No

## Browser technical data

Feature	Support in the browser
Back to previous page	Yes
Bearer type GPRS (IP)	Yes
Bearer type GSM Data (IP)	Yes, HSCSD, ISDN and analog.
Bookmarks	Yes, up to 100 named bookmarks for easy and frequently visited pages. Folders and sorting supported.
Bookmark Export/Import	Yes, can be sent and received using vBookmark format via Infrared, Bluetooth, SMS, MMS and email.
Cache	Yes (size 300 kB).

Feature	Support in the browser
Character sets *	<p>ISO: ISO-8859-1, ISO-8859-2, ISO-8859-3, ISO-8859-4, ISO-8859-5, ISO-8859-6, ISO-8859-7, ISO-8859-8, ISO-8859-8-i, ISO-8859-9, ISO-8859-10</p> <p>Windows: windows-1250, windows-1251, windows-1252, windows-1253, windows-1254, windows-1255, windows-1256, windows-1257</p> <p>US-ASCII</p> <p>Unicode: UTF-8, UTF-16BE, UTF-16LE, ISO-10646-UCS-2, ISO-10646-UCS-2_LE, ISO-10646-UCS-4, ISO-10646-UCS-4_LE</p> <p>Japanese: Shift_JIS, EUC-JP, ISO-2022-JP</p> <p>Simplified Chinese: GB2312, GB_2312-80, GBK</p> <p>Traditional Chinese: BIG5</p> <p>Korean: EUC-KR, KS_C_5601-1987</p> <p>Cyrillic: KOI8-R</p> <p>Thai: windows-874, TIS-620</p> <p>Special: x-euc-jp, x-sjis, ISO8859-1</p> <p>*) When creating WML applications, it is recommended to always save the page contents as UTF-8, and that this is clearly indicated in the pages before publishing. This ensures that the contents of the application can be viewed, regardless of character sets used in gateways and the phone. All characters are not supported in all phones. The software version depends on which market the phone is associated to. Also, please note that the phone may not support input on a WAP Service which uses certain characters (languages), even if those characters are supported for browsing in the phone.</p>
Clear cache	Yes
Colour	Colour display
Home page	Yes, up to 10 different; one for each Internet profile.
HTML version for browser	XHTML, Mobile Profile 1.2, HTML 4.01, WML 1.3, CSS, DOM2, ECMAScript.
Hyperlinks in Text	Yes, highlighted as blue text.
Hyperlinks in Images	Yes, indicated by a frame.
Image Animation	Yes
Image Formats	BMP, JPEG, GIF (including animated) PNG, WBMP and SVGt.
Network Settings	Up to 10 different settings available by selecting profile (Internet, Banking, Gateway and so on.).
OTA Support	Yes
PPP Authentication	PAP, CHAP supported.

Feature	Support in the browser
Reload page	Yes
Security	WTLS class 1-3 TLS version 1, Client authentication SSL version 3, Client authentication WIM on SIM ICC X.509 certificate support, WAP Profile WPKI OTA download of trusted certificates
User Agent Profiles	Yes, list of client characteristics - for example display size.
WAP/WML WAP	WAP 2.0/WML 1.3
Internet profiles	Dynamic - up to 10 internet profiles, each with its own settings.

## Operator technical data

Feature	Support for WAP
<b>Web Browser</b>	Access NetFront™ 3.3
Version	2.0 baseline
HTML	XHTML Mobile Profile
Access NetFront 3.3	<ul style="list-style-type: none"> <li>HTML 4.01, XHTML 1.1 Including mobile profile</li> <li>CSS 1 &amp; CSS 2 (Partial)</li> <li>ECMAScript 3rd edition (equal to Java script 1.5)</li> <li>DOM level1, level2 and Dynamic HTML (Partial)</li> <li>Graphic Formats: BMP, JPEG, GIF (including animated) PNG, WBMP and SVGT.</li> </ul>

### PROVISIONING

Provisioning types	The Ericsson-Nokia OTA solution	OMA Client provisioning (v1.1)
	Over the Air Settings Specification, v7.1 © Ericsson and Nokia	
Total Parameter sets	10 (shared between the WAP provisioning types). < or = 10 (total number of WAP profiles).	



