

White Paper

September 2006

W850



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 below 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 technology and its main applications, as well as the main functions and features of the phone.

Note: This document contains general descriptions for this specific Sony Ericsson mobile phone.

People who can benefit from this document include:

- Operators
- Service providers
- Software developers
- Support engineers
- Application developers
- Market units and sales

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Sony Ericsson Developer World

On 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 Web site 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 Web site.

Document history

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Product overview

W850 is a natural step in the Sony Ericsson 'True Music' evolution. W850 truly touches your senses as the next generation Walkman®. The everyday need for multiple devices - such as a compact mobile phone, a quality Walkman® player and a digital camera- are all in the one device with easy-to-use functionality.

Features include:

- A state of the art Walkman® player
- Dedicated music keys
- A music FM radio with RDS
- Full music track download over the air via PlayNow™
- Music recognition - TrackID™
- The latest in 3G technology for voice and video telephony
- 2.0 megapixel camera and built-in LED flash light
- Easy-to-use horizontal digital camera menu
- Web browser html
- RSS reader
- Easy content management with PictureDJ™ and VideoDJ™ and more
- 3D gaming

The slim elegant compact slider phone has a large 2-inch 262k QVGA colour screen. Memory capacity is up to 16 MB internally with a memory slot for a 1 GB Memory Stick PRO Duo™, which is included together with an adaptor in the kit at purchase. The memory card supports up to 4 GB storage capacity. The ergonomic keypad allows you to write text messages quickly, type in phone numbers or search for particular content such as songs and pictures.

You can multitask with applications running in the background, for example, listen to your favourite tracks, talk and browse, send messages or download music at the same time.

A USB cable is provided for you to synchronize or transfer files between phone and computer.

Note: To provide continuously updated information about the implemented technology and functionality of this product, this White Paper will be released in updated revisions.

Key features

2-inch colour screen

The large 2-inch (240x320 pixels) full graphic QVGA 262k colour screen enhances viewing, facilitating high-quality multimedia and entertainment.

Walkman® player 2.0

The Walkman® player converts the phone into a portable MP3 and Real® 8 player. Play music, streamed or downloaded. The folder system enables you, for example, to organize your favourite songs into groups and create simple playlists. The Walkman® key gives you direct access to your music files without having to browse the menus.

FM Radio with RDS

The FM radio is built-in and offers instant and easy access to FM radio channels.

Music recognition - TrackID™

Obtain title, artist and album information about unknown songs, such as when listening to the FM radio or recording music from an external source, using the microphone.

PlayNow™

Content such as music, video and images may be previewed before purchase. A unique direct link to download music, video, games, themes and images, which is easy to use and promises you best-selling content for mobile download. By selecting PlayNow™, you can, for example, go straight to a live list of top music hits.

It will be possible to download all formats supported in the phone. Music, video and images may be previewed before purchase. The music format is MIDI, MP3, MP4, Real 8 or WAV (Polyphonic 24 voices or more).

Disc2Phone

Music management software on the CD which is included in the kit.

You can 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 software included on the CD in the box. Search for and select music on your computer or audio CDs and convert your existing audio tracks to MP3 format.

Memory Stick PRO Duo™ slot

The memory slot supports Memory Stick PRO Duo™. Different kinds of content (pictures, audio, video clips etc.) can be stored on the memory card, and transferred to other memory cards -compatible consumer products, for example, Sony digital cameras, video cameras, portable music players, TVs, photo printers and computers.

2.0 Megapixel camera and Video call camera

There are two built-in cameras. The main camera is 2.0 Megapixel and includes 2.5x digital zoom for camera pictures, 4x digital zoom for video clips, fixed focus to take quality pictures with ease and supports a built-in LED flash. The horizontal user interface adds extra usage quality when handling the camera. The main camera captures a picture or a video clip and stores it in the phone. A picture or a video clip can be shared as a picture message with friends or family. The phone supports QCIF size video recording and streaming and QVGA playback.

Accessing video call mode via the main menu activates the VGA video call camera. The video call camera includes a 2x digital zoom.

Built-in LED flash light

Lighting conditions can be enhanced by using the built-in LED flash light, which is easily activated via the camera settings and a keypad shortcut.

RSS Reader

Really Simple Syndication (RSS) is used to deliver frequently updated content (such as news headlines) from a Web site as feeds to readers during browsing.

HTML Web browser support

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.

Gaming

Gaming is a very popular feature in mobile phones, and with Java™, users can download new games and skill levels to further enhance their entertainment experience. Several embedded games are included in the phone at purchase.

Java™

Download additional applications which are information- and entertainment- based. This gives users a chance to personalize the functions and features in their phones, and developers the opportunity to create new applications.

Bluetooth™ wireless technology

Several devices (simultaneous Bluetooth connections) can be connected up to 10 metres away using Bluetooth wireless technology. For example, when it rings, the phone can be answered with a Bluetooth headset, and images can be sent to another phone at the same time. Several mobile phones can take part in a Bluetooth-supported game and the phone and a computer can exchange data such as images, video clips, vCards, music files and calendar data. There is support for Bluetooth version 2.0.

