White Paper

January 2003

# T310/T312


Sony Ericsson

# Preface

## Purpose of this document

The Sony Ericsson T310/T312 White Paper is designed to give the reader a deeper technical understanding of how the T310/T312 is designed, and of how it interacts with other media. This document will make it easier to integrate the T310/T312 with the IT and communications solutions of a company or organization.

People who can benefit from this document include:

- Corporate buyers
- IT Professionals
- Software developers
- Support engineers
- Business decision-makers

More information, useful for product, service and application developers, is published at http://www.SonyEricsson.com/mobilityworld/, which contains up-to-date information about technologies, products and tools.


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/



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# Contents

# Product overview

The Sony Ericsson T310/T312 is designed for entertainment and imaging, with features that are bursting with fun for consumers, and its a revenue winner for network operators. The T310/T312 marketing focus is on mobile gaming, imaging and messaging. It has all EMS and picture messaging (text messaging with pictures and sounds), e-mail and MMS (Multimedia messaging), and a snap-on camera as a core accessory.

With a GPRS (General Packet Radio Services) modem built in, the T310/T312 offers a fast and satisfying mobile Internet experience. The T310/T312 is a triple band 900/1800/1900 premium product which is planned to be available Q1, 2003.

## Key functions and features

### Downloadable games

Gaming is already a very popular feature in Sony Ericsson phones. Now the mobile Internet portal offers the possibility of downloading games. Network operators may also offer games download to their customers as an added value offer. Users can add new games and skill levels to further enhance the entertainment value of Sony Ericsson phones.

T310/T312 games download is made possible by a true virtual machine. The Sony Ericsson portal for downloading of games for the T310/T312 is accessible with only one key press in the games menu. The flexibility of the downloadable games solution is dedicated to provide an enhanced gaming experience.

The downloadable games can fully take advantage of the phone´s interfaces, such as TCP/IP, SMS, vibrator and backlights. The virtual machine executes the downloading of games for the optimal game experience. The user can download an unlimited number of games as long as the file system allows it, i e until the phone memory is full.

The downloading concept includes certification of the games, which makes it possible to create a revenue chain and favourable business opportunities for network operators and content providers. The virtual machine uses technology for the highest level of security.

The software development kits are available via www.mophun.com

### Polyphonic ring signals

Pleasing to the ear, polyphonic ring signals can play up to 32 tones simultaneously making a more musical sound. The word “polyphony” means playing with several tones at the same time. Almost all music that we listen to consists of polyphonic melodies. Up to now, the majority of the GSM mobile phones doesn’t support polyphonic sounds and ring signals.

T310/T312 users can share ring signals, and download them from the Web.

Early Ericsson mobile phones supported a proprietary non-polyphonic format called eMelody. Due to the musical limitations of eMelody, and as it became popular to create, send and download ring melodies, Ericsson and Sony Ericsson, together with other manufacturers created the more advanced non-polyphonic sound format - iMelody.

The development from the iMelody format to the MIDI format means a revolution to the sound quality. The MIDI files are small, and perfect for mobile devices, which has limited storage capacity.

MIDI - Musical Instrument Digital Interface - is a specification for a communications protocol principally used to control electronic musical instruments. MIDI is today a well known standard used by musicians, composers, arrangers and so forth.

A MIDI signal or file does not contain any music. It contains text information as binary data about what, when and how an instrument/melody is played. When this data reaches a synthesizer, the synthesizer translates it into music from the following attributes:

- What instrument is to be selected and played by the synthesizer.
- How a melody is played.
- When connected to an amplifier with speakers, the sound becomes audible.

Please visit www.midi.org for more information.

## Imaging

With a digital camera attached to your T310/T312, you can take, view, store and send high-quality pictures over the air to another mobile phone, as MMS messages, or you can send them to an e-mail address or Web photo album. Downloading images from the Web is another alternative. Thousands of on-line image collections already exist on the Web and many sites are already gearing up to include images for use in mobile phones.

There are various ways to incorporate images and other multimedia into your communication. You can attach pictures to people listed in your phone book and have pictures or icons of the caller identifying them in your display.

The pictures are stored in the picture browser in the phone. From here, the user can select view, thumbnail or full view, as well as keep track of the number and size of the pictures stored in the phone.

## Digital Rights Managements

Digital Rights Management (DRM) is a technology that enables secure distribution, promotion and sale of Digital Media.

T310 includes implementation of EMS ODI (Object distribution Indicator) and MMS limited forwarding (Sony Ericsson proprietary forward lock for MMS content).

When downloading via WAP, the T310 includes support for OMA (Open Mobile Alliance) defined DRM solution forward lock, meaning that Content is packaged in a DRM package and delivered to the device. The support of forward lock means that it is not possible to forward the downloaded content to any other device. Forward lock is useful for all types of content that the provider wants to charge for.

Related information such as the “OMA-Download-DRM, v1.0” specification can be found at http://www.openmobilealliance.org/documents.html.

## Multimedia Messaging

Reacting to the enormous popularity of mobile phone messaging, Sony Ericsson has incorporated the latest messaging standard into the T310/T312, along with a colour display for an enhanced imaging experience.

Say it in words, say it with pictures, animate it, add sound. Multimedia birthday and holiday greetings are great fun to put together using the T310/T312. On vacation, use your mobile phone and accessories to send a digital postcard with stylized text, digital pictures of where you are, and authentic sound clips to friends and family back home. If, when shopping, you find something a friend might like, you can instantly send a digital picture of the item and ask if they like it.

With MMS, the subscription applications get more interesting, for example stock information, movie trailers and weather reports.

## Full graphic 256 colour display

The large colour display of the T310/T312 enhances viewing, facilitating high-quality multimedia messaging and personalized imaging. The standby display looks like the desktop in a computer, with the menus presented as icons.


## Joystick navigation on the keypad

The T310/T312 has an easy-to-use 5-directional joystick function. Using finger or thumb, you can easily navigate the new T310/T312 menu system. When you arrive at the required function in a menu, instead of pressing Yes, just gently press the joystick and the feature is activated. The T310/T312 MMI is adapted for easy joystick navigation.

## Browser supporting WAP 2.0 - XHTML™

The T310/T312 supports the WAP 1.2.1 browser and protocol stack as well as the WAP 2.0 browser.

The browser supports the markup languages of WAP 2.0 – XHTML Mobile and XHTML Basic. These two subsets of the Web standard XHTML are supported by all major Web browsers. An XHTML page can be viewed in both the WAP browser and in any standard Web browser. All of the basic XHTML features are supported, including text, images, links, check boxes, radio buttons, text areas, headings, horizontal rules and lists.

In addition to XHTML, the browser supports WML. The user can navigate between WML and XHTML pages.

T310/T312 also supports cookies, often used by Web sites to store site-specific information in the browser between visits to the site. Cookies are often used by e-commerce sites (shopping carts and wish lists), and to save the user from entering the same information more than once.

## GPRS

GPRS uses Internet-style packet based technology. It uses the radio link only for the duration of time that it transfers data. GPRS offers the user the speed needed for satisfactory mobile Internet usability. The T310/T312 supports GPRS 3+1.

## Design

The basic form gives a strong and sophisticated product image by using a simple cylindrical shape with relaxed, smooth surfaces and slightly curved sides featuring concave grips. The bezel surrounding the display wraps across the front surface creating an innovative wide-screen design element. The split-line speaker outlet between the front and the bezel enables a completely new look reducing unnecessary ornamental detailing. The navigation keys are clustered into one design detail around the joystick to ensure best possible ergonomics. Below the keypad is a small expansion of the surface, featuring a separate detail, which enhances the grip while pushing the lower keys. The front cover is not exchangable and the battery cover slides into place. There is also a loophole for a carrying strap accessory.

## Customization

The T310 has a separate co-brand inlay part for more flexible customization. The co-brand inlay is snapped on to the front, in the area below the keypad, and is mounted on the phone as the last step in our production chain. This makes it possible for a shorter lead time when printing operator details on customized phones. Furthermore, the co-brand print is covered with a top coat for greater wear resistance.

## Content

Content such as games, pictures and sounds can vary depending on the customization requirements.

This document describes the general content plan for T310. Content can also be found at http://wap.SonyEricsson.com.

## Direct download links

The direct download link is a function designed to encourage downloading of content via WAP to enrich the user experience. Furthermore the

download link also tries to influence the user to use WAP-based services and get used to using data oriented services on the network.

The Fun&Games menu includes a link called Download which directs the user to the Sony Ericsson WAP site where there are links to Games, Pictures, Themes and Sounds.

The presence of the link and the URL of the link can be customized according to customer choice. It is also possible for operators to include an additional link with their own URL and generic name for all languages.

# More in-phone functions

### E-mail

The T310/T312 has a fully functional e-mail client. With inbox, outbox, save draft and reply options, you have all the functions you need for effective e-mail communication in a small and powerful mobile phone. Constantly connected to a POP3, SMTP or IMAP4 e-mail server anywhere on the Internet, your T310/T312 stores messages (without attachments) dynamically, depending on available memory, and updates your inbox automatically and over the air. Check your e-mail anywhere. Reply to e-mail on the move. Friends, family and business contacts know that when they send you e-mail, you receive it and can read it and act on it immediately. You can include pictures in outgoing e-mails, but not receive attachments. Hyperlinks in e-mails are supported.

### EMS (Enhanced Messaging Service)

You can send text, pictures and sounds in easy-to-create and fun messages. EMS has been adopted by several leading mobile phone manufacturers, making it possible for T310/T312 users to send enhanced text messages to users of other makes of mobile phones. EMS makes it possible for the user to use text formatting (style, size, alignment and paragraphs) in a text message. At purchase there are several pre-defined images and animations in the T310/T312.

### Predictive Text Input Software

Text messaging with your T310/T312 is made easier than ever with the introduction of predictive text input software. Instead of having to press keys several times for a letter, software in your T310/T312 chooses from a dictionary of words and phrases and anticipates what word or phrase you are writing, giving your mobile phone keyboard ease of use comparable to that of a full-size keyboard.

### Screen saver and sleep mode

The screen saver is activated when the phone has been idle for 26 seconds. There is a pre-defined screen saver at the purchase of the phone, but the user can choose his/her own image/animation as a screen saver. After a short period of time the screen saver changes to sleep mode, to save power.

### Memory management

Most applications in the T310/T312 share the same memory, allowing for efficient memory usage. When the memory runs low, the user gets information about the current memory situation, where each application's usage is displayed. In the memory manager menu, the user can delete downloaded content from applications, in order to set memory free. The memory available for the user is approximately 340 KB (Kilobytes).

### Mobile chat

Mobile chat makes text messaging easier, since a chat-session opens up immediately when a text message is received from a phone. Because the user stays connected during the session, the messages open up automatically. All previous messages from both persons are visible on screen, each writer being distinguished by a nickname.

### Picture phone book
The phone book in the T310/T312 lets the user assign a picture or a personal ring signal to a certain phone number. When the user gets a call from this person, the picture (instead of the number) is shown in the display.

### Events
The T310/T312 Events feature keeps track of important meetings that you need to attend, phone calls that you need to make or tasks that you need to do. 20 items can be saved. You can also choose to add, reschedule, edit, send or delete events.

### iMelody and Melody Composer
The user can play, compose, edit and send melodies within the improved Melody Composer. The composer has an improved graphical user interface to simplify melody handling. All new and edited melodies are stored in the iMelody format.