Feature	Support for WAP	
Parameter set list	name homepage and homepage title (1st bookmark element) proxy/GW address bookmarks (remaining bookmark elements) CSD phone number CSD data rate CSD dial type GPRS APN protocol authentication GW authentication secure connection on/ off	name, homepage, proxy/GW address, CSD phone number, CSD data rate, CSD dial type, CSD response timer, GPRS APN, protocol authentication, GW authentication, GPRS QoS
Parameter sets include	CSD, GPRS (different sets).	
Factory pre-configuration	CSD (possibility to lock a setting), GPRS.	
OTA	CSD, GPRS configuration possible.	
Security mechanism		
Bearer	The Ericsson-Nokia solution	OMA Client Provisioning
OTA via SMS	Operator verification through a code that can be included in the OTA configuration data. This code is shown to the user who can choose to install or not.	Uses security mechanism (SEC) methods according to WAP- 183-ProvCont-20010724-a (see <a href="http://www.openmobilealliance.org">www.openmobilealliance.org</a> ).
Interface		
Bearer	The Ericsson-Nokia solution	OMA Client Provisioning
OTA via SMS	A question whether to install, with the code if available is asked. The user may have to choose whether to create a new profile or to replace an existing profile.	For NETWPIN the user is asked to accept to install received settings. For USERPIN, USERNETWPIN and USERPINMAC the user is subsequently asked to enter a PIN code that is a shared secret between the service provider and the user.
OTA via Cell Broadcast	-	-
Re-provisioning Interface	The Ericsson-Nokia solution	OMA Client Provisioning

Feature	Support for WAP	
OTA via SMS	Same interface as above.	If the settings previously installed were privileged or have higher priority, the settings might not be possible to install again unless the terminal is reset, otherwise as above.
OTA via Cell Broadcast	-	-
Carrier reset/provisioning	Yes, but not if the set is pre-configured in the factory and locked.	
SWIM	Not used for provisioning. The SWIM is only used for WAP security, both WTLS connections and digital signatures.	
SWIM certificate	Both client and trusted certificates can be used for WTLS connections and digital signatures.	
Applicative provisioning		
Preferred bearer customization	Yes	
Email customization	Yes, but not through provisioning.	
Other applications/features	Yes (MMS, SyncML, Wireless Village).	
Technologies		
OMA Client provisioning	Yes, WAP provisioning document v1.1.	
Openwave OTA	No	
Other	Yes, the Ericsson-Nokia solution. OTA Settings Specification v7.1.	
Provisioning bearer	SMS	
Parameter sets available	< or = 10 (total number of Internet profiles)	
Parameter sets for OTA modification	< or = 10 (total number of Internet profiles)	
PUSH		
Content types		
Service Indication (SI)	Yes	
Service Loading (SL)	Yes	
Cache Operation (CO) content type	Yes	
Session Initiation Application (SIA)	Yes	
Man Machine Interface		
SI/content retrieval postponing	Yes	
SI menu structure accessibility	Messaging, Inbox	

Feature	Support for WAP
SL reception warning	The user can make a choice if a dialogue is wanted or not before loading the SL. Messaging/Settings/Push/Allow push msg/Always ask
SIA reception warning	Yes
Cache size limitations	The oldest push in the inbox will be discarded.
Number of push messages	Depending on the size of the push messages. Around 20 push messages with a size of 500 bytes can be stored.
Push de-activate	Yes (Messaging/Settings/Push/Allow push msg).
Dynamic push menu changes	No. There are no changes in the menus when activating/deactivating push.
<b>Security</b>	
Mechanisms for push	None
Trust with PPG	Sending a SIA is the most trustful.
WSP push sessions	Not supported.
HTTP Push session	Yes
White list	Service Center, IP address
<b>User agent profile</b>	
UA profile content sent at beginning of WSP session	No
URL sent pointing to the UA profile at the beginning of WSP session	No, WSP not supported.
URL location	On the manufacturer WAP site.
<b>WTAI</b>	
WTA Make Call	Yes
WTA Send DTMF	Yes
WTA Add Phone Book	Yes
<b>DOWNLOAD</b>	
<b>WAP solutions</b>	
HTTP GET solution to download content over WAP	Yes
Download Fun from Openwave	No
Other download content over WAP	Yes, download limit (HTTP protocol).
HTTP GET solution to download content	Yes

Feature	Support for WAP
Other download content	Yes. No download limit when using HTTP protocol.
Download application/product memory check	Yes
Downloaded object solution	Yes. The user is informed where the content is saved and asked if it should be used at once or later.
UAP indication for downloading	Yes
Other features	Yes. Store, delete, forward, use and manage.
Object formats	Formats supported in the phone.
HTTP GET solution to download content	Yes
<b>GRAPHICAL USER INTERFACE</b>	
<b>Man Machine Interface</b>	
Selection keys	Yes
Separate/dedicated back or erase keys	Yes
Display backlight on when browsing	Yes
Predictive writing	Yes
“http://” string displayed automatically when entering URLs	Yes
<b>Elements</b>	
Pop-up menus	Yes, in XHTML.
Radio buttons	Yes, in XHTML.
Check boxes	Yes, in XHTML.
Buttons	Available as XHTML form controls.