Bluetooth audio streaming

Listen to audio from compatible devices.

Personal Information Management (PIM)

Stay up to date with everyday events by synchronizing phone contacts, calendar appointments and tasks in the phone with similar programs in a computer. The USB cable which comes with the phone, the built-in Infrared or Bluetooth feature can be used together with the synchronization software which is available on the CD in the kit or can be downloaded from www.sonyericsson.com/support.

Push email

W850 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 or MMS).

Images



Technologies in detail

This chapter includes short descriptions of the technologies available in this product compared to two other Sony Ericsson products.

Functions and features

The following includes short descriptions of the technologies available in W850 compared with the W950 and the W810.

Feature	W850	W950	W810
3D games	Yes	Yes	Yes
3G enabled Technology that enables 384 kbps data transfer and video telephony.	Yes	Yes	No
Activity menu (multi-tasking) The user can easily handle missed calls, new text and picture messages, task reminders, shortcuts and get quick access to favourite Internet bookmarks.	Yes with enhanced functionality for background applications.	Yes	Yes
Alarm clock Set a time for simple or recurring weekly alarms.	Yes	Yes	Yes
Backlight White backlight to illuminate the phone screen.	Yes	Yes	Yes
Battery	3.6V, 900mAh, Lithium Polymer	BST-33, 900mAh	3.6V, 900 mAh, Lithium Polymer
Battery charging time	At least 90% charged within 2 hours. Fully charged within 2.5 hours.	Fully charged within 2.5 hours.	At least 90% charged within 2 hours.
Bluetooth audio streaming	Yes	Yes	No
Bluetooth wireless technology Wireless connectivity between devices. Range - up to 10 metres. Support for specification of the Bluetooth System, version 2.0.	Yes with enhanced data rate (EDR)	Yes	Yes
Business card exchange Exchange contact information.	Yes	Yes	Yes
Calculator	Yes	Yes	Yes

Feature	W850	W950	W810
Calendar Calendar with day, week and month views and reminders.	Yes with enhanced functionality	Yes	Yes
Call list View calls made and received.	Yes	Yes	Yes
Camera	2.0 Megapixel	No	2.0 Megapixel
Camera active lens cover Open the cover and camera functionality starts automatically.	No	No	No
Camera auto focus The camera automatically focuses on the subject in a focus area in the screen/viewfinder.	No	No	Yes
Camera button A dedicated camera button. Press once to activate the integrated camera.	Yes	No	Yes
Camera file browser Browse the picture folder without leaving the camera function.	Yes	No	Yes
Camera flash	LED flash light for still pictures, video camera light, flash light application.	No	LED flash light for still pictures, video camera light, flash light application.
Camera keys on top When the camera is used in horizontal mode - the side buttons with camera functionality are on top, for a digital still camera feel.	Yes	No	Yes
Camera menu Easy-to-use horizontal digital camera menu.	Yes	No	Yes
Camera: Picture stabilizer Picture and video image stabilizer functionality.	No	No	No

Feature	W850	W950	W810
Chinese input method Chinese input methods: Text input methods based on Simplified or Traditional Chinese. Bopomofo, Pinyin or Stroke.	Yes	Yes	Yes
Clock On-screen clock.	Yes	Yes	No
Co-branding area	21.8 x 6.51 mm	TBI	6.5 x 20.5 mm
Code memo A safe place to store all PIN codes and other information. To access Code memo, only one PIN code is needed.	Yes	Yes	Yes
Colour	Precious Black Golden White	Mystic purple	Satin Black
Contacts Phonebook with fields for name, phone and fax numbers, email address, street address, company, title.	Yes	Yes	Yes
Conference calls Support for multiparty calling.	Yes	Yes	Yes
Connector A1 (Fast port)	Yes	Yes	Yes
Content online Downloadable pictures, games, themes, ringtones available online.	Yes	Yes	Yes
Copyright protection - DRM 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).	Yes	Yes	Yes
Design	Slider form	Stick form	Dual front

Feature	W850	W950	W810
Device Management (DM) DM utilizes GPRS as bearer (basic network connectivity needs to be in place) of the provisioning data and allows the operator to access the phone and check and set different settings such as network connectivity (GPRS), email, MMS, Internet 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) 1.2.	Yes	Yes	Yes
Digital zoom 	2.5x for pictures 4x for video clips 2x for video calls	No	4x
Email Built-in email client with inbox, outbox, compose/send messages and other functions.	Yes	Yes	Yes
EMS (Enhanced messaging) Text messaging (SMS) with support for pictures and sounds.	Yes	Yes	Yes
Exterior description Length x Width x Thickness (mm) Weight (g)	98 x 47 x 21 118	106 x 54 x 15 112	100 x 46 x 19.5 99
Fast port A system connector which enables faster data transfer between the phone and a computer.	Yes	Yes	Yes
File manager Folder structure storage to help store and organize pictures, sounds and other phone content.	Yes with enhanced functionality for camera content	Yes	Yes
Flight mode All phone radio transmitters and receivers are inactivated. This starts the phone so that only certain functions are available, such as the calendar, the Walkman® player or a game. The phone may then be used in some areas, such as aeroplanes or hospitals, where full mobile phone functionality is prohibited.	Yes	Yes	Yes