### Sound browser
From the Sound browser function, the user can handle all sounds (for example MIDI, eMelodies, iMelodies and sound recordings) stored in the phone. The user can play, send and view information on the sounds. Ring signals (MIDI, eMelody, iMelody, vMel) can be downloaded via WAP or exchanged via SMS (iMelodies), infrared and MMS (MIDI, iMelodies). Sound recordings can be exchanged via infrared and MMS. The maximum number of sounds is limited only by the amount of free memory.

Please also see information about the MIDI format under “Polyphonic ring signals” on page 5

### Camera application
The camera application in the T310/T312 supports the Communicam™ MCA-20 and the Communicam™ MCA-25. The user can browse, view, send and store pictures in the phone. It is also possible to set different picture sizes.

### Themes
With themes, the user can change the appearance of the display, for example, the text, the background colours and the background picture. The phone comes with a number of pre-defined themes. It is possible to download and exchange additional themes. The maximum number of themes is limited only by the amount of free memory.

# Multimedia in the T310/T312

The T310/T312 is a multimedia phone. The colour display together with the audio functionality gives the user several multimedia possibilities. For example, sounds can be recorded and stored. By using themes, it is easy to change the appearance of the display. Pictures, audio, animations and themes can be transmitted via MMS.

**Graphics**
Graphics (tables, charts, diagrams and layouts) has a major impact on the way we work. The T310/T312 supports JPG (max 640x480), GIF (max 160x120), WBMP (max 320x320) and animated GIFs. With MMS, the user can personalize the appearance of the display – for example the text, the background colours and the background picture.

**Audio**
The user of the T310/T312 can use the mobile phone as a sound recorder. With the sound recorder function, it is easy to make a voice recording, for example a personal rendition of “Happy Birthday”. The audio function in the T310/T312 also allows downloading of sounds and melodies.

**Pictures**
With a digital camera attached to your T310/T312, you can take, view and store pictures. It is also possible to download colour pictures to your T310/T312. The pictures are stored in the picture browser in the phone. From here, the user can

select view, thumbnail or full view, as well as keep track of the number and size of the pictures stored in the phone.

The pictures stored in your T310/T312 can be used for creating your own digital postcards. This is easily done by adding text to the pictures and sending them via MMS.

**Themes**
With themes, the user can change the appearance of the display, for example the text, the background colours and the background picture. The phone comes with a number of pre-defined themes, and it is possible to download additional themes. The maximum number of themes is limited only by the amount of memory.

**Image formats**
For information on Image formats and downloading of images, see “Image format technical data” on page 71 and “Images – downloading to phone” on page 71.

# MMS (Multimedia Messaging Service)

One of the key features in the T310/T312 is the Multimedia Messaging Service (MMS), expected to become the preferred messaging method of mobile terminal users, since there are virtually no limits to the content of an MMS transmission. An MMS message from the T310/T312 can contain text, graphics, animations, images, audio clips and ring melodies. For more detailed information, see “Multimedia Messaging Service” on page 55. For third-part developers’ information, please visit www.SonyEricsson.com/mobilityworld/ and look for the MMS Developers’ guidelines.

Defined and specified by 3GPP as a standard for third generation implementation, MMS completes the potential of messaging. Sending digital postcards and PowerPoint-style presentations is expected to be among the most popular user applications of MMS. Eagerly awaited by young users in particular, MMS is projected to fuel the growth of related market segments by as much as forty percent.

Using the Wireless Application Protocol (WAP) as bearer technology and powered by the high-speed transmission technologies EDGE, GPRS and UMTS (W-CDMA), Multimedia Messaging allows users to send and receive messages that look like PowerPoint-style presentations. The messages may include any combination of text, graphics, photographic images, speech and music clips. MMS will serve as the default mode of messaging on all terminals, making total content exchange second nature. From utility to sheer fun, it offers benefits at every level and to every kind of user.


*Figure 1. An MMS message can contain images, music, audio and graphics.*

# MMS objects

Although MMS is a direct descendant of SMS, the difference in content is dramatic. The size of an average SMS message is about 140 bytes, while the maximum size of an MMS message is limited only by the memory. That is why the key word to describe MMS content is rich. Complete with words, sounds and images, MMS content is endowed with the user's ideas, feelings and personality.

An MMS message can contain one or more of the following:

**Text**
As with SMS and EMS, an MMS message can consist of normal text. The length of the text is unlimited, and it is possible to format the text. The main difference between an EMS and MMS message is that in an MMS message, text can be accompanied not only by simple pixel images or melodies but by photographic images, graphics, audio clips and in the future, video sequences.

**Templates**
The T310/T312 comes with a number of MMS pre-defined templates, for example templates for birthday cards, meeting requests etc.

**Audio**
MMS provides the ability to send and receive full sound (iMelody, MIDI and AMR) messages. Not only can users share a favourite song or ring signal with a friend, they can also use the mobile phone to record sound and send it along with a message. Because sound includes speech as well as music, this extra dimension of an MMS message makes for enhanced immediacy of expression and communication. Rather than sending a downloaded birthday jingle in EMS, for example, a user can send a clip of his or her own personal rendition of "Happy Birthday".

**Pictures and themes**
By using either a digital camera attached to the T310/T312 with a snap-on camera accessory, users can take a snapshot and immediately send it to a recipient. The ability to send pictures is one of the most exciting attributes of MMS, as it allows users to share meaningful moments with friends, family and colleagues.

Mobile picture transmission also offers inestimable utility in business applications, from sending on-site pictures of a construction project to capturing and storing an interesting design concept for later review. Editing a picture by adding text allows users to create their own electronic postcards, an application that is expected to substantially cut into the traditional postcard-sending market.

Themes (downloaded or pre-defined) can be exchanged via MMS.

**SMIL presentations**
SMIL stands for Synchronized Multimedia Integration Language and is pronounced "smile". SMIL in the T310/T312 allows the user to the create and transmit PowerPoint-style presentations on the mobile device. SMIL is an advanced XML-based protocol, and Sony Ericsson MMS supports a subset of this protocol. Using a simple media editor, users can incorporate audio and animated GIFs along with still images, animations and text to assemble full multimedia presentations.

The idea of SMIL is to allow the user to customize the page timing in Powerpoint-style presentations. The user can decide in which order the image and text will be displayed, as well as for how long the images and text lines are to be shown in the display

**PIM communication with MMS**
With MMS in the T310/T312, it is easy to send and receive business cards (vCard) and events.


*Figure 2. Example of the creation of an MMS message.*

# Benefits

Essentially enabling the mobile terminal to serve as image processor and conveyor, Multimedia Messaging accommodates the exchange of important visual information as readily as it facilitates fun. Business and leisure usage of MMS will be dynamically merged, resulting in enhanced personal efficiency for users and increased network activity for operators. In short, MMS affords total usage for total communication

Because MMS uses WAP as its bearer technology and is being standardized by 3GPP, it has wide industry support and offers full inter operability, which is a major benefit to service providers and end users. Ease-of-use resulting from both the gradual steps of the messaging evolution and the continuity of user experience gained from inter operability is assured.

The MMS server, through which MMS messages are sent, supports flexible addressing (to both normal phone numbers (MSISDN) and e-mail accounts), which makes user interface more friendly and allows greater control for operators. The MMS server, moreover, is responsible for the instant delivery feature of MMS.

# MMS technical features

The MMS standard, just like SMS, offers store-and-forward transmission (instant delivery) of messages, rather than a mailbox-type model. MMS is a person-to-person communications solution, meaning that the user gets the message directly into the mobile. He or she doesn't have to call the server to get the message downloaded to the mobile. Unlike SMS, the MMS standard uses WAP as its bearer protocol. MMS will take advantage of the high speed data transport technologies EDGE and GPRS and support a variety of image, video and audio formats to facilitate a complete communication experience.

## Architecture

The MMS Centre (MMS-C) is comprised of the MMS Server, the MMS Proxy-Relay and the MMS Store. The MMS Centre is the central element of the MMS network architecture, providing storage and operational support, enabling instant delivery of multimedia messages from terminal-to-terminal and terminal-to-e-mail, and supporting flexible addressing. The centre's MMS Proxy-Relay interacts with the application being run on the MMS-enabled terminal to provide various messaging services. WAP is used as bearer of an MMS message between the MMS-C and the MMS client (application). The WAP Gateway is used for delivery and retrieval of messages.

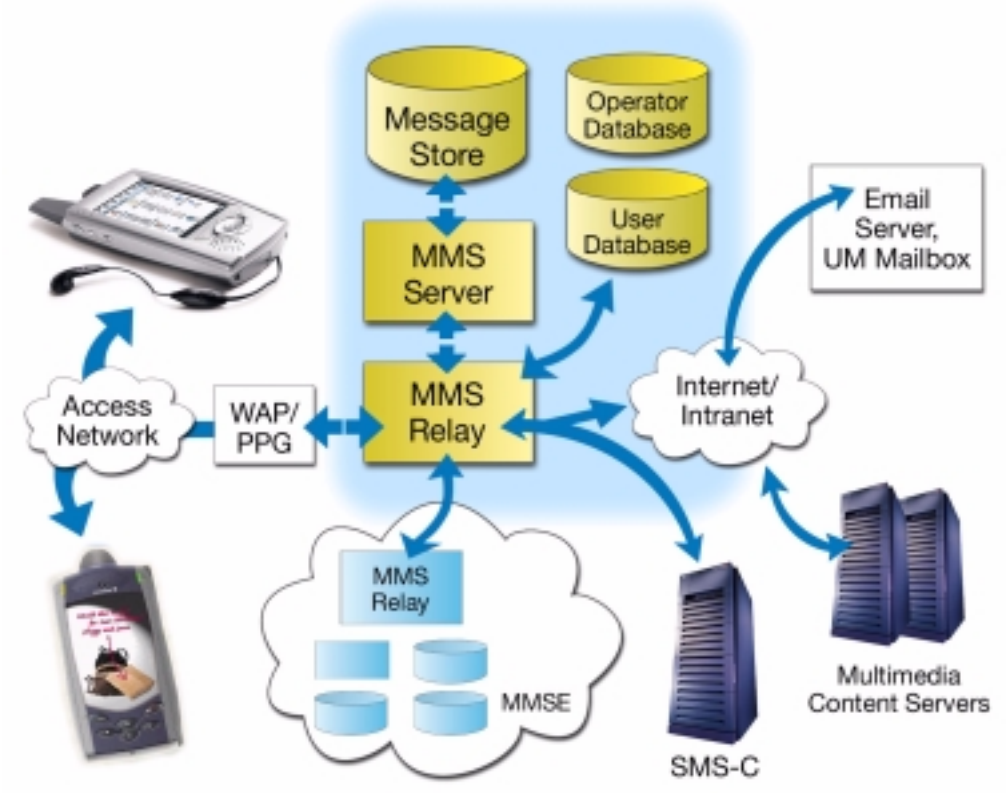



*Figure 3. The architecture of MMS*

## Message conversion

The MMS-C is able to perform limited message conversion - for example, from MMS to SMS - so that processing and air time is not wasted in sending messages to mobile terminals that do not have adequate capability to receive them. It also handles service aspects such as store and forward, guaranteed delivery, subscriber preferences, operator constraints, and billing information. The MMS-C also vouches for high quality messaging, e.g. by format conversion. This means that the MMS-C recognizes which formats are supported in the mobile phone, and adapts the MMS messages to these formats.

## OTA configuration

Users can easily get MMS into their phone. MMS supports OTA, meaning that the user does not have to configure the settings manually.
The configuration is done by the operator.