## Java™

Feature	Functionalities
<b>Java 2, Micro Edition (J2ME™)</b>	<ul style="list-style-type: none"> <li>• CLDC 1.1 (JSR 139)</li> <li>• MIDP 2.0 (JSR 118)</li> <li>• Wireless Messaging API (JSR 120/205)</li> <li>• Mobile Media API (JSR 135)</li> <li>• Java™ Technology for the Wireless Industry (JSR 185)</li> <li>• Java™ API for Bluetooth™ (JSR 82)</li> <li>• PDA Optional Packages for J2ME™ Platform (JSR 75)</li> <li>• Web Services (JSR 172)</li> </ul>

Feature	Functionalities
Java 3D™	<ul style="list-style-type: none"><li>• Mascot Capsule Micro3D Version 3</li><li>• Mobile 3D Graphics API for J2ME™ (JSR 184)</li></ul>

# Abbreviations

## **3GPP™**

3rd Generation Partnership Project

## **AAC**

Advanced Audio Coding

## **AMR**

Adaptive Multi Rate  
Audio format for speech sounds

## **API**

Application Programming Interface

## **CS**

Circuit Switched

## **CSD**

Circuit Switched Data

## **CSS**

Cascading Style Sheet

## **DM**

Device Management  
DM utilizes GPRS as bearer of the provisioning data (basic network connectivity needs to be in place) and allows the operator to access the phone and check and set different settings such as Network connectivity (GPRS), email, MMS, WAP and JAVA. DM is achieved by supporting Over The Air provisioning 7.1 (OTA), OMA Client Provisioning 1.1 (CP) and OMA Device Management (DM) 1.2.

## **DRM**

Digital Rights Management; controlling copying and distribution of contents, with respect to intellectual property rights.

## **e-GSM**

Extended GSM. New frequencies specified by the European Radio Communications Committee (ERC) for GSM use when additional spectrum is needed (network-dependent). It allows operators to transmit and receive just outside GSMs core 900 frequency band. This extension gives increased network capability.

## **EFR**

Enhanced Full Rate, speech coding

## **EMS**

Enhanced Messaging Service. Allows the user to add simple pixel pictures and animations, sounds and melodies to a text message. The EMS 3GPP™ standard also includes text formatting.

## **ETSI**

European Telecommunications Standards Institute.

## **FR**

Full Rate, speech coding

## **GIF**

Graphics Interchange Format

## **GPRS**

General Packet Radio Services

## **GSM**

Global System for Mobile Communications. The GSM system family includes GSM 850, GSM 900, GSM 1800 and GSM 1900. There are different phases of roll-out for the GSM system and GSM phones are either phase 1 or phase 2 compliant.

## **HR**

Half Rate, speech coding

## **HSCSD**

High Speed Circuit Switched Data

## **HTML**

HyperText Markup Language

## **HTTP**

HyperText Transfer Protocol

## **IETF**

Internet Engineering Task Force

## **IMAP**

Internet Message Access Protocol, a method of accessing email or bulletin board messages that are kept on a mail server.

IMAP Idle is an optional expansion of the IMAP email protocol that allows the server to send new message updates to the client in real time.

## **IRDA**

Infrared Data Association

## **JPEG**

Joint Photographer Expert Group

## **LED**

Light Emitting Diode

## **LAN**

Local Area Network

## **MIDI**

Musical Instrument Digital Interface

## **ME**

Mobile Equipment

## **MMI**

Man Machine Interface. See UI.

## **MP3**

MPEG-1 layer 3, an effective audio coding scheme. See MPEG4/MPG4.

## **MPEG4/MPG4**

Moving Picture Experts Group

MPEG-4 is an ISO/IEC standard developed by MPEG. MPEG-4 extends the earlier MPEG-1 and MPEG-2 algorithms with synthesis of speech and video, fractal compression, computer visualisation and artificial intelligence-based image processing techniques.