Feature	W850	W950	W810
FM radio with RDS FM radio with presets, auto and manual search. The handsfree is used as an antenna. The radio can also be used as an alarm signal.	Yes	Yes	Yes
Games download Replace in-phone games with new ones.	Yes	Yes	Yes
Games embedded	Yes	Yes	Yes
GPRS General Packet Radio Services - a communications standard enabling packet data transfer of 21.4 Kbit/s per timeslot. Multislot class 10 supported (max 5 simultaneously).	Yes	Yes	Yes
High Speed Data HSCSD - a communications standard enabling GSM data transfer 9.6 - 14.4 kbps.	Yes	Yes	Yes
Icon Desktop 12 A graphic icon desktop with 12 interactive icons.	Yes	Yes	Yes
Infrared port A wireless connector enabling you to connect the phone to a laptop or another infrared device in order to share pictures, synchronize or use the phone as a modem.	Yes	Yes	Yes
Instant messaging (Wireless Village) Chat - several people can take part in a mobile messaging session.	Yes	No	Yes
Internet blogging Share up to full-size pictures over the Internet on your personal Web page. The size of uploaded pictures is dependent on customizations.	Yes	No	No

Feature	W850	W950	W810
Internet browser	Yes	Yes	Yes
cHTML - A mobile device adapted version of the standard Internet communications protocol HTML.	Yes	Yes	Yes
Full HTML support, ECMA script, DOM levels 1 & 2, etc).	Yes	Yes	No
Progressive download of video files.	Yes	Yes	Yes
Internet security	Yes, SSL/TLS	Yes	Yes
Encrypts confidential information such as credit card and bank account numbers. Necessary for mobile banking and shopping.			
Java™	Java Platform, Micro Edition™, Java 3D™	Java Platform, Micro Edition™, Java 3D™	Java Platform, Micro Edition™, Java 3D™
Support for Java Platform, Micro Edition™ technology.			
Keys - navigation and more	8+1 navigation 2 soft Back C Activity menu Walkman® key Internet/operator	Touch screen C Walkman® key	4+1 navigation 2 soft Back C Activity menu Walkman® key
Keys - keypad	12 alphanumeric	12 alphanumeric	12 alphanumeric

Feature	W850	W950	W810
Keys and buttons - side and other	Volume/camera zoom Multimedia (play/stop button) Separate on/off Camera button Photo A/B keys: A=Camera or Video shoot mode B= Camera scenes or Video Night mode	Volume Back Multimedia (Play/stop button) Separate on/off Jog dial	Volume/camera zoom Multimedia (Play/pause button) Separate on/off Camera button
Macromedia® Flash Lite™ For impressive animated wallpapers, menus and other graphic elements.	Yes	No	Yes
Media player	See Walkman® player and Video player	See Walkman® player and Video player	See Walkman® player and Video player
Mega Bass™ An audio feature which enhances bass frequencies for better overall music experience.	Yes	Yes	Yes
Memory (built-in) User-free memory in phone.	Up to 16 MB	Up to 4 GB	Up to 20 MB
Memory Stick PRO Duo™ slot Slot for inserting a mini peripheral storage device (up to 4GB). Compatible with many cameras, computers and other devices.	Yes	No	Yes
Menu shortcuts A function making it possible to dedicate shortcuts to the most-used phone functions.	Yes	Yes	Yes
MMS (Multimedia messaging) Picture messaging with text and sound.	Yes	Yes	Yes
MMS video Support in the phone for sending video using MMS.	Yes	Yes	Yes

Feature	W850	W950	W810
Modem GSM Internet dial-up support.	Yes	Yes	Yes
MusicDJ™ A sampler music tool with MIDI drum, guitar, keyboard, bass and brass loops in different music styles, which can be combined to create polyphonic ringtones.	Yes	Yes	Yes
Music tones Music tones, also called master tones, are DRM protected music by original artists. Various digital audio formats are supported.	Yes	Yes	Yes
My friends Wireless Village server community.	Yes	Yes	Yes
Networks 3G GSM	UMTS 2100 GSM (R99) 900, 1800, 1900, E-GSM 900	UMTS 2100 GSM (R99) 900, 1800, 1900, E-GSM 900	GSM 850 (3GPP™ 31.010-1), GSM 900 (CTR 19 and CTR 20) including e-GSM mode, GSM 1800 (CTR 31 and CTR 32) and GSM 1900. GPRS and EDGE in all bands.
OMA Data Synchronization (SyncML) A device communications standard that enables remote synchronization between devices.	Yes SyncML 1.2 SyncML 1.1	Yes	Yes
OTA settings Internet, email and other settings can be sent over the air to the phone.	Yes	Yes	Yes
Photo light (built-in) When lighting conditions are poor, activate the picture light.	Yes	No	Yes

