White Paper

May 2007

Sony Ericsson P1

Sony Ericsson

Preface

Purpose of this document

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

The aim of this White paper is to give the reader an understanding of the technology Sony Ericsson P1 uses and to show the main applications, functions and features of the phone.

People who can benefit from this document include:

- Operators
- Service providers
- Software developers
- Support engineers
- Application developers
- Retailers
- IT decision makers

This White paper is published by:

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

Phone: +46 46 19 40 00
Fax: +46 46 19 41 00
www.sonyericsson.com

First edition (May 2007)
Publication number: EN/LZT 162 101 R3A

Sony Ericsson Developer World

At www.sonyericsson.com/developer, developers will find documentation and tools, such as phone White papers, Developer Guidelines for different technologies, SDKs and relevant APIs. The Web site also contains discussion forums monitored by the Sony Ericsson Developer Support team, an extensive Knowledge Base, Tips & Tricks, example code and news.

In addition, Sony Ericsson offers technical support services to professional developers. For more information about these professional services, visit the Sony Ericsson Developer World Web site.

Document history

Change history		
2007-05-16	R3A	Miscellaneous updates
2007-05-11	R2A	Miscellaneous updates
2007-05-08	R1A	First released version

Contents

Product overview

Sony Ericsson P1 is a "no compromise" converged device, successfully combining stylish look and feel, compact form factor and full business and personal use functionality.

Sony Ericsson P1 is designed to attract people whose work and personal lives are closely entwined. They will buy Sony Ericsson P1 because they are looking for **one device** that meets all their needs. They need to be well organised and have all information in one place and they do not want to miss out on business or personal arrangements. Design and style are important and they want to project a successful, sophisticated and modern image. Especially email, high-speed transfer and quick office editors are perceived to be very useful. In a very tangible way these functions support an efficient mobile life style.

Sony Ericsson P1 offers multitasking to allow several actions to be performed at once, such as, talk and browse the Web, or download music and watch video clips. In hot spots and on board selected air and train carriers Sony Ericsson P1 offers WLAN connection, and with two integrated digital cameras (3.2 megapixel in the back, VGA in the front) the user can conduct face-to-face video calls.

Sony Ericsson P1 is the ultimate business tool on the market today.

Key functions and features

Function or feature	Sony Ericsson P1 support	Page
Operating system	Symbian OS™ V9.1 platform, including OMA DRM and platform security	54
MMI	UIQ 3.0	55
Size	106 x 55 x 17 mm	-
Weight	124 g with battery	-
Screen	2.6" large QVGA (240 x 320 pixels) touchscreen with 262 k colours that supports landscape view for imaging and browsing	59
Colour	Silver Black	-
Processor	ARM9	-
Talk time	GSM up to 10 hours UMTS up to 3.5 hours	-
Standby time	GSM up to 440 hours UMTS up to 350 hours	-
Interaction	Using touchscreen, dual function keyboard, 3-way Jog Dial and selection keys	8
3G	UMTS, video and 3GPP streaming	51
UMTS	E-GSM 900. GSM 1800, GSM 1900 and UMTS 2100	60
WLAN	802.11b compliant (11 Mbit/s)	36
Voice over IP, VoIP	Sony Ericsson P1 will be VoIP enabled. Third party client software required.	36
Bluetooth™ Wireless Technology	2.0, includes car handsfree profile	38
Infrared	SIR	40
USB	USB 2.0 FS (Full Speed)	40
Data transfer speed	Full speed 12 Mbps	-
Standby view	Customizable top-level menu giving rapid access to Sony Ericsson P1 features	9
Media player	Supports playback, streaming and playlists	28
Upgradeable	Via the Sony Ericsson Update Service	46
Camera	Integrated 3.2 megapixel camera with 3x digital zoom, 18-bit colour depth, auto focus for still pictures, video clip recording and video calls. Picture gallery and Picture editor applications included.	26

Video camera	VGA	-
Video call	Allows video calls and video conferencing via the built-in dual cameras	17
Video call talk time	Up to 2 hours	-
Browser	Opera browser that supports frames and JavaScript™ technology	34
Push email	Prepared for major providers	22
Messaging	SMS, MMS, EMS and email	21
Internet wizard	Creates the settings for Internet and email use	
FM RDS radio	Offers instant and easy access to FM radio channels	33
PIM applications	Contacts, Calendar, Tasks, Notes, Sound recorder, Time and alarm clock, Stop watch, Converter, Calculator, and UTC support	19
Business card scanner	Allows scanning and converting of business cards to contacts	27
Multitasking	Allows several applications to be open at once	-
Viewers	Microsoft® Excel, Word, PowerPoint®, and Adobe™ PDF	24
Editors	Microsoft Word, PowerPoint, and Excel	24
Themes	Easy personalization of animated icons, screen savers, wallpapers and skins	49
Speaker phone		17
Memory card	512 MB Memory Stick Micro™ (M2™) memory card included	37
Flight mode	Includes the option to turn WLAN on	-
Local synchronisation	Via SyncML	44
Remote synchronisation	Via SyncML	43
Business telephony	With SIP-signalling to server	17
Games	Vijay Singh Pro Golf 2005™ and QuadraPop	33
Additional applications	RSS Reader, MusicDJ™ and PlayNow™ 2.0	32

Controls and operation

Sony Ericsson P1 overview

Standby view

Once the phone is started the Standby view automatically appears on the screen.

The Standby view acts as the starting point for performing a variety of tasks and for accessing applications via the Main menu.

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

Touchscreen

Sony Ericsson P1 offers a large touchscreen with 262.000 colours that supports landscape view for imaging and browsing.

To navigate menus and select items the user taps the screen using a fingertip or the stylus.

Text input methods

Sony Ericsson P1 offers three text input methods:

- The dual function keyboard located below the screen. The backlight evenly lights up the dual function keyboard. Four keyboard types supported.
- On-screen keyboard located at the top of the screen, when available.
- Directly-on-the-screen writing, using the stylus.

Text options supported:

- Add symbol
- Input type (ABC, abs, Abc or 123)
- Auto capitalization
- Predictive text input
- 1st language
- 2nd language (when predictive text is selected)
- Spell word (when predictive text is selected)
- My word (when predictive text is selected)

- Word suggestion (when predictive text is selected)

Enhanced text prediction

For all three inputting methods (dual function keyboard, on-screen keyboard and handwriting recognition) enhanced text prediction can be used. The primary word or next word prediction suggestion is presented, with additional suggestions in a pre-edit box at the top of the screen. If a word is misspelled, the pre-edit box may also suggest closely matching words in the selected language dictionaries, words that have been typed previously, or items that have been stored in the 'My words' personal dictionary.

Note: While entering text, the user has the option to either select any of the word suggestions displayed, or to ignore them and continue entering text via the chosen method. If a prediction suggestion is shown when sending/saving the input text, this word will not be sent/saved.

Push email

Sony Ericsson P1 is designed to be a true mobile email device. Creating, sending and receiving email messages and inviting people to meetings will be as simple as when it is performed on a home or office computer.

As a true mobile email device Sony Ericsson P1 supports full push email and allows for attachments handling. The push email solution Exchange ActiveSync™ is normally pre-installed on Sony Ericsson P1. Other popular email solutions such as BlackBerry® or Intellisync can also be used.

Models and languages

Models

International version – Sony Ericsson P1i
- Europe, Middle East, Americas, Latin Asia
- Latin characters (a, b, c…) keyboard and numeric keypad
- Latin characters handwriting recognition
- Cyrillic keyboard version
- Arabic keyboard version
- Chinese Bopomofo

Chinese version – Sony Ericsson P1c
- GPRS only and no WLAN capability
- People's Republic of China
- Chinese keyboard, Pinyin and Strokes input methods
- Latin and Strokes characters on the keyboard
- Chinese handwriting recognition
- Client for online Chinese dictionary
- Lunar calendar

Languages

Additional languages for Sony Ericsson P1 will be available at: www.sonyericsson.com/support.

- American English (AE)
- Arabic (AR)
- Brazilian Portuguese (BR)
- Canadian French (CF)
- Czech (CS)
- Danish (DA)
- Dutch (NL)
- English (EN)
- Estonian (ET)
- Finnish (FI)
- French (FR)
- German (DE)
- Greek (EL)
- Hong Kong Chinese (ZH)
- Hungarian (HU)
- Indonesian (ID)
- Italian (IT)
- Latin American Spanish (XL)
- Latvian (LV)
- Lithuanian (LT)
- Malay (MS)
- Norwegian (NO)
- Polish (PL)
- Portuguese (PT)
- Romanian (RO)
- Russian (RU)

- Simplified Chinese (ZS)
- Slovak (SK)
- Slovenian (SL)
- Spanish (ES)
- Swedish (SV)
- Traditional Chinese (ZT)
- Turkish (TR)

Product comparison

The Sony Ericsson Sony Ericsson P1 and P990 smartphones have important differences in hardware but minor differences in software.