# EMS (Enhanced Messaging Service)

Enhanced Messaging Service (EMS) adds new powerful functionality to the well-known SMS standard. With it, mobile phone users can add life to SMS text messaging in the form of pictures, animations, sound and formatted text. This gives the users new ways to express feelings, moods and personality in SMS messages. As well as messaging, users will enjoy collecting and swapping pictures and ring signals and other melodies, downloading them from the Internet or editing them directly on the phone.

EMS uses existing SMS infrastructure and industry standards, keeping investments to a minimum for operators and providing a familiar user interface and compatibility with existing phones and with other manufacturers.

## EMS – more than just words

### Sounds and melodies

EMS gives the user the ability to send and receive sounds. These can be pre-defined sounds, such as “Chime high” and “Notify”, or melodies (ring signals in the phone), downloaded from the Internet, received in SMS messages or composed by the user on the phone keypad or a PC.

Several sounds and melodies can be inserted in one message, and they can be combined with pictures.

### Pictures, animations and formatted text

Phones supporting EMS include a set of pre-defined pictures for inserting in SMS messages. New pictures and animations are downloaded from the Internet or received in SMS messages. Several pictures can be inserted in one message, and they can be combined with sounds and melodies. The users can format text in messages with different styles and sizes.

### Concatenated messages

A part of the EMS standard is the support for concatenated messages, which means that the phone is able to automatically combine several messages both when creating and receiving EMS. This is useful to be able to build and display messages with rich content since the amount of information in each SMS is limited by the SMS standards.

## New possibilities with messaging

The EMS standard is now a part of the SMS standard and supported by the major network operators and mobile phone manufacturers. This universal approach enables a fast penetration and development of new services and applications within messaging.

### Creativity explosion

Users will be inspired to create and swap their own melodies and pictures. But more importantly, professional content creators and providers are already preparing to offer imaginative and creative contents for use with EMS. Based on subscriptions, fees or ads, network operators will be able to provide wide ranges of ring signals, operator logos and corporate icons, as well as personal and mood-related pictures and melodies. Movie, music and game companies can promote new products and events with designer melodies, animations and pictures.

## Huge business potential

Network operators can now enhance their services and attract more customers by offering pictures, animations, ring signals and melodies for download at their portals. Operators can charge more per EMS message since it contains more data. Thereby EMS adds more value to the operators and to the end users.

## Increase SMS revenue

EMS uses the same basic network support as ordinary SMS, and with the same familiar user interface. From an operator's point of view, SMS is low tech because minimal investment is needed to provide an effective EMS service to subscribers and little maintenance is required. EMS will create additional revenue for service providers and network operators by increasing SMS traffic.

## Compatible with SMS standards

Users will find EMS as easy to use as SMS. At the moment 15 billion SMS messages are sent every month worldwide. Roughly 80% of this traffic is user-to-user, i.e. mobile phone users sending short messages to each other using the keypad of the phone to enter text. The remaining 20% is shared by downloads and notifications of different kinds.

The Enhanced Messaging Service (EMS) was first submitted to the standards committees by Ericsson. Ericsson presented the outline structure of EMS to the relevant ETSI/3GPP committees. The major mobile phone manufacturers and most operators are actively contributing to the 3GPP standards. Hence the EMS standards have evolved and are now stable and complete as part of the 3rd Generation Partnership Project (3GPP) technical specification.

An EMS message can be sent to a mobile phone that does not support EMS, or only supports part of EMS. All the EMS elements i.e. text formatting, pictures, animations and sounds are located in the message header. The EMS contents will be ignored by a receiving phone that does not support the standard. Only the text message will be displayed to the receiver. This is true consumer-friendly standardization. EMS is compatible to SMS across most of the range of mobile phones from the oldest to the newest.

Some companies in the mobile phone industry have developed their own messaging technologies, which only work with their own phone models. Network operators are in favour of EMS because it is universal – many of the major mobile phone manufacturers are constructively improving and developing the EMS standards even further for implementation in their products.

## Examples of EMS contents and applications

A wide range of contents, applications and services may be developed. Below is a list of examples and areas where messaging can be enhanced with EMS.

**User-to-user message**
Messages usually originating from the keypad of a mobile phone can include pictures, melodies, formatted text with EMS.

**Voice and e-mail notifications**
Notifying mobile phone users that they have new voice or fax mail messages waiting - including icons or melodies with EMS.

**Unified messaging**
The user typically receives a short message notifying them that they have a new message in their unified messaging box, with icons or formatted text further enhancing the message.

**Internet e-mail alerts**
An Internet e-mail alert is provided in the form of a short message that typically details the sender of the e-mail, the subject field and first few words of the e-mail message, and in this case formatted text is excellent to identify message elements.

**Ring signals**
Downloading ring signals from the Internet.

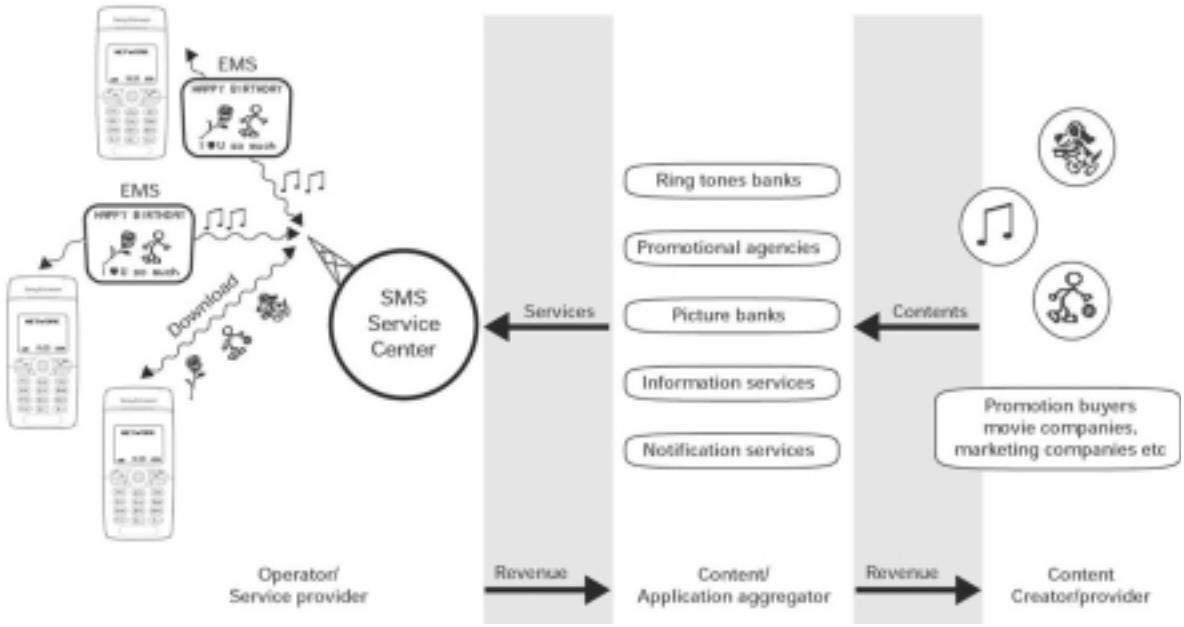
**News & commercials**
World news illustrated, sports scores and news headlines, finance and stock market news with diagrams and tickers, commercial product promotions, weather reports with maps, tunes from TV commercials as ring signals.

**Info & entertainment**
Ring signals, e-greetings, football club logo, joke-of-the-day illustrated by pictures or sound, horoscopes, movie related animation or theme

song, TV show promotions, music artist promotions, lottery results, food and drinks pictures and recipes, mood-related pictures.

**Corporate**
Flight schedules, pre installed corporate logos, map snippets and travel info, company branded icons and ring signals, corporate e-mail notifications, affinity programmes where companies notify customers of product updates etc, banks notifying customers about new services and interest rates, call centres providing answers to questions about a product, vehicle positioning combining EMS with Global Positioning System (GPS) position information, job dispatch with delivery addresses for sales or courier package delivery, using EMS in a retail environment for credit card authorization, remote monitoring of machines for service and maintenance purposes.

**Using Web, WAP And SMS for download**
Already today services exist on the Internet where users can create melodies, and view icons and pictures, subscribe to entertainment and informations services. These may develop further in the future to support access via PC over the Internet, from the phone using WAP and even with an SMS request interface.




The diagram shows a model over the possibilities with Enhanced Messaging Service:

- When the Operator/Service provider enables EMS in the network, users will enjoy adding life to messages with sounds, melodies, pictures and formatted text.
- New ranges of Content/Application aggregators on the operator network or the Internet can provide EMS contents and services to the users over SMS.
- Content Creators/providers can see a new demand for creative contents. Also, promotional activities from movie companies, record labels etc can provide ring signals, movie snapshots etc.

The added value in SMS messaging will create new revenue which can be shared between the network operators, the application aggregators and the content providers.

# WAP services

The T310/T312 supports the WAP 1.2.1 browser and protocol stack as well as the WAP 2.0 browser.

The T310/T312 has a WAP browser, supporting WAP 2.0 (WML 1.3). WAP 2.0 optimizes usage of higher bandwidths and packet-based connections of wireless networks.

The typical WAP client is a small, portable device connected to a wireless network. This includes mobile phones, pagers, smart phones, PDAs and other small devices. Of course, compared to desktop and laptop computers, these devices are limited by user interface, low memory and low computing power.

The WAP browser in the T310/T312 is compliant with WAP 2.0 and includes WTLS class 3 as well as mechanisms for digital signatures. It supports WML and XHTML. The WAP browser in the T310/T312 is also designed to access information such as timetables, share prices, exchange rates, Internet banking and other interactive services. For more details, see “WAP browser technical data” on page 59.

## Using WAP in the T310/T312

The built-in WAP browser in the T310/T312 gives the user portable, fast and secure access to a wide variety of services, including personalized services, with new opportunities for business, individuals and service providers:

**Push services**
Businesses and service providers can “push” content or service indications to work groups and/or customers. Examples of pushed content would be mail alerts, messaging, news, stock quotes, contacts, meeting requests, etc.

**Support of XHTML**
The WAP browser supports the markup languages of WAP 2.0 – XHTML Mobile and XHTML Basic. These two subsets of the Web standard XHTML are supported by all major Web browsers. An XHTML page can be viewed in both the WAP browser and in any standard Web browser. All of the basic XHTML features are supported, including text, images, links, check boxes, radio buttons, text areas, headings, horizontal rules and lists.

**Support for cookies**
This version of WAP has support for cookies (client based), an application used by Web sites to store site-specific information in the browser between visits to the site. Cookies give the site owner a possibility to see when a person has visited their site. They also save the user from having to enter the same information (e.g. the password or user ID) more than once. Cookies are often used by e-commerce sites (shopping carts and wish lists).

**Sending bookmarks**
WAP 2.0 enables the sending of bookmarks via infrared as well as via SMS.

**Provide settings**
Using SMS messages, configuration settings can be sent over the air, OTA, so that the user does not need to configure the WAP access settings manually. WAP settings may also be customized by the operator. For more information, see “WAP operator technical data” on page 61.

**Adapt to phone type**
The User Agent Profile function allows WAP content to be automatically optimized for the T310/T312, ensuring the intended user experience.

**Several bearer types**
The T310/T312 accesses WAP over a standard GSM Data connection as well as over a GPRS connection (network-dependent services.)