Feature	W850	W950	W810
PhotoDJ™ A drawing tool in the phone where new pictures and existing pictures and photos can be altered.	Yes	Yes	Yes
Picture gallery A thumbnail view image gallery where sections of several pictures can be viewed at the same time.	Yes	Yes	Yes
Picture phonebook Add a picture to a saved contact. The picture appears on the screen when the saved contact calls.	Yes	Yes	Yes
PlayNow™ (direct link) Listen to music before you purchase and download to your phone.	Yes	Yes	Yes
PlayNow™ Games (direct link) Preview games straight from the phone desktop in three clicks before you purchase and download.	Yes	Yes	Yes
Polyphonic ringtones	40 tones	40 tones	40 tones
Predictive text input	Yes	Yes	Yes
Push email	Yes OMA email notification IMAP Idle	Yes OMA email notification IMAP Idle	No
RSS Reader Frequently updated content delivered as feeds via a Web site, for example, news headlines in the browser.	Yes	Yes	No
Screen Type: Size: Resolution: Technology: Colours displayed together: Backlight colour:	Full graphical 2.0 inches 320 x 240 pixels TFT, QVGA 262,000 (18 bit) White	Full graphical 2.6 inches 320 x 240 pixels TFT, QVGA 262,000 (18 bit) White	Full graphical 1.9 inch 176 x 220 pixels TFT 262,000 (18 bit) White

Feature	W850	W950	W810
Screen saver	Yes	Yes	Yes
Settings download (Ready to run) Set up functions, such as the Internet browser and picture messaging, that require a connection to the Internet. This function runs in the setup wizard or can also be chosen in the Settings menu. This function is not included in the setup wizard for customized phones.	Yes	Yes	No
SIM card lock The possibility to protect the SIM card with a four-digit PIN code.	Yes	Yes	Yes
SMS long (Text messaging) Concatenated SMS text messaging.	Yes	Yes	Yes
Sleep mode A power-saving feature that minimizes battery power consumed when the phone is in standby.	Yes	Yes	Yes
Sony Ericsson Remote Update Service Download the latest operator-approved software, over the air, for your mobile phone.	Yes	No	Yes
Sony Ericsson Update Service Connect the phone to an Internet-connected computer, download the latest operator-approved software from the web, www.sonyericsson.com/support , and update your mobile phone.	Yes	Yes	Yes
Sound recorder A recording device in the phone that can record voice messages or other sounds.	Yes	Yes	Yes
Speakerphone	Yes	Yes	Yes
Speed dialling Allocate contacts in the phone book to specific keys on the keypad.	Yes	Yes	Yes
Standby time	Up to 350 hours	Up to 340 hours	Up to 350 hours

Feature	W850	W950	W810
Status view The screen shows the network being used, the time and other status information	Yes	Yes	Yes
Stopwatch	Yes	Yes	Yes
SVG Tiny 1.1 Scalable Vector Graphics for impressive animated wallpapers, menus and other graphic elements.	Yes	Yes	Yes
Synchronization PC Synchronize and share phone content with a computer.	Yes	Yes	Yes
Talk time	Up to 7 hours	Up to 7.5 hours	Up to 8 hours
Tasks Keeps track of important things you have to do.	Yes	Yes	Yes
Themes Phone menu texts and background graphics.	Yes	Yes	Yes
Timer Set the phone to alert after a specific time.	Yes	Yes	Yes
Twin camera Two cameras - a video camera optimized for video calling located above the main screen and an additional camera capable of taking still pictures and recording video clips.	Yes	No	No
UMTS A 3G technology standard capable of data transfer 384 kbps.	Yes	Yes	No
USB connectivity support Connect the phone to a computer with the USB cable provided and the memory in the phone appears on the computer screen as a mass storage device.	Yes	Yes	Yes
Vibrating alert The phone vibrates when a call comes in.	Yes	Yes	Yes

Feature	W850	W950	W810
Video call camera	Yes	No	No
Video calling When you make a video call, the recipient can be seen in the screen. The service requires UMTS/WCDMA.	Yes	No	No
Video call talk time	1 hour 55 mins	No	No
VideoDJ™ Create video sequences by combining different clips and adding music and images.	Yes	Yes	Yes
Video player Play video clips, streamed or downloaded. Record and transfer video clips to another phone or a computer via available transfer method.	Yes	Yes	Yes
Video streaming Real-time streaming of video, for example, live cam. Media can also be downloaded and saved in the phone memory.	Yes	Yes	Yes
Viewfinder When using an in-phone camera or snap-on accessory camera, the picture can be previewed before it is captured.	Yes	N/A	Yes
Voice control Voice answer, reject and call. Assign voice commands to items in the phonebook and when a call is made, the voice command can be used instead of pressing keys.	Yes	Yes	Yes
Voicemail Support for voicemail operator service including automatic answering and message recording.	Yes	Yes	Yes
Walkman® player A digital music player. It is possible to play music files in the folder system, organize your favourite songs into groups and creating simple playlists. A play and stop function simplifies listening.	Yes	Yes	Yes

Feature	W850	W950	W810
Walkman® key Get direct access to your music files without having to browse the menus. Press the Walkman® key to gain direct access to the Walkman® player.	Yes	Yes	Yes
WAP 1.2.1 A mobile Internet standard to access specially designed Internet sites.	Yes	Yes	Yes
WAP 2.0 XHTML A mobile Internet standard to access specially designed Internet sites. WAP 2.0 supports colour and interactive lists.	Yes	Yes	Yes