## **MT**

Mobile Termination

## **ODI**

Object Distribution Indicator

## **OMA**

Open Mobile Alliance, promotes interoperability and a wireless standard for delivering email, text-based Web pages and data to cellphones, PDAs, pagers and other mobile terminals.

OMA email enables the mobile email client to be notified of a new email using mobile network protocols.

## **OTA**

Over-the Air Configuration. To provide settings for the phone by way of sending an SMS message over the network to the phone. This reduces the need for the user to configure the phone manually.

## **PDA**

Personal Digital Assistant

## **PDP**

Packet Data Protocol

## **PIM**

Personal Information Management

**PNG**

Portable Network Graphic

**QVGA**

Quarter Video Graphics Array

**RTSP**

Real Time Streaming Protocol session control

**SMS-C**

Service Centre (for SMS)

**SI**

Service Indication

**SL**

Service Loading

**SIM card**

Subscriber Identity Module card – a card that must be inserted in any GSM-based mobile phone. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized, but both types have the same functions.

**SMS**

Short Messaging Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to a mobile phone.

**SP-MIDI**

Scalable Polyphony MIDI. See MIDI.

**SS**

Supplementary Services

**SSL**

Secure Socket Layer

**SVGT**

Scalable Vector Graphics Tiny. A vector graphics format for the Web that is expressed in XML.

**TLS**

Transport Layer Security

**UI**

User interface

**UMTS**

Universal Mobile Telecommunications System. The telecommunications system, incorporating mobile cellular and other functionality, that is the subject of standards produced by 3GPP™.

**URL**

Uniform Resource Locator.  
The global address of documents and other resources on the World Wide Web.

**USSD**

Unstructured Supplementary Services Data

**vCard**

vCard automates the exchange of personal information typically found on a traditional business card, for use in applications such as Internet mail, voice mail, Web browsers, telephony applications, call centres, conferences, PIMs/PDAs, pagers, fax, office equipment, and smart cards. vCard is specified by IETF. See IETF.

**VGA**

Video Graphics Array

**WAP**

Wireless Application Protocol. Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user.



## **WAP service**

A WML application residing on a web site.

## **WAV**

Windows Media Audio

## **WBMP**

Wireless BitMap.

A graphic format optimized for mobile computing devices.

## **WML**

Wireless Markup Language. A markup language used for authoring services, fulfilling the same purpose as HyperText Markup Language (HTML) does on the World Wide Web (WWW). In contrast to HTML, WML is designed to fit small handheld devices.

## **WMLScript**

WMLScript can be used to enhance the functionality of a service, just as, for example, Java Script may be utilized in HTML. It makes it possible to add procedural logic and computational functions to WAP-based services.

## **WSP**

Wireless Session Protocol

## **WTLS**

Wireless Transport Layer Security

## **XHTML**

Extensible HyperText Markup Language

## **XML**

Extensible Markup Language

# Related information

## Documents

---

- Sony Ericsson User Guide
- Sony Ericsson FAQ
- AT Command Reference Manual
- WAP 2.0 Specifications

## Links

---

- [www.sonyericsson.com/](http://www.sonyericsson.com/)
- [www.ericsson.com/mobilityworld/](http://www.ericsson.com/mobilityworld/)
- [www.midi.org](http://www.midi.org)
- [www.extendedsystems.com](http://www.extendedsystems.com)
- [www.gsmworld.com/](http://www.gsmworld.com/)
- [www.bluetooth.com](http://www.bluetooth.com)
- [www.imc.org](http://www.imc.org)
- [www.3gpp.org](http://www.3gpp.org)
- [www.irda.org](http://www.irda.org)
- [www.etsi.fr](http://www.etsi.fr)
- [www.wapforum.org](http://www.wapforum.org)
- [www.imc.org/pdi/](http://www.imc.org/pdi/)
- [www.syncml.org](http://www.syncml.org)
- [www.w3.org/TR/xhtml-basic/](http://www.w3.org/TR/xhtml-basic/)
- [www.java.sun.com](http://www.java.sun.com)
- [www.memorystick.org/](http://www.memorystick.org/)
- [www.memorystick.com/](http://www.memorystick.com/)

## Trademarks and acknowledgements

---

The Bluetooth™ word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by Sony Ericsson is under license.

Memory Stick™ and Memory Stick Micro™ (M2™) are trademarks or registered trademarks of Sony Corporation.

QuickShare™, PlayNow™, VideoDJ™, MusicDJ™ PhotoDJ™ and Style Up™ are trademarks or registered trademarks of Sony Ericsson Mobile Communications AB.

