White Paper

Preliminary version - PA4

W950

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

Preliminary version - PA4

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 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		
2006-05-12	Version PA1	First preliminary version.
2006-05-21	Version PA2	Updated after fact review
2006-05-30	Version PA3	Updated after language review
2006-06-08	Version PA4	Updated after Product Planning/Product Management review

Preliminary version - PA4

Contents

Preliminary version - PA4

Product overview

The W950 is a slim, compact, stylish Walkman® phone built on the Symbian operating system.
A 4 GB built-in memory, large touch screen and dedicated music keys support the music experience and positions the W950 as the top of the line Walkman® phone.

3G makes surfing the Web on the go a fast and satisfying experience. The Opera™ 8.0 Web browser in combination with the touchscreen makes the interactive mobile Internet pure pleasure.

For PC synchronisation or transferring files between the phone and a computer, a USB cable is provided in the kit. W950 supports USB high-speed mode, allowing transfer of gigabytes of files in only minutes.

W950 uses multitasking to allow you to perform several actions at once, for example you can listen to music while browsing the Web, or work with PIM applications during a phone call.

Key features

2.6-inch colour touchscreen

The large 2.6-inch (240x320 pixels) full graphic QVGA 262k colour touch-sensitive screen enhances viewing and navigation, facilitating high-quality multimedia and entertainment.

Walkman® player

The Walkman® player converts the phone to a portable eAAC+, AAC+, AAC, MP3 and WMA player. Dedicated hardware keys and a rich graphical interface that supports album arts and lets you pick an album with the tap on the screen, makes the W950 a state of the art portable music machine.

4 GB Media memory

The W950 has a built-in 4 GB solid state flash memory that can hold up to 4000 songs in eAAC+ format or around 1000 songs in MP3 format. The Media memory is accessible from a PC using USB High speed which permits a transfer of files at 480 Mbps. This means that a gigabyte of data can be transferred in only around three minutes.

Opera™ 8.0 web browser

Opera 8.0 allows full HTML browsing and supports all de facto standards. It features normal or small screen rendering as well as full screen view.

FM Radio with RDS

The FM radio with RDS (radio data system) offers instant and easy access to FM radio channels. RDS information which is sent out by the currently tuned-in radio station, is displayed directly on the screen. Just plug in the handsfree that works as an antenna and start listening to your favourite station. The radio can also be started by the alarm clock.

Music recognition

A music clip is recorded from the FM radio or Sound recorder, and sent to the TrackID™ Internet service to get the song title, artist and album name, if available.

Gaming

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 embedded games included in the phone at purchase.

UIQ 3.0 / Symbian 9.1 operating system

UIQ 3 is a media-rich, flexible and customizable software platform, pre-integrated and tested with Symbian OS v9. The Symbian OS makes it possible to add useful applications to the phone including navigation, travel and organizer enhancements.

JAVA™

Download extra content with Java™, for example, new information- and entertainment-based applications. This gives users a chance to personalize the functions and features in their phones, and developers the opportunity to create new applications.

Preliminary version - PA4

Disc2Phone

Music management software on the CD which is included in the kit. Music files can be transferred from a computer to the phone. Search for and select music on your computer or audio CDs and convert your existing audio tracks to MP3 format.

PlayNow™ 3.0

PlayNow™ is a direct-link download application. PlayNow users can connect to a live list of top music hits, videos, games and pictures. Content can be previewed before purchasing.

Video player

The Video player supports MPEG4, 3GPP, RealMedia and Windows Media Video 9. It is possible to play locally stored video clips as well as streaming content from the Internet.

Portable Handsfree with remote control

The Walkman® player and the FM radio can be controlled with the stereo portable handsfree remote controller. The remote controller has Play/Pause, Volume up/down, FF/next song or station and REW/ previous song or station. Calls can be received while listening to music.

Bluetooth™ wireless technology

Several devices (simultaneous Bluetooth connections) can be connected to W950 using Bluetooth wireless technology up to 10 metres away. For example, the phone can be answered with a Bluetooth headset when it rings 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, business e-cards, music files and calendar data. The W950 also supports real time transferring of stereo audio to, for example, a stereo Bluetooth headset.

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 available on the CD in the kit or from www.SonyEricsson.com/support.

Push email

The push email clients for the major operator solutions are supported in W950.

Controls and operation

A	On/off button	G	Cancel button
B	Jog Dial	H	12 keys - alphanumeric
C	Back button	I	Volume control. Press and hold to skip to previous or next music track or radio station
D	Walkman® player indicators (not shown)	J	Multimedia play/stop button
E	Walkman® launch button		

Walkman®

A press on the dedicated Walkman® button, immediately opens the Walkman® player in play view. Navigation is easy and instinctive. When the Walkman player is launched, symbols light up on the front, clearly showing how the top three keys on the keypad are used to play/stop and skip to previous or next track. A dedicated play/stop button and a combined volume key and previous/next button on the side of the phone makes it easy to operate the Walkman® player with the phone still in the pocket.

The combination of the large touch-sensitive screen and a graphically rich interface that includes album arts, makes browsing the music collection intuitive.

Preliminary version - PA4

Standby view

The Standby view is displayed when W950 starts.

Standby view Screen
TBD

The Standby view acts as the starting point for tasks performed on W950, it does this by linking to the feature rich applications of the phone.

The Standby view is highly customizable, just about every aspect of its appearance, content, navigation methods and behaviour can be changed.

Multitasking

It is possible to have several applications open on W950 at any time. An open application can either be closed using the back key or simply left open.

Selecting Task manager displays a list of open applications. To return to an open application select it from the Task manager or the Main menu.

Editing features to move text from one application to another can be used.

Text input methods

There are four text entry methods:

- Keypad prediction - keypad based predictive text input.

- Handwriting recognition - using the stylus to write characters directly on the screen.

- On-screen keyboard - a virtual keyboard that can be launched from the status bar.

- Multitap - standard Multitap keypad input (only available when Handwriting recognition or the On-screen keyboard is active).

Keypad prediction

Keypad prediction allows words to be entered by a single press of a key to input any of the letters associated with that key. When using keypad based predictive text input, the primary word suggestion is presented where you are writing; additional suggestions are presented in a pre-edit box at the top of the screen.

Word suggestions and next word suggestions

Word suggestions and next word suggestions are optional text prediction functions that a user can enable or disable for all input modes, independently. As with keypad prediction, primary word suggestions and next word suggestions are presented where you are writing, with additional suggestions presented in a pre-edit box at the top of the screen.

For the input methods of Handwriting recognition, On-screen keyboard and Multitap, the functions of word suggestions and next word suggestions are complimentary. This means that when entering text via one of these methods, you have the option to select one of the suggested words displayed, or to ignore them and continue entering text normally.

Additionally if you mistype or misspell a word using one of these input methods, when the word suggestions functionality is enabled the pre-edit box may also suggest closely matching words. These words would either be from one of your selected language dictionaries, from a word you may have previously typed, or from items that you have added to your 'My words' personal dictionary.

Flight mode

UMTS, GSM or Bluetooth™ connection from a mobile phone may be harmful to the safe operation of an aircraft.

Flight mode is a special mode that disables all radio transmissions, but still allows the user to listen to music, use PIM applications and play games.

Miscellaneous

Models

Standard W950
- Europe, Middle East, Americas, Latin Asia
- Latin, Cyrillic, Hebrew and Arabic keypad available
- Latin character handwriting recognition

- *TBD*

Accessories

W950 supports a large range of accessories. See "Accessories" on page 48.

Manuals

A User guide, Quick guide and a Web guide for W950 will be available on www.sonyericsson.com/support. The Web guide offers more in depth information on W950 functionality.

Languages

The languages for W950 will be available on the Internet for download on www.sonyericsson.com/support.

Preliminary version - PA4

Images

Product comparison

The Sony Ericsson W950 and M600 have important differences in both hardware and software.

The W950 is a Walkman® phone aimed at the music-loving Professional and Selective Pioneer—combining a sleek mobile phone with a serious music player.

M600 is a compact messaging phone, with an innovative dual function keyboard. M600's main focus is messaging with push email functionality.

Preliminary version - PA4

Overview

W950:

M600:

- Is a Walkman® phone built on the platform UIQ 3.0 and Symbian 9.1.
- Incorporates Walkman® player with album arts and graphic equalizer—providing a dedicated music user interface.
- Is targeted at music-loving Selective Pioneers.
- Comes with a **4 GB in-built flash memory (holds up to 4000 songs)**
- Has a built-in FM radio with RDS support.
- Has extended services such music recognition from the FM radio and Sound recorder. The user can obtain title, artist and album information about unknown songs.
- Supports USB 2.0 high speed for fast transfer from PC.
- Supports OMA DRM phase 2.
- Supports streaming stereo audio over a Bluetooth connection.
- Comes with a stereo headset with remote control,
- and music management Disc2Phone software.

- Is a messaging phone built on the platform UIQ 3.0 and Symbian 9.1.
- Is a phone whose users can receive, handle and send email conveniently and efficiently.
- Is targeted at Rational and Selective Pioneers
- Has a unique dual function QWERTY keyboard. This concept allows users to switch between numeric and alphabetic input modes.
- Supports the push email clients for the major operator solutions.
- Is supplied with VPN software to ensure security.
- Is supplied with a 64 MB Memory Stick Micro™ (M2™).

Added and removed features

Hardware

Added to W950

– Flush 12-key alphanumeric keypad. Also, Walkman® launch button and C (cancel) button.

– Volume control and multimedia play/stop button.

– Dedicated illuminated Walkman® player indicators on the keypad.

– 4 GB internal memory.

– USB High speed support.

In M600, but not W950

– Dual function keyboard.

– Slot for memory stick.

– Personalizable Internet button.

Software

Added to W950

– Walkman® player instead of Media player.

– RDS FM radio.

– Digital Rights Management (DRM) phase 2.

In M600, but not W950

– CDC Java.

Comparison table

	W950	M600
Hardware		
Size (mm) and weight	106 x 54 x 15, 112g	107 x 54 x 15, 112g
Colour	Mystic purple	Granite black, crystal white
System	Dual mode UMTS 2100-GSM 900/1800/1900	Dual mode UMTS 2100-GSM 900/1800/1900
Battery	BST-33	BST-33
Talk time (hours)	GSM up to 7.5 hours UMTS up to 2.5 hours	GSM up to 7.5 hours UMTS up to 2.5 hours
Stand-by time (hours)	GSM up to 340 hours UMTS up to 250 hours	GSM up to 340 hours UMTS up to 250 hours
Music mode (hours)	10 hours	
Operating system	Symbian™ OS V9.1	Symbian™ OS V9.1
MMI	UIQ 3.0	UIQ 3.0
Display	2.6" 320 x 240 pixels QVGA, 262 k colour TFT touchscreen	2.6" 320 x 240 pixels QVGA, 262 k colour TFT touchscreen
Jog Dial	3 way	3 way
RAM memory	64 MB	64 MB
Flash memory	128 MB	128 MB
Application CPU	ARM9	ARM9
User memory internal	80 MB + 4 GB	Up to 80 MB (without 3D games)
User memory external	No	64 MB Memory Stick Micro™ (M2™)
Key lock key	No	No
Back key	Yes	Yes
Play key	Yes	No
Backlight in keyboard	Yes	Yes
Connectivity	USB 2.0 high speed (up to 480 Mbps) USB mass storage support USB charging support IrDA Bluetooth 2.0	USB 2.0 full speed (up to 12 Mbps) USB mass storage support USB charging support IrDA Bluetooth 2.0
Software		
Music	Walkman® player.	Media player.
Browser	Opera 8.0 browser that supports frames and Javascript.	Opera 8.0 browser that supports frames and Javascript.
Symbian	9.1	9.1
UIQ	3.0	3.0
Multitasking	Yes	Yes

Preliminary version - PA4

Audio formats	MP3, AAC, AAC+, eAAC+, AU, iMelody, AMR, RMF, DLS, Real Audio, G-MIDI level 1 with 40 voices polyphony, WAV, XMF and WMA (Windows Media Audio).	MP3, AAC, AAC+, eAAC+, AU, iMelody, AMR, RMF, DLS, Real Audio, G-MIDI level 1 with 40voices polyphony, WAV, XMF.
Video formats	MP4 (MPEG4 and AAC-LC), 3GP (H.263 AMR NB and AAC), Real Audio Video and Windows Media Video 9 (WMV).	MP4 (MPEG4 and AAC-LC), 3GP (H.263 AMR NB and AAC) and Real Audio Video.
Image editor	Yes	Yes
Packaging		
Memory Stick	No	64 MB Memory Stick Micro™ (M2™) Includes Try and Buy applications
Case and cleaning cloth	TBD	TBD
CDs	Yes PC Suite Try and Buy applications	Yes PC Suite

June 2006

Preliminary version - PA4

Technologies in detail

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

Multimedia

Walkman® player

The keypad and dedicated hardware buttons are used to start and stop playback, switch tracks and adjust volume. A remote control on the handsfree, lets you use the Walkman® player without even taking the phone out of the pocket.