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 Release 99 recommendations. GSM 900, GSM 1800, EGSM and WCDMA FDD mode supported, 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, UMTS SIM - 3GPP TS 31.101. Small plug-in card, 1,8 V and 3 V.
Memory	Up to 16 MB internal (depending on software configuration/file content) + slot for Memory Stick PRO Duo™.
Data transfer speeds	Up to 384 kbps (downlink) Up to 384 kbps (uplink)

Performance and technical characteristics

Dimension	WCDMA	GSM 900/ E-GSM 900	GSM 1800	GSM 1900
Frequency range (MHz)	TX:1920 – 1980 RX:2110 – 2170	TX: 880 – 915 RX: 925 – 960	TX: 1710 – 1785 RX: 1805 – 1880	TX:1850 –1910 RX:1930 – 1990
Channel spacing	5 MHz with 200 kHz channel rasters	200 kHz	200 kHz	200 kHz
Number of channels	277	174 Carriers *8 (TDMA)	374 Carriers *8 (TDMA)	299 Carriers *8 (TDMA)
Modulation	QPSK	GMSK	GMSK	GMSK
TX Phase Accuracy	Error Vector Magnitude: <17.5%	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)
Duplex spacing	190 MHz	45 MHz	95 MHz	80 MHz
Frequency stability	+/- 0.1 ppm	+/- 0.1ppm	+/- 0.1ppm	+/- 0.1ppm
Voltage operation (nominal)	3.6 V	3.6 V	3.6 V	3.6 V
Transmitter RF power output	24dBm Class 3 (0.25 W peak)	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	50 ohm

Dimension	WCDMA	GSM 900/ E-GSM 900	GSM 1800	GSM 1900
Transmitter Spurious emission (according to specification)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to 3GPP spec.)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz	< - 30 dBm	< - 30 dBm
Receiver RF sensitivity	Better than - 106.7 dBm @ 12.2 kbps CS voice	Better than - 102 dBm	- 102 dBm	- 102 dBm
Receiver RX Bit error rate	< 0.1%	< 2.4%	< 2.4%	< 2.4%

USSD technical data

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

GPRS technical data

Dimension	Support
Compatible GPRS and SMG specifications	Release 99 according to ETSI specification
Data rates	Multislot class 10 supported (max 5 simultaneously) CS-1, CS-2, CS-3, CS-4 9,050 bps, 13,400 bps, 15,600 bps, 21,400 bps supported (network-dependent).
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

Dimension	Support
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, GEA3
Support of compression algorithms	Yes, V42bis and IP header compression.
Mode of operation	Class B and Class C modes of operation supported. DTM Mode supported (subset of class A).
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
PDP context	10 PDP context descriptions stored in mobile PDP context description is edited via application in mobile, AT-command or via OTA Simultaneous PDP contexts are supported, maximum 4.
SIM	GPRS aware, as well as non-GPRS aware; SIM cards are supported.
AT commands	Some of the supported commands: AT+CGDCONT - DEFINE PDP CONTEXT AT+CGEQREQ - Quality of Service Profile (REQUESTED) AT+CGEQMIN - Quality of Service Profile (Minimum Acceptable) AT+CGATT - PACKET DOMAIN SERVICE ATTACH OR DETACH AT+CGACT - PDP CONTEXT ACTIVATE OR DEACTIVATE AT+CGDATA - ENT For more information, see www.sonyericsson.com/developer ,

SIM AT services supported

Service	Mode	Support
CALL CONTROL BY SIM		Yes
MO SMS CONTROL		No

Service	Mode	Support
DATA DOWNLOAD TO SIM	Cell Broadcast SMS	Yes Yes
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

Service	Mode	Support
POLLING OFF		Yes
POLL INTERVAL		Yes
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
		1 = SMS packing by the ME required
SEND SS		Yes
SEND USSD		Yes

Service	Mode	Support
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
SET UP EVENT LIST	'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
	'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
SET UP IDLE MODE TEXT	'08' = Browser termination	Yes
	'09' = Data available	Yes
	'0A' = Channel status	Yes
		Yes, 1 row of text is supported
SET UP MENU		Yes
TIMER MANAGEMENT		Yes
OPEN CHANNEL		Yes
CLOSE CHANNEL		Yes
RECEIVE DATA		Yes

Service	Mode	Support
SEND DATA		Yes
GET CHANNEL STATUS		Yes

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 timeout 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 screen 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 will see 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 will see the text 'Setting up a call current call will be disconnected'. If the 'OK' key is pressed the current call will be 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 will be available for selection, in the same way as the Select Item command.