Images

Sony Ericsson P1

P990

Hardware comparison table

	Sony Ericsson P1	P990
Hardware		
Size (mm) and weight	106 x 55 x 17, 124g	114 x 57 x 21-26 (body flip), 155g
Display	2.6” 240 x 320 pixels	2.76” 240 x 320 pixels
RAM memory	128 MB	64 MB
Flash memory	256 MB	128 MB
User memory internal	Up to 160 MB (without 3D games)	Up to 60 MB (without 3D games)
User memory external	512 MB Memory Stick Micro™ (M2™)	64 MB Memory Stick™ Duo PRO
Camera	3.2 megapixel	2 megapixel
Lens cover	No	Yes
Flip	No	Yes
Navigation key	No	Yes, a 5-way navigation key
Keylock key	No dedicated keylock key included. Alternative keylock methods available.	Yes
Play key	No	Yes

Industrial design

Sony Ericsson P1 is a thin and sleek UMTS smartphone, with a highly contemporary look. The slim form factor makes the phone easy to carry, hold and use. The main focus in Sony Ericsson P1 is efficient communication and messaging, with the most versatile ways of entering text.

The large bright touchscreen (2.6" QVGA TFT, 262 k colours), the on-screen keyboard, handwriting recognition and the dual function keyboard support easy and versatile messaging. Auto correction, word completion and keyboard illumination all improve the texting and dialling functionality of the phone.

To navigate menus and select items there is a Jog Dial and a Back button close to each other on the side of the phone. A long press on the Back button in Standby view locks the keyboard.

Alternatively the user can use a fingertip or the included stylus to navigate menus and select items.

For Internet access there is a button on the side of the phone, which directly opens the Browser of the phone.

With the integrated 3.2 megapixel camera at the back of the phone, the user can take pictures and video clips and store them in the phone memory or on a memory card. The megapixel quality gives excellent results when images are printed or viewed on a computer or TV.

When using the camera the viewfinder is displayed in landscape orientation. The camera has a photo light which acts as a flash.

User interface

Miscellaneous

Accessories

Sony Ericsson P1 supports a large range of accessories, please see “Accessories” on page 57 for a list.

Manuals

User guide and Web guide for Sony Ericsson P1 will be available at: www.sonyericsson.com/support. The Web guide will also be accessible from the phone, where it is bookmarked in the browser.

Technologies in detail

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

Phone applications

The following call features have been included in Sony Ericsson P1:

- Ongoing call menu: Sony Ericsson P1 has a dynamic ongoing 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: Sony Ericsson P1 allows SMS and MMS messages, as well as contact cards to be easily sent during a call.
- Call notes: Sony Ericsson P1 can launch Notes during a call. 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: Sony Ericsson P1 can automatically create follow up call tasks. The task contains the phone number, contact name, time of call, and date of call.
- Speakerphone.

Video call

With the speed of UMTS and video call functionality, the Sony Ericsson P1 can be used to share news face-to-face with your business colleagues, family or friends. During a video call, the stream can be switched from the front VGA camera to the back megapixel camera. Use the megapixel camera to share images, such as scenery, with the video call recipient.

One of the camera feeds can be swapped to show a stored picture, allowing the callers reaction to be seen.

The camera can be set up to automatically switch on when you receive a call.

The VGA camera is mounted in portrait mode. Landscape video call images are produced from the portrait image feed by clipping the top and bottom of the portrait image. This affects the resolution of the VGA camera and causes a zooming effect.

In video call mode there is no support for Bluetooth headsets.

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 communication system, no matter which phone they are using. Sony Ericsson P1 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).
- A 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 manage, 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. Sony Ericsson P1 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. Sony Ericsson P1 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 person 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 Sony Ericsson P1 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 Sony Ericsson P1.

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

The 160 MB storage space designed for user data is where the PIM applications data is stored. As this is a dynamic memory it is impossible to state which number of contacts, email messages, and so on that can be stored in this part of the memory. For example, fewer email messages make room for more contacts.

From the perspective of synchronization performance, however, there are requirements (which the phone meets). See "Synchronization capacity" on page 44 for more information.

Contacts

The Contacts application in Sony Ericsson P1 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 Sony Ericsson P1 when it is synchronized with a computer application such as Microsoft® Outlook® or Lotus Notes®. Contact data can also be added and edited on Sony Ericsson P1. Local and remote synchronization is possible using the SyncML standard. See “Synchronization and data transfer” on page 42 for more information.

Data can also be beamed to and from Sony Ericsson P1 using infrared and Bluetooth™ connectivity. It can also be sent and received using Messages. See “Object exchange – 'Send as'” on page 45 for more information.

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 contacts 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 the same email, SMS, EMS or MMS message to groups of contacts.

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. Meeting invitations can be received by email and added to the Calendar.

The alarm signal can be personalized using sound clips. Appointments can be shared using infrared, Bluetooth™ connectivity, and also by Messages. Local and remote synchronisation are both supported using SyncML. See “Synchronization and data transfer” on page 42 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 Messages, synchronized locally and remotely using SyncML. See “Synchronization and data transfer” on page 42 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 the FM radio or any supported sound that is stored on the phone or inserted memory card.

For the alarm to work, the phone must be switched on. If the alarm is used to wake the user up, Flight mode is recommended.

Sound recorder

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

The Sound recorder allows the user to:

- Record a personal ringtone
- Make changes to existing recordings
- Rename recordings
- Save recordings to the phone or a memory card
- Delete recordings

The music recognition function, TrackID™, is available from Sound recorder. See "Music recognition – TrackID™" on page 33 for more information.

Calculator

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

Timer

The Timer application can be used to remind the user within a certain amount of time. The application is hidden until the time has passed. A message is displayed and a sound is played exactly when the time has passed.

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. Up to 9 events can be recorded.

Converter

The Converter helps converting 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
- An entry in Contacts

Messaging

Email

Sony Ericsson P1 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. Sony Ericsson P1 is supplied with Internet and email wizards which help users easily configure an email account. OTA (Over The Air) configuration of email and ISP accounts is supported.

Sony Ericsson P1 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.

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 Sony Ericsson P1 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. Sony Ericsson P1 allows distribution lists to be created and sender ID information is sent with message alerts.

Sony Ericsson P1 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)
- File produced in the document editors

Attachments may be viewed using the preinstalled viewers for Microsoft Word, Microsoft Excel, Microsoft PowerPoint and Adobe™ Acrobat™ Reader™ (PDF). See “Quickoffice™” on page 24 for more information.

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 computer is transferred in to the corresponding 'synchronized email account' inbox on Sony Ericsson P1. Messages and replies written using this account on Sony Ericsson P1 are transferred and sent via the computer.

Web based email can, of course, be accessed using the Sony Ericsson P1 browser.

Email folders

Messaging accounts have the following folders: Inbox, Outbox, SIM, Draft and Sent. Additional folders may be created, see “Local folders” on page 22 for more information.

Local folders

To improve the organization of your folders you can create more folders locally on Sony Ericsson P1. Local folders are only visible in the Messaging application. Local folders cannot be created on a Memory Stick Micro™ (M2™).

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 messages.

Sony Ericsson P1 is prepared for these solutions with Exchange ActiveSync pre-installed. A rich set of other third party applications are available, for example, OneBridge, Intellisync, BlackBerry, Seven Duality, and Visto Mobile.

Push methods

The various solutions use different methods to push 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 messages 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 the use of a fixed password for push email. 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.

Exchange ActiveSync™

The push email application Exchange ActiveSync™ is normally pre-installed in the phone and ready for setup.

With Exchange ActiveSync™ corporate email, calendar items and contacts on a Microsoft™ Exchange Server 2003 or 2007 can be wirelessly synchronized with the corresponding information in the phone. When on the move, the user can easily, for example, look up details in the company global address book or accept a request for a meeting.

All changes in the phone are automatically synchronized with the user's Exchange Server data. Similarly, all changes to the Exchange Server data are transferred to the phone. With the Direct Push feature activated, synchronization is immediate. If the user, for example, receives a new email in Outlook™ (or a similar client) it is instantly copied to the phone.

Unified mailbox

SMS, EMS, and MMS messages; local Information; beamed and auto configuration messages are all stored within one Unified inbox in Messaging.

- SMS (Short Message Service) – A user can send messages containing up to 160 characters to and from GSM mobile phones (up to 70 characters using unicode text). Sony Ericsson P1 also supports concatenated SMS messages, that is, a user can write a longer message and Sony Ericsson P1 will automatically send it using as many SMS messages that are needed. The user can reply to an SMS message with an MMS message and send a fax using the SMS message as the bearer. There is enhanced support for delivery reports and short message class support.

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

- MMS (Multimedia Messaging Service) – MMS messages may include combinations of video clips, animations, pictures, sounds and text. The following tasks can be performed using this service: smart uploads and downloads, automatic transmission when leaving Flight mode, video recording directly from the MMS application, background transmission, direct link use (customized shortcuts to an operator's Web site to get new templates), and replying to MMS messages with SMS messages.

- Local information, automatic configuration items, and beamed items are all to be found in the Unified inbox.

Area Information

Area information is SMS Cell Broadcasting.

An SMS cell broadcast allows information to be sent to all mobile phones in a particular geographical 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 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 below the network operator name in the phone display. This is often the telephone area code or postal code of the current location.

Quickoffice™

Quickoffice™ is an application that can be used to view and edit Microsoft Word, Excel, PowerPoint and text documents. It can also be used to create new documents and spreadsheets.

Quickoffice™ scans Sony Ericsson P1 and displays a File manger which lists all compatible files (.xls, .doc, .ppt, and .txt) depending on where they are in the phone (the internal memory, memory card, or email can be searched). The File manager view can be changed to only display files that are compatible with one of the support programs.

From the File manager you can delete, move or copy documents, create new documents, and open existing ones. You can also send documents using any of the methods available on the device (email, MMS, infrared, WLAN or Bluetooth™ connectivity).