Songs may be collected in numerous ways, including Internet download and file transfer from the PC.

The phone comes with the Disc2Phone PC software that supports extracting songs from CDs, compression and transfer to the phone. Thanks to the USB High-speed support, transferring songs goes quickly. A gigabyte of files can be transferred in about three minutes.

Music can be further organized on the W950. Music is grouped by Album, with album art being displayed on the screen, by Artist or arranged in user created playlists.

The user can rate songs or assign moods to them. Based on these ratings and moods, automatic playlists can be generated, and different visual effects can be used to visualize moods.

The player also generate automatic playlists based on, for example, the most or least played songs.

The Walkman® player features an equalizer with predefined settings like Mega Bass™, Pop and Classical.

It is intelligently aware of other applications in W950. Playback is paused when a telephone call is made or received.

FM Radio

The FM radio works on the 87.5 to 108.0 MHz frequency band.

A handsfree headset or an accessory with a FM-radio antenna must be attached to the phone for the FM-radio to work.

The FM radio with RDS offers instant and easy access to FM radio channels. The RDS function displays radio text information directly on the screen, the information is sent out by the radio station the user is currently tuned in to. The stereo handsfree or the phone's loudspeaker can be used to listen to the radio.

Using the FM radio it is possible to do the following:

- Record a short section of a song and automatically use the TrackID™ Internet service to identify it.
- The FM radio can be selected as the alarm signal allowing W950 to work as a clock radio.
- Display frequency, station name, RDS, radio text and signal strength if the information is available.
- Automatic or manual station search.
- Enter required frequency manually.
- Save a station and customize its saved name.
- Automatically switch to stations when they are broadcasting news or traffic announcements.
- Mute the radio.
- Listen to the FM radio in the background while using another of the phone's applications.

Video player

The Video player allows users to view and manage video clips that are stored both remotely and locally. The Video player supports the common features that are available in PC video players, (play, stop, reposition within the clip, next and previous media file) in addition to play back options such as default view option, repeat current clip and repeat all clips.

Video clips are played back with 30 frames per second, giving TV-like quality. It is possible to set bookmarks, so that watching can be resumed at a certain point in the movie later on.

Streaming

The video player plays streaming content from the Internet using RTSP (Real Time Streaming Protocol) session control according to 3GPP specification.

PlayNow™

PlayNow™ is a unique direct-link quality music download application. PlayNow users can connect to a live list of top music hits, videos, games and pictures. Content can be previewed before purchasing.

The content available from PlayNow differs from country to country. Games can not be previewed and are only available in certain phone modes.

Phone applications

- In call menu: W950 has a dynamic in call menu that changes to help the user perform actions quickly and simply.

- Accept Calls: Users can specify which calls to accept and which calls to reject.

- Rich call functionality: W950 allows SMS, MMS, and contact cards to be easily sent during a call.

- Call notes: W950 can launch Notes when a call is ongoing. The note is automatically named with the other party's number, name (if known), time of call and date. The user can start writing in the note immediately.

- Follow up call: W950 can automatically create follow up call tasks. The task contains the phone number, contact name, time of call, and date of call.

- Speakerphone.

Business telephony

Corporations have traditionally used fixed-line and DECT phones in the office, but now there is a strong trend towards the use of mobile phones to

access business telephony features. Of prime importance, however, is that users can still access the features and functionality of their corporate

Preliminary version - PA4

communication system, no matter which phone they are using. W950 can interact with the following corporate systems:

• A Corporate switch PABX, (Private Automatic Branch Exchange), equipped with a mobile extension port, (like the Ericsson MD110 and BusinessPhone).
• The mobile centrex service, if provided by the operator.
• A telephony server located at the operator's or customer's premises.

Feature buttons

The user activates corporate features by selecting commands from a list, which can be dynamically sent by the server via an IP link, or pre-configured by the company's IT manager, the operator or a service provider. Each command displays a text description of the function.

When a command is selected, pre-configured DTMF tones are used to communicate the desired function to the server. The phone can even be used to send data that the user is prompted to provide, such as the date they will be back from a business trip. Feature commands and text descriptions have to be programmed using XML and then imported into the phone.

Ongoing call features are reached from the active call view.

Offline commands and corporate telephony settings can be accessed by pressing the 'corporate telephony' icon once a calling card has been set up. Activating a command will result in an IP packet being sent to the server.

Routing of corporate calls

If a company uses a PABX, calls must be routed via the PABX to gain access to corporate features and resources. W950 can route outgoing calls to the corporate switch, instead of to the dialled B-party. To complete a call, the B-number is then sent to the mobile extension port of the PABX and the call set-up is completed. This process is completely transparent to the user.

A user may dial either an internal number, such as, 1234, or a public number, like +468 123 4567. W950 can be set to bypass the switch for certain types of calls.

Configuring the phone for the company

The person responsible for the corporate communication services defines how the phone shall be configured. This may be the company's IT manager, the operator or a service provider. They define what feature commands shall be displayed in the phone, how these commands interact with the PABX and what text is displayed. They also define how W950 should handle calls to and from the corporate switch. This is all done in an XML-structured configuration file, with the extension .pbx. Once created, this configuration file can be easily installed onto W950.

To ensure that only authorized personnel have access to the PABX, approved mobile phone numbers are added to the list of mobile extensions in the PBX, and only these numbers will be able to use the facilities available.

For more information please go to www.SonyEricsson.com/professionalsolutions and look for "Areas of use".

PIM applications

Contacts

W950 Contacts application holds the details of all the user's contacts. It is fully integrated with the phone and other PIM applications. Each contact can contain multiple phone numbers and email addresses, names, addresses, birthday details, anniversary details, personal notes and a picture or photograph. Most of this information will typically be transferred to W950 when it is synchronized with a PC application such as Microsoft™ Outlook™ or Lotus Notes. Contact data can also be added and edited on W950. Local and remote synchronization is possible using the SyncML standard; see "Synchronisation and data transfer" on page 34 for more information.

Data can also be beamed to and from W950 using infrared and Bluetooth™ connectivity. It can also be sent and received using Messaging. See See "Object exchange - 'send as'" on page 37. for more details.

Contacts are displayed in a list, which may be filtered by folder such as business or personal. To see a contact's details select the contact. Tap the icons alongside the contact's details to launch a phone call, a new message or a URL in the browser.

Calls received from new numbers can automatically cause the user to be prompted to save the number.

Contact details can be added to a distribution list. Distribution lists can be used to send groups of contacts the same email, SMS, EMS or MMS.

Calendar

The Calendar application keeps track of appointments and events and enables reminder alarms to be set. The calendar view has been enhanced to display the selected day's events on the screen.

Calendar entries are displayed in local time, but all appointments and reminders are saved in UTC (Coordinated Universal Time). If the user moves to a different time zone the calendar updates the appointments and reminders automatically. Meet-

ing requests can be sent from the Calendar application via email. Meeting invitations can be received by email and added in to Calendar.

The alarm signal can be personalized using sound clips. Appointments can be shared using infrared, Bluetooth™ connectivity, and also by Messaging. Local and remote synchronisation are both supported using SyncML, see "Synchronisation and data transfer" on page 34 for more information. The Chinese models support the lunar calendar.

Tasks

Tasks is a simple yet powerful application that can be used to make reminder notes. Task items may be beamed, exchanged using Messaging, synchro-

nized locally, and remotely using SyncML, see "Synchronisation and data transfer" on page 34 for more information.

Notes

Notes provides a quick means of making notes in either text or sketch format. Notes can be launched during a call.

The note is automatically named with the other party's number, name (if known), time of call and date.

Time and alarm clock

Time is a sophisticated alarm clock, which can show the time both locally and in another time zone. If the user swaps the local time zone to the other specified time zone the local time zone is

automatically displayed in the second time zone area. Alarms can be set. The alarm signal can be any supported sound that is stored on the phone.

Sound recorder

Sound recorder is a simple screen-driven dictation machine with the added advantage that recordings can be beamed and exchanged via Messaging. Sound recorder can also:

• Record a personal ringtone.

• Music recognition using TrackID™. A music clip is recorded and sent to the TrackID™ service to get the song title, artist and album name, if available. TrackID™ is a free service.
• Make changes to existing recordings.
• Rename recordings.
• Delete recordings.

Calculator

Calculator has the features of a standard desk calculator, and is always available from the application launcher.

Stopwatch

Stopwatch can be instantly started and stopped to measure an exact duration of time. The stopwatch continues to run when a call is answered. The stopwatch can run in the background if the application is closed, an icon is displayed in the status bar to show that it is running. You can time and record up to nine events.

Converter

Converter helps you to convert the following measurements; Distances, Volumes, Weights, Temperatures, Speeds, Areas and Currencies.

Speed dial

The user can launch the following features from picture speed dial:

- A call.
- The entry in Contacts.

Messaging

Email

W950 supports the following standards:

POP3	POP is used to retrieve and delete messages from an incoming mail server in the network
IMAP4	IMAP is also used to copy, retrieve, move and delete messages from an incoming mail server. IMAP has more features than POP such as remote folders. IMAP4 also offers support for the IDLE command, which if supported by the server, offers push capabilities.
SMTP	SMTP is used to send messages from a mail client to a mail server.
MIME	MIME is a format that describes data, such as, defining the attachments included in email.

Most of the standards above are supported by Internet Service Providers and many corporate environments. W950 is supplied with an Internet wizard which helps users to configure an account. OTA (Over The Air) configuration of email and ISP accounts is supported.

W950 supports SSL and TLS encryption.

Automatic polling can be used so that email is automatically collected and presented in the Inbox. Controls are provided to filter messages based on size, enabling cost and download time to be managed.

Another option enables only email headers to be presented in the Inbox. Headers are quick to download. The user may read and select headers and request the message to be downloaded if necessary.

Preliminary version - PA4

If IMAP4 is used you can enable the IDLE command to keep connected to the email server. This allows the server to push new messages directly to the W950 as they arrive.

Email transmission is performed in the background, making it possible to perform other messaging functions during transmission.

A list of recently used addresses are available when creating a message. W950 allows distribution lists to be created and sender ID information is sent with message alerts.

W950 can send any type of attachment, including the following:

- Pictures.
- Video clips.
- Audio files.
- SIS files.
- JAR/JAD files.
- Themes.
- vObjects (vCalendar, vCard, vNote, vBookmark).

A signature may be set up so that essential details are automatically copied to the end of each outgoing email.

The supplied Sony Ericsson PC Suite enables email to be synchronized with Microsoft™ Outlook™ and Lotus® Notes®. During synchronization, new email from the PC is transferred in to the corresponding 'synchronized email account' Inbox on W950. Messages and replies written using this account on W950 are transferred and sent via the PC.

Web based email can, of course, be accessed using the W950 browser.

Email folders

Messaging accounts have the following folders: Inbox, Outbox, SIM, Draft and Sent. You can create additional folders if you want, see Local folders below.

Local folders

To improve the organization of your folders you can create more folders locally on W950. Local folders are only visible in the Messaging application.

Push email

Push email is a method of 'pushing' or forwarding email to mobile devices as soon as a message reaches the email server. These solutions may also include Calendar and Contacts synchronization. Push email solutions allow email messages to be delivered in the background in the same way as SMS or MMS.

W950 is prepared for these solutions and a rich set of 3rd party applications are available from companies such as Extended Systems, Intellisync, JP Mobile, Research In Motion (Blackberry), Microsoft™ (Exchange ActiveSync), Seven, Smartner and Visto.