Entertainment

Walkman® player 2.0, Video player

File types	Formats	Extensions
Audio	AAC, AAC+, Enhanced ACC+ MP3 (192 kbit/s for local playback) MP4 M4A 3GP AMR WAV G-MIDI (level 1 with 40 voices polyphony) IMY (in file manager only) EMY (in file manager only) RealAudio® 8 WMA 10 (Windows Media Audio)	.mp4, .3gp .mp3 .mp4 .m4a .3gp .amr .wav .mid .wma
Video (including audio part)	MP4 (video: MPEG4, audio: AAC) 3GP (video: MPEG4 or H.263, H.264, audio: AAC or AMR) RealVideo® 8	.mp4 .3gp
Streaming transport	RTSP according to 3GPP	
Video coding	MPEG-4 Simple Visual Profile Level 0 H.263, H.264 Baseline Profile Level 1, RealVideo 8, WMA 10 (Windows Media Audio)	
Audio decode	AAC, AMR, MPEG layer 3, RealAudio 8	
Features	Automatic loop of songs in playlist Automatic pause on telephone call	
Ringtone file formats	MIDI (General MIDI 1, SP-MIDI) E-Melody I-Melody AMR-NB MP3 MP4 3GP M4A WAVE RHZ XMF	

Imaging/Messaging

2.0 Megapixel camera

Facts and figures	
Picture sizes (resolution)	VGA (640 x 480 pixels) 1 Megapixel (1280 x 960 pixels) 2 Megapixel (1600 x 1200 pixels)
Colour depth	24 bit (8 bit per RGB channel), 262k colours
Camera memory	Using phone memory or Memory Stick PRO Duo™; no memory dedicated to the camera only.
Digital zoom	2.5x with VGA picture size
Photo light	Yes
Auto focus	No
Night mode	Yes
Self-timer	Yes
Effects	Negative/ Sepia/ Black&White/ Off
White balance	Auto/ Incandescent/ Fluorescent/ Daylight/ Cloudy
Picture quality	Choose between Normal and Fine
Time and date	Add a time and date to a picture
Macro setting	No
Video recorder	
Video sizes	176 x 144 128 x 96
Video shoot mode	For picture message/ High quality video
Digital zoom	4x
Format	.3GP
Frames per second	10

Video call camera

Facts and figures	
Picture sizes (resolution)	176 x 144 pixels (QCIF) 128 x 96 pixels (SQCIF)
Digital zoom	2x
Night mode	Yes

Facts and figures

White balance	Yes
Brightness	Yes
Video coding	H.263 (Profile 0) MPEG4
Audio coding	AMR

Pictures and animations

Formats	JPEG, BMP, GIF (including animated), PNG, WBMP, Macromedia® Flash® and Scalable Vector Graphics
Sharing via	IR, Bluetooth, MMS, email, computer file transfer 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	

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, default is VGA	24 bit	
WBMP				

Short Messaging Service

Feature	Support
SMS Service Centre Number	It is possible to pre-load the SMS Service 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.
Reply to messages	It is possible to reply to received messages by SMS, MMS, voice message.
Input methods	Predictive writing and multitap.
Copy 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 predefined 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 requested when sending).
forward the message	Yes
save the message on SIM	Yes
know the remaining capacity storage	Yes, > 95% full warning, capacity on SIM when saving to SIM.
Possibilities of the previously received message:	
reply to the sender	Yes (only to the sender, not to all or part of the message recipients).
save the message in the inbox	Yes
forward the message	Yes

Feature	Support
know the remaining capacity storage	Yes, > 95% full warning, capacity on SIM when saving to SIM.
Supported ways for replying to a received SMS:	
via SMS, MMS, voice message	Yes
via phone call (set up a call to the number contained in the message body)	Yes
via WAP call (go to the WAP address contained in the message body)	Yes
via USSD session	No
Print via infrared	No
Possibility to enable the user to send an SMS to a list of recipients	Yes.
Possibility to write an email address as a recipient address	Yes, if email gateway is present.
SMS storage	On the SIM and in the phone.
Nokia Picture Messaging	Yes

Enhanced Messaging Service - Unified

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	10
Capacity storage	Up to 1000 and the space on the SIM card.
Outgoing messages	<p>It is possible to...</p> <ul style="list-style-type: none"> • see how many short messages an EMS message consists of before sending it. • choose whether to send the message or not after writing it.
Incoming messages	<ul style="list-style-type: none"> • A signal is heard once all parts of the message have been received or when a timeout occurs. • 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.

Feature	Support
Delivery report for concatenated messages	A receipt is received in the handset when all parts of a concatenated message have been delivered if a delivery report is requested when it is being sent.
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	It is possible to... <ul style="list-style-type: none"> • receive (always), send via EMS (if not copyright protected). • download melodies and commercial tunes from WAP/WAP portals.
WBMP	Yes
Picture sizes	16x16, 32x32 pixels, variable size in black and white.
Pictures	It is possible to... <ul style="list-style-type: none"> • edit pictures using PhotoDJ™. • receive (always), send via EMS (if not copyright protected). • download pictures from WAP/WAP portals.
Animations	There is support for 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. It is possible to... <ul style="list-style-type: none"> • send and receive animations.
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 MMS profile. An MMS profile 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"> • MMS/CSD: Yes • MMS/GPRS: Yes
Possibility to configure the MMS parameters by OTA provisioning	<ul style="list-style-type: none"> • MMS/CSD: Yes • MMS/GPRS: Yes