Quickword™

Quickword™ allows you to view and edit word processing documents saved in standard .doc format on Sony Ericsson P1. Computer format email attachments can be opened directly on the device without the need for pre-conversion at a computer. Existing documents may also be edited.

Documents can be transferred to and from Sony Ericsson P1 using email, MMS, infrared, WLAN, or Bluetooth™ connectivity. Also memory cards can be used. Quickword™ opens files created with Microsoft Word 97, 2000, XP and 2003 and are saved in Microsoft .doc format.

When a document is opened for editing, a copy of the document is created so that the original file is intact. When saving a file, Quickword™ creates a native Microsoft Word file.

Key features

- Refined user interface for easier document editing and viewing.
- Multiple Undo and Redo commands including cut, copy, paste and formatting functions.
- View tables embedded within documents and edit the text (tables are displayed in a single column format for easier viewing on Sony Ericsson P1, actual table format of the document is not affected).
- MS Word compatible paragraph and style formatting.
- Advanced text formatting and full font control including typeface, size, bold, italics, superscripts, subscripts and underline.
- Open, view, edit and create both .doc (MS Word) and .txt (text) files.

- Edit Word documents, and forward to colleagues just as you would from your desktop computer or laptop.
- ZoomView™ lets you pick the display size best for you.
- Quick navigation through documents.
- Colour support and colour picker for changing font colours.
- Keyboard support for folding portable keyboards and on device text entry.
- Format paragraphs with left, center and right text justification.
- Portrait and landscape mode supported.
- Cut and paste text, undo edits, and more.
- Edit-protect mode prevents editing or making alterations while reviewing documents.

Quicksheet™

Quicksheet™ is a full function spreadsheet with Microsoft Excel compatibility.

Quicksheet™ opens files created with Microsoft Excel 97, 2000, XP and 2003 and saves in Microsoft .xls format.

Key features

- Offers the most frequently used scientific, financial, statistical, date & time, lookup and aggregate Excel functions and sorting.
- Multiple sheets per workbook and sheet linking.
- Advanced cell editing features that allow to you create and modify spreadsheets easily. Permits cell formatting in a number of different ways.
- Quickly sort data and lists.
- Find and Find/Replace functions.
- Cell and font colour formatting.
- Column resizing, row and column freezing.
- Portrait and landscape mode supported.
- Saves changes as a native Excel file that can be sent via an infrared, WLAN, USB or Bluetooth connection, or via email.

Quickpoint™

Quickpoint™ allows you to view and edit Microsoft PowerPoint presentations. The application is compatible with MS Office 97, 2000, XP and 2003. It allows a variety of modes for viewing such as slide, notes and outline views.

Key features

- Edit slide text in Outline view and show the changes in the Slide View.
- Edit speaking notes.
- Edit PowerPoint presentations and forward them to colleagues just as from a desktop computer or laptop.
- View and edit PowerPoint slides and notes. Advanced viewing includes three views: Outline view, Slide view, and Speaker Notes view.
- Zoom in and out.
- Portrait and landscape mode supported.
- Save changes as a native PowerPoint file that can be sent via an infrared, WLAN, USB or Bluetooth connection, or via email.
- Give presentations directly on the Sony Ericsson P1 with iGo® Pitch Duo™ display accessory or on a remotely controlled computer.
- Send presentations to a TV using the Sony Ericsson Media Viewer MMW-100 or to a Bluetooth enabled PC projector.

Pdf+

Pdf+ is a viewer for Portable Document Format (or PDF) files. Pdf+ reads and displays standard PDF files, without the need for conversion on a computer to a proprietary format.

Pdf+ features:

- View the text, line drawings and bit maps in the document.
- Browse the document, and go to a specific page.
- Wrap the text to make it fit the screen.
- Zoom in and out to maximize the amount of text and graphics that can be read on the screen.
- Hide the title and the status pane to maximize the viewing area.
- Search for strings in the text of the document.
- View and follow bookmarks.
- Follow links to other pages in the document.
- Follow URLs.
- Read files protected with a user password.

The 'wrap' view displays the document so that as much text as possible is visible on the screen. Images and line drawings are not visible in this view. Pdf+ can display a large number of PDF 1.0, 1.1, 1.2 and 1.3 files.

Limitations: Pdf+ does not handle the dynamic content of a PDF file, such as hypertext links, and cannot render Type 0 or Type 3 fonts.

Document types supported

Document type	Features
Adobe PDF	Viewer
Microsoft Excel	Editor
Microsoft PowerPoint	Editor
Microsoft Word	Editor

Camera

3.2 megapixel camera

With the integrated 3.2 megapixel camera, the user can take pictures and video clips and store them in the phone memory or on a memory card.

The megapixel quality gives excellent results when images are printed or viewed on a computer or TV.

Images can be sent as an attachment in an email or as a picture message. The picture can also be sent via an infrared, WLAN, USB or Bluetooth™ connection.

The still picture resolution can be set to:

- QXGA (2048 x 1536)
- UXGA (1600 x 1200 pixels)
- SXGA (1280 x 960 pixels)
- VGA (640 x 480 pixels)

The image quality settings can be set to:

- Fine (low compression)
- Normal (medium compression)
- Economy (high compression)

All these resolutions provide an 18-bit colour depth (262 k colours).

When using the camera the viewfinder is displayed in landscape orientation. The camera has a photo light which acts as a flash, the flash can be manually enabled when required.

Auto focus

The camera has auto focus functionality. To operate auto focus the camera button is pressed halfway. The camera focuses on the image, a symbol is displayed in the viewfinder to indicate that the image is in focus. Press the camera button all the way to take the image or release it to change the camera position and re-focus the image. Auto focus can be turned off, and the image is captured immediately when the camera button is pressed.

Macro mode is used for close-ups. The lens focuses on a much shorter distance, 10 - 50 cm.

Smart zoom

For close-up pictures, the camera has a 3.0 x digital smart zoom, working in 22 steps. When the zoom level is increased, the frame size is reduced – smart zoom.

Burst mode

When taking a photo of an object that moves quickly, burst mode may be used to take four pictures in rapid succession. Burst mode takes pictures in VGA resolution.

Using the camera and video

The camera and video can be started with the camera button or from the Main menu. To many of the camera settings there are shortcuts on the keypad, thus eliminating the need for opening the Settings menu and pointing at the screen.

Recording video clips

When the camera application is running, the user can select video capture mode. Video clip capture quality can be set to:

High - AAC-LC ('Fine' in phone) (sound = mono 8 kHz @ 12.2 kbps)		
Frame size	**Frame rate (FPS)**	**Bandwidth (kbps)**
QVGA	15	384
QCIF	30	256
QQVGA	30	192
SQCIF	30	128
Normal - AAC-LC ('Normal' in phone) (sound = mono 8 kHz @ 12.2 kbps)		
Frame size	**Frame rate (FPS)**	**Bandwidth (kbps)**
QVGA	10	256
QCIF	15	128
QQVGA	15	96
SQCIF	24	96
Low - AMR-NB ('Economy' in phone) (sound = mono 8 kHz @ 12.2 kbps)		
Frame size	**Frame rate (FPS)**	**Bandwidth (kbps)**
QVGA	7.5	192
QCIF	7.5	64
QQVGA	10	64
SQCIF	15	64

Video format

Video can be stored in the following formats:

- 3GPP for low quality video recordings to be used in MMS messages.
- MPEG-4 for normal and high quality video recordings.

Auto-exposure control

The camera has a full automatic exposure control that selects the optimal exposure needed to get an excellent picture.

Lighting adjustment

The camera has built-in compensation for bright skies that automatically adjusts the brightness of landscape pictures. This avoids the dark and dull images that automatic cameras sometimes give in difficult lighting situations. It is especially effective for outdoor photography on grey and cloudy days.

Photo light

The camera has a high quality LED light to improve picture quality in dark environments.

Business card scanner

It is possible to take a photo of a business card and then use the Business Card Reader application to scan the card. The scanned text can then be saved as a contact.

The business card scanner is able to handle Latin and Chinese (traditional and simplified) fonts, and can handle business cards in the English, Chinese, German, French, Spanish, Italian, Portuguese and Swedish languages.

Picture gallery

With the Picture gallery application the user is able to view, send and organize photographs. The application also allows the contents of a folder to be shown as a slide show. The user can then move from picture to picture manually or let Picture gallery do it automatically.

Picture gallery supports image types JPEG, BMP, GIF (including animated), MBM, PNG, and WBMP in 262 k colours.

From Picture gallery it is possible to launch the Picture editor.

Picture editor

Using the 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 images. A simpler version of the Picture editor is used for creating images for EMS messages.

Entertainment/multimedia

Media player

From the Media player the user can access three media functions:

- Music – Select to access music tracks. Songs may be collected in numerous ways, including Internet download, file transfer from computer or memory card.
  Music can be organized and listened to on Sony Ericsson P1. Music is grouped by Album, Artist and Track in the music library. The Tracks view displays all the music available. Tracks can be added to the music library manually.
- Video – Select to access video clips.
- Radio – Select to launch the FM radio. See “FM radio” on page 33 for more information.
- Online – Access saved bookmarks to music and videos.

To avoid including ringtones in the music library content that should be excluded can be specified.

The Media player features an equalizer with predefined settings like MegaBass, Pop, Classical. It supports different audio and video formats, streaming, download and playback.

The Media player is intelligently aware of other applications in Sony Ericsson P1, playback is paused when a telephone call is made or received.