**Bandwidth efficiency**
Unlike traditional Internet services, WAP services are relayed to wireless devices as binary encoded data, maximizing bandwidth efficiency. A GPRS connection further increases efficiency.

**Easy create for WAP**
Creating a WAP service is no harder than creating an Internet/intranet service, as WML and WMLScript are based on well-known Internet languages such as HTML and JavaScript.

**Using standard tools**
Service creators can use standard tools such as ASP (Active Server Page) or CGI (Common Gateway Interface) to generate content dynamically. Services can be created once and then made accessible on a broad range of wireless networks.

**Maintain customer base**
Existing services can be adapted to WAP. The necessary binary encoding is handled by a WAP Gateway, allowing HTML-based services to be viewed on the WAP browser of the T310/T312. An XHTML page can be viewed in both the WAP browser and in any standard Web browser.

**Improve productivity**
A business can use a WAP gateway to provide a secure connection to its corporate network, improving internal communication flow by making information available to mobile as well as office users.

**The WAP profiles**
A WAP profile holds network settings and user identification, allowing the user to switch easily between corporate services and WAP services on the Internet, simply by switching WAP profile.

The T310/T312 has dynamic WAP profile handling, which means that the user can add, edit and delete WAP profiles. The T310/T312 has a maximum of 5 WAP profiles.

During WAP browsing, the options button on the T310/T312 gives the user immediate access to a dynamic option menu for WAP services, similar to a mouse right-click in PC programs.

# Bearer type characteristics

The T310/T312 accesses WAP services over IP. IP can be provided either over GSM Data or GPRS, depending on network services.

Typical differences which distinguish the bearer types are listed below.

### GPRS access

- Data is transmitted in packets, with transmission capacity being used by the application in use on an as-needed basis.
- Higher transmission speed than with GSM Data or SMS access.
- Pricing of GPRS can for example be dependent on the volume of data transmitted, rather than the duration of the connection.
- Ideal for complex pull services, browsing, data transfer, provisioning, pager services, messaging services, info services, push initiations.

### GSM data access

- Circuit connection of data calls, which means that the phone is connected during the entire WAP session.
- Pricing is comparable to that of data calls in the network.

# Gateway characteristics

A WAP Gateway provides Internet/intranet as well as WAP services to the mobile browser. A Gateway is identified by an IP number, depending on access type.

**End-to-end gateway navigation**
The WAP 2.0 supports E2E (End-toEnd) Gateway navigation, making it possible for example for a bank to redirect its clients from the Internet gateway to its own gateway.

# Security using WAP

For certain WAP services, such as banking services, a secure connection between the phone and WAP gateway is necessary. An icon in the display of the T310/T312 indicates when a secure connection is in use.

The T310/T312 is based on the WAP 2.0 (WML 1.3) specification suite, in which security functionality is specified by a technology called Wireless Transport Layer Security (WTLS). The WAP protocols for handling connection, transport and security are structured in layers, with security handled by the WTLS layer, operating above the transport protocol layer. WTLS classes define the levels of security for a WTLS connection:

- WTLS class 1 – encryption with no authentication.
- WTLS class 2 – encryption with server authentication.
- WTLS class 3 – 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.

A Wireless Identity Module (WIM) can contain both trusted and client certificates, private keys and algorithms needed for WTLS handshaking and signature generation. The WIM module can be placed on a SIM card and is then referred to as a SWIM card.

### Certificates

To use authenticated connections, the user needs to have certificates stored in the phone. There are two types of certificates:

- Trusted certificate
  A certificate that guarantees that a WAP site is genuine. If the phone has a stored certificate of a certain type, it means that the user can trust all WAP gateways that use the certificate. Trusted certificates can be pre-installed in the phone, in the SWIM or they can be downloaded from the trusted supplier's WAP page.
- Client 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. Client certificates can be pre-installed in the SWIM card.

### WIM locks (PIN codes)

There are two types of WAP security locks (PIN codes) for a SWIM, which protect the subscription from unauthorized use. The PIN codes should typically be provided by the supplier of the SWIM.

- Access lock
  An access lock protects the data in the WIM. The user is asked to enter the PIN code the first time the SWIM card is accessed when establishing a connection.
- Signature lock
  A signature lock is used for confirming transactions, much like a digital signature.

In the T310/T312, the user can check which transactions have been made with the phone when browsing. Each time the user confirms a transaction with a signature lock code, a contract is stored in the phone. The contract contains details about the transaction.

# Configuration of WAP settings

An easy way to perform WAP configuration in the T310/T312 is to use the step-by-step WAP configurator available on http://www.SonyEricsson.com. The configurator utilizes OTA provisioning.

Manual configuration is done using the menu system in the phone. This is described in the User's guide.

### Over-the-air provisioning of WAP settings

To simplify the configuration of WAP settings in the T310/T312, all settings can be sent to the phone as an SMS message. This makes it easy for an operator, a service provider or a company to distribute settings for Internet/intranet, and WAP, without the user having to configure the phone manually. This also makes it easy to upgrade services, as no manual configuration is required.

- The OTA configuration message is distributed via SMS point-to-point.
- The setup information is a binary encoded XML message (WBXML). To receive information about OTA specifications, please contact your local Sony Ericsson representative for consumer products. A configurator that utilizes OTA provisioning can be tested on www.SonyEricsson.com.
- The user is alerted about new settings when the ongoing browsing session ends. Settings are not changed during an ongoing browsing session.
- User interaction is limited to receiving and accepting/rejecting the configuration message, and selecting which WAP profile to allocate the settings to.
- Security can be handled using a keyword identifier displayed on the screen as a shared secret between the SMS sender and recipient. It is important that the user can verify that the configuration message is authentic.

## Push services

Examples of WAP services that can be pushed include:

- Notification of new e-mail, voice mail, etc.
- News, sports results, weather forecasts, financial information (stock quotes etc.).
- Personal Information Manager (PIM) - delivery of contacts, meeting requests etc.
- Smart card e-cash.
- Interactive games.

In the T310/T312, the user selects whether to allow push messages or not. There are two different forms of Push services:

**Service Indication (SI)**
An SI service sends to the browser a text message with a URL of a WAP page. If the user decides to load the URL, normal WAP browsing commences. When an SI is received by the T310/T312, the user can load it immediately, postpone it or delete it. Received SIs are stored in the Push Inbox and can be viewed and loaded at a later time. The Push Inbox displays a list containing the first part of each received message. The list is sorted by action attribute (high/medium/low) or reception time of the message.

**Service Loading (SL)**
An SL service sends and displays a WAP page if accepted by the user. If the SL is not accepted, it is loaded and stored in the cache for later use. The user can start the browser and load the page from the cache manually.

# Mobile Internet

The mobile Internet offers much more than mobile access to the Internet. It opens up a whole new range of situation-based services that give the user access to personalized communications, information and entertainment, anytime, anywhere.

## Data connections

In order to browse via WAP or use an Internet connection, the user must have a data communication connection configured in the phone. This connection contains specific settings and parameters to connect to an appropriate server. Several data connections can be saved in the T310/T312. To make it easier for the user, data connections can be provided by the operator via OTA provisioning.

Advantages of data connections include:

- Once the data connections are defined and named, the user does not have to enter the settings for the connection again.
- Data connections can be re-used at any time.
- Individual data settings for working with WAP, e-mail or the Internet can be stored and activated as needed.
- Data connections can be used for both GSM Data and GPRS connection settings.
- Bearer type for WAP and corresponding bearer-specific parameters may be selected.
- Data connections contain all the necessary settings for the Internet access point, including modem pool phone number or IP address, user ID and password.

# General Packet Radio Services

The introduction of GPRS (General Packet Radio Services) is one of the key steps in the evolution of today's GSM networks for enhancing the capabilities of data communication. Data traffic is increasing enormously (over both wired and wireless networks), with the growth in demand for Internet access and services paralleling that for mobile communications. Users want access to the Internet while they are away from their offices and homes, and surveys have found that the vast majority of business professionals want the ability to send and receive e-mail, browse the Web and transmit text and graphics on a portable device.

That is why the main applications driving Mobile Internet development are e-mail clients and Web browsers.

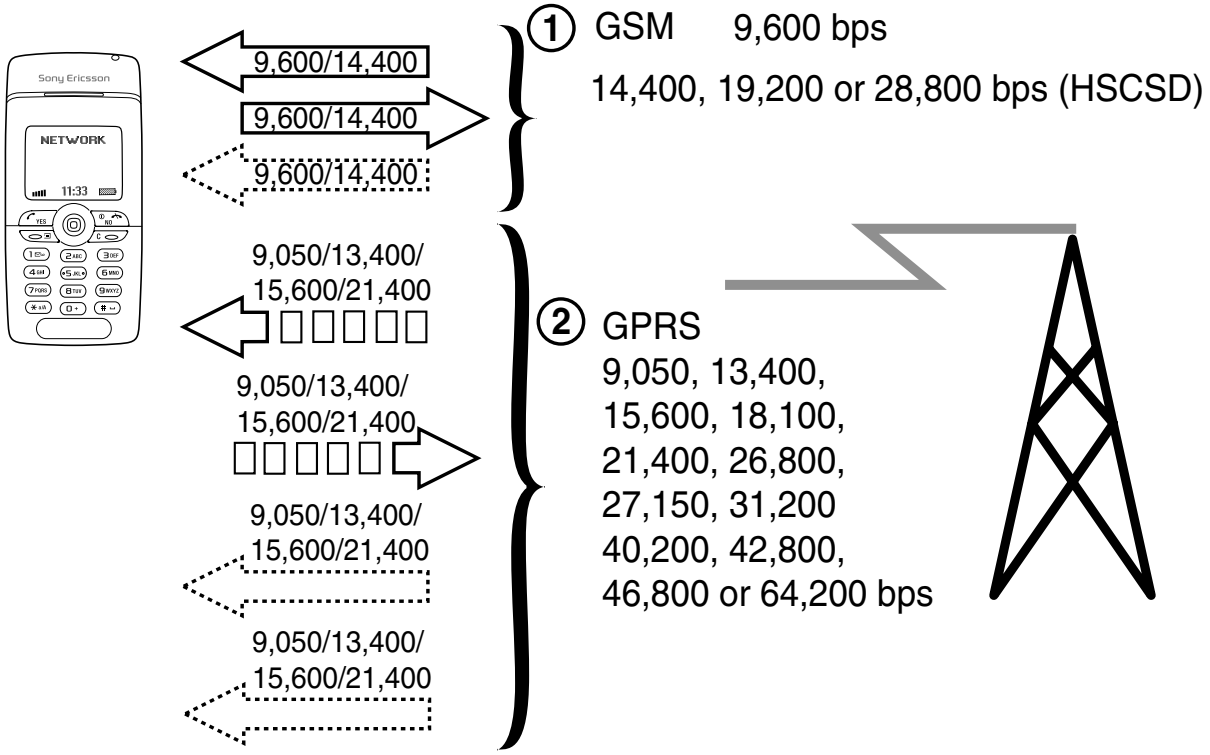
The demand for high-speed Internet access will be the key driver for coming generations of wireless services, and GPRS can deliver the necessary speed. GPRS allows innovative services to be created, enabling new and previously inaccessible market segments to be addressed and increasing customer loyalty.

GPRS applications can be developed as both horizontal and vertical. Vertical applications are specific, including those for operations such as

reaching police and emergency, taxi, delivery or automated services (vending machines, supervision, vehicle tracking). Horizontal applications are more generic and include those for Internet access, e-mail, messaging, e-commerce and entertainment.