Push methods

The solutions use different methods to push the messages, usually IP push, by listening to dedicated ports when a session is active, this is similar to instant messaging solutions. Some solutions

may also use SMS with triggers to the application to start a sync/download, sometimes referred to as pseudo-push.

Security

All solutions use end-to-end security using SSL, 3DES or AES encryption. Most solutions are based on using a fixed password for push mail. Initially key exchange is also done by using device parameters such as the IMEI number. A few solutions combine push with one-time passwords that are limited for a certain amount of time before being re-entered. Many solutions have functionality for enforcing screen passwords. There is also sometimes theft and loss protection through wipe-out commands and lock-out.

Unified mailbox

SMS, EMS, MMS, Local Information, Beamed and Auto configuration messages are all stored within one unified Inbox in messaging.

- SMS (Short Message Service). With SMS a user can send text messages containing up to 160 characters to and from GSM mobile stations (up to 70 characters using unicode text). W950 also provides concatenated SMS, that is, the user can write a longer message and W950 will automatically send it using more than one SMS. You can reply to an SMS with an MMS and send a fax using SMS as the bearer. There is enhanced support for delivery reports and short message class support.

- Local Information, Automatic configuration items, beamed items will be found in the Inbox.

- Enhanced Messaging Service (EMS) adds powerful functionality to the well-known SMS standard. An EMS can include; sounds and melodies, pictures and animations and formatted text. EMS message can be sent as concatenated messages.

- MMS messages may include combinations of video clips, animation, pictures, sound and text. The following tasks can be performed from an MMS; smart uploads and downloads, automatic transmission when leaving Flight mode, record video directly from the MMS application, background transmission, direct links (these are customized shortcuts to an operators Web site to get new templates) and reply to an MMS with an SMS.

Area Information

Area information is SMS Cell Broadcasting.

An SMS cell broadcast allows information to be sent to all mobile handsets in a particular geographic area. Information such as traffic news or local weather reports can be sent to an area covered by a single cell or to the entire network.

Broadcast messages are organised into a number of channels, this allows different types of messages to be broadcast on different channels. Using the phone, users can choose which broadcast channels to subscribe to. The requested text messages are received, the message either scrolls across the

standby screen or is placed in the Inbox. The user can choose if they want to save the message to the Inbox or not.

Broadcast subscriptions are controlled from the Area information dialog.

When a user is subscribed to channel 50, and this channel is supported by their network, the ID of the current cell (or group of cells) is displayed underneath the network operator name in the phone display. This is often the telephone area code or postal code of the current location.

Picture Gallery

Picture Gallery enables you to view, send and organize your photographs. Picture Gallery supports image types JPEG, BMP, GIF (including animated), MBM, PNG, and WBMP in up to 262 k colours. You can also launch Picture Editor from Picture Gallery.

Picture Editor

Using Picture Editor, it is possible to crop, rotate and resize images. The editor also includes fun layers, clip art and tools for drawing on the image using the stylus. Different pen sizes and colours are available, as well as a text tool for formatting and inserting text into the image. When creating MMS messages, the Picture Editor is used for editing inserted JPEG, PNG, GIF and BMP images as well as for creating simple JPEG image from scratch. A simpler version of Picture Editor is used for creating images for EMS messages.

Entertainment

MusicDJ™

MusicDJ™ is a MIDI sampler with pre-recorded drum, bass, chord and accent loops in different music styles. The samples are combined to create personal polyphonic ringtones.

Games

Gaming on the W950 is greatly improved due to the 3D Hardware accelerator.

Vijay Singh Pro Golf 2005

Vijay Singh Pro Golf 2005 simulates the experience of being the unseated golf champion. This game is one of the best games of golf available on a mobile. Pro Golf 2005 looks and plays like the best console golf sims of the 16-bit era.

- Choose from several golfer archetypes, ranging from the power hitter to the short-game wizard
- Take on Vijay on either nine or 18 holes.
- Choose from three difficulty levels.
- There is a standard swing meter, which uses timed button presses to determine a shot's power and accuracy.
- Aim your shot by rotating your character. The impact this has on your shot's trajectory will simultaneously be shown on a map of the hole.

- Putting uses a familiar meter as well, and it takes place on a wire-frame grid, the purpose is to impress you with the complexity of golf's short game.

In every shot situation, the control feels pretty tight, and there's a distinct difference between clubs. If you want to chip your way out of a bunker, you'd better use a sand wedge. This sort of realism is a must in the simulation category.

This very polished-looking 2D title seamlessly shifts between camera angles. Your viewpoint will shift at least twice on every stroke, highlighting different parts of the shot. In this way, Pro Golf 2005 does a better job of approximating the presentation of televised golf than its 3D competitors.

QuadraPop

QuadraPop is a simple yet addictive Java™ based puzzle game. To make an item disappear, you need to have at least four items of the same kind in connection with each other. The more items that disappear at the same time, the higher the score. During

the game, blocking items may appear, to make it harder for the items to connect. A blocking item will go away only if an item next to it disappears.

Browser

W950 features the integrated Opera 8.0 browser. The Opera browser has been designed to display practically all Web pages on the Internet. The browser supports the de facto HTML standard "street HTML" (used by most Web developers), JavaScript™, Frames, and the ability to add plug-in applications. This means that the users can access their favourite Web pages.

Users can quickly and easily switch between portrait and landscape presentation as well as change from a normal view with scroll bars to a full screen view. The user can use pen motions to slide the page on the screen.

Users can select fit to screen to reformat pages to fit inside the screen width and eliminate the need for horizontal scrolling. (Small Screen Rendering is supported)

Some key features:

- Tap and hold on a bookmark to display the page in a new window.
- Tap and hold a link to view a context-sensitive menu of alternative actions: an http: link would give the options Open, Open in new window, Open in background and Send as.
- Secure downloads manager that is especially useful for downloading commercial media objects that need to be paid for.
- Pages can be saved for offline viewing.
- All private data can be cleared with one command.
- Built-in pop-up blocking.

Browser security

W950 supports TLS/SSL to provide a secure encrypted link between the browser and the web site. This method is commonly used for secure transactions on the Web. An icon in the display indicates when a secure connection is in use.

TLS Security

When using certain Internet services the user may require a secure connection between the phone and the Web site, such as, when using banking services. An icon in the display indicates when a secure connection is used. W950 is based on the WAP 2.0 specifications where security functionality is specified with a technology called WAP TLS Profile (Wireless Application Protocol Transport Layer Security).

The Internet protocols that handle the connection, its transport and its security are structured in protocol layers. The security is handled by the TLS layer operating above the transport protocol layer. There are three TLS classes that define the levels of security for a TLS connection:

- Anonymous TLS involves encryption with no authentication.
- Server authentication involves encryption with server authentication.
- Client authentication involves encryption with both server and client authentication

Preliminary version - PA4

Certificates

To use secure connections, the user needs to have certificates saved in the phone. Certificates can be downloaded and installed when required. There are two types of certificates:

Server authentication	Requires a server certificate stored at the server side and a trusted certificate stored at the client side.
Client authentication	Requires a client certificate stored at the client side and a trusted certificate stored at the server side.

Certificate authority	A trusted certificate used to verify that a Web site is genuine. If the phone has a stored trusted certificate of a certain type, it means the user can trust all Web sites which present a certificate that can be verified by the trusted certificate. Certificates are preinstalled in the phone and can be downloaded from the trusted supplier's Web page.
User certificate	A personal certificate that verifies the user's identity. A bank that the user has a contract with may issue this kind of certificate.

W950 is preinstalled with X.509 certificates from Baltimore, Entrust, Geotrust, GlobalSign, GTE Cybertrust, RSA, Sony Ericsson, Thawte and Veri-Sign.

RSS feeds

RSS provides a way for Web sites to distribute their content outside of a Web browser. A news Web site might have an RSS feed which contains breaking stories, while a magazine Web site may provide an RSS feed with excerpts of their latest articles.

An RSS feed is a file containing a list of news items, each of which has a title, a description and a URL link to read more on the content provider's Web site.

With the RSS Feeds application the user gets information from the Internet into an easy-to-view format without browsing the Web sites. The user can browse information from dozens - or hundreds - of Web sites without ever visiting them.

RSS Feeds includes the following features:

• Subscription.

• Update feeds manually or via a predefined schedule.
• Organize feeds into folders.
• Read news items.
• Send a news item to another device via email, SMS, MMS, Bluetooth™ connectivity or infrared.
• Link to more information via the Web browser.

Connectivity

Bluetooth™ wireless technology

W950 features built-in Bluetooth™ 2.0 wireless technology. Its Bluetooth power class 2, +4 dBm radio link, operates in the globally available 2.4 GHz radio frequency band, ensuring fast and secure communications up to a range of 10 metres, or more in ideal conditions. Please note that in the few countries where the use of Bluetooth wireless technology is not allowed, the Bluetooth function will be disabled. In countries where only lower output than 4 dBm or 0 dBm is allowed, the output is limited as a customized factory setting.

Bluetooth wireless technology facilitates instant connections, which are maintained even when the devices are not in the line of sight. Enhanced audio quality voice transmission is provided under adverse conditions, making it possible to use a headset connection at all times.

Using Bluetooth™ wireless technology in the W950

True wireless connection
Connect without cables to headsets, car handsfree equipment, computers/PDAs, digital still and motion video cameras and other devices.

Up to 16 added devices
The W950 identifies and maintains up to 16 devices which are displayed in a list.

Radio link
No line of sight is required; the phone can remain in a briefcase or in a pocket (infrared requires line of sight).

Secure and fast
Data connection with a Bluetooth™ connectivity PC/laptop or PDA turns the phone into a modem for connecting to the Internet and for data transfer (faster than infrared or cable).

Synchronization
Fast synchronization, even without line of sight, of calendar, notes and phonebook with PC/laptop.

Business cards
Quick exchange of business cards, notes and calendar events with other phones and devices.

Imaging and music
Exchange still images and video clips with another mobile phone, a PC/laptop, and with a digital still and motion video camera. Use the W950 as a modem to send pictures from a digital still and motion video camera to an imaging server.

Exchange music files with another mobile phone and a PC/laptop. Play MP3, MIDI sent by the phone.

Enable images to be shown on a TV or other display via an accessory, such as the Bluetooth™ Media Viewer MMW-100.

Transfer stereo audio in real time, to a stereo headset that supports A2DP, Bluetooth audio streaming.

Audio quality
W950 uses an algorithm that repairs lost audio packets. When needed, a new packet is inserted with content based on previous packets. This, in conjunction with the high sensitive and high output power radio will enhance the audio quality compared to a standard Bluetooth device.

File sharing
By using the Server role of the File Transfer Profile, the phone enables the use of a computer to manage content files that reside in the phone's file system. Most computer Bluetooth applications provide an explorer-like user interface for the file transfer service. The content in the Games and more folder is not exposed in the file transfer server. Opening one of the folders will show a list of

Preliminary version - PA4

files related to that folder, such as, images in the Pictures folder. Using the computer application the user can now: retrieve files from phone to computer, delete files from the phone and transfer files from the computer to the phone using the normal drag and drop mechanisms provided by the computer.

File browsing

By using the client role of the File Transfer Profile, the phone enables the user to access file systems of other devices, that support the server role of the same profile. After pairing the phone with the other device, the user can connect to the other device by selecting it in the list of My devices under the Bluetooth menu and selecting the Browse option that should be available on the left selection key. If the browse option does not appear the user can select the Service option to update the phone's knowledge that file browsing is possible with this device. When the phone is connected to the file server, the user can browse the shared folders and retrieve files listed in the folders. The user can transfer files to the file server device using the normal Send/via Bluetooth option.

Media viewing

The phone can send images and sounds to a media viewer device, such as, the MMW-100 TV adaptor accessory. The user can also conveniently run a slide show on the TV showing a set of nice phone camera pictures for family and friends. The phone can connect to a Bluetooth device that can receive images, the image can be transferred to the remote screen and displayed.

Profiles

The following Bluetooth profiles are supported in the W950:

- Dial-up Networking Profile.
- Generic Access Profile.
- Generic Object Exchange Profile.
- Object Push Profile.
- Serial Port Profile.
- Handsfree Profile.
- Headset Profile.
- Synchronization Profile.
- Basic Imaging Profile.
- File Transfer Profile.
- Human Interface Device (HID) host only Profile.
- Stereo Advanced Audio Distribution Profile.

- Advanced Audio/Video Remote Conference Profile.