Playlists

One of the most central Media player features is the use of playlists. This feature allows users to create their own ‘collections’ of songs and gives easy access to them. It is possible to create, sort and manage playlists using audio files that are stored in the phone memory or on a memory card.

Preinstalled ringtones are already placed in a separate ringtone folder.

Play modes

The Media player has two different play modes: shuffle and loop.

- Shuffle plays a randomly selected file from the current playlist. Played files are de-selected and not repeated.
- Loop restarts the playlist when the last item in the list is reached.

DRM protection

In Sony Ericsson P1 the following types of DRM protection are used: FWL (Forward Lock), CD (Combined Delivery) and SD (Separate Delivery). All protection types can be applied on MP3, AAC and MPEG4 files. See “DRM” on page 47 for more information.

All protection types can be applied to all types of multimedia content such as audio, video, images and Java midlets.

Ringtones

Ringtones can be played in the Media player. Any file in a supported audio format can be used as a ringtone as long the operator has not disabled that format for ringtone use.

Ringtones can be downloaded using PlayNow™ or created using MusicDJ™.

Streaming

Media player content is streamed using RTSP (Real Time Streaming Protocol) session control, according to the 3GPP specification.

Audio support is AMR-NB, AAC, AAC+ and eAAC+, according to 3GPP.

3GPP specifies the following codecs:

- MPEG-4 Visual Simple Profile Level 0-3
- H.263 Profile 0 Level 10

Sony Ericsson P1 also supports:

- Real Audio
- Real Audio Video

Media formats

Audio formats

Format	Description
AAC-LC	Advanced Audio Coding. AAC is the latest audio coding standard, defined in the MPEG-2 standard and used for high-quality audio compression. AAC provides higher quality than MP3 at the same bit rate, or for the same audio quality it uses a 30 per cent lower bit rate. It supports the coding of multichannel audio, with up to 48 main channels and 16 low-frequency channels. The AAC offers three different profiles to facilitate trade off between quality, memory and processing power requirements. They include: Main Profile (MP), Low Complexity (LC) and Scalable Sampling Rate (SSR). The Media player can play AAC-LC format audio which is encoded into an MPEG-4 file or stream. The Sound recorder uses the AAC-LC format for recording. AAC-LC includes High Efficiency AAC+.
AMR-NB	Adaptive Multi Rate. AMR-NB is a speech compression format that is highly optimized for the mobile environment, requiring as little as 4.75 Kbps bandwidth. AMR-NB is used to convey voice recordings in MMS, 3GPP video clips or streams. Sony Ericsson P1 records AMR using 12.2 Kbps with a sample rate of 8 kHz.

AU	Similar to WAV, this is an audio format commonly used in the Macintosh, Unix and Java™ worlds. It is not commonly used for content on mobile devices.
iMelody	A format commonly used for monophonic ringtones. (Sony Ericsson P1 ringtones can use up to 40 voices.)
MIDI	Musical Instrument Digital Interface. MIDI is not a recording of music, but a description which enables a local synthesizer to play the music from the instructions included in the MIDI file. Since a MIDI file only represents player information, it is far more concise than formats that store the sound directly. An advantage is very small file sizes. A disadvantage is the lack of specific sound control. MIDI is ideal for polyphonic ringtones. (Sony Ericsson P1 ringtones can use up to 40 voices.)
SP-MIDI	SP-MIDI stands for Scalable Polyphony MIDI. SP-MIDI is based on the MIDI format and adapted for mobile phones and other portable products. The objective is to secure interoperability between products with different sound capabilities. Initial recommendations for using SP-MIDI in 3GPP™ applications are discussed in a separate document, “Scalable Polyphony MIDI Device 5-24 Note Profile for 3GPP™”.
MP3	MP3 is the file extension for MPEG audio layer 3. Layer 3 is one of three coding schemes (layer 1, layer 2 and layer 3) for the compression of audio signals. Layer 3 uses a very efficient compression method, removing all irrelevant parts of a sound signal that the human ear cannot perceive. The result is, CD digital audio (CDDA) is converted to MP3 with almost untouched quality, compressed by a factor of around 12. The high compression of audio in MP3 files makes them relatively small, though MP3 files can be created with different size and quality compromises. The small file size, together with the excellent sound quality, are the main reasons for the MP3-format’s massive popularity when sharing music over the Internet.
RMF	Rich Music Format™. A file format developed by Beatnik combining the compact size of MIDI files with the high quality of sampled sound.
WAV	A wave file is identified by a file name extension of WAV (.wav). Used primarily in PCs, the wave file format has been accepted as a viable interchange medium for other computer platforms, such as Macintosh. This allows content developers to freely move audio files between platforms for processing. In addition to the uncompressed raw audio data, the wave file format stores information about the file's number of tracks (mono or stereo), sample rate, and bit depth.
WMA	Windows Media Audio (WMA) is a proprietary compressed audio file format developed by Microsoft. It was initially intended to be a competitor to the popular MP3 format, but has not yet received such popularity.
XMF	Xtended Music Format. XMF is a technology for collecting other music and sound resources, such as Standard MIDI Files, DLS instrument files, WAV or other digital audio files. XMF does not describe musical notes, notations, instrument sounds or audio recordings. Instead, it offers content creators a method to collect all those elements and put them in a single file. In the end, this means easier handling and more consistent predictable playback.

DLS	The DLS file format is used to store both the digital sound data and articulation parameters needed to create one or more 'instruments.' An instrument contains 'regions' which point to WAVE 'files' (samples) also embedded in the DLS file. Each region specifies a MIDI note and velocity range which will trigger the corresponding sound and also contains articulation information such as envelopes and loop points. Articulation information can be specified for each individual region or for the entire instrument."
Real Audio 9	RealAudio is a proprietary encoding format from RealNetworks. It also supports repositioning during real-time playback.
eAAC+ (eAAC+, AAC+ V2)	eAAC+ is AAC+ with the addition of Parametric Stereo (PS). PS significantly increases the codec efficiency for low bit rate stereo signals.
AAC+ (HE AAC, AAC+)	'High-efficiency AAC' is the official MPEG name for the combination of AAC and Spectral Band Replication (SBR). SBR is a bandwidth extension technique enabling audio codecs to deliver the same quality at half the bit rate.

Video formats

Format	Description
MPEG-4 ISO File Format (.mp4), ISO/ IEC 14496-14, including: • MPEG-4 • AAC-LC, AMR-NB (audio)	File formats that are specified as a part of the ISO/IEC MPEG-4 international standard. It is used to store media types defined by the ISO/IEC Moving Picture Experts Group, and can be used to store other media types as well. It is, typically used to store data in files, though it will be used in data streams and possibly in other ways. The .mp4 allows multiplexing of multiple video and audio streams in one file, variable frame- and bit-rates, subtitles and still images. It also allows streaming over the Internet.
3GPP File Format (.3gp), 3GPP TS 26.234 V5.6.0, including: • MPEG-4, H.263, H.264 (video) • AAC-LC, AMR-NB (audio)	File formats which are used in mobile phones to store media (audio/video). This file format is a simpler version of "ISO 14496-1 Media Format". This format can only carry video encoded as MPEG-4, H.263, or H.264. Audio is stored in AAC-LC or AMR-NB formats.
RealMedia	A digital sound and video file format that is the registered trademark of RealNetworks. This format is typically used to stream media through the net.
Windows Media Video, WMV	A generic name for the set of video codec technologies developed by Microsoft. It is part of the Microsoft Windows Media framework.

Picture editor formats

Format	Example file size	Description
BMP	226 KB	Microsoft® Windows® Bitmap. A graphics format defined by Microsoft supporting 1, 4, 8 or 18-bit colour depth. No compression, so files can be very large. Used for icons and very small images.
GIF	42 KB	Graphics Interchange Format. Highly compressed by limiting the colour palette to 16 or 256 colours. GIF is therefore good for icons and diagrams. When a Note is sent as an email attachment, the GIF format is used.
GIF (animated)	210 KB (5 frames)	A GIF animation containing a number of images in a timed and repeating sequence. Some Sony Ericsson P1 applications display only the first image in the sequence.
JPEG (.JPG)	13 KB	An image compression format managed by the Joint Photographic Experts Group. The format supports various degrees of compression, enabling different quality/file-size balances to be provided in one standard. JPG files support millions of colours and are therefore good for 'real life' photographs.
MBM		Multi Bitmap. This is a Symbian OS format for colour and greyscale bitmap images.
PNG	166 KB	Portable Network Graphics. PNG compresses images with millions of colours so there is no loss of detail, but comparatively large file sizes. Not commonly used.
WBMP	23 KB	Wireless BitMap. An image format optimized for small mobile devices. Sony Ericsson P1 supports Black and White, 2-bit greyscale and 6-bit colour modes, according to ETSI 3GPP TS 23.040

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 cannot be previewed and are only available in certain phone modes.

MusicDJ™

A sampler music tool with MIDI drum, bass, chord and accent loops in different music styles, which can be combined to create polyphonic ringtones. MusicDJ™ is touchscreen enabled.

FM radio

The FM radio works on the frequency bands:

- 87.5 to 108.0 MHz for US/ European.

The above frequencies work worldwide, with the exception of Japan.

An Sony Ericsson P1 handsfree headset or an accessory with an 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. This 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:

- Select the FM radio as the alarm signal, allowing Sony Ericsson P1 to work as a clock radio.
- Display frequency, station name, RDS, radio text and signal strength – if this information is available.
- Perform an automatic or manual station search.
- Enter the 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.