GPRS is able to take advantage of the global coverage of existing GSM networks. Applications developed for GPRS can be deployed on a large scale and can reap the associated benefits. GPRS also provides a secure way to connect to private networks, banking and financial services.

With GPRS, the T310/T312 sends data in “packets” at a very high speed. The T310/T312 uses transmission capacity only when data is sent or received. For details, see “GPRS technical data” on page 66.




A comparison between GSM and GPRS

1. A normal GSM call uses only one of eight repeating time slots in the GSM channel, giving a data speed of 9,600 bps. The T310/T312 supports a more efficient coding scheme, giving data speeds of up to 14,400 bps (with necessary network support). Furthermore, High Speed Circuit Switched Data (HSCSD) adds the possibility of using two time slots for receiving data, increasing the data speed to as much as 28,800 bps (network dependent).

2. In GPRS, data is sent in packets, with up to three time slots being combined to provide the necessary bandwidth. The T310/T312 is prepared to support 3+1 time slots, giving speeds of up to 40,200 bps for receiving data, depending on coding scheme.

## Using GPRS in the T310/T312

Instead of occupying an entire voice channel for the duration of a data session, the T310/T312 sends/receives data in small packets, as needed, much like IP on the Internet. Because of this, the T310/T312 has data transmission abilities summoned by the application in use on an as-needed basis.

The GPRS specification includes four coding schemes – CS1, CS2, CS3 and CS4 – that allow theoretical data speeds of 9,050 bps, 13,400 bps, 15,600 bps and 21,400 bps respectively. The T310/T312 works with all four coding schemes, but data speed will naturally vary according to network configuration. At the moment, CS-3 and CS-4 are not supported in any live network, i e present speed is limited to 40,200 bps.

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 the T310/T312 has several advantages, for example:**

- All connection settings can be managed by using the data connections feature.
- High speed
- Cost efficient when downloading large files, images etc.
- Use transmission capacity only when needed, thus reducing costs.
- WAP over GPRS
- Access the Internet via WAP at high speed.
- E-mail over GPRS
- Data communication
- Transfer data and access the Internet or an intranet with a PC, PDA or handheld device connected via infrared.
- Receive GPRS configuration settings from the provider over the air, OTA, making manual configuration unnecessary.
- User controlled settings
- Take advantage of full user control in the data connections menu, establishing multiple descriptions and accessing advanced settings for GPRS.

# Modem and AT commands

The T310/T312 contains a complete GSM/GPRS modem. This provides data and e-mail communication, as well as Internet/intranet access, for a connected PC, PDA or handheld device. Once the PC/PDA is connected to the phone using infrared, and the appropriate software is installed, the modem in the phone works in a similar way to a PC Card modem, or an external modem.

In the T310/T312, AT commands are used for:

- controlling the data communication between the PC and the remote service
- configuring and requesting settings and behaviours in the phone, from a connected PC or PDA

## GSM data communication

The built-in data capability turns the phone into a modem when connected to a PC/PDA. The T310/T312 offers the user data connection anytime, anywhere, unmatched by fixed telephone networks. Each GSM channel is divided into eight repeating time slots. A normal GSM voice or data call is circuit switched, and only one time slot is used for each call. The data speed is therefore

limited to 9,600 bps. For more information, see “Built-in GSM data modem technical data” on page 69.

### High Speed Data gives a faster speed

High Speed Data (HSCSD) increases speeds for circuit switched data by allowing the phone to use a coding scheme with a high capacity, and to use two time slots for receiving data. The download speed is increased to up to 28,800 bps. The speed for sending data is limited to 14,400 bps. The data rate can be increased several times by the use of rate adaption, inter working with ISDN. This also provides additional features, such as quick call set-up capability.

### GPRS at high speed

With GPRS data is transmitted in packets. Pricing of GPRS may be dependent on the data transmitted, which means very low cost when no data is sent or received. When transmitting large amounts of data, it may be possible to increase bandwidth automatically to allow faster transmission speed, up to 40,200 bps download speed.

# AT commands support

This section outlines the AT commands supported by the T310/T312. The information here can be of use for advanced users, to indicate the possibilities they have to:

- develop new communications software
- add the T310/T312 to an application’s list of compatible modems
- adjust the settings of their mobile telephone and modem

The modem in the T310/T312 supports the V.25ter command set, which is the standard communication set used by modems.

The T310/T312 is compatible with industry de facto extensions, ETSI 07.05, 07.07 and 07.10.

### Overview of AT command functions

AT commands are used to configure the mobile telephone, to request information about the current configuration or operational status of the mobile phone, and to test availability and request the range of valid parameters, when applicable, for an AT command.

The built-in modem can be set to any one of three modes of operation. These are:

**Off-line command mode**
The command mode for entry of AT commands, when the device is first turned on.

**On-line data mode**
Allows “normal” operation of the built-in modem, for exchanging data or facsimiles with a remote modem.

**On-line command mode**
For sending AT commands to the built-in modem while remaining connected to a remote modem.

### The AT commands in the T310/T312 are grouped as follows:

- Control and Identification
- Call Control
- Interface Commands
- Data Compression
- Mode Management
- Audio Control
- Accessory Menus
- Accessory Authentication
- Voice Call Control
- Accessory Identification
- GSM DTE-DCE Interface Commands
- GSM Call Control
- GSM Data
- GSM High Speed Circuit Switched Data
- GSM Network Services
- GSM USSD
- GSM Facility Lock
- GSM Mobile Equipment, Control and Status
- GSM Mobile Equipment Error Control
- GSM SMS and PDU Mode
- GSM GPRS
- GSM Phone book
- GSM Clock, Date and Alarm Handling

- GSM Subscriber Identification
- Ericsson Specific AT Commands for GSM
- MMI Settings
- ObEx
- WAP Browser

# Infrared transceiver

Infrared communication creates a data link between two communications devices through an infrared beam of light. On the T310/T312, this link is used to connect with desktop computers, PDAs, Sony Ericsson handheld computers, laptop PCs, other phones (for example, the T68i), and other hardware supporting the standard. The Infrared Data Association (IrDA) has set the hardware and software standards that form the infrared communication links. The T310/T312 complies with the IrMC 1.1 specification, which defines how mobile telephony and communication devices can exchange information. Key benefits of using the T310/T312 with its built-in infrared transceiver:

- True wireless communication
- Low power consumption
- Ability to send and receive e-mail and data on the connected PC/PDA
- Ability to connect to the Internet or intranet/LAN from the connected PC/PDA
- Ability to manage the phone book from a PC
- Exchange of business cards with vCard compatible devices
- Exchange of ring signals between compatible phones
- Ability to attach a photo from a digital camera in outgoing e-mail

## Connection via infrared

IrDA 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 exchange data. For optimal performance, place the T310/T312 within 20/30 cm and in direct line with the infrared port on the PC/PDA, or other phone. An advantage of the necessary proximity of devices is reduced risk of transmitting data to other nearby devices. An infrared link is a serial connection, which means that data bits are sent one after another in a long stream. The IrDA–SIR Data Link Standard is a protocol that makes transmission of data faultless. The standard provides a high level of noise immunity, which means that the connection should not be affected by standard fluorescent light and electromagnetic fields – making it suitable for the modern office environment. However strong sunlight may affect the connection.

# In-phone functions and features

*Subscription and/or network-dependent

| | | |
|---|---|---|
| A | Antenna connector, external for HF kits | No |
| | | |
| B | Background light | Yes |
| | Background pictures, pre-defined | Yes |
| | Background pictures, downloadable | Yes, only limited by memory |
| | *Bluetooth* wireless technology support | No |
| | Bookmarks (URL memory) | Yes, 25 |
| | Built-in antenna | Yes |
| | Business card exchange | Yes |
| | | |
| C | Call functions | |
| | Call counter | Yes, outgoing and total (not incoming) |
| | Call barring* | Yes |
| | Call divert* | Yes |
| | Call hold* | Yes |
| | Call list (last dialled, answered and missed calls) | Yes, 30 entries |
| | Call screening* | Yes |
| | Call time/call cost (a.k.a Advice of Charge, Information/Charging)* | Yes |
| | Call transfer* | Yes |
| | Calling card service | Yes |
| | Calling Line Identification (CLI) | Yes. Either as the number of the caller, or as a picture, icon or personal ring signal assigned to the number of the caller. |
| | Conference calls* | Yes |
| | | |

| | | |
|---|---|---|
| | Camera application | Yes. The application supports the Communicam™ MCA-20 and the Communicam™ MCA-25. The user can browse, view, send and store pictures. It is also possible to set different picture sizes. |
| | Chat application | Yes, SMS as radio bearer, developed in-house. |
| | Clock | Yes, with Automatic Time Zone* |
| | Closed User Groups (CUG)* | Yes |
| | Colour display | Yes, 256 colour, 101x80 pixels |
| | Connected Line Identity Presentation (COLP) | Yes |
| | Contacts | Yes |
| | Copyright protection | Yes, possible with copyright protection via EMS, MMS and DRM according to OMA level1. |
| | CSD, Circuit Switched Data* | Yes |
| | | |
| D | Date | Yes |
| | Display light | Yes |
| | | |
| E | EDGE (Enhanced Data rates for Global Evolution)* | No |
| | E-mail address storage | Yes |
| | E-mail client | Yes, supporting IMAP4, POP3, SMTP. |
| | EMS (Enhanced Messaging Service)* | Yes, with 15 pre-defined EMS pictures, 15 pre-defined EMS animations and 10 pre-defined EMS sounds. |
| | External antenna connector | No |
| | | |
| F | File system | Yes. At the purchase of the T310/T312 phone, there is 340 KB of memory space for own objects such as pictures, sounds and themes. |
| | Fixed Dialling Numbers (FDN)* | Yes |
| | | |

| | | |
|---|---|---|
| G | Games | Yes, 3 pre-installed: Ace of Spades, Deep Abyss and Minigolf. Others can be downloaded. Number only limited by available memory. |
| | Group Graphics | Yes (downloadable profiles) |
| | GPRS (General Packet Radio Services)* | Yes, up to 40.2 kbps (kilo bits per second) with multi slot class 4, 3+1 times lots in CS-2. |
| | | |
| H | High Speed Data (HSCSD)* | Yes, up to 28.8 kbps with multi slot class 2. |
| | | |
| I | Image browser | Yes. Gives access to pictures stored in the phone. |
| | Imaging support | Yes |
| | Infrared port | Yes |
| | Input methods | T9 Text Input (including Arabic, Hebrew and Thai), multitap alphabetic, (GSM standard). Stroke, Bopomofo and Pinyin for Chinese versions. |
| | | |
| J | Joystick | Yes |
| | | |
| K | Keypad lock | Yes |
| | | |
| L | Languages | 43 |
| | | |
| M | Melody composer | Yes |
| | Memory check | Total memory available for content: 1.1MB.<br>• Total preloaded content: 760 KB (not possible to remove for the user)<br>• Free memory for the user: 340 KB |
| | MMS (Multimedia Messaging Service) | Yes |
| | MMS pictures, pre-defined | Yes, 11 |
| | MMS templates, pre-defined | Yes, 3, more can be downloaded via WAP |
| | Mobile chat | Yes |