Remote control

The phone keypad is configured for control of a certain computer application through a special type of HID configuration file consisting of an XML file for the keypad and an image for the display. HID configuration files can be downloaded into the phone using the normal file transfer mechanisms.

Users can even modify the files themselves on their computers. A few configuration files pre-loaded in the phone enable the user to navigate on a computer desktop and control presentations and Media players.

System functions

Characteristics

The HID configuration files, and the set of predefined HID configuration files, are customizable. The configuration files can be modified by the user if transferred to, and opened on, a computer.

Used enablers and bearers

The HID based remote control function works over Bluetooth. It is possible to download the HID configuration files via Bluetooth, IR or USB. It is also possible to transfer the files to another device using Bluetooth or infrared.

Power save mode

The phone uses sniff mode on headset, handsfree and HID connections which means reduced power consumption and shorter connection set-up times.

IrDA

IrDA (Infrared Data Association) is a point-to-point communication link between two infrared ports. The infrared beam has to be directed towards the target infrared port and as long as the two infrared ports are within sight and range, the devices can exchange data.

Object Exchange via infrared (IrObex) supports transferring objects between compatible phones. You can use W950 to control electrical devices that have an infrared port, such as, a television or DVD player.

USB

W950 is USB 2.0 (Universal Serial Bus) compliant. The idea of the USB is to allow easy connection of a mobile phone to a PC. USB is designed to be "completely Plug and Play", meaning that devices will be correctly detected and configured automatically as soon as they are attached.

USB in a mobile phone means convenient data transfer between the phone and a PC.

Synchronisation of PIM applications with a PC using the PC Suite, uses the USB Full Speed mode at 12 Mb/s.

For transferring large amounts of data, the user can select USB 2.0 High speed up to 480 Mb/s. This greatly reduces the time needed to transfer, for example, a large number of music files.

W950 supports USB charging, however, not in conjunction with High speed mode.

Data storage

W950 is divided into two parts:

- A phone memory with a phone part, and an 'Organizer' part running Symbian OS. The 'organizer' part consist of a RAM (Random Access Memory) that is controlled by the Symbian OS operating system, and a 128 MB flash memory. The flash memory is split into 48 MB for operating purposes and up to 80 MB for storage of user data, additional languages and settings such as the active theme. This part behaves just like a normal disk drive. The folders can be viewed and managed from the File manager application or from a connected PC.

- A 4 GB flash Media memory for user file storage, primarily intended for music files. This memory behaves like a normal disk drive. It can be accessed as a USB mass storage device from a PC, allowing the fast transfer of files.

Flash memory retains data even with no power applied. Unlike some PDA devices, W950 does not require a small 'memory backup' battery. Data stored on W950 is therefore not subject to loss due to such a battery running down.

User storage

The user storage space on the phone memory (C: drive) and Media memory is shared across applications without any imposed restrictions, apart from the whole space becoming full.

Unlike a PC, the user does not need to be aware of the underlying filing system. Applications will always store information automatically in the appropriate folder, simplifying the management of data. Third party applications may implement more complex file management solutions where required.

The W950 supports USB High speed data transfer at 480 Mbps. In this mode, the phone is seen as a USB mass storage device from the PC. The first time the phone is connected to a computer via USB, the user will be given the choice to enter either normal mode or mass storage mode. The mode can be changed at any time from the phone's

control panel. When connected to computer in mass storage mode, the Media memory and all files stored on it are inaccessible from within the phone and its applications. The Media memory is accessible again as soon as USB is disconnected. Normal mode must be used when synchronizing PIM applications or making backups using the PC suite.

User storage configuration in the new W950

Applications and information are placed in the phone memory of W950 in the factory. This provides sample demonstration, educational, multimedia and fun content so that W950 can be used directly out of the box. Much of this can be deleted by the user in order to make the space available for personal use.

Action at master reset

Master Reset restores the phone to its purchase state, all user data is deleted. When a Master Reset is initiated the user can select to keep all user-installed applications. Data can be restored as follows:

If the user has previously backed up W950 using the Sony Ericsson PC Suite, then the C: drive can be restored to the condition it was in when the backup was made. The exception is DRM Forward Lock protected files which cannot be transferred to other media and therefore not backed up.

Otherwise, data can be re-loaded from the Sony Ericsson Web site.

Since Multimedia content is easily transferable using infrared or Bluetooth™ wireless technology beaming, it is simple to restore favourite content from someone else's W950 (unless DRM protected).

The 4 GB Media memory is not affected by a master reset.

Folder view of internal storage

When viewed from a PC using Sony Ericsson PC Suite, the 'C:' drive is named 'Phone Memory', but only a subset of the folders is accessible from the PC.

The 4 GB flash memory is named "Media Memory".

On both the phone memory and the Media memory, there is a folder for each media type: audio, video and image. Documents are stored under the 'document' folder. An 'Other' folder provides a place for files that do not fit into the other categories.

A folder is created beneath the applicable media type. There is no limit on the number of subfolders that can be created. Unfiled folders are created in the initial folder structure and all material is placed in the unfiled folder by default. Sony Ericsson Multimedia Content is stored in 'Sony Ericsson' subfolders.

Synchronisation and data transfer

To be truly mobile, users must be able to carry their important information with them. Equipping mobile phones with Personal Information Manager (PIM) programs like calendars, task lists and phonebooks gives users access to their most important data anywhere and anytime. The information is kept updated by synchronizing it with the information at the office or at home. The growing use of groupware such as Microsoft™ Outlook™ means that more and more meetings are booked electronically in daily business life.

W950 uses the SyncML 1.2 protocol for synchronization. This means that it has the compatibility to synchronize with a wide variety of devices over a number of different communications media.

SyncML – an open standard for synchronization

SyncML background

Leading the way in providing remote synchronization capability, Sony Ericsson realizes that interoperability of remote synchronization is of utmost importance if mobile data usage is to become as widespread as generally predicted. That is why Ericsson, along with IBM, Lotus, Motorola, Matsushita, Nokia, Palm Inc., Psion and Starfish Software, founded the SyncML initiative in February 2000. Supported by more than 600 software and hardware developers, the SyncML initiative seeks to develop and promote a globally open standard for remote synchronization, called SyncML. Unlike many other synchronization platforms, SyncML is an open industry specification that offers universal interoperability. Since it uses a common language, called XML, for specifying the messages that synchronize devices and applications, SyncML has been called the only truly future-proof platform for enabling reliable and immediate update of data. The benefit for the end user is that SyncML can be used almost anywhere and in a wide variety of devices, regardless of application or operating system.

W950 uses SyncML for both local synchronization (with a PC using Bluetooth™ connectivity or a cable connection) and remote synchronization over HTTP.

What information can be synchronized in the W950?

Application	Remote sync	Local sync
Contacts	✓	✓
Calendar	✓	✓
Tasks	✓	✓
Note (text part only)	**	✓
Email	**	✓
Bookmarks	**	✓

Preliminary version - PA4

** Note, Email and Bookmark implementation are proprietary and therefore not SyncML compliant.

Remote synchronization

Remote synchronization takes place over the air using HTTP and is the ideal way to keep the W950 up to date. 3G enables a fast connection to the network - the synchronization can be started in seconds.
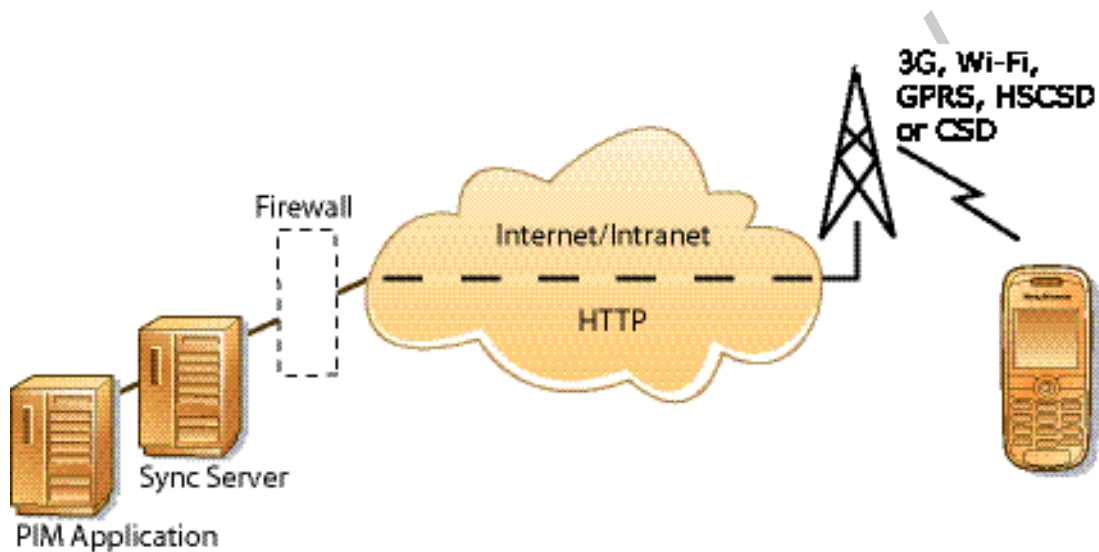
Synchronization services will be offered by third-party service providers and as added capability to corporate PIM applications. Corporate PIM applications such as Microsoft™ Exchange can be supplemented with SyncML capability.

Server alerted synchronization

If updates are made on the PC the server automatically notifies W950. The updates are automatically synchronized to W950. A remote server can initiate a synchronization with the W950 using WAP Push.

June 2006

Preliminary version - PA4

Local synchronization

W950 is supplied with PC software for local synchronization. It may be loaded from the CD-ROM.
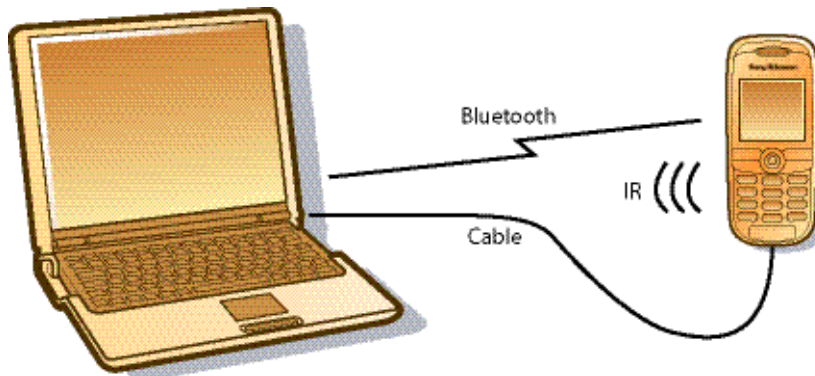
Bluetooth™ wireless technology, infrared or cable

W950 always synchronizes using SyncML, regardless of connection type. It connects via Bluetooth™ wireless technology, infrared or USB cable. The cable is connected directly to the phone or via the desktop charger connector.

Automatic synchronisation

Synchronisation can be configured to start automatically, given that a suitable synchronisation program must be running on the other device:

- When the USB cable is plugged in to W950.
- When Bluetooth is activated on both devices and they come into operating range.
- When infrared is activated on both devices and the infrared sensors are aligned.

Intelligent process

A synchronization engine performs the task of synchronizing. For local synchronization, the synchronization engine is an application that runs on the desktop computer. The synchronization engine compares, updates and resolves conflicts to ensure that the information in the phone is the same as that in the computer.

Compatibility

The PC software, supplied with the phone, enables synchronization with the following applications:

- Microsoft™ Outlook™ Express 4.0, 5.x.
- Microsoft™ Exchange.

- Microsoft™ Outlook™ 2000, 2002, 2003.
- Microsoft™ Internet Explorer 5.0 and 6.0 (for Bookmark synchronization).
- Lotus Notes® 5.0, 6.0, 6.5.

The PC requirements are as follows:

- 120 MB free space on hard disk.
- Microsoft™ Windows™ 2000 (SP4) or XP Professional or Home (SP2).
- Minimum recommended hardware configuration for the version of Windows in use.

File transfer utility

A utility is provided which enables files to be transferred to and from a W950 connected to a PC. Typical uses for this include:

- Storing music files on W950.
- Moving images to W950 to use, for instance, in personalization, MMS messages.
- Moving sound clips to/from W950 for personalization.