Music recognition – TrackID™

Function that enables the user to record a few seconds of a song, send it to a music recognition service on the Internet and have information about the song – title, artist and album information – sent to the user's phone. TrackID™ is not available in all countries.

Games

To enable the development of even more sophisticated applications the Sony Ericsson P1 supports OpenGL ES and features full PowerVR® hardware 3D graphics acceleration.

Included applications:

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 is 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.

Qudrapop

Qudrapop is a Java™ based game. Qudrapop is a simple yet addictive 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

Sony Ericsson P1 features the integrated Opera 8 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. The Opera browser is primarily an HTML browser.

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

Sony Ericsson P1 supports the 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 such as banking, the user may require a secure connection between the phone and the Web site. Sony Ericsson P1 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

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.

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:

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.

Sony Ericsson P1 comes preinstalled with X.509 certificates from Baltimore, Entrust, Geotrust, GlobalSign, GTE Cybertrust, RSA, Sony Ericsson, Thawte and VeriSign.

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 for more information 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 an infra-red, WLAN, USB or Bluetooth connection, or via email.
- Link to more information via the Web browser.

Connectivity

WLAN

Wireless LAN, WLAN, is a network access technology becoming increasingly common around the world. It allows users with portable computers and wireless devices to access network resources wirelessly, at the office, in the home, or in public spaces (public Access Zones or so-called “hot spots”), such as cafés, airports, aeroplanes and hotels.

Sony Ericsson P1 WLAN may be used as an alternative to any other type of network connection, such as, a GSM, UMTS, infrared or Bluetooth™ connection, and it may be chosen as the preferred connection method for any of the Sony Ericsson P1 data applications.

The WLAN functionality is compliant with the IEEE 802.11b standard (11 Mbit/s), and will work simultaneously with Sony Ericsson P1 GSM, UMTS, infrared or Bluetooth connection interfaces.

The WLAN functionality can be switched on or off as required, including when the Sony Ericsson P1 is placed into Flight mode.

The Sony Ericsson P1 allows the user to rapidly make a connection to a public hot spot. A WLAN icon is available on the Sony Ericsson P1 status bar and this icon may be used to open the WLAN set-up screen. The user may then use the WLAN and scan for available networks. A connection to a chosen hot spot may then be made without the need for entering any technical details about the network.

The phone also uses a feature called “Fast connect” to allow the user to simply enter the encryption key or password when trying to make a connection to an unknown access point that uses WPA-PSK, WPA2-PSK or WEP encryption.

It is possible to use WLAN in conjunction with a personal firewall and virus scanner.

For connection to a private network in the office or at home, Sony Ericsson P1 supports the following encryption/authentication methods:

- WEP
- Shared WEP
- Dynamic WEP
- WPA Personal and WPA2 Personal
- WPA Enterprise and WPA2 Enterprise

Setting up more complex settings for infrastructure and ad-hoc modes is simplified by the use of a wizard that presents relevant options after each selection is made. For example, a WEP key selection screen follows the selection of shared encryption.

Virtual private networks software is supplied for use with WLAN in Infrastructure network mode.

Voice over IP, VoIP

Sony Ericsson P1 comes with enablers for creating a Voice over IP (VoIP) client. This makes it possible to use the phone as a complement to, or even as a replacement for, a fixed phone at home. A Sony Ericsson partner may develop, market and deliver VoIP clients using the audio and network enablers provided in Sony Ericsson P1. Near-realtime PCM Record & Play, echo cancellation, and access to audio paths are a few examples of enablers.

The Sony Ericsson WLAN implementation makes it possible for a VoIP client to use wideband codecs, WLAN Powersave for increased standby times, and WMM for requesting a high Quality of Service (QoS) level.

If the WLAN signal strength is decreased, the VoIP client has the opportunity to initiate a Circuit Switched call in order to maintain an ongoing call.

Memory Stick Micro™ (M2™)

SanDisk Corporation and Sony Corporation have developed the Memory Stick Micro™ (M2™), an ultra-small IC recording media designed to meet the growing storage needs of highly compact, multi functional mobile phones. Licensing for the development of Memory Stick Micro™ (M2™) compatible hardware started in October, 2005.

A Memory Stick Micro™ (M2™) memory card is approximately one-quarter the size of the Memory Stick™ PRO Duo media, yet only about 1.2 mm thick. The media's edges are slotted lengthways to allow for more slim-line designed connectors to reduce space in host devices.

The Memory Stick Micro™ (M2™) incorporates Sony's MagicGate copy-protection mechanism.

Dimensions	15 x 12.5 x 1.2 mm
Volume	225 mm^3
Connector pin	11-pin
Maximum capacity	4 GB
Max. data transfer rate	160 Mbps
Operating voltage	2.7 V / 3.6 V
Interface	Serial interface and 4-bit parallel interface
Operating temperature	-25 ~ +85^{o}C
Copyright protection	MagicGate

The Sony Ericsson P1 supports the Memory Stick Micro™ (M2™) – a convenient way of adding storage and other functions to the phone.

A Memory Stick Micro™ (M2™) can be plugged into any standard size Memory Stick™ slot using a Memory Stick Micro™ (M2™) adaptor. The Memory Stick™ has full electrical and file system compatibility.

PC and Apple® Mac® support

PCs and Apple® Mac® computers may be enabled for Memory Stick™ via built-in Memory Stick™ slots, PC Card adaptors, USB adaptors and even a Memory Stick™ enabled mouses. (Memory Stick Micro™ (M2™) adaptor is required).

Industry support

The Memory Stick™ concept is supported by a wide range of companies including major names in consumer electronics, computing, automotive, mobile phone, photographic and semiconductor sectors of industry. As of July 2006, 655 companies have declared support. See www.memorystick.com for more information.

Memory Stick™ compliant products include PCs, PDAs, digital cameras, portable music players, printers, projectors and entertainment robots. Future applications include home and car audio, game machines and multimedia kiosks.

Memory card in Sony Ericsson P1

Sony Ericsson P1 is delivered with a 512 MB Memory Stick Micro™ (M2™) memory card. Here are some examples on how to use the memory card in Sony Ericsson P1:

- Transfer images to other image-aware devices, such as PCs and printers.
- Transfer data and media (sound, pictures, video clips, documents etc) between the Sony Ericsson P1 and a PC or Mac.
- Store backup copies of important files on the memory card.

- Install new applications from the memory card.
- Have third party applications make use of memory card storage.
- Transfer data using the USB cable between a memory card in Sony Ericsson P1 and a connected computer.
- Personalize Sony Ericsson P1 using media on a memory card.
- Use media on a memory card when composing MMS messages.

The following built-in applications are able to interact with a Memory Stick Micro™ (M2™) memory cards: images and video, Media player, Email (attachments), viewers and editors (such as Quickword™), MMS (media), Browser, Phone (ringtones, screensaver), Contacts (pictures of contacts, ringtones).

Compatibility with other Memory Stick™ devices

Sony Ericsson P1 defines its own folder structure on a Memory Stick Micro™ (M2™), within a vendor-specific area and this is the only area that can be accessed by all of Sony Ericsson P1 applications, except for the File manager. The File manager may be used to move files between the Sony Ericsson P1's MMFH (Multimedia File Handling) system and folders placed on a Memory Stick Micro™ (M2™) by other devices, thus allowing files to be shared between Sony Ericsson P1 and other devices.

Connection to computer

A Memory Stick Micro™ (M2™) may be inserted into a computer or camera with Memory Stick™ support, using a Memory Stick Micro™ (M2™) adaptor.

Bluetooth™ wireless technology

Sony Ericsson P1 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 Sony Ericsson P1

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

Sony Ericsson P1 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, whereas an infrared connection requires line of sight.

Secure and fast

Data connection with a Bluetooth™ connectivity computer 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 computer.

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 computer, or with a digital still or motion video camera. Use Sony Ericsson P1 as a modem to send pictures from a digital camera to an imaging server.

Exchange music files with another mobile phone or a computer. Play MP3 and MIDI files 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.

Audio quality

Sony Ericsson P1 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 user to use a computer to manage content files that reside in the phone's file system or on a Memory Stick Micro™ (M2™). Most computer Bluetooth applications provide an explorer like user interface for the file transfer service. When connecting to the phone, the computer application will show one folder for the content in the phone's file system and another folder for the content on the Memory Stick Micro™ (M2™). 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 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 Sony Ericsson P1:

- 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 a Bluetooth connection. It is possible to download the HID configuration files via an infrared, WLAN, USB or Bluetooth connection. It is also possible to transfer the files to another device using an infrared or Bluetooth connection.

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 the transferring of objects between compatible phones. Sony Ericsson P1 can be used to control electrical devices that have an infrared port, such as, a television or DVD player.

USB

Sony Ericsson P1 is USB 2.0 FS (12 Mbps) compliant. The idea of the USB port is to allow easy connection of the phone to a computer.

USB is designed to be completely “Plug and Play”, that is, 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 computer.

Sony Ericsson P1 supports USB charging, which means that the user can have the phone battery charged while USB connected to, for example, a computer. This possibility is very useful if the user travels a lot.

Data storage

Sony Ericsson P1 is divided into two parts:

- A GSM phone part, having flash memory. This is very similar to a conventional mobile phone.
- An 'Organizer' part running Symbian OS and having a large amount of flash and RAM memory plus a Memory Stick Micro™ (M2™) slot and the ability to exchange files with a PC.

The RAM (Random Access Memory) is controlled by the Symbian OS operating system and is not used to store any user or program data. The RAM is totally re-initialized when Sony Ericsson P1 is started.