| | | |
|---|---|---|
| | Modem | Yes, via IR |
| | | |
| N | Nokia Group Graphics | Yes, receiving |
| | Nokia Operator Logos | Yes, receiving |
| | Nokia Picture Messaging | Yes, sending/receiving |
| | Nokia Ring Tones | Yes, receiving |
| | | |
| O | Option key | Yes, gives the most common options for the function currently in use. The option key also provides a help menu for certain functions. |
| | | |
| P | Personal management | |
| | Calculator | Yes |
| | Events | Yes |
| | Calendar | No |
| | Alarm clock with snooze function | Yes |
| | Stopwatch | Yes |
| | Timer | Yes |
| | Code memo | No |
| | | |
| | Phone book | |
| | Capacity | 250 numbers in phone + SIM |
| | Maximum number of ADN read from the SIM | 255 |
| | Maximum number of FDN read from the SIM | 55 |
| | Phone book user groups | Yes, 10 |
| | | |
| | Phone lock | Yes |
| | | |
| | Pictures | |
| | Total storage capacity | Limited by the memory |
| | Number of pre-existing pictures | 41 in total: 15 EMS, 11 MMS, 14 Wallpapers, 1 Screen saver. |

| | | |
|---|---|---|
| | Possibility to download | Yes, storage capacity limited by memory |
| | Possibility to create | Yes, storage capacity limited by memory |
| | Picture messaging | Yes, sending/receiving |
| | Picture Phone book | Yes |
| | Pictures, exchange | Yes, via EMS, MMS and infrared. |
| | | |
| | Polyphonic ring signals | Yes, 11 pre-defined. |
| | Predictive text input | Yes |
| | Profiles | Yes, 7 |
| | | |
| R | Re-dialling, automatic | Yes |
| | | |
| | Ring signals | 11 pre-defined Polyphonic, 14 pre-defined iMelodies. |
| | Total storage capacity | Limited by the memory |
| | Number of pre-existing ring signals | 25 in total: 11 Polyphonic, 14 iMelodies. |
| | Possibility to download | Yes, storage capacity only limited by the memory |
| | Possibility to compose | Yes, storage capacity only limited by the memory |
| | Ring signal exchange | Yes, via EMS, MMS and infrared. |
| | | |
| S | Screen saver | Yes |
| | Shortcuts | Yes |
| | | |
| | SIM related features | |
| | SIM voltage | 3V and 5V |
| | Number of networks that the handset can manage on the SIM card | 60 |
| | SDN support | Yes, 15. Located in Phone book menu/ Special numbers/ Service numbers |
| | SIM Application Toolkit* | Yes |
| | SIM card copy | Yes |
| | SIM card lock | Yes (support of GID 1 and GID 2) |

| | | |
|---|---|---|
| | Sleep mode | Yes |
| | SMS (Short Messaging Service)* | Yes |
| | SMS, long messages (also known as concat-enated SMS)* | Yes, up to 10 messages of 160 characters each (or 70 Chinese characters). |
| | SMS Cell Broadcast* | Yes |
| | SMS counter | Yes |
| | SMS templates | Yes, up to 10 templates of 30 characters each |
| | | |
| | Sound browser | Yes. Gives the user access to sounds stored in the phone. |
| | Sound handling | Yes (iMelody, MIDI and AMR) |
| | Sound recorder | Yes, the total time is only limited by the memory. The sound recordings cannot be used as ring signals. |
| | Speaker phone | No |
| | Speech coding | Enhanced, Full and Half Rate |
| | Speed dialling | Yes |
| | Start-up/Shut-down show | Yes |
| | Status menu | Yes |
| | Swatch Internet Time | No |
| | Synchronization with PC | No |
| | SyncML | No |
| | | |
| T | Themes, pre-defined | Yes, 5 |
| | Themes, downloadable | Yes, only limited only by memory |
| | Themes, exchange | Yes, via infrared or MMS |
| | Two Line Service (a.k.a Alternate Line Service, ALS) | Yes |
| | | |
| U | USB protocol support | Only limited functionality |
| | USB physical interface support | No, only with accessory |
| | Connection to a PC USB port | No, only with accessory |

| | | |
|---|---|---|
| | Battery recharging through USB port | No |
| | Maximum data rate through USB port (bit/s) | 9600 |
| | | |
| V | Vibrator | Yes |
| | Vibrator mode: vibrating only | Yes |
| | Vibrator mode: vibrating then ringing | No |
| | Vibrating mode: vibrating + ringing | Yes |
| | Vibrator: activation | Option key or long press on “c”. |
| | Voice coding | Yes, EFR, FR and HR |
| | Voice command | No |
| | Voice recognition | No |
| | | |
| W | WAP browser | Yes, WAP 2.0 browser with support for XHTML Basic and mobile profile |
| | WTLS for added WAP security* | Yes, WTLS class 1/2/3 and SignText |

# SIM application toolkit

The SIM Application Toolkit (SIM AT) is a smart card-centric method of deploying programs that apply only to GSM and to SMS and USSD transports. Programs must be distributed on smart cards. WAP is an Internet-centric method of deploying programs that is independent of network technology. Programs and content are kept centrally on web servers and downloaded as required. While there is some overlap, WAP is a particularly good choice when deploying programs that also have an HTML version for desktop use. Work is currently under way on building interfaces between the two technologies.

For an operator, a company or service provider, SIM AT offers a powerful way to deploy programs and services to users, without the need for new or upgraded equipment. All necessary setup and programming is distributed to users over the air, directly to their phones. In the T310/T312, a separate menu is available for functions residing on the SIM card. These can include sub menus for controlling functions, and also functions which allow the phone to initiate calls, send data, and display information to the user.

# SIM AT services supported by the T310/T312

| Service | | Mode | Support in T310/ T312 |
|---|---|---|---|
| CALL CONTROL | | | Yes |
| CELL BROADCAST DOWNLOAD | | | 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 press Yes to confirm his/her choice | Yes |
| | bit 1: | 0 = digits (0-9, *, # and +) only | Yes |
| | | 1 = alphabet set | Yes |
| | bit 2: | 0 = SMS default alphabet | Yes |
| | | 1 = UCS2 alphabet | Yes |
| | bit 3: | 0 = character sets defined by bit 1 and bit 2 are enabled | Yes |
| | | 1 = character sets defined by bit 1 and bit 2 are disabled and the Yes/No response is requested | Yes |

| Service | | Mode | Support in T310/ T312 |
|---|---|---|---|
| GET INPUT | | General: No. of hidden input characters | 20 |
| | bit 1: | 0 = digits (0-9, *, # and +) only | Yes |
| | | 1 = alphabet set | Yes |
| | bit 2: | 0 = SMS default alphabet | Yes |
| | | 1 = UCS2 alphabet | Yes |
| | bit 3: | 0 = ME may echo user input on the display | Yes |
| | | 1 = user input not to be revealed in any way (see note) | Yes |
| | bit 4: | 0 = user input to be in unpacked format | Yes |
| | | 1 = user input to be in SMS packed format | Yes |
| | bit 8: | 0 = no help information available | Yes |
| | | 1 = help information available | No |
| 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 |

| Service | | Mode | Support in T310/ T312 |
|---|---|---|---|
| REFRESH | | General: The reset option requests the user to wait while the phone restarts | Yes |
| | | '00' =SIM Initialization and Full File Change Notification | Yes |
| | | '01' = File Change Notification | Yes |
| | | '02' = SIM Initialization and File Change Notification | Yes |
| | | '03' = SIM Initialization | Yes |
| | | '04' = SIM Reset | Yes |
| SELECT ITEM | | | Yes |
| SEND DTMF | | | Yes |
| SEND SHORT MESSAGE | bit 1: | 0 = packing not required | Yes |
| | | 1 = SMS packing by the ME required | Yes |
| SEND SS | | | Yes |
| SEND USSD | | | Yes |
| SET UP CALL | | General: Capability configuration | Yes |
| | | Set-up speech call CallParty Subaddress DTMF support | 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 | No |
| | | '01' = Call connected | No |
| | | '02' = Call disconnected | No |
| | | '03' = Location status | Yes |

| Service | Mode | Support in T310/ T312 |
|---|---|---|
| | '04' = User activity | No |
| | '05' = Idle screen available | Yes |
| | '06' = Card reader status | No |
| | '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 supporte d |
| SET UP MENU | | Yes |
| SMS PP DOWNLOAD | | Yes |

# User interaction with SIM AT

## DISPLAY TEXT

Text of up to 240 characters (80 UCS coded) is supported.

**Text clearing times**

- 10-20 seconds. 60-second time-out limit for the user to clear the text.

**'Key' responses**

- 'Long NO' – Proactive session terminated by user.
- 'NO' – Backward move in proactive session.
- Any other key clears display if the command is performed successfully.

## GET INKEY

Prompt for a one-character input. Pressing 'YES' without entering a character gives warning message "Minimum 1 character".

**'Key' responses**

- 'CLR' clears current character.
- 'Long NO' terminates the proactive session.
- 'NO' – Backward move in proactive session.
- 'YES' – Command performed successfully.

## GET INPUT

Prompt for character input. Pressing 'YES' without entering a character gives warning message "Minimum 'no.' characters". The phone will refuse to accept further input when maximum response length is exceeded.

**MMI Maximum Response lengths**

- Digits Only – 160 characters
- SMS default alphabet characters – 160 characters
- Hidden Characters (digits only) – 40 characters

**'Key' responses'**

- 'CLR' clears current character/characters.
- 'Long NO' terminates the proactive session.

- ‘NO’ – Backward move in proactive session.
- ‘YES’ – Command performed successfully.

## REFRESH

When a refresh command is executed by the phone, it displays the message “Please wait” and then restarts.

## SELECT ITEM

Scroll to highlight item for selection. The maximum number of items supported by the phone within one Select Item command is 30.

**‘Key’ responses**

- Down arrow – Scroll down list.
- Up arrow – Scroll up list.
- Long ‘NO’ terminates proactive session.
- ‘NO’ – Backward move in proactive session.
- ‘YES’ – Command performed successfully.

## SEND SHORT MESSAGE

Default message “Sending message, please wait” can be replaced by the Alpha Identifier text, or suppressed completely if a null text is provided. Responses are “MESSAGE FAILED” or “MESSAGE SENT”.

**‘Key’ responses**

- Long ‘NO’ or ‘NO’ terminates 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 the 'YES' key is pressed the current call will be put on hold and the new call set up. If the ME is on a call when the command ‘Set Up Call, disconnecting all other calls’ is sent, the user will see the text ‘Setting up a call current call will be disconnected’. If the ‘YES’ key is pressed the current call will be disconnected and the new call set up.

## SET UP MENU

Incorporates a SIM Application Toolkit Menu Item into the ME’s main menu structure. From the standby display the right or left arrow buttons can be pressed to select the Menu Items. (Note: The SIM AT menu option is found in the ‘Connect’ menu.)

If an Alpha Identifier is supplied in the Set Up Menu command, this is used as the SIM AT entry in the ME’s main menu. If no alpha identifier is supplied and only one item provided, then this item is used as header. If no alpha identifier is supplied and several items are found in the menu, a default title is used. If the SIM AT Menu Item is selected using the ‘YES’ key all the items sent in the Set Up Menu command will be available for selection, in the same way as the Select Item command. A limit of 30 menu items has been set within this command.

**‘Key’ responses**

- Down arrow – Scroll down list.
- Up arrow – Scroll up list.
- Side key: Scrolls the menu.
- ‘YES’ – Envelope (Menu Selection).