Backup and restore

Backup is initiated from the connected PC. Note that the USB cable must be used for backup. Infrared or Bluetooth wireless technology cannot be used for this purpose. Files in the user data area (which includes loaded third party applications) are backed up to PC storage.

The restore utility takes stored data from the PC and places it back on to W950.

Preliminary version - PA4

Language change utility

W950 has a larger, richer UI compared to an ordinary mobile phone. Applications often have help information. Consequently, it is impractical to store languages on the phone. To facilitate a language change, a PC utility is provided which enables the required language to be loaded on W950. The Language Change Utility is not available for Chinese models.

Software installation utility

This utility enables W950 applications to be installed from the PC.

Internet wizard

This utility assists the user to create 3G, GPRS, HSCSD and CSD connection definitions for Internet and email use. All the necessary

information can be entered in a logical way. Set infrared status to Modem in the Control Panel to use this facility over infrared.

Object exchange - 'send as'

W950 makes it easy to transfer objects over Bluetooth, infrared and Messaging. This is presented to the user via 'Send as' commands in applications. Simply select an item such as a contact, select 'Send as' and select the method to be used for sending. Typical applications are to beam an appointment to other people, or to receive a new background image.

Application (Data Type)	Bearer > IR	Bluetooth	SMS	MMS	Email
Contact (vCard)	✔	✔	✔	✔	✔
Appointment (vCall)	✔	✔	✔	✔	✔
Tasks (vCall)	✔	✔	✔	✔	✔
Note**	✔	✔	✔	✔	✔
Image	✔	✔		✔	✔
Sound Clip (Ringtone)	✔	✔		✔	✔
Bookmark	✔	✔	✔	✔	✔
Sound recorder (Voice Notes)	✔	✔		✔	✔
Third Party Application ('Send as' API)	✔	✔		✔	✔

To perform a 'Send as' beam operation using infrared, the two devices are lined up and the sender initiates the transfer.

To beam over Bluetooth, a scan finds other devices within range. The user can then select the required device and send the information across.

When sending over SMS, MMS or email, the required message type is created with the selected object attached. It is then sent over the air.

Preliminary version - PA4

Sony Ericsson PC suite

The Sony Ericsson PC Suite CD-ROM includes the following:

Local Synchronisation	PC software for synchronising PIM data between the phone and PC applications such as Microsoft™ Outlook™ and Lotus® Notes®.
Backup Manager	Utility to back up the data from the phone for storage on a PC. Restore enables data to be returned to the phone, such as after a software upgrade.
File Manager	Enables Windows Explorer to see the phone as a device and the phone memory and Media memory as two disk drives on the device. Multimedia files may be copied between the PC and the phone.
Application Installer	Utility to install new applications from the PC.
Download Language	Enables the user to load a different language from www.SonyEricsson.com/support and switch the phone UI to that language, assuming the specific phone supports this.
Mobile Networking Wizard	A wizard that helps the user to set up 3G, GPRS, HSCSD and CSD connections so that a personal computer can be connected to the Internet, or to a corporate network, via the phone.
Sony Disc2Phone	Software for loading your phone with your favourite tracks. You can use it to search for music on your computer or audio CDs, convert your existing music files, and then copy the MP3s to your phone.
Adobe Photshop Album SE	Software for viewing, finding, fixing, and sharing your photos.
Apple QuickTime Player	QuickTime Player is a multimedia player that you can use to view many kinds of files, including video, audio, still images, graphics, and virtual reality (VR) movies. QuickTime supports the most popular formats on the Internet for news, sports, education, movie trailers, and other entertainment.
Drivers	Drivers for using the phone as a modem over infrared, Bluetooth or Cable.

DRM

Digital Rights Management, DRM, is a technology that enables the secure distribution, promotion, and sale of digital media. Examples of such content include music, personal images, wallpapers and screen savers with themes from films, ringtones from musical artists, and branded games. In other words, content providers can control how users may use different types of content in devices, such as mobile phones, phones or PDAs. Content providers can also control the use of content in related services, such as MMS and download. Sony Ericsson is actively focusing on technology standardization for the DRM concept, and supports the ongoing standardization work and activities of the OMA (Open Mobile Alliance). Sony Ericsson is fully committed to open standard solutions in the mobile environment and is a principal driver of many open standard

initiatives. This will ensure the interoperability of mobile terminals in the DRM area and also result in a strong, competitive DRM standard.

The W950 supports OMA DRM 2.0 giving the same user experience as OMA DRM 1.0. OMA DRM 1.0 is supported as described below.

FWL – forward lock

W950 supports OMA DRM Forward Lock which is the simplest OMA DRM case, with no special access keys defined. The content is provided in a single DRM packaged file, thus protecting the content from being distributed from the device by the user. It enables a secure means for the content provider to deliver/provide content which incurs a charge. Forward Lock content will normally be received by W950 as part of an MMS message or via HTTP download. W950 supports OMA Download. More information is available at www.SonyEricsson.com/developer.

CD – combined delivery

W950 supports OMA DRM Combined Delivery/ Forward Lock. Content and associated access keys are downloaded or delivered to the user as a single DRM packaged file. This means the content, or access keys issuer, controls the extent the content can be used. As with pure Forward Lock, the user will be unable to distribute this content for use on another device.

SD – separate delivery

W950 supports OMA DRM Separate Delivery. Content and associated access keys are received as separate DRM packages, either simultaneously or at different points in time. This enables the distribution of content to other users and has the same possibilities to control usage of the content as exist with Combined Delivery/Forward Lock.

Distribution of the content to other users will require the recipient to obtain access keys from the rights issuer in order to use the content.

Protection properties

Content that is protected according to the OMA DRM standard is given special properties.

Content with Forward Lock protection cannot be further distributed: The user cannot send the content to other devices since the "Send to" option is disabled for media protected with Forward Lock.

All three types of protected content packages can be transferred to the Media memory, thereby enabling the storage of large amounts of content.

OMA DRM Forward Lock/Combined Delivery protected content on removable media cannot be used in another device other than the device it was saved on. Only Separate Delivery packages can be used on another device, after obtaining access keys to use the content on the new device. Access keys to use the content can never be distributed from user to user (device to device). Access keys always have to be obtained directly from the rights issuer.

DRM package

DRM packaging software is typically included in the software used by the content provider. It is used to create the DRM package according to the OMA DRM standards before it is delivered to the device, including content and associated access keys.

In Japan, only files with SD protection for playback will be accepted in the Media player and in some European markets only DRM content can be used for automated use/themes such as ringtones.

Personalization

The W950 can be personalised by the user in one of the following ways:

- Update the User Interface using services, such as, M-Service.
- Use PC-based utility application.

- Via Over the Air (OTA) configuration, initiated by the operator, user or IT helpdesk.

Alterations to the appearance of many of the screens may be simply carried out through changing the phone's Theme. New Themes may be loaded on to the W950 from the Internet and other sources.

Background and application shortcuts

Users can set a static image, or animated GIF, to be the background 'wallpaper' for the standby screen. Formats JPEG, GIF, BMP, WBMP, MBM and PNG are supported. Larger images will be resized to fit.

The application shortcut buttons may be personalized by the user.

Screen saver

A 'screen saver' image can be displayed after a period of inactivity. The user can switch this facility on and off. Supported formats are the same as for the background image above. Note that use of animated GIF increases power consumption.

Device lock may be used in combination with the screen saver. Upon pressing a button or touching the screen, the user will be prompted to activate keys and/or enter the device lock code.

When the screen saver is deactivated, the W950 will revert to the state it was in before the screen saver was activated.

Picture phone book

The user may store a picture of each contact in the Contacts application. When an incoming call is received with CLI matching that contact, the contact's picture will be displayed together with the other information. The contact's picture is also displayed when making a call, or using the speed dial screen in picture view mode. A copy of the picture is held in the Contacts database; therefore, the original picture may be deleted or renamed without losing the copy stored in Contacts.

Ringtones

The user can add as many ringtones as desired, subject only to available file space. Ringtones may be collected from many sources including MMS, EMS and transfer from a PC.

Any compatible audio file in the multimedia storage (on the Phone memory or Media memory) including MP3 can be selected as a ringtone. The W950 can play both iMelody format ringtones and the following polyphonic formats: AMR, AU, MIDI, RMF (Beatnik), MP3 and WAV.

A system default ringtone is provided. This is the ringtone when the W950 is first initialised. It cannot be deleted and is retained after a Master Reset.

A Personal ringtone may be selected for a contact - simply select the required ringtone while entering or editing the contact's details. When the Calling Line Identification (CLI) of the incoming call is matched to a contact, the Personal ringtone for that contact will be played. If the ringtone has been deleted, moved, renamed or is located on the Media memory and the phone is connected to a PC as USB mass storage, then the system default ringtone will be played.

If no CLI information is available, then only a default ringtone can be played. If the user has selected a personalized default ringtone and it is available (can be read from the phone memory or Media memory) then it will be played, otherwise the system default will be played.

Themes and skins

A Theme or skin is a way to provide a complete customized visual experience for the user.

Themes can define:

- Text, outline and background colours.

- Background images.
- Graphical appearance of interface elements.
- Sounds for events, for example, ring signals, message alerts, notification, area info, auto set-up and reminder.

Themes and skins can be created or downloaded.

Over-The-Air (OTA) Configuration

OTA remote configuration provides simple set-up of services. The user is spared the task of finding complex technical information and then manually entering it via the UI. Instead, a Web request or a call to be the mobile operator's helpdesk is all that is necessary - the appropriate settings can then be sent via SMS directly to the W950.

OTA configuration using the Ericsson/Nokia Over The Air Settings Specification enables the following parameters to be provisioned:

- WAP Account (Account name and WAP Gate-way settings).
- ISP Settings (Bearer information, username, password).
- Bookmark (name and URL).

- SyncML DS settings.
- MMS Settings.

The following parameters may be remotely configured according to WAP Forum specifications:

- WAP Account
- ISP Settings

Further OTA configuration is provided using Nokia Smart Messaging. It is used to set up email accounts, specifically:

- ISP (Bearer information, username, password, IP and DNS addresses, login script)
- Email account (Username, password, address, server details)

Sony Ericsson phone configurator

Sony Ericsson's phone configurator provides settings for many networks as a free service to owners of Sony Ericsson mobile phones. It can be found at www.SonyEricsson.com.

Locks

W950 has the following lock functionality:

Keylock

The Keylock can be turned on or off by:

- A long press on the back key from standby view.
- The standard keypad sequence (# then unlock) from standby view.

Keylock can also be turned on from the status bar more menu.

Auto keylock is a user setting, only activated from standby.

Phone lock

The phone lock can be set to 'off', 'at power on' or 'when SIM changed'.

When set to 'at power on' the phone lock code has to be entered every time the phone is turned on.

When set to 'when changing SIM' the phone lock will be activated if the SIM is changed, this prevents other users from using the phone with their SIM without the owner's consent.

The code can be changed by the user as long as they know the current code.

SIM card lock

The SIM card lock can be set to 'off' or 'at power on'.

If the SIM card lock is set to 'off' the SIM can be used by any user without the SIM owner's consent.

If the SIM card lock is set to 'at power on', every time the W950 is switched on the user will have to enter a predefined code. The code can be changed by the user as long as they know the current code.

Preliminary version - PA4

3G

Increased 3G data rates, together with extended multimedia and entertainment content, has enhanced the use of mobile Internet in a revolutionary way.

The 3G (third-generation) service combines high speed radio access with IP (Internet Protocol)-based services.

The connectionless nature of IP makes access a lot faster: file downloads take less time and we can be connected to a network within a few seconds.

3G has significantly boosted network capacity allowing operators to support more users, and offer more sophisticated services.This phone is dual mode, meaning the user will be able to use W950 without having to think about which system is in operation – the handover between the two systems is seamless.

GSM and WCDMA development

Wideband technology is deployed in parallel with the enhancement of the existing spectrum, re-using parts of the GSM infrastructure. All spectrum assets are valuable, as there is a substantial increase in both the number of subscribers and the volume of traffic in the networks. This seamless solution gives operators a flexible network where the systems interact according to current demand.