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

NetFront is an Internet browsing software of ACCESS CO., LTD.

NetFront, Rapid-Render and Smart-Fit Rendering are trademarks or registered trademarks of ACCESS CO., LTD. in Japan and other countries.

XHTML™ is a registered trademark of the W3C.

Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

3GPP™ is a trademark of ETSI in France and other jurisdictions.

Java and all Java based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries. End-user license agreement for Sun Java™ J2ME™.

1. Restrictions: Software is confidential copyrighted information of Sun and title to all copies is retained by Sun and/or its licensors. Customer shall not modify, decompile, disassemble, decrypt, extract, or otherwise reverse engineer Software. Software may not be leased, assigned, or sub licensed, in whole or in part.

2. Export Regulations: Software including technical data, is subject to U.S. export control laws, including the U.S. Export Administration Act and its associated regulations, and may be subject to export or import regulations in other countries. Customer agrees to comply strictly with all such regulations and acknowledges that it has the responsibility to obtain licenses to export, re-export, or import Software. Software may not be downloaded, or otherwise exported or re-exported (i) into, or to a national or resident of, Cuba, Iraq, Iran, North Korea, Libya, Sudan, Syria (as such listing may be revised from time to time) or any country to which the U.S. has embargoed goods; or (ii) to anyone on the U.S. Treasury Department's list of Specially Designated Nations or the U.S. Commerce Department's Table of Denial Orders.

3. Restricted Rights: Use, duplication or disclosure by the United States government is subject to the restrictions as set forth in the Rights in Technical Data and Computer Software Clauses in DFARS 252.227-7013(c) (1) and FAR 52.227-19(c) (2) as applicable.

All other trademarks and copyrights are the property of their respective owners.

# Index

<b>Numerics</b>		HSCSD .....	47
3GPP .....	46	HTML .....	47
<b>A</b>		HTTP .....	47
AAC .....	46	<b>I</b>	
ACELP .....	46	IETF .....	47
Acknowledgements .....	50	Image decoders .....	30
AMR .....	46	Image encoders .....	30
API .....	46	<b>L</b>	
<b>B</b>		LAN .....	47
Battery .....	10	LED .....	47
Bluetooth™ .....	36	Links .....	50
<b>C</b>		<b>M</b>	
Camera .....	7, 29	ME .....	47
Picture size .....	29	Media player .....	28
CDMA .....	46	Memory .....	22
Cell-ID .....	46	Micro browser .....	47
CS .....	46	MIDI .....	47
CSD .....	46	MMI .....	47
CSS .....	46	MP3 .....	47
<b>D</b>		MPEG4 .....	47
Design .....	12	MPG4 .....	47
DM (Device Management) .....	46	MT .....	47
Documents .....	50	Multimedia Messaging Service (MMS) .....	34
DRM .....	46	<b>N</b>	
DTMF .....	46	Networks .....	16
<b>E</b>		<b>O</b>	
EFR .....	46	Object Exchange .....	21
e-GSM .....	46	ODI .....	47
EMS .....	46	OMA .....	47
Enhanced Messaging Service (EMS) .....	32	OTA .....	47
ETSI .....	46	<b>P</b>	
Exterior description .....	22	PDA .....	47
<b>F</b>		PDP .....	47
FR .....	46	Performance and technical characteristics .....	22
<b>G</b>		Pictures .....	30
General technical data .....	22	PIM .....	47
GIF .....	46	<b>Q</b>	
GPRS .....	23, 46	QVGA .....	48
GSM .....	46	<b>R</b>	
<b>H</b>		RPE .....	48
HR .....	46	RTSP .....	48

**S**

Short Messaging Service (SMS) .....	31
SI .....	48
SIM	
AT services .....	24
Card .....	48
Card type .....	22
SL .....	48
SMS .....	48
SMS-C .....	48
SP-MIDI .....	48
SS .....	48
SyncML	
Technical data .....	37

**T**

Technical specifications .....	22
Terminology and abbreviations .....	46
Trademarks and acknowledgements .....	50

**U**

UI .....	48
UMTS .....	48
URL .....	48
USIM .....	22
USSD .....	23, 48

**V**

vCard .....	48
VGA .....	48
Video clips .....	7

**W**

WAP .....	48
Operator technical data .....	40
Service .....	49
Technical data .....	38
WAV .....	49
WBMP .....	49
WML .....	49
WMLScript .....	49
WSP .....	49
WTLS .....	49

**X**

XHTML .....	49
XML .....	49