The available 256 MB flash memory is split into approx. 95 MB for operating purposes and up to approx. 160 MB for storage of user data, such as, audio files, pictures, documents, additional languages and settings such as the active theme. Flash memory retains data even with no power applied. Unlike some PDA devices, Sony Ericsson P1 does not require a small 'memory backup' battery. Data stored on Sony Ericsson P1 is therefore not subject to loss due to such a battery running down.

The first memory bank is used like a ROM. It stores the Symbian (UIQ) operating system, the built-in applications and some essential multimedia information like a default ringtone. It also stores the language files for UK English which is the default language of the Standard Sony Ericsson P1. Chinese models also have Chinese stored on the ROM.

Note: The extensive MMI of Sony Ericsson P1 means that it is impractical to hold many languages inside the phone, as is the case for some other models.

Part of the flash memory provides a 'C:' drive of up to approx. 160 MB capacity. This behaves just like a normal disk drive. The folders can be viewed and managed from the File manager application or from a connected PC.

User storage

The user storage space (C: drive) 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.

Additional storage space is available by using memory cards. Sony Ericsson P1 is delivered with a 512 MB Memory Stick Micro™ (M2™) memory card. Memory cards of up to 4 GB capacity are supported. Any number of memory cards may be used for storage. See “Memory Stick Micro™ (M2™)” on page 37 for more information on how to use memory cards when exchanging data with other devices.

Depending on the application, data can be beamed, mailed, uploaded to the Web, transferred to a PC or moved to a memory card in order to archive and create free user space on Sony Ericsson P1. See “Synchronization and data transfer” on page 42.

User storage configuration in the new Sony Ericsson P1

Applications and information are placed in the internal storage of Sony Ericsson P1 in the factory. This provides sample demonstration, educational, multimedia and fun content so that Sony Ericsson P1 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 Sony Ericsson P1 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 following locations:

- Try and Buy applications on a Memory Stick Micro™ (M2™).
- Sony Ericsson Web site.

Since Multimedia content is easily transferable using memory cards, an infrared connection or Bluetooth™ wireless technology, it is simple to restore favourite content from someone else's Sony Ericsson P1 (unless DRM protected).

Folder view of internal storage

This section explains in more detail how the data is organized on the C: drive.

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.

There is a folder for each media type: audio, video and image. Documents (such as Microsoft Word files) 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.

Synchronization 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.

Sony Ericsson P1 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 use 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. Because 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.

Sony Ericsson P1 uses SyncML for both local synchronization (with a PC using Bluetooth™ connectivity or a cable connection) and remote synchronization over HTTP.

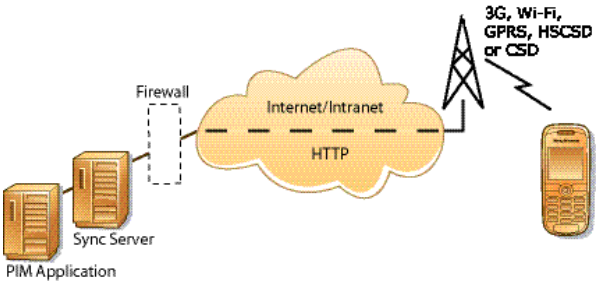
What information can be synchronized in Sony Ericsson P1?

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

** Note, Email and Bookmarks 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 Sony Ericsson P1 up to date. 3G enables a fast connection to the network - the synchronization can be started in seconds.



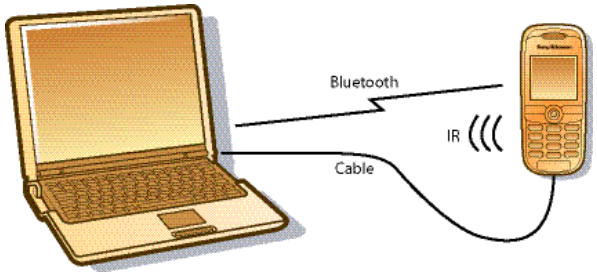
Synchronization services will be offered by third-party service providers and as added capability to corporate PIM applications. Corporate PIM applications such as Microsoft® Exchange can be supplemented with SyncML capability.

Server alerted synchronization

If updates are made on the PC the server automatically notifies Sony Ericsson P1. The updates are automatically synchronized to Sony Ericsson P1. A remote server can initiate a synchronization with the Sony Ericsson P1 using WAP Push.

Local synchronization

Sony Ericsson P1 is supplied with PC software for local synchronization. It may be installed from the supplied PC Suite CD.



Bluetooth™ wireless technology, infrared or cable

Sony Ericsson P1 always synchronizes using SyncML, regardless of connection type. It connects via Bluetooth™ wireless technology, infrared or cable. The cable is connected directly to the phone or via the desktop charger connector.

Synchronization capacity

Sony Ericsson P1 meets the standard performance requirement to synchronize the following number of items “within a reasonable time”:

Contacts	2000
Calendar items	1000
Notes	500
Tasks	500
Email messages	1000
Bookmarks	500

Automatic synchronisation

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

- When the USB cable is plugged in to Sony Ericsson P1.
- When Bluetooth wireless technology 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 Suite software, supplied with the phone, enables synchronization with the following Personal Information Managers (PIMs):

- Microsoft® Outlook® 2000, SP3
- Outlook 2002, SP2
- Outlook 2003, SP1
- Outlook 2007
- Lotus Notes® 5.0, 6.0, 7.0
- Internet Explorer 6, 7
- Windows Address Book
- Windows Contacts

The PC Suite software is designed to work with:

- Windows 2000 Professional, SP4
- Windows XP Home, SP2
- Windows XP Professional, SP2
- Windows Vista Business, Enterprise, Home Basic, Home Premium, Ultimate

The general system requirements are as required by the used PC operating system, or as a minimum:

- PC with 500 megaherz or higher processor clock speed
- 256 megabytes (MB) of RAM or higher
- 1.5 gigabytes (GB) of available free hard disk space
- Super VGA (800 x 600) or higher resolution video adapter and monitor
- Keyboard and Microsoft Mouse or compatible pointing device

Older operating systems, for example, Windows 98, Windows ME and Windows NT will not work together with PC Suite.

It is recommended that the PC Suite software is installed for the same language as the operating system on the PC.

File transfer utility

A utility is provided which enables files to be transferred to and from Sony Ericsson P1 connected to a PC. Typical uses for this include:

- Archiving pictures taken on Sony Ericsson P1 to PC storage.
- Moving images to Sony Ericsson P1 to use in personalization, MMS messages etc.
- Storing MP3 files in Sony Ericsson P1 or on a memory card.
- Moving sound clips to/from Sony Ericsson P1 for personalization.
- Storing work documents (Word, Excel) on Sony Ericsson P1 to read on the move.

Backup and restore

Backup is initiated from a 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 installed third party applications) are backed up and stored on the PC.

The restore utility takes stored data from the PC and places it back on to Sony Ericsson P1.

Language change utility

Sony Ericsson P1 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 Sony Ericsson P1. The Language Change Utility is not available for Chinese models.

Software installation utility

This utility enables Sony Ericsson P1 applications to be installed from a PC.

Settings download

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'

Sony Ericsson P1 makes it easy to transfer objects via an infrared or Bluetooth connection or via Messages. 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.

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

To perform a 'Send as' beam operation using a WLAN connection, the receiver must be WLAN enabled and be able to connect to Sony Ericsson P1.

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

To beam an item over a Bluetooth connection, scanning is used to find other devices within range. The user can then select the required device and send the information across.

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

Sony Ericsson PC Suite

Among others, 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®.
File Manager	Enables Windows Explorer to see the phone as a device and the internal and Memory Stick Micro™ (M2™) storages as two disk drives on the device. Multimedia files may be copied between the PC and the phone.
Backup and Restore	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.
Download language	Enables the user to load a different language from the CD-ROM and switch the phone UI to that language, assuming the specific phone supports this. The language files are also available at www.sonyericsson.com/support.
Application Installer	Utility to install new applications from the PC.
Settings download	Wizard for creating 3G, GPRS and HSCSD settings for Internet and email connections.
Drivers	Drivers for using the phone as a modem over an infrared or Bluetooth connection, or using the USB cable.

Sony Ericsson Update Service

The Sony Ericsson Update Service offers a convenient way for a user to always keep the phone's software up to date. When an improved software version is available, it can be downloaded whenever the user wishes.

As a first step, the Update Service software needs to be downloaded and installed on an Internet-connected computer. The next step is to connect the phone to the computer, download the latest

operator approved software from the Web (www.sonyericsson.com/support) and have the phone updated.

The user is guided smoothly through the update process and no user data will be lost.

DRM

The Digital Rights Management (DRM) technology enables the secure distribution, promotion, and sale of digital media. Examples of such content include screen savers, themes, ringtones, and branded games (currently restricted to java games/ midlets only). In other words, content providers can control how users may use different types of content in devices, such as, mobile phones, computers 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 Open Mobile Alliance (OMA). 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 phones in the DRM area and also result in a strong, competitive DRM standard.

Sony Ericsson P1 supports the OMA DRM v1 standard.

FWL – Forward Lock

Sony Ericsson P1 supports OMA DRM Forward Lock. It is the simplest OMA use case, with no special licences defined. The content is provided in a single DRM packaged file, thus protecting the content from being distributed 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 Sony Ericsson P1 as part of an MMS message or via HTTP download. Sony Ericsson P1 supports OMA Download. More information is available at www.sonyericsson.com/developer.