Feature	Support
Possibility for all the parameters from the parameters set to be OTA provisioned at the same time	<ul style="list-style-type: none"> • MMS/CSD: Yes • MMS/GPRS: Yes
Possibility for only one parameter, in the set of parameters, to be OTA provisioned	<ul style="list-style-type: none"> • MMS/CSD: No • MMS/GPRS: No
OTA provisioning solution	OTA Settings Specification v7.1 © Ericsson and Nokia and OMA provisioning
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 and OMA provisioning
Functionalities that the user is able to set during message composition:	<ul style="list-style-type: none"> • message subject • message priority • email recipient address • message Cc, Bcc recipient(s) address(es) • delivery report request • read report request • MSISDN recipient address • Delivery time • Validity period
From where can the user insert multimedia elements into multimedia messages:	File Manager directly from camera Contacts Calendar Task Note Browser (vBookmark)
Possibility for sent messages to be memorized into a folder in handset memory	Yes
Actions that the user can perform after message retrieval:	<ul style="list-style-type: none"> • reply to the sender of the message SMS/MMS • reply to the sender and to Cc, Bcc people SMS/MMS • forward the message MMS • delete the message • save message into terminal • call the sender of a message • Save item • Mark as unread • Details
Multimedia codecs/formats supported for audio	AAC, AMR, MPEG Layer 3, Real 8, AWB, WAV, MP4, MIDI, iMelody, 3GPP, XMF, M4A, RHZ.
Multimedia codecs/formats supported for video	MPG4, 3GPP, SDP, Real 8

Feature	Support
Multimedia codecs/formats supported for image	JPEG, GIF87, GIF89A, PNG, SVG, WBMP, BMP, Shockwave Flash.
Supported formats for message presentation:	<ul style="list-style-type: none"> message body + attachments (email presentation) SMIL version as described in OMA MMS IOP document version 1.2
Maximum message size that can be handled by the handset for message	Content Class and Creation mode are applied. Maximum size can also be customized.

Email client technical data

Feature	Support
Bearer type UTMS (IP)	Yes
Bearer type GSM Data (IP)	Yes, HSCSD, ISDN and analog
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, ISO-2022-JP Cyrillic: KOI8-R Simplified Chinese: GB2312, GB18030 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	Yes
Message management	Window of 50 latest messages Headers only or size limits
ESMTP	Yes
Background sending	Yes

Connectivity

Bluetooth technical data

Dimension	Support
Bluetooth capability statement	This phone supports Bluetooth Specification, version 2.0 with enhanced data rate (EDR).
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 JSR-82 Java API Object Push Profile Personal Area Networking Profile Serial Port Profile Synchronization Profile SyncML OBEX binding Advanced Audio Distribution Profile (A2DP) Audio/Video Remote Control Profile Phonebook Access Profile
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	Class 2, typical +3dBm or 2mW
Frequency band	2.4 GHz - the unlicensed ISM band.
Power consumption	GSM host processor excluded: <ul style="list-style-type: none"> • Standby, Bluetooth On mode: <0.5mA • Voice to headset (HV3): 15 mA (11 mA with EDR functionality, 2EV3). Dependent on various parameters such as whether the phone is master or slave. • Data mode average: 27mA at 172.8 kbps symmetrical
Data transmission rate	Up to 600 kbps asymmetric and up to 350 kbps symmetric from an application level.

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 SyncML 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, Bookmarks:vBookmark 1.0
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 (for example, username and password) to access the remote database.	Yes
Configuration parameters that can be entered/modified by the user.	Server URL, Username, User PWD, Paths to databases (Calendar, Contacts, Tasks, Notes and Bookmarks), 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 1.2
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

Web browser data

Feature	Support in the browser
Back/forward to previous/next page	Yes
Bearer type GPRS	Yes
Bearer type GSM Data	Yes, HSCSD, ISDN and analog.
Bookmarks	Yes, with 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).
Character sets *	<p>UTF-8 (Default), UTF-16, USASCII, Latin1, UCS2.</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
Home page	Yes, up to 10 different; one for each Internet profile.
HTML version for WAP browser	<p>XHTML, Mobile Profile 1.2</p> <p>Full HTML is supported</p> <p>ECMA Script is supported</p> <p>DOM level 1& 2 is supported</p> <p>WAP 2.0/WML 1.3</p>
Hyperlinks in Text	Yes, highlighted as blue underlined text.
Hyperlinks in Images	Yes, indicated by a frame
Image Animation	Yes
Image Formats	GIF (interlaced and non-interlaced) WBMP, no transparent layers, JPEG, PNG, BMP and SVG.
Network Settings	Up to 10 different settings available by selecting WAP profile (Internet, Banking, Gateway etc.).
OTA Support	Yes
PPP Authentication	PAP, CHAP supported.
Reload page	Yes

Feature	Support in the browser
Security	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
Tables	Yes
User Agent Profiles	Yes, list of client characteristics - for example screen size.
Internet profiles	Dynamic - up to 10 WAP profiles, each with its own settings.