User experience

For the consumers, using a network consisting of GSM, GPRS and WCDMA parts is a seamless experience. GPRS allows qualified mobile Internet applications, while the introduction of WCDMA brings a whole new set of user services, using the full potential of wideband data transport

Handover/service continuity

The scope of this text includes service requirements for handover maintaining continuity of service to a wireless terminal, as it moves between the radio coverage area, or "cells", associated with different base station sites. This functionality is called "handover". It is a key requirement to allow for dual or multi-mode terminals to handover traffic from UTRAN to other

radio systems such as GERAN and vice versa. This part describes the general principles for service continuity within UMTS Radio Access Network, within GSM/GPRS and between UMTS Radio Access Network and other radio systems such as GSM/GPRS. As a principle, the requirements on service continuity characteristics should be according to the target network on which the service is maintained.

Service continuity

Service continuity should support the following scenarios:

- Continuity of active circuit switched services when moving within UMTS Radio Access Network, within GSM/GPRS and between UMTS Radio Access Network and GSM/GPRS coverage areas.
- Continuity of active and packet switched sessions when moving within UMTS Radio Access Network, within GSM/GPRS and between UMTS Radio Access Network and GSM/GPRS coverage areas.

General operational considerations

Mechanisms defined to support service continuity between different radio systems or radio access modes should effectively cope with a number of coverage scenarios:

- Limited coverage in a "sea" of coverage provided by another radio system or radio access mode.
- Selective operation at a geographical boundary, with extensive UMTS Radio Access Network coverage on one side, and extensive coverage from another radio system on the other side.
- Geographically co-located areas of UMTS Radio Access Network coverage and another radio system.

Performance requirements

Temporary degradation of service caused by handover

During intra-UMTS Radio Access Network handover or handover from UMTS Radio Access Network to GSM/GPRS, degradation of service should be no greater than during intra-GSM/GPRS handover. The duration of the discontinuity experienced by packet switched and circuit switched real time services should be shorter than that in the handover of voice calls over GSM/GPRS.

Requirements on multiple bearer services handover from UMTS radio access network to GSM/GPRS

Consideration must be given to services that may involve multiple bearer services (and simultaneous sessions). The mapping between UMTS Radio Access Network bearer services and GSM/GPRS bearer services depends on many factors such as data rate, delay constraints, error rate etc. In the event that certain UMTS Radio Access Network bearer services cannot be handed over to GSM/GPRS, the handover of some of the bearers to maintain the service should not be precluded.

In the case where a user equipped with a dual mode terminal is in UMTS Radio Access Network coverage, and has multiple PDP contexts activated (for instance to support multimedia), then it is preferable to handover one PDP context, rather than dropping all of them.

As a first priority only the PDP contexts which have an associated QoS that can be supported by the GSM/GPRS should be candidates for handover.

If there are still multiple PDP contexts as "handover candidates", then the operator should choose which PDP is maintained. When roaming, the serving network should make this decision. The operator may choose to either:

- Drop all of the PDP contexts.
- Choose one based upon criteria such as duration, amount of traffic transferred, etc.

Handover in W950

This phone is compliant with the 3GPP R99 December 2002 release.

GSM to UMTS

The product supports circuit switched voice handover from GSM to UMTS.

UMTS to GSM/GPRS

The product supports packet switched data handover and circuit switched voice handover from UMTS to GSM/GPRS.

Positioning

The basic cost efficient positioning method available in 3G networks relies on measuring round-trip time. In 3G it is called Cell-ID + TA (Timing in Advance).

Time difference measurement, involving several base stations, can be used to obtain a more accurate position.

Positioning methods are already used to support location-based information services such as ©YellowPages, restaurant guides, traffic information, directions and friend finder applications. Typically SMS or voice has been used as delivery mechanisms. Java™ and MMS will add new possibilities to deliver attractive location-based applications.

GPRS

The introduction of GPRS was a big step in the evolution of the GSM networks for enhancing the capabilities of data communication. Data traffic has increased (over both wired and wireless networks), with the growth in demand for Internet access and services paralleling that of mobile communications.

We can now see that the demand for high-speed Internet access is the key driver for coming generations of wireless multimedia and entertainment services, and GPRS is important as a stepping stone when we enter the 3G network era. GPRS has allowed innovative services to be created and granted access to new and previously inaccessible market segments, which will be further developed with 3G.

GPRS is able to take advantage of the global coverage of existing GSM networks. Applications developed for GPRS have been deployed on a large scale and have thus reaped the associated benefits.

With GPRS, W950 sends data in "packets" at a very high speed. The phone remains connected to the network at all times, using transmission capacity only when data is sent or received. Instead of occupying an entire voice channel for the duration of a data session, W950 sends and receives data in small packets, as needed, much like IP on the Internet. Thanks to this, the phone is always online, using transmission capacity only when data is sent or received. W950 is compatible with GPRS R99.The GSM system limits the ability to use all eight time slots, so W950 uses up to four time slots for receiving data, and up to one slot for transmitting.

Information about the identity of the phone and the characteristics of the connection are described in the PDP (Packet Data Protocol) context. This information is stored both in the phone and in the mobile network, so that each phone is identified and "visible" to the system.

Using GPRS with W950 has many advantages:

- Constant connection
  Keep an open connection to an email system or the company network, staying online to receive and send messages at all times. All connection settings can be managed by using the data connections feature.
- High speed
  Gain access automatically to increased bandwidth when downloading large files such as images.
- Cost efficient
  Use transmission capacity only when needed, thus reducing costs.
- Email over GPRS
  Remain connected to an email system while reading and preparing messages, (which are then sent at high speed).

Symbian OS operating system

Symbian OS is the open operating system licensed by the world's leading mobile phone manufacturers. It is designed for the specific requirements of advanced 2G, 2.5G and 3G mobile phones. Symbian OS combines the power of an integrated applications environment with mobile telephony, bringing advanced data services to the mass market.

Symbian OS supports a wide range of device categories with several user interfaces, this includes UIQ, which is the software platform used by W950.

Preliminary version - PA4

Key features of symbian OS v9.1:

General:

- Improved system performance, especially at start up.
- New multimedia framework supporting recording, playback and streaming.
- Direct access to screen and keyboard gives high performance; graphics accelerator API; and increased UI flexibility (support for multiple simultaneous display, multiple display sizes and multiple display orientation).
- Java™ support for the latest wireless Java standards. See "Java™" on page 47 for more details.
- Communications protocols using; Wide area networking stacks including TCP/IP (dual mode IPv4/v6) and IPSec. Improved personal area networking support including infrared (IrDA), Bluetooth™ connectivity and the introduction of USB. Support is also provided for multihoming and link layer Quality-of-Service (QoS) on GPRS and UMTS networks.
- Symbian OS v9.1 is ready for the 3G market with support for: WCDMA (3GPP R4); GSM circuit switched voice and data (CSD); packet-based data (GPRS); SIM; and U-SIM.
- Supports the Unicode Standard version 3.0.
- Data synchronization has been improved to cover the following: over-the-air (OTA) synchronization support using OMA standards (OMADS 1.2); PC-based synchronization over, Bluetooth connectivity, infrared and USB; a PC Connectivity suite providing the ability to transfer files and synchronize PIM data.
- Improved device management which provides network operators and enterprises with new capabilities to manage phones in the field. This includes OMA DM 1.1.2 support and OMA client provisioning 1.1.
- Support for Bluetooth wireless technology eSCO and Bluetooth stereo headset profiles have been implemented.

Security:

The aims of the security developments in Symbian OS v9.1 are to protect the integrity of the phone, provide extra control over user billable events and to prevent malicious software corrupting executables and data. The aims have been met by:

- Providing platform security by a proactive system defence mechanism based on granting and monitoring application capabilities through Symbian Signed certification. The infrastructure allows applications to have private protected data stores.
- A proactive defence mechanism against malware. The platform security infrastructure uses a capability based model which ensures that sensitive operations, such as, modifying user data, making calls and using network connections, can only be accessed by applications which have been certified by an appropriate signing authority.
- Data caging; this allows applications to have their own private data protection. This allows applications a guaranteed secure data source. This can be used for applications, such as, ecommerce. An application can access other directories marked as open but cannot access another application's private directory.
- Additional platform security includes; full encryption and certificate management, secure protocols (HTTPS, SSL and TLS) and WIM framework.

EKA2 Kernel:

- A new realtime kernel (EKA2) with guaranteed response times provides the basis for a robust and power-efficient phone. Predictable real time operation means that the OS will respond to interrupts, system and user threads within a known period. This means that no task in the system can prevent the OS from responding to key tasks.
- Support for multiple simultaneous IP connections.

Development and testing:

- Provides new customization and configurability options for the operating system.
- Symbian OS is built using the ARM RVCT 2.1 compiler. This compiler is compliant with the ARM EABI standard. This allows compatibility with the latest ARM compilers and reduces the Symbian OS footprint while enhancing performance.

- Developing for Symbian OS - native system and application development in C++, supported by CodeWarrior and shortly Eclipse-based IDEs.

Java MIDP 2 supported by all mainstream Java tools. PC-hosted emulator for general development.

UIQ 3.0

The new UIQ 3.0 platform offers support for multiple form factors on the same code base and ease of operator configuration.

UIQ 3.0 is based on Symbian OS v9.1 and is equipped to meet the various demands from phone manufacturers, network operators and end users.

- Customization of software is important. UIQ 3.0 offers new features for operator customizations and branding. Sony Ericsson will use these features to configure W950 to meet requirements

from network operators. The same customizations can then be re-used on other UIQ phones with different form factors.

- Developers can utilize the new features of UIQ 3.0 to easily develop applications.
- The SDK (Software Developers Kit) can be used to expand these applications or create new ones. Building blocks, layout managers and a wide range of controls, such as menus and dialogs, make it easier to design applications for UIQ. Using these tools also gives the applications the UIQ look and feel which users are familiar with. The application framework and system services are the basis of the UI platform.

Java™

W950 supports Java™ ME CLDC 1.1

CLDC 1.1 JARs supported:

- JTWI 1.0 (JSR-185) consisting of CLDC (Connected Limited Device Configuration) 1.1 HI (JSR-139), MIDP 2.0 (JSR-118), WMA 1.1 (JSR-120).
- PDA PIM and File Access (JSR-75).
- Bluetooth™ wireless technology (JSR-82).
- Wireless Messaging API 2.0 (JSR-205).
- Web Service (JSR-172).
- Mobile Media API (JSR-135).
- Mobile 3D Graphics (JSR-184).
- Nokia UI API 1.1.

W950 consumer package

The exact contents of the W950 package depend on the localization.

The basic contents are as follows:

- W950 with stylus.

- Battery.
- Stereo headset with remote control.
- Travel charger.
- USB cable.
- User documentation package.
- Sony Ericsson PC Suite CD.