# Security and M-commerce technical data

| Feature | Support in the T310/T312 for m-commerce |
|---|---|
| Dual-slot | No |
| Associated with a STK card, allowing ISO B0' bank card payments | If separate card, no |
| Associated with a STK card, allowing EMV bank card payments | If separate card, no |
| Certified by the "GIE Carte Bancaire" | If separate card, no |
| WIM support | If separate card, no |
| Ability to use a WIM application embedded on a SIM/USIM card | Yes |
| WIM application embedded on a SIM/USIM card the default WIM application | Yes |
| Number of smart card readers in the handset | 1 |
| DRM solution | Possible with copyright protection via EMS, MMS and DRM level 1 via WAP. |
| Release of SIM Application Toolkit supported | R99 with exceptions (missing AT commands, for example “Show icon” – still under investigation) |
| Information to the user while in secured mode (WTLS) | Yes, via icon |
| Access to the WIM | WIM can only be accessed by native applications, e.g. the browser |

| Feature | Support in the T310/T312 |
|---|---|
| USSD support | GSM Phase 1/ 2 (Cross-phase compatibility). GPRS behaviour according to class B |
| Mode support -mode | MMI-mode supported.<br><br>No application mode support (not needed for any application). |
| MMI-mode details | USSD messages displayed until removed by user<br><br>It is possible to scroll up and down the text in USSD messages |

# Terminology and abbreviations

**3GPP**
3rd Generation Partnership Project.

**AMR**
Adaptive Multi Rate. Audio format for speech sounds.

**API**
Application Programming Interface.

**ASP**
Active Server Page. Server technology that generates web pages dynamically.

**Bearer**
The method for accessing WAP from the phone, for example GSM Data (CSD) and SMS.

**bFTP**
binary File Transfer Protocol.

**Bookmark**
A URL and header/title stored in the phone.

**Browsing session**
The period from the first access of content until the termination of the connection.

**Calling Line Identification (CLI)**
Shows the number of the caller, or a picture assigned to the number of the caller in the mobile phone display. Not all numbers can be displayed. Network-dependent service.

**Card**
A single WML unit of navigation and user interface. May contain information to present to the user, instructions for gathering user input, etc.

**CDMA**
Code division Multiple Access. A generic term that describes a wireless air interface based on code division multiple access technology.

**CGI**
Common Gateway Interface. Server technology that generates web pages dynamically.

**CS**
Circuit Switched.

**CSD**
Circuit Switched Data.

**Deck**
A collection of WML cards.

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

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

**Dual band**
GSM 900/1800.

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

**EDGE**
Enhanced Data rates for Global Evolution. EDGE uses a new modulation schema to enable data throughput speeds of up to 384kbps using existing GSM infrastructure.

**EFR**
Enhanced Full Rate, speech coding.

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

**ETSI**
European Telecommunications Standards Institute.

**FR**
Full Rate, speech coding.

**Gateway**
A WAP Gateway typically includes the following functions:

- A Protocol Gateway – the protocol gateway translates requests from the WAP protocol stack to the WWW protocol stack (HTTP and TCP/IP).
- Content Encoders and Decoders – the content encoders translate Web content into compact encoded formats to reduce the size and number of packets travelling over the wireless data network.

**GIF**
Graphics Interchange Format.

**GPRS**
General Packet Radio Services.

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

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

**GSM 1800**
Also known as DCS 1800 or PCN, this is a digital network working on a frequency of 1800 MHz. It is used in Europe and Asia-Pacific.

**HR**
Half Rate, speech coding.

**HSCSD**
High Speed Circuit Switched Data.

**HTML**
HyperText Markup Language.

**HTTP**
HyperText Transfer Protocol.

**Image**
WBMP or GIF image contained in a Card.

**IrMC**
Infrared Mobile Communications standard.

**IrDA**
Infrared Data Association.

**ISP**
Internet Service Provider.

**ITTP**
Intelligent Terminal Transfer Protocol.

**LED**
Light Emitting Diode.

**LAN**
Local Area Network.

**ME**
Mobile Equipment.

**Micro browser**
Accesses and displays Internet content in a mobile phone, using small file sizes and the bandwidth of the wireless-handheld network.

**MMI**
Man-Machine Interface.

**MS**
Mobile Station.

**MT**
Mobile Termination.

**ODI**
Object Distribution Indicator.

**OMA**
Open Mobile Alliance.

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

**PDA**
Personal Digital Assistant.

**PDP**
Packet Data Protocol.

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

**PIM**
Personal Information Management.

**SMS-C**
Service Centre (for SMS).

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

**SI**
Service Indication.

**SL**
Service Loading.

**SIM card**
Subscriber Identity Module card – a card that must be inserted in any GSM-based mobile phone. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized, but both types have the same functions. The T310/T312 uses the small plug-in card.

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

**SS**
Supplementary Services.

**TCP/IP**
Transmission Control Protocol/Internet Protocol.

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

**URL**
Uniform Resource Locator.

**USSD**
Unstructured Supplementary Services Data.

**VASP**
Value Added Service Provider.

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

**WAE**
Wireless Application Environment.

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

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

**WAP service**
A WML application residing on a web site.

**WBMP**
WAP Bitmap.

**WBXML**
Wireless Binary Extensible Markup Language.

**WDP**
Wireless Datagram Protocol.

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

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

**WSP**
Wireless Session Protocol.

**WTLS**
Wireless Transport Layer Security.

**WWW**
World Wide Web.

**XML**
Extensible Markup Language.

**XHTML**
Extensible HyperText Markup Language.

# Related information

## Documents

- The T310/T312 User's guide

## Links

- http://www.SonyEricsson.com/
- http://wap.SonyEricsson.com/
- http://www.Ericsson.com/mobilityworld
- http://www.gprsworld.com/
- http://www.imc.org/
- http://www.3gpp.org/
- http://www.irda.org/
- http://www.imc.org/pdi/
- http://www.etsi.org/
- http://www.wapforum.org/
- http://www.w3.org/TR/xhtml-basic/

## Trademarks and acknowledgements

# Technical specifications

The consumer pack includes:

- Mobile Phone T310/T312
- Standard Battery BST-22 (700 mAh, li-ion)
- Standard Charger, CST-13
- User’s guide, including battery information
- Accessory leaflet
- Service and Support leaflet
- SAR Leaflet

# General technical data

| | |
|---|---|
| Product name | T310/T312 |
| SAR measurements: figures | European/Asian markets: SAR 10g max value, phone: 0.80 W/kg<br>Australian market: SAR 1g max value, phone: 1.20 W/kg<br>American (FCC) markets: SAR 1g max value PCS-band, phone: 0.45 W/kg<br><br>American (FCC) markets: SAR 1g max value PCS-band, body worn: 0.37 W/kg (1880 MH) |
| SAR measurements: laboratory | Electromagnetic Near Field and Radio Frequency Dosimetry, Sony Ericsson Mobile Communications |
| System | Tri-band. GSM phase 2 recommendations. GSM 900 (3GPP TS 51.010-1), GSM 1800 (3GPP TS 51.010-1) and GSM 1900 (NATWG 03), e-GSM supported |
| Speech coding | HR, FR, EFR supported where available, for high speech quality |
| SIM card | Small plug-in card, 3V or 5V type |
| Type number | 1130602-BV, 1130602-CN |

# Exterior description

| | |
|---|---|
| Dimensions | 104 x 49 x 20 mm |
| Weight (incl battery) | 97 g |
| Graphic display | Full graphic LCD 80 x 101 pixels<br><br>256 colours, 34 x 28 mm (30.3 x 24 mm used) |

| | |
|---|---|
| Display | Type: graphical<br>Resolution: 101 pixels wide, 80 pixels high<br>Size, viewing: 34 x 28 millimetres, 101 x 80 pixels<br>Size, used: 30.3 x 24 millimetres, 101 x 80 pixels<br>Technology: LCD, 256 colours<br>Colours displayed together: 256 colours<br>Size (lines): up to 8 depending on font size<br>Refresh rate: 70 Hz<br>Backlight colour: 1<br>Font sizes: 3<br>Possibility to display the Euro symbol: yes |
| Antenna | Built-in |
| Text size | A selection of text sizes |
| Text rows | Varies depending on text size used |
| Colours | 3 (Fancy blue, Funky purple and Flaming gold) |
| Battery | Li-Polymer Battery BST-22 (700 mAh, li-ion) |
| Battery LED | Yes, red light for charging status |
| Network LED | No |
| Keypad | Metallic painted hard plastic on silicon mat, 5-way joystick and select<br>16 keys + joystick + side key (five different keypads: Latin, Arabic, Hebrew, Chinese, Thai)<br>Keypad lock: option key or long press on “c”.<br>Use of several keys simultaneously (e g for games) is possible |

# Ambient temperatures

| | |
|---|---|
| Operating | Max: +55°C, Min -10°C |
| Storage | Max: +70°C, Min -40°C |
| Charging | Max: +35°C, Min 0°C |

# Supported Man-Machine Interface (MMI) languages

Depending on software in the phone, these languages are supported:

Albanian (SQ), Arabic (AR), Bulgarian (BG), Chinese Simplified (ZS), Chinese Traditional (ZC) (merger of Chinese Traditional Hong Kong (ZH), and Chinese Traditional Taiwan (ZT)), Croatian (HR), Czech (CS), Danish (DA), Dutch (NL), English (EN), Estonian (ET), Farsi (FA), Finnish (FI), French (FR), German (DE), Greek (EL), Hebrew (IW), Hungarian (HU), Indonesian (IN), Italian (IT), Latin American Spanish (XL), Latvian (LV), Lithuanian (LT), Malay (MS), Norwegian (NO), Polish (PL), Portuguese (PT), Romanian (RO), Russian (RU), Serbian (SR), Slovakian (SK), Slovenian (SL), Spanish (ES), Sotho (ST), Swedish (SV), Thai (TH), Turkish (TR), Zulu (ZU), American English (AE), Brasilian Portuguese(PB) and Canadian French (CF).

# Talk, standby and charging times

| Dimension | Value in GSM 900 | |
|---|---|---|
| Standard Battery (LiPolymer) BST-22 (700 mAh li-ion) | Talk time | up to 11 hours |
| | Standby time | up to 400 hours (paging rate 9, 1 neighbour present) |
| | Charging time | 2 hours |

# Games

| Name | Type of game | Interactive | Vibration |
|---|---|---|---|
| Deep Abyss | Platform | Yes, highscore can be sent via WAP. | Yes |
| Ace of Spades | Card | Yes, highscore can be sent via WAP. | Yes |
| Minigolf | Sport | Yes, highscore can be sent via WAP. | Yes |

* All games will stop and be saved in the memory if interrupted by an incoming call. You can resume the games after the call.
* All games in the T310/T312 are owned by Sony Ericsson Mobile Communications.