Web browser and Operator technical data

Feature	Support for browser
Web browser	
Version	2.0 baseline
HTML	XHTML Mobile Profile
Access NetFront 3.3	<ul style="list-style-type: none"> HTML 4.01, XHTML 1.1 Including mobile phone CSS 1 & CSS 2 (Partial) ECMAScript 3rd edition (equal to Java script 1.5) DOM level1, level2 and Dynamic HTML (Partial) Graphic formats: GIF, Animated GIF, JPEG, progressive JPEG, PNG, MNG, BMP, WBMP
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 browser	
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 www.openmobilealliance.org).
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 WAP profile or to replace an existing WAP 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 browser	
OTA via SMS	Same interface as above.	If the settings previously installed were privileged or have higher priority, it might not be possible to install the settings 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 SSI/TLS connections and digital signatures.	
SWIM certificate	Both client and trusted certificates can be used for digital signatures.	
Applicative provisioning		
Preferred bearer customization	Yes	
Email customization	Yes	
Other applications/features	Yes (MMS, SyncML, Wireless Village, OMA Device Management, Push To Talk).	
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 browser
SL reception warning	The user can choose whether 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	Depends on the size of the push messages. Around 20 push messages with a size of 500 bytes can be stored.
Push deactivate	Yes (Messaging/Settings/Push/Allow push msg).
Dynamic push menu changes	No. There are no changes in the menus when activating/deactivating push.
Security	
Mechanisms for push	None
Trust with PPG	Sending a SIA is the most reliable.
WSP push sessions	The White List is supported.
Denial of service/spoofing	
User agent profile	
UA profile content sent at beginning of WSP session	No
OA profile content size	
URL sent pointing to the UA profile at the beginning of WSP session	Yes
URL location	On the manufacturer Internet site.
WTAI	mailto:scheme smsto:scheme mmsto:scheme
WTA Make Call	Yes
WTA Send DTMF	Yes
WTA Add Phone Book	Yes
DOWNLOAD	
OMA download functionality	Yes
HTTP GET solution to download content	Yes
Other download content	Yes. No download limit when using HTTP protocol.
Download application/product memory check	Yes

Feature	Support for browser
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, manage.
Object formats	Formats supported in the phone.

GRAPHICAL USER INTERFACE

Man Machine Interface

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	Not displayed but the “http://” is added automatically to the URL.

Elements

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
Java™ Platform, Micro Edition	<ul style="list-style-type: none"> • CLDC 1.1 (JSR 139) • MIDP 2.0 (JSR 118) • Wireless Messaging API (JSR 120/205) • Mobile Media API (JSR 135) • Java™ Technology for the Wireless Industry (JSR 185) • Java™ API for Bluetooth (JSR 82) • PDA Optional Packages for Java™ ME platform (JSR 75) • Web Services (JSR 172) • Advanced Multimedia Supplements API (Camera Capabilities of JSR-234)
Java 3D	<ul style="list-style-type: none"> • Mascot Capsule Micro3D Version 3 • Mobile 3D Graphics API for Java™ ME platform (JSR 184)

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.

Deck

A collection of WML cards.

DRM

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

DTMF or Touch Tone

Dual Tone Multi-Frequency signal – codes sent as tone signals. Used for telephone banking, accessing an answering machine, etc.

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 GSM's core 900 frequency band. This extension provides increased network capability.

EDR

Enhanced Data Rate.

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.

FM

Frequency Modulation of the (radio) carrier wave.

FR

Full Rate, speech coding.

GIF

Graphics Interchange Format.

GPRS

General Packet Radio Services.

GSM

Global System for Mobile Communications. GSM is the world's most widely used digital mobile phone system, now operating in over 100 countries around the world, particularly in Europe and Asia-Pacific.

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.

IrDA

Infrared Data Association.

JPEG

Joint photographer expert group.

MIDI

Musical Instrument Digital Interface.

ME

Mobile Equipment.

MMI

Man-Machine Interface. See UI.

MP

Megapixel.

MP3

MPEG-1 layer 3. An effective audio coding scheme.

MPEG4/MPG4

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.

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.

RDS

Radio Data System.

RSS

Really Simple Syndication.

RTSP

Real Time Streaming Protocol session control.

SDK

Software Development Kit

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. The phone uses the small plug-in card.

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.

SS

Supplementary Services.

SSL

Secure Socket Layer.

TLS

Transport Layer Security.

UI

User interface.

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, voicemail, Web browsers, telephony applications, call centres, conferences, PIMs /PDAs, pagers, fax, office equipment and smart cards. vCard is specified by 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. A collection of cards is called a deck, which usually constitutes a service.

WAP Application

A collection of WML cards, with the new context attribute set in the entry card.

WAP service

A WML application residing on a Web site.

WAV

Waveform Audio.

WBMP

Wireless BitMap.
A graphic format optimized for mobile computing devices.

WMA

Windows Media Audio.

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

WWW

World Wide Web

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/
- www.ericsson.com/mobilityworld/
- www.midi.org
- www.extendsystems.com
- www.gsmworld.com/
- www.bluetooth.com
- www.imc.org
- www.3gpp.org
- www.irda.org
- www.etsi.fr
- www.openmobilealliance.org
- www.imc.org/pdi/
- www.w3.org/TR/xhtml1-basic/
- www.java.sun.com
- www.memorystick.org/
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