CD – Combined Delivery

Sony Ericsson P1 supports OMA DRM Combined Delivery/Forward Lock. Content and associated licences are downloaded or delivered to the user as a single DRM packaged file. This means that the content or licence issuer controls to which 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

Sony Ericsson P1 supports OMA DRM Separate Delivery. Content and associated licences are received as separate DRM packages, either simultaneously or at different points in time. This enables the distribution of content to other users – with the same possibilities to control the use of the content as exist with Combined Delivery/Forward Lock. Distribution of content to other users will require them to obtain licences from the licence issuer.

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 since the “Send to” option is disabled.

All three types of protected content (FWL, CD and SD) packages can be transferred to a Memory Stick Micro™ (M2™) memory card, thereby enabling storage of large amounts of content.

OMA DRM Combined Delivery/Forward Lock protected content on a Memory Stick Micro™ (M2™) 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 licences to use the content on the new

device. Thus, a Memory Stick Micro™ (M2™) is one way of distributing Separate Delivery content to several users. Licences to use the content can never be distributed from user to user (phone to phone). Licences always have to be obtained directly from the licence 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 v1 standard before it is delivered to the phone, including content and associated licences.

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

Personalization

Sony Ericsson P1 can be personalized by the user in one of the following ways:

- Use of a 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 Sony Ericsson P1 from the Internet or other sources.

Background and application shortcuts

Users can set a static image, or animated GIF, to be the background 'wallpaper' for the standby screen. The image size is 208 x 189 pixels and the following formats are supported: JPEG, GIF, BMP, WBMP, MBM and PNG. Larger images will be resized to fit.

The application shortcut buttons may be personalized by the user. The user may also select to have them displayed all the time.

Screen saver

A 'screen saver' image is displayed after a period of inactivity. The user can switch this facility on and off and select the delay period before the screen saver is displayed. Image size is 208 x 320 pixels and the format is the same as 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, Sony Ericsson P1 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 a CLI (Calling Line Identification) matching a phone contact, the contact's picture is 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 Memory Stick Micro™ (M2™), MMS, EMS and transfer from a PC.

Any compatible audio file in the multimedia storage (internal or memory card) including MP3 can be selected as a ringtone. Sony Ericsson P1 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 Sony Ericsson P1 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 exists on a memory card that is unplugged, 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 internal storage or memory card) 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 a 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 the mobile operator's helpdesk is all that is needed – the appropriate settings can then be sent via SMS directly to the phone.

OTA configuration using the OMA Client Provisioning v1.1 (WAP OMA Provisioning) specification, which is a backward compatible extension of the client provisioning functionality included in WAP 2.0 (v1.0), enables the following parameters to be provisioned:

- WAP account (account name and WAP Gateway settings)
- ISP settings (bearer information, username, password)
- Browser settings including Bookmark (name and URL)
- OMA DS Sync settings (SyncML)
- MMS settings
- Email account for POP3, IMAP4 and SMTP including settings (username, password, address, server details)
- OMA Device Management

Sony Ericsson phone configurator

To configure the phone for Internet, email and MMS the necessary settings for many networks can be downloaded from www.sonyericsson.com/support. This is a free service to owners of Sony Ericsson mobile phones.

Locks

Sony Ericsson P1 has the following lock functionality:

Keylock

The Keylock can be turned on or off by:

- A long press on the back key.
- The standard keypad sequence (# then unlock).
- The status bar battery icon dialog.

Locking the keypad can invoke the 'power save now' option or the screen saver (user setting).

Auto keylock is a user setting, only activated from the Control panel.

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 Sony Ericsson P1 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.

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 users 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 Sony Ericsson P1 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 colocated 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 Sony Ericsson P1

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 messages, has been used as delivery mechanism. Java™ and MMS messages 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, Sony Ericsson P1 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, Sony Ericsson P1 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. Sony Ericsson P1 is compatible with GPRS R99. The GSM system limits the ability to use all eight time slots, so Sony Ericsson P1 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 Sony Ericsson P1 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 band-width when downloading large files, images etc.
- 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 Sony Ericsson P1.

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 55 for more information.
- 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, which 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 enchancing 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 Sony Ericsson P1 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™

Sony Ericsson P1 supports two kinds of Java™ ME: CLDC 1.1 and CDC 1.0.

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

CDC 1.0 JARs supported:

- Foundation profile 1.0 (JSR-46)
- Personal profile 1.0 (JSR-62)
- PDA File Access (JSR-75)

Sony Ericsson P1 consumer package

The exact contents of the Sony Ericsson P1 package depend on the localization.

The basic contents are as follows:

- Sony Ericsson P1 with two styluses
- Memory Stick Micro™ (M2™), 512 Mb
- Battery BST-40
- Travel Charger CST-70
- Desk Stand CDS-65
- USB cable DCU-65
- Stereo Portable Handsfree HPM-62
- Pouch, grey
- User documentation package
- Sony Ericsson PC Suite CD

Accessories

ACCESSORY	PRODUCT NAME
Batteries	
Standard Battery	BST-33
Home & Office & Power	
Charger	CST-60
Desk Stand	CDS-60
Desk Stand	CDS-65
Headset Charger	CST-61
Home Audio System	MDS-70
Home Audio System II	MDS-xx
Micro Travel Charger	CMT-60
Music Desk Stand	MDS-60
Music Desk Stand II	MDS-xx
Music Remote Control	MRC-60
Two Port Standard Charger	CST-75
Handsfree	
Akono™ Headset	HBH-600
Akono™ Headset	HBH-602
Akono™ Headset	HBH-608
Bluetooth™ Headset	HBH-610
Bluetooth™ Headset	HBH-660
Bluetooth™ Headset	HBH-662
Bluetooth™ Headset	HBH-GV435

Bluetooth™ Headset	HBH-GV435a
Bluetooth™ Headset	HBH-IV835
Bluetooth™ Headset	HBH-IV840
Bluetooth™ Headset	HBH-PV700
Bluetooth™ Headset	HBH-PV702
Bluetooth™ Headset	HBH-PV705
Bluetooth™ Headset	HBH-PV710
Mono Portable Handsfree	HPB-62
Portable Handsfree	HPB-60
Sport Portable Handsfree	HPS-60
Personal Music	
Sports Stereo Portable Handsfree	HPM-65
Stereo Bluetooth™ Headset	HBH-DS200
Stereo Bluetooth™ Headset	HBH-DS970
Stereo Portable Handsfree	HPM-64
Stereo Portable Handsfree – kitting	HPM-62
Stereo Portable Handsfree with display	HPM-90
Stereo Portable Handsfree with RC	HPM-82
Stereo Portable Handsfree with RC	HPM-85
Ultra Style Stereo Portable Handsfree	HPM-70
Car	
Advanced Car Handsfree	HCA-60
Antenna Cable	HCE-12
Bluetooth™ Car Handsfree	HCB-300
Bluetooth™ Car Speakerphone	HCB-100
Bluetooth™ Car Speakerphone with display	HCB-120
Cigarette Lighter Adapter	CLA-60
Entry Bluetooth™ Car Speakerphone	HCB-50
Stereo Mute Box	HCE-26
Universal Car Holder	HCH-60
Connectivity	
Exclusive USB Cable	DCU-65
USB Cable	DCU-60

Multimedia	
Bluetooth™ Music Receiver	MBR-100
Bluetooth™ Media Centre	MMV-200
Bluetooth™ Wrist Watch	MBW-100
Music Cable	MMC-60
Music Cable 3.5 mm	MMC-70
Music Radio Transmitter	MMR-60
OneGrip Speakers	MPS-75
Portable Speakers	MPS-60
Imageware	
Pouch	

Technical specifications

General technical data

Product name	Sony Ericsson P1
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	For settings, User data (such as, images, contacts, messaging) and third party applications: Up to 128 MB external.
Additional storage	Memory Stick Micro™ (M2™), up to 4 GB size supported. Sony Ericsson P1 is delivered with a 512 MB memory card.
Data transfer speeds	Full speed 12 Mbps

Length	106 mm
Width	55 mm
Thickness	17 mm
Weight	124 g
Antenna	Built-in
Colour	Silver Black
Battery	1120 mAh

Screen

Display type	TFT, transflective
Display size	2.6”
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	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	< 5° 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

Dimension	GSM 900/ E-GSM 900	GSM 1800	GSM 1900	WCDMA
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 10 hours UMTS up to 3.5 hours
Standby time	GSM up to 440 hours UMTS up to 350 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
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.

Dimension	Support	
SIM	GPRS aware, as well as 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

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

Keyboard and buttons

- 35 keyswitches
- Jog Dial, 3-way: up, down and inwards
- Browser button (programmable) to switch to the integrated browser
- On/Off button
- Back button to switch back a view
- Camera button

Input

Sony Ericsson P1	• Dual function keyboard • On-screen keyboard (over 20 keyboards including Arabic) • Natural handwriting over the whole screen • Word completion (using eZiText from Zi Corporation) • Next word prediction (using eZiText from Zi Corporation) • Spelling suggestions • Dual language prediction support (prediction options for bilingual users in both a primary and a secondary language)

Third party application support

Note: The list below may be subject to future updates, that is, new applications may be added, others removed.