Accessories

Accessories	Product name
Batteries	
Standard Battery	BST-33
Chargers/Desk Stands	
Micro Travel Charger	CMT-60
Desk Stand	CDS-60
Charger	CST-60
Car	
Cigarette lighter adapter	CLA-60
Bluetooth™ Car Handsfree	HCA-60 and HCB-300
Dedicated Car Holder for W950	HCH-67
Universal Car Holder	HCH-60
Handsfree	
Portable Handsfree	HPB-60 and HPE-60
Sport Portable Handsfree	HPS-60
Bluetooth™ Handsfree	HBH-200
Akono™ Headset	HBH-300
Akono™ Headset	HBH-600
Akono™ Headset	HBH-602
Akono™ Headset	HBH-605

Preliminary version - PA4

Akono^{TM} Headset	HBH-608
Akono^{TM} Headset	HBH-610
Akono^{TM} Headset	HBH-620
Akono^{TM} Headset	HBH-660
Akono^{TM} Headset	HBH-662
Akono^{TM} Headset	HBH-670
Entertainment	
Stereo Portable Handsfree kit	HPM-61
Ultra Style Stereo Portable Handsfree	HPM-70
Connectivity	
USB Cable	DCU-60
Imageware	
Executive Case	IEC-20
Stylus Pack	ISP-XX
Concepts	
Quick Install BT Car Kit	HCB-300

Technical specifications

General technical data

Product name	W950
System	Tri-band GSM Release 99 recommendations. GSM 900 (CTR 19 and CTR 20) GSM 1800 (CTR 31 and CTR 32) EGSM and WCDMA FDD mode supported Latin America 1800, 1900 and e-GSM mode supported.
Speech coding	HR, FR, EFR, AMR supported where available, for high speech quality.
Operating system	Symbian OS v9.1 UIQ 3.0
Processor	ARM
GSM SIM/ UMTS USIM card	GSM SIM - GSM 11.11, UMTS USIM - 3GPP™ TS 31.102. Small plug-in card, 1,8 V and 3 V.
Internal memory size	4 GB + 80 MB.
Data transfer speeds	USB High speed, up to 480 Mbps
Length	106 mm
Width	54 mm
Thickness	15 mm
Weight	112 g
Antenna	Built-in
Colours	Mystic purple
Battery	900 mAh

Screen

Display type	TFT
Display size	QVGA
Pixel size	240 x 320
Colour resolution	262 k
Screen surface	Touch-sensitive
Illumination	Variable intensity backlight

Performance and technical characteristics

Dimension	GSM 900/ E-GSM 900	GSM 1800	GSM 1900	WCDMA
Frequency range (MHz)	TX: 880 – 915 RX: 925 – 960	TX: 1710 – 1785 RX: 1805 – 1880	TX: 1850 – 1910 RX: 1930 – 1990	TX:1920 – 1980 RX:2110 – 2170
Channel spacing	200 kHz	200 kHz	200 kHz	5 MHz with 200 kHz channel rasters
Number of channels	174 Carriers *8 (TDMA)	374 Carriers *8 (TDMA)	299 Carriers *8 (TDMA)	277
Modulation	GMSK	GMSK	GMSK	QPSK
TX Phase Accuracy	< 5º RMS Phase error (burst)	< 5º RMS Phase error (burst)	< 5º RMS Phase error (burst)	Error Vector Magnitude: <17.5%
Duplex spacing	45 MHz	95 MHz	80 MHz	190 MHz
Frequency stability	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm
Voltage operation (nominal)	3.6 V	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)	24dBm Class 3 (0.25 W peak)
Transmitter Output impedance	50 Ω	50 Ω	50 Ω	50 Ω
Transmitter Spurious emission	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to GSM spec)	< - 30 dBm (according to GSM spec.)	< - 30 dBm (according to GSM spec.)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to 3GPP™ spec)
Receiver RF level	Better than – 102 dBm	– 102 dBm	Better than – 102 dBm	Better than -106.7 dBm @ 12.2 kbps CS voice
Receiver RX Bit error rate	< 2.4%	< 2.4%	< 2.4%	< 0.1%

Current consumption, talk and standby times

Talk time	GSM up to 7.5 hours UMTS up to 2.5 hours
Operating time	Up to 8 hours Music playback up to 10 hours
Standby time	GSM up to 340 hours UMTS up to 250 hours

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	• 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 (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).
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

Preliminary version - PA4

Dimension	Support	
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	
Support of compression algorithms	Yes, V42bis and IP header compression.	
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	
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 2.	
SIM	GPRS aware and non-GPRS aware SIM cards are supported.	
AT commands supported	AT+CGDCONT - DEFINE PDP CONTEXT AT+CGQREQ - Quality of Service Profile (REQUESTED) AT+CGQMIN - Quality of Service Profile (Minimum Acceptable) AT+CGATT - PACKET DOMAIN SERVICE ATTACH OR DETACH	AT+CGACT - PDP CONTEXT ACTIVATE OR DEACTIVATE AT+CGDATA - ENT

Preliminary version - PA4

GPRS maximum data rates (Kpbs)

		CS-1 9.05 Kbps	CS-2 13.5 Kbps	CS-3 15.6 Kbps	CS-4 21.4 Kbps
4 + 1	Rx	36.2	53.6	62.4	85.6
	Tx	9.05	13.4	15.6	21.4

HSCSD maximum Data Rates (Kpbs)

		9.6 Kbps per timeslot	14.4 Kbps per timeslot
2 + 1	Rx	19.2	28.8
	Tx	9.6	14.4

Hardware buttons

On/Off button.
Keypad with 12 keys.
Walkman key
C (Cancel) key
Jog Dial, 3-way: up, down and inward.
Back button to switch back a view. Pressing and holding turns the keylock on and off when in standby view.
Play/stop button for the Walkman player. Also mutes/unmutes the FM Radio.
Volume up/down rocker key. Long press on this button skips to previous or next track or radio station.

Text input

Hardware keypad with text prediction.
Handwriting recognition and on-screen keyboard with advanced text prediction, including automatic word completion and next word suggestion.

Third party application support

TBD

Walkman® player

File formats	.3ga - 3GPP Multimedia File .3gp - 3GPP Multimedia File .aac - Advanced Audio Coding .amr - Adaptive Multi-Rate Codec .au - uLaw/AU Audio File .imy - iMelody Ringtone Format .jts - MMAPI built-in Tone sequence .m4a - MPEG-4 Audio File .mid - Midi Melody (MusicDJ) .mid - Scalable Polyphony MIDI .midi - Musical Instrument Digital Interface .mmf - SMAF (Synthetic music Mobile Application Format) .mp3 - MPEG Audio Stream, Layer III .mp4 - MPEG-4 Audio File .mxmf - Mobile XMF (eXtensible Music Format) .ra - Real Media .ram - Real Media .rmf - Beatnik Rich Music Format .rng - Nokia Format Ringing Tone .wav - Waveform Audio .wma - Windows Media Audio .xmf - eXtensible Music Format
Audio decoding	iMelody AMR-NB Midi SP-Midi XMF DLS MPEG-4 AAC-LC aacPlus (HE AAC, AAC+) Enhanced aacPlus (EAAC+) MPEG-1 1/2/2.5 Layer 3 (MP3) WAV Real Audio 9 WMA, Windows Media Audio 9

Video player

File Format	.3gp[a] - 3GPP Multimedia File .mp4[b] - MPEG-4 Video File .pvx - Packet Video Streaming .ram - Real Media .rm - Real Media .sdp - SDP format .wmv - Windows Media Video
Streaming transport	RTSP according to 3GPP™
Video decoding	MPEG-4 Simple Visual Profile Levels 0-3 H.263 Profile 0 Level 10 H.263 Profile 3 Level 10 Real Video version 8 Real Video version 9 Windows Media Video 9

a.AAC-LC and AMR-NB audio supported
b.AAC-LC and AMR-NB audio supported

Pictures

Formats	JPEG, BMP, GIF (including animated), PNG, MBM, WBMP, SVG-tiny
Sharing via	IR, Bluetooth™ wireless technology, MMS, Email, PC file trans-fer, USB

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'	Megapixel		• JFIF v1.02 • EXIF
BMP	The bitmap image format used by Windows®.	XRAM dependent, default is VGA.	18-bit	
WBMP				
PNG				

Preliminary version - PA4

Image encoders

Decoder	Details	Size	Colour depth	File format
GIF	89a			
JPEG	ISO/IEC JPEG • Baseline DCT • Non-differential • Huffman coding • Symbol 'SOF0'	Megapixel		JFIF v1.02
BMP	The bitmap image format used by Windows®.	XRAM dependent. Default is VGA.	18-bit	
WBMP				

Short message service

Feature	Support in W950
SMS Centre Number	It is possible to pre-record 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	Keyboard, on-screen keyboard, touch screen, predictive text input and multitap.
Reply to messages	It is possible to reply to received messages by MMS, SMS or phone call.
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
Print via IrDA	No
Use pre-defined messages	No
Possibilities when receiving a message:	
Reply to the sender	Yes
Forward the message	Yes
Save the message on SIM	No

June 2006

Preliminary version - PA4

Feature	Support in W950
Get delivery time and date	Yes, but not via messaging
Print via IrDA	No
Possibilities of the previously sent message:	
Delivery report of the message	Yes
Forward the message	Yes
Save the message on SIM	Yes
Know the remaining capacity storage	Yes
Print via IrDA	No
Possibilities of the previously received message:	
Reply to the sender	Yes
Save the message in the Inbox	Yes
Forward the message	Yes
Know the remaining capacity storage	Yes
Supported ways for replying to a received SMS:	
Via SMS	Yes
Via phone call (set up a call to the number contained in the message body)	Yes
Via USSD session	No
Possibility to offer the user the ability of sending an SMS to a list of recipients	Yes, using phonebook groups or entering multiple numbers manually.
Possibility to write an email address as a recipient address	No
SMS storage	In handset and SIM.
Nokia Picture Messaging	No

Enhanced message service

Feature	Support in the W950
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	TBD

Preliminary version - PA4

Feature	Support in the W950
Capacity storage	TBD
Outgoing messages	It is possible to: • 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	• A signal is heard once all parts of the message have been received. • 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.
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.
Text formatting	• Centred, left and right aligned text. • Small, normal and large font size. • Bold, italic, underlined and strikethrough style.
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: • Send and receive melodies via EMS, if the melodies are not protected by copyright. • Download melodies and commercial tunes. • Create melodies.
WBMP	Yes
Picture sizes	16 x 16 mm, 32 x 32 mm, variable size in black and white.
Pictures	It is possible to: • Edit pictures. • Send and receive pictures via EMS, if the pictures are not protected by copyright. • Create pictures. • Download pictures. • Receive pictures in enhanced messages originated by service providers.
Animations	The handset supports the following animations: I am ironic, I am glad, I am sceptic, I am sad, WOW!, I am crying. Plus the other nine animations defined in 23.040 v4.3.0. It is possible to send and receive animations.
TP-PID field value given by the handset before sending an EMS message	0x00

Multimedia messaging service

Feature	Support in the W950
Support of MMS protocol stack version	1.2
MMS/circuit switched parameters and MMS/ packet switched parameters placement	MMS is bound to a Data Account. A Data Account contains either circuit switched parameters or packet switched parameters.
Possibility to pre-configure the MMS parameters in factory	• MMS circuit switched: Yes • MMS packet switched: Yes
Possibility to configure the MMS parameters by OTA provisioning	• MMS circuit switched: Yes • MMS packet switched: Yes
Possibility for all the parameters from the parameters set to be OTA provisioned at the same time	• MMS circuit switched: Yes • MMS packet switched: Yes
Possibility for only one parameter from the parameters set to be OTA provisioned	Using Device Management: • MMS circuit switched: Yes • MMS packet switched: Yes Using Client Provisioning: • MMS circuit switched: No • MMS packet switched: No
OTA provisioning solution	OMA Device Management and OMA Client Provisioning supported
MMS User Agent functional entity will be a separate entity from Web browser:	Yes
MMS User Agent support	OMA UAProf.
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	OMA Device Management and OMA Client Provisioning
Functionalities that the user is able to set during message composition:	• Message *subject* • MSISDN recipient address • *email* recipient address • Message *Cc* recipient(s) address(es) • *delivery report* request • *read-reply* report request • *message* priority • *validity* period
From where can the user insert multimedia elements into multimedia messages:	• Terminal memory
Supplier indication if MMS User Agent will be able to handle a network-based address book	No
Possibility for sent messages to be memorized into a folder in handset memory	Yes

Preliminary version - PA4

Feature	Support in the W950
Actions that the user can perform after message notification:	• Retrieve the message immediately • Defer message retrieval • Reject message
Actions that the user can perform after message retrieval:	• Reply to the sender of the message • Reply to the sender and to Cc people • Forward the message • Delete the message • Save message into terminal
Multimedia codecs/formats supported for audio	AMR, MP3, AAC, WAV Depending on content class/creation mode settings, the following formats are also supported: AAC-LC AMR-NB SP-MIDI XMF DLS Real Audio
Multimedia codecs/formats supported for video	MP4, H263 Depending on content class/creation mode settings, the following format is also supported: Real Video
Multimedia codecs/formats supported for image	Baseline JPEG, wbmp, SVG, GIF 89a
MMS User Agent provides:	• Text formatting facilities (only text size) • Coloured text/background (Viewer/player supports coloured text and background.) • Keyboard, On-screen keyboard, touch screen and predictive text input.
Support of MMS protocol stack version	1.2
MMS/circuit switched parameters and MMS/packet switched parameters placement	MMS is bound to a Data Account. A Data Account contains either circuit switched parameters or packet switched parameters.
Possibility to pre-configure the MMS parameters in factory	• MMS circuit switched: Yes • MMS packet switched: Yes
Possibility to configure the MMS parameters by OTA provisioning	• MMS circuit switched: Yes • MMS packet switched: Yes

SIM AT services supported

Service		Mode	Support
CALL CONTROL BY SIM			Yes
DATA DOWNLOAD TO SIM		Cell Broadcast	Yes
		SMS	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

Preliminary version - PA4

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	Yes Yes
SEND SS		Yes
SEND USSD		Yes
SET UP CALL	General: Capability configuration Set up speech call CallParty Subaddress DTMF support	Yes No 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

Preliminary version - PA4

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 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 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:

Preliminary version - PA4

- '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, or 1530 characters if concatenation is activated.

- 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.

Integrated browser technical data

Security	WTLS Class 1, 2, 3; WTLS Cipher RC5 with key length 128TLS/SSL; TLS Cipher RC4 with key length 128SignText
Certificates	Predefined: Baltimore, Entrust, GlobalSign, GTA Cybertrust, RSA, Thawte and VeriSign.

Security

Data protection	SIM PIN (at power on)Device Lock (at power on and/or activated by screensaver)
Browser	TLS, SSL, WTLS, Certificate handling
Third party applications	Support for signed applications

Abbreviations

3GPP™

3rd Generation Partnership Project.

AAC

Advanced Audio Codec.

ALS

Alternate Line Service. A system that allows a user to have more than one line allocated to a single SIM subscription.

AMR

Adaptive Multi-Rate. A variable rate speech coding (compression) method selected by the 3GPP for the 3G evolution of the GSM phones.

API

Application Programming Interface

AU, .au

Format for audio data files.

Bluetooth™

Bluetooth™ wireless technology is a secure, fast, point-to-multipoint radio connection technology. It is a specification for a small-form factor, low-cost radio solution providing links between mobile computers, mobile phones and other portable handheld devices, and connectivity to the Internet. Available from the Bluetooth Special Interest Group (SIG), www.bluetooth.com.

BMP

Microsoft™ Windows Bitmap. A graphics format defined by Microsoft supporting 1, 4, 8 or 18-bit colour depth. No compression, so files can be large.

bps

Bits per second - rate of data flow.

CB

Cell Broadcast. Type of SMS message.

cHTML

A version of HTML optimized for small devices.

CLDC

Connected Limited Device Configuration. The J2ME 'configuration' implemented in W950. CLDC specifies a runtime environment with specifically limited resources, suitable for memory-constrained devices.

CLI

Calling Line Identity. Shows the number of the person calling you in your mobile phone display. W950 will also display the name and photograph of the caller if they are in Contacts.

You can then make an informed choice as to whether or not to take the call. Bear in mind that not all numbers can be displayed. To use this service, it must be supported by your network.

COM Port

Defines a serial/RS-232 port within the Windows environment. May be physical (COM1 port on the rear of the PC) or virtual (COM5 port communicating with a PC card modem).

CS

Circuit Switched. Connection from A to B which has a fixed bandwidth and is maintained over a period of time, such as, a voice telephone call.

CS-1 to CS-4

Coding Scheme. Determines the data rate per timeslot in GPRS.

CSD

Circuit Switched Data. CSD is a GSM service providing a CS data connection at a rate of 9.6 or 14.4 Kbps.

CSS

Cascading Style Sheet. A feature of browsers.

Preliminary version - PA4

DCIM

Digital Camera Images. The name of the root directory when storing images according to the Design rule for Camera File system (DCF) standard.

DRM

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

DTMF

Dual Tone Multi Frequency. A method of coding digits as a combination of two audible tones.

DUN

Dial-Up Networking.

ECML

Electronic Commerce Modelling Language.

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 900MHz frequency band. This extension gives increased network capability.

EMS

Enhanced Messaging Service. An extension of SMS enabling pictures, animations, sound and text formatting to be added to text messages. 3GPP has included EMS in the standards for SMS.

ETSI

European Telecommunications Standards Institute. www.etsi.org

FCC

Federal Communications Commission. US government agency which regulates radio communications.

FR

Full Rate, speech coding.

GIF

Graphics Interchange Format. Format for storing images which also supports animated images. Highly compressed by limiting the colour palette to 16 or 256 colours.

G-MIDI

General MIDI. Specifies a minimum level of performance compatibility.

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 160 countries around the world.

GSM 900

The GSM system family includes GSM 900, GSM 1810 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.

GSM 1810

Also known as DCS 1810 or PCN, this is a GSM digital network working on a frequency of 1810 MHz. It is used in Europe and Asia-Pacific.

GSM 1900

Also known as PCS. Refers to a GSM system running in the 1900MHz band. Used in the USA and Canada, for instance.

HR

Half Rate, speech coding.

HSCSD

High Speed Circuit Switched Data.

HTML

HyperText Markup Language.

HTTP

HyperText Transfer Protocol.

Preliminary version - PA4

IMAP4

Internet Message Access Protocol version 4. Used to collect email from a mail server. Has more features than POP3.

iMelody

A format for monophonic ringtones.

IrDA

Infrared Data Association.

ISDN

Integrated Services Digital Network. Can provide circuit-switched data connections in multiples of 64 Kbps.

ISP

Internet Service Provider.

J2ME™

Java2™ Micro Edition - an edition of the Sun Microsystems Java programming/runtime environment specifying two runtime environment 'configurations' aimed at small devices.

Java™ Phone

An API in Java™ used for interacting with a phone.

JFIF

JPEG File Interchange Format

JNI™

Java™ Native Interface

JPEG

Joint Photographic Experts Group, best known for the .JPG format for still image compression.

JVM™

Java™ Virtual Machine

Kbps

Kilobits per second - rate of data flow.

KVM

'Kilo' Virtual Machine

LAN

Local Area Network.

MAC Address

Media Access Control address. This is a hardware address that uniquely identifies each node on a network.

MBM

Multi Bitmap. Image file format on Symbian OS.

ME

Mobile Equipment. (Phone excluding SIM card)

MeT

Mobile Electronic Transactions. An initiative founded by Ericsson, Nokia and Motorola to establish a secure and consistent framework for mobile transactions.

MIDI

Musical Instrument Digital Interface. MIDI defines a protocol and file format which enables music to be described and stored in binary form.

MIDP

Mobile Information Device Profile. An API (or 'profile' in J2ME nomenclature) defined to enable a standard programming API for mobile devices. MIDP compliant applications execute in the restricted environment defined by the CLDC.

MIME

Multipurpose Internet Mail Extensions. A protocol defining how messages are sent on the Internet. MIME is used to describe how attachments are encoded and what type of data they contain.

MMS

Multimedia Messaging Service. Logical extension of SMS and EMS, MMS defines a service enabling sound, images and video to be combined into multimedia messages.

MMS-C

MMS Service Centre

Preliminary version - PA4

MO

Mobile Origination. Such as, an SMS message sent from a mobile terminal.

MP3

MPEG Audio Layer 3. An audio compression technology that is part of MPEG-1 and MPEG-2 specifications. Commonly used to distribute music on the Internet and on portable players.

MPEG

Moving Picture Experts Group. A working group of ISO/IEC in charge of the development of standards for coded representation of digital audio and video.

MS

Mobile Station. (Phone and SIM card)

MT

Mobile Termination.

OS

Operating System, such as Symbian OS, Linux, Microsoft™ Windows™.

OTA

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

PC

Personal Computer.

PCS

Personal Communications Services, often used to describe GSM1900 networks.

PDA

Personal Digital Assistant. A handheld computer having functions such as address book, calendar etc.

PDP

Packet Data Protocol.

Personal Java™

An edition of Java™ appropriate for mobile devices such as PDAs.

Phone book

A memory in the SIM card where phone numbers can be stored and accessed by name or position.

PIM

Personal Information Management. Generic term for applications such as Contacts, Calendar, Tasks etc.

PKI

Public Key Infrastructure.

PNG

Portable Network Graphics. Format for storing images on file with data compression but without lowering of quality (loss of information).

POP3

Post Office Protocol. Used to collect email from a mail server.

PSTN

Public Switched Telephone Network, such as, ordinary analogue phone line for speech and/or computer modem.

PTD

Personal Trusted Device. Concept in MeT

QCIF

Quarter Common Intermediate Format. A video format size of 176 x 144 lines.

QQVGA

Quarter Quarter VGA, 160 x 120 pixels.

QVGA

Quarter VGA size, typically refers to a portrait oriented screen 240 pixels wide x 320 pixels high.

RAS

Remote Access Service.

Preliminary version - PA4

RMF

Rich Music Format^{TM} A file format developed by Beatnik combining the compact size of MIDI files with the high quality of MP3 and WAV.

Rx

Receive

SC

Service Centre (for SMS).

SDK

Software Development Kit

SIM card

Subscriber Identity Module card - a card that must be inserted in any GSM-based mobile terminal. 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. W950 uses the small plug-in card.

SIM-AT

SIM Application Toolkit - a means of providing simple applications that are stored on the SIM card.

SMIL

Synchronized Multimedia Integration Language. Used by MMS to describe how media objects are to be played.

SMS

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

SMSCB

SMS Cell Broadcast.

SMTP

Simple Mail Transfer Protocol. Protocol used to send email from an email client via an SMTP server.

SIR IrDA

Standard IrDA, up to 115 kbps IrDA.

SS

Supplementary Service

SWIM

A SWIM card is a SIM card containing a WIM

T9

(Text on 9 Keys) A text input system from Tegic that adds intelligence to multi-tapping letters on a telephone keypad.

TCP/IP

Transmission Control Protocol/Internet Protocol.

TLS

Transport Layer Security. As used by Web browsers.

Tx

Transmit

TTY (Teletypewriter)

A telecommunication device with a keyboard and a visual display that is used primarily by people who are deaf, hard of hearing, or have a speech disability.

UI

User Interface. Sometimes called 'Man-Machine Interface'.

UIQ

A customizable pen-based user interface for media-rich mobile phones that is based on the Symbian OS. It may be used as the basis for building an attractive and efficient UI.

URL

Uniform Resource Locator. Points to a service or information on the Internet.

USSD

Unstructured Supplementary Services Data. Narrow-band GSM data service. An example is, entering *79*1234# might return the stock price for stock 1234.

Preliminary version - PA4

vCal; vCalendar

vCalendar defines a transport and platform-independent format for exchanging calendar and scheduling information for use in PIMs/PDAs and group schedulers. vCalendar is specified by IETF.

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, PIMs /PDAs, pagers, fax, office equipment, and smart cards. vCard is specified by IETF.

VGA

Video Graphics Array. Graphics standard introduced by IBM, having a resolution of 640 x 480 pixels.

VPN

Virtual Private Network.

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.

WAV

Waveform audio. Format for storing sound.

WBMP

Wireless BitMap. Part of the WAP specifications, an image format optimized for small mobile devices.

WBXML

Wireless Binary Extensible Markup Language.

WIM

Wireless Identity Module.

WMA

Windows Media Audio, a compressed audio file format developed by Microsoft™.

WML

Wireless Markup Language. A mark-up 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.

WTLS

Wireless Transport Layer Security. Part of WAP, WTLS provides privacy, data integrity and authentication on transport layer level between two applications.

XHTML

Extensible Hypertext Markup Language

XML

Extensible Markup Language

Related information

Documents

- The W950 User Guide.
- Sony Ericsson W950 FAQ.
- AT Command Reference Manual.
- WAP 2.0 Specifications.

Links

- www.SonyEricsson.com
- www.SonyEricsson.com/fun/
- www.SonyEricsson.com/developer/
- www.SonyEricsson.com/support
- www.ericsson.com/mobilityworld/
- www.extendedsystems.com
- www.bluetooth.com
- www.imc.org
- www.3gpp.org

- www.irda.org
- www.etsi.org
- www.wapforum.org
- www.imc.org/pdi/
- www.syncml.org
- www.w3.org/TR/SVGMobile/
- www.w3.org/TR/xhtml-basic/
- www.java.sun.com

Trademarks and acknowledgements

Apple and Mac are trademarks of Apple Computer, Inc.

Opera is a trademark or registered trademark of Opera Software ASA

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.

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

XHTML™ is a registered trademark of the W3C.

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

Mega Bass™ is a trademark of Sony Corporation.

QuickShare™ and PlayNow™ are trademarks or registered trademarks of Sony Ericsson Mobile Communications AB.

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

June 2006

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

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 sublicensed, 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, reexport, 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) (ii) and FAR 52.227-19(c) (2) as applicable.

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

June 2006

Preliminary version - PA4

June 2006

Preliminary version - PA4

Index

Preliminary version -