Application	
AccuWeather – Offers access to a wealth of world-wide weather. Detailed current conditions give the user a look at what the weather is currently doing for their location, or for any of thousands of locations around the world.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
ACM (Advanced Call Manager) – Ultra-fast recognition of remote callers.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Audible Air – Digital audio books, newspapers and programs from Audible, the Internet's leading provider of spoken word audio.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Boingo	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Chess Professional – Multi award winning chess application, renowned for its superb playability for players of all levels.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Crystal Arabic (Psiloc) – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Arabic language.	Bought from Application Shop

Application	
Crystal Hebrew (Psiloc) – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Hebrew language.	Bought from Application Shop
Crystal Hindi (Psiloc) – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Hindi language.	Bought from Application Shop
Crystal Thai (Psiloc) – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Thai language.	Bought from Application Shop
Ericsson Mobile Organizer – Easy-to-use access for enterprise users to corporate email and other PIM data on the move.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Google Mail – Webmail designed for mobile phones.	Free application that can be downloaded to the phone using a Web link in the phone.
Handy Day – Personal assistant keeping track of appointments and tasks. Quick and convenient access to applications, files and contacts.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Handy Expense – Where is the money gone during business trips. Handy Expense keeps track of them, and also compiles expense reports.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Handy Safe – A perfect assistant for secure and convenient management of data, like passwords, credit card details, user names, accounts, Web pages, and insurance policies.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
LocationFree TV – Allows the user to enjoy video content, both at home and on the go. To make use of LocationFree, a separate device called LocationFree Base Station is needed.	Free application that can be downloaded to the phone using a Web link in the phone.
Mahjongg – Single player game (probably Asian origin). The objective of the game is to remove all the tiles from a layout.	Try and buy application that can be downloaded to the phone using a Web link in the phone.

Application	
McAfee File Encryption – Protection to the phone from threats such as viruses and other malware.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
McAfee Firewall Mobile – Protection against hackers, data-stealing applications and identity theft.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
McAfee VirusScan Mobile – The leading solution for real-time protection against viruses, worms, Trojans and so on.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Mobile Blogger – Helps users create their own free personal photo albums and start sharing them immediately.	Free application that can be downloaded to the phone using a Web link in the phone.
Personal Assistant – By simply entering search words as natural language, e.g. “all songs with Robbie Williams”, the user will get a list of all songs with Robbie Williams.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Photoword – The user simply takes a picture of any printed text, points on the picture, at any word. PhotoWord will immediately translate it.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
ShoZu 3.0 – Free phone service that makes it incredibly easy to send and receive photos, videos and music while on the move.	Free application that can be downloaded to the phone using a Web link in the phone.
Skype – Voice over IP application that lets the user make mobile phone calls over the Internet.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Speero Voice Translator – The user just says a phrase in one of three languages (English, Japanese or Spanish) and it gets immediately translated into one of the other languages.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
VPN Manager – Secure mobile access to corporate email, intranet content and enterprise applications.	Try and buy application that can be downloaded to the phone using a Web link in the phone.
Wayfinder Navigator – Together with a Bluetooth GPS, turns the phone into a top-of-the-line GPS Navigator. Editor's choice Mobile Magazine 2005.	Try and buy application that can be downloaded to the phone using a Web link in the phone.

Application	
WorldMate – World clock, global weather forecasts, comprehensive flight schedules for over 800 airlines, and much more.	Try and buy application that can be downloaded to the phone using a Web link in the phone.

Media player

File Format	Video: MP4 (MPEG4 and AAC-LC), 3GP (H.263 AMR NB/WB and AAC) and Real Audio Video Audio: AU, iMelody, AAC, AMR, MP3, RMF, DLS, Real Audio, G-MIDI level 1 with 72 voices polyphony, WAV (up to 16 KHz sample-rate), XMF
Streaming transport	RTSP according to 3GPP™
Video decoding	MPEG-4 Simple Visual Profile Level 0 H.263 Profile 0 Level 10 H.264 Baseline profile (available at MRD)
Audio decoding	AAC-LC, AMR-NB, AU, iMelody, Midi, SP-Midi, MPEG layer 3, RMF, WAV, XMF, DLS, Real Audio 9, eACC+ and ACC+.
Features	Automatic loop of songs in folder. Automatic pause on telephone call.

Pictures

Formats	JPEG, BMP, GIF (including animated), PNG, MBM, WBMP, SVG-tiny
Sharing via	IR, Bluetooth™ wireless technology, MMS, Email, PC file transfer, Memory Stick Micro™ (M2™), 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			

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 Sony Ericsson P1
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 phones will be able to see the picture correctly.
Input methods	Dual function keyboard, on-screen keyboard, touchscreen, 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

Feature	Support in Sony Ericsson P1
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
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 phone and SIM.
Nokia Picture Messaging	No

Enhanced Messaging Service

Feature	Support in the Sony Ericsson P1
Level of compliance supported by the phone 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 phone is able to handle to generate a concatenated message	TBD
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 phone 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.

Feature	Support in the Sony Ericsson P1
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 phone 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 phone before sending an EMS message	0x00

Multimedia Messaging Service

Feature	Support in Sony Ericsson P1
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.

Feature	Support in Sony Ericsson P1
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 • directly from camera
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 phone memory	Yes
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 AMR-WB 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

Feature	Support in Sony Ericsson P1
MMS User Agent provides:	• text formatting facilities (only text size) • coloured text/background (Viewer/player supports coloured text and background.) • Dual function keyboard, on-screen keyboard, touchscreen 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 SMS	Yes Yes
DISPLAY TEXT		Text of up to 240 characters (120 UCS2 coded).	Yes
	bit 1:	0 = normal priority	Yes
		1 = high priority	Yes
	bit 8:	0 = clear message after a delay	Yes
		1 = wait for user to clear message	Yes
GET INKEY		General: The GET_INKEY requires that the user confirms his/her choice	Yes

	bit 1:	0 = digits (0-9, *, # and +) only
		1 = alphabet set
			Yes
			Yes

	bit 2:	0 = SMS default alphabet 1 = UCS2 alphabet	Yes Yes
	bit 3:	0 = character sets defined by bit 1 and bit 2 are enabled 1 = character sets defined by bit 1 and bit 2 are disabled and the Yes/No response is requested	Yes Yes

Service		Mode	Support
GET INPUT		General: No. of hidden input characters	252

	bit 1:	0 = digits (0-9, *, # and +) only
		1 = alphabet set
			Yes

			Yes
	bit 2:	0 = SMS default alphabet 1 = UCS2 alphabet	Yes
			Yes
	bit 3:	0 = ME may echo user input on the display 1 = user input not to be revealed in any way (see note)	Yes
			Yes
	bit 4:	0 = user input to be in unpacked format 1 = user input to be in SMS packed format	Yes
			Yes
	bit 8:	0 = no help information available 1 = help information available	Yes
			Yes
LAUNCH BROWSER			Yes
MORE TIME			Yes
PLAY TONE			Yes
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

Service		Mode	Support
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
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

Service	Mode	Support
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:

- '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 sup-pressed 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

Terminology and 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.

AWT

Abstract Windowing Toolkit. A Java™ Graphical User Interface library.

BAE

Beatnik Audio Engine™

Bearer

Path over which data flows. Specifically in CSD and HSCSD, the type of telephony link from the GSM network to the server – PSTN or ISDN.

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.

Bookmark

A URL and header/title stored in the phone, enabling the user to go directly to a Web page.

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 Sony Ericsson P1. 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. Sony Ericsson P1 will also display the name and photo of the caller if 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).

CPHS Compliancy

The Common PCN Handset Specification (CPHS) is an industry standard that defines terminal and SIM functionality in addition to the standard GSM specifications.

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.

CSP

Customer Service Profile. on a SIM card will determine which menus on the phone are available to the user.

CSS

Cascading Style Sheet. A feature of browsers.

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.

EFR

Enhanced Full Rate, speech coding. Provides better speech quality than HR or FR.

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.

GGSN

Gateway GPRS Support Node

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.

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

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.

PDF

Portable Document Format. A format created by Adobe for storing and distributing documents.

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).

Polyphonic

'Many sounds'. The maximum number of notes an instrument can play at the same time, commonly 16 in MIDI devices.

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.

RADIUS

Remote Access Dial-In Service. Facility at the ISP or corporation to manage remote data connections.

RAS

Remote Access Service.

RMF

Rich Music Format™ 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

Service Provider

A company that provides services and subscriptions to mobile phone users.

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 a 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. Sony Ericsson P1 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.

TE

Terminal Equipment. Generic term for GSM terminals such as phones and PC cards.

Terminal Adaptor

Generic term for the equipment terminating a digital communications line such as an ISDN2 line. Sony Ericsson P1 is a Terminal Adaptor since it interfaces to GSM digital data services.

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.

V.110

ETSI standard for data over an ISDN circuit.

V.120

ETSI standard for data over an ISDN circuit.

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.

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 Sony Ericsson P1 User Guide
- Sony Ericsson Sony Ericsson P1 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.midi.org
- 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.memorystick.org
- www.memorystick.com
- www.java.sun.com

Trademarks and acknowledgements

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

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

Adobe, Adobe PDF and Adobe Acrobat Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

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

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

Quickoffice, Quickword, Quicksheet and Quickpoint are either trademarks or registered trademarks of Cutting Edge Software, Inc.

Java and all Java based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries.

End-user license agreement for Sun Java™ J2ME™:
1. Restrictions: Software is confidential copyrighted information of Sun and title to all copies is retained by Sun and/or its licensors. Customer shall not modify, decompile, disassemble, decrypt, extract, or otherwise reverse engineer Software. Software may not be leased, assigned, or sub licensed, in whole or in part.

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

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

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