Additional games can be found at http://wap.SonyEricsson.com/

| Technical platform information | |
|---|---|
| AVR micro-controller | 12 Mhz frequency |
| Video management memory | Yes, 8 KB |
| API (Application Program Interface) | Yes, Mophun |

**API features**

| | |
|---|---|
| Send/receive via TCP/IP link | Yes |
| Send/receive via SMS | Yes |
| Send/receive via infrared | Yes |
| Vibrator on/off | Yes |

| | |
|---|---|
| Backlight on/off | Yes |
| Full colour support | Yes |
| Certification control of games | Yes |
| True sandbox technology | Yes |
| True file support | Yes |
| Sprite detection collision | Yes |

# Speech coding

| Dimension | Full rate | Enhanced full rate |
|---|---|---|
| Type | RPE/LPC with LTP | ACELP |
| Bit rate | 13.0 kbps | 12.2 kbps |
| Frame duration | 20 ms | 20 ms |
| Block length | 260 bits | 244 bits |
| Class 1 bits | 182 bits | |
| Class 2 bits | 78 bits | |

# Cell broadcast service

| Feature | Support in the T310/T312 |
|---|---|
| User notification of the reception of a CB message | Message displayed on screen |
| Handling of reception of several unread messages | The last message overwrites the previous one |
| Support of all CBMI from 0 to 65535 | Yes |
| File support | CBMI and CBMID |
| Support CB SIM data download | Yes |
| Support of all applicable Data Coding Scheme values as defined in 3G TS 23.038 V3.3.0 | Yes |
| Ability to display in a understandable way a message with a DCS “language unspecified” whatever language is set in the SIM card | Yes |
| Ability to extract a phone number or short number of a CB message to re-use it (to send an SMS or call the sender) | Yes |
| Support of multi-page CB-messages | Yes |

# Short Messaging Service

| Feature | Support in the T310/T312 |
|---|---|
| SMS Center Number | It is possible to store the SMS Center Number. |
| Pictures | It is possible to insert a picture/an icon into the text message. EMS compliant mobile handsets will be able to see the picture correctly. |
| Input methods | Predictive text input |
| Reply to messages | It is possible to reply to received messages by SMS, phone call, ... |
| Message creation methods support | Predictive writing, Multitap |
| Enhanced predictive writing method by: | |
| copy, cut and paste words | No |
| teaching of predictive words that are not in the predictive dictionary | Yes |
| Possibilities when creating a message: | |
| save a sent message in a “sent items” folder | Yes |
| insert a line in the message | Yes |
| assign a validity period to the message | Yes |
| print via IrDA | No |
| use pre defined messages | Yes |
| Possibilities when receiving a message: | |
| reply to the sender | Yes (only to the sender, not to all or part of the message recipients) |
| forward the message | Yes |
| save the message in the inbox | Yes |
| get delivery time and date | Yes |
| print via IrDA | No |
| Possibilities of the previously sent message: | |
| delivery report of the message | Yes |
| forward the message | Yes |
| know the remaining capacity storage | Yes |
| print via IrDA | No |
| Possibilities of the previously received message: | |

| Feature | Support in the T310/T312 |
|---|---|
| reply to the sender | Yes (only to the sender, not to all or part of the message recipients) |
| 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 WAP call (go to the WAP address contained in the message body) | Yes |
| via USSD session | No |
| Possibility to offer the user the ability of sending an SMS to a list of recipients | Yes, using Phone book groups |
| Possibility to write an e-mail address as a recipient address | Yes, if SMS type=e-mail |
| SMS storage | In the SIM and in the phone. |

# Enhanced Messaging Service

| Feature | Support in the T310/T312 |
|---|---|
| Level of compliance supported by the handset regarding the specifications described in release 4. | Enhanced Messaging Service (EMS) according to the standard 3GPP TS 23.040 v4.3.0, with the addition of the ODI feature from 3GPP TS 23.040 v5.0.0. |
| Number of messages that the handset is able to handle to generate a concatenated message | 10 |
| Capacity storage | 100 messages |
| Outgoing messages | It is possible to:<br>• see how many short messages an EMS message consists of before sending it.<br>• choose whether to send the message or not after writing it. |
| Incoming messages | A pre-defined signal is heard once all parts of the message have been received or when a timeout occurs.<br><br>It is possible to re-use the content of an EMS message. Sounds, pictures, animations, text formatting, 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. |
| Attachments | It is possible to attach pictures, animations and sounds to an EMS message. |
| Text formatting | Centred, left and right aligned text.<br><br>Small, normal and large font size.<br><br>Bold, italic, underlined and strike through 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:<br>• edit and create melodies by using the phone keypad.<br>• send and receive melodies via EMS.<br>• download melodies and commercial tunes from Web/WAP portals.<br>• create melodies on Web/WAP portals. |
| WBMP | Yes |

| Feature | Support in the T310/T312 |
|---|---|
| Picture sizes | 16 x 16 pixels, 32 x 32 pixels, variable size receipts in black and white. |
| Pictures | It is possible to:<br><br>• send and receive pictures via EMS.<br>• create pictures on Web/WAP portals.<br>• download pictures from Web/WAP portals.<br>• receive pictures in enhanced messages originated by service providers. |
| Animations | The handset supports the following animations: I am ironic, I am glad, I am sceptic, I am sad, WOW!, I am crying. Plus the other 9 defined in 23.040 v4.3.0.<br><br>It is possible to:<br><br>• send and receive animations.<br>• download animations from Web/WAP portals. |
| TP-PID field value given by the handset before sending an EMS message | 0x00 |

# Multimedia Messaging Service

| Feature | Support in the T310/T312 |
|---|---|
| MMS/CSD parameters and MMS/GPRS parameters placement | MMS is bound to a WAP profile. A WAP profile is bound to a Data Account. A Data Account contains either CSD parameters or GPRS parameters. |
| Possibility to pre-configure the MMS parameters in factory | MMS/CSD: Yes<br>MMS/GPRS: Yes |
| Possibility to configure the MMS parameters by OTA provisioning | MMS/CSD: Yes<br>MMS/GPRS: Yes |
| Possibility for all the parameters from the parameters set to be OTA provisioned at the same time | MMS/CSD: Yes<br>MMS/GPRS: Yes |
| Possibility for only one parameter from the parameters set to be OTA provisioned | MMS/CSD: No<br>MMS/GPRS: No |
| OTA provisioning solution | OTA specified by Ericsson and Nokia |
| MMS User Agent functional entity will be a separate entity from WAP browser: | Yes |
| MMS User Agent support | WAP WTA, WAP UAProf and WTA Public. |
| Supplier indication of realized inter operability tests between its MMS User Agent and MMS Relay/Server from other suppliers | Yes |
| Functionalities that the user is able to set during message composition: | message *subject*<br>MSISDN recipient address<br>*e-mail* recipient address<br>message *Cc* and Bcc recipient(s) address(es)<br>*delivery report* request<br>*read-reply* report request<br>*message* priority |
| From where can the user insert multimedia elements into multimedia messages: | phone memory<br>directly from camera |
| Supplier indication if MMS User Agent will be able to handle a network-based address book | No |

| Feature | Support in the T310/T312 |
|---|---|
| Possibility for sent messages to be memorized into a folder in handset memory | Yes |
| Actions that the user can perform after message notification: | retrieve the message immediately<br><br>defer message retrieval<br><br>reject message |
| Actions that the user can perform after message retrieval: | reply to the sender of the message<br><br>reply to the sender and to Cc people<br><br>forward the message<br><br>delete the message<br><br>save message into terminal |
| Multimedia codecs/formats supported for audio | AMR |
| Multimedia codecs/formats supported for video | None |
| Multimedia codecs/formats supported for image | Baseline JPG, GIF 89a, Wireless bitmap, BWMP |
| MMS User Agent provides: | text formatting facilities (only textsize)<br><br>coloured text/background (Viewer/player supports coloured text and background. Not editable in composer)<br><br>predictive writing |
| Supported formats for message presentation: | message body + attachments<br>(e-mail presentation)<br><br>SMIL version as described in “Nokia/Ericsson MMS Conformance document<br><br>(not WML and SMIL 2.0 Boston) |
| Storage capacity | 340 KB available for user data (images, sounds, MMS,...) |
| Maximum message size that can be handled by the phone for message | Limited by available phone memory: file system and infrastructure. |
| Possibility to configure unconditional message modification (such as media modification in messages) | Yes |

| Feature | Support in the T310/T312 |
|---|---|
| MMS User Agent will report problems to user in case of: | message not sent causes no user subscription to service, if included in ResponseText (please see WAP209)<br><br>message not sent causes required functionality not supported by MMS Relay/Server, if included in ResponeText (please see WAP209)<br><br>message not sent causes insufficient credit (in case of prepaid charging), if included in ResponeText (please see WAP209) |

# Instant messaging/ Chat

| Feature | Support in the T310/T312 |
|---|---|
| Support of instant messaging | No |
| Chat application | Yes, SMS as the bearer. |

# Performance and technical characteristics

| Dimension | GSM 900/E-GSM 900 | GSM 1800 | GSM 1900 |
|---|---|---|---|
| Frequency range | TX: 880 – 914 MHz<br>RX: 925 – 959 MHz | TX: 1710 – 1785<br>RX: 1805 – 1880 | TX: 1850 – 1910<br>RX: 1930 – 1990 |
| Channel spacing | 200 kHz | 200 kHz | 200 kHz |
| Number of channels | 174 Carriers *8 (TDMA) | 374 Carriers *8 (TDMA) | 299 Carriers *8 (TDMA) |
| Modulation | GMSK | GMSK | GMSK |
| TX Phase Accuracy | < 5° RMS Phase error (burst) | < 5° RMS Phase error (burst) | < 5° RMS Phase error (burst) |
| Duplex spacing | 45 MHz | 95 MHz | 80 MHz |
| Frequency stability | +/- 0.1 | +/- 0.1 | +/- 0.1 |
| Voltage operation (nominal) | 3.6 Volts | 3.6 Volts | 3.6 Volts |
| Transmitter RF power output | 33 dBm Class 4 (2W peak) | 30 dBm Class 1 (1W peak) | 30 dBm Class 1 (1W peak) |
| Transmitter Output impedance | 50 Ω | 50 Ω | 50 Ω |
| Transmitter Spurious emission | < -36 dBm up to 1 GHz<br>< -30 dBm over 1 GHz<br>(according to GSM spec.) | < - 30 dBm (according to GSM spec.) | < - 30 dBm (according to GSM spec.) |
| Receiver RF level | Better than – 102 dBm | – 102 dBm | – 102 dBm |
| Receiver RX Bit error rate | < 2.4% | < 2.4% | < 2.4% |

# WAP browser technical data

| Feature | Support in the T310/T312 WAP browser |
|---|---|
| Back to previous page | Yes |
| Bearer type GPRS (IP) | Yes |
| Bearer type GSM Data (IP) | Yes, HSCSD, ISDN and analog |
| Bookmarks | Yes, up to 25 named bookmarks for easy access to frequently visited pages |
| Bookmark Export/Import | Yes, can be sent and received as link using SMS and vBookmark format via infrared |
| Cache | Yes (size 6 KB) |
| Character sets * | UTF8 (Default), US ASCII, Latin1, UCS2 |
| Clear cache | Yes |
| Colour | Colour display |
| Home page | Yes, up to 5 different, one for each WAP profile |
| HTML version for WAP browser | xHTML, mobile profile and Basic |
| Hyperlinks in Text | Yes, highlighted by inverse video |
| Hyperlinks in Images | Yes, indicated by a frame |
| Image Animation | No |
| Image Formats | GIF (interlaced and non-interlaced), WBMP, no transparent layers, JPG |
| Network Settings | Up to 5 different settings available by selecting WAP profile (Intranet, Internet, Banking, Gateway etc.) |
| OTA Support | Yes |
| PPP Authentication | PAP, CHAP supported |
| Reload page | Yes |
| Tables | Yes |
| User Agent Profiles | Yes, list of client characteristics - e.g. display size |
| WAP/WML WAP | WAP 2.0/ WML 1.3 |

| Feature | Support in the T310/T312 WAP browser |
|---|---|
| | *) When creating WML applications, it is recommended that you always save the page contents as UTF8, and that this is clearly indicated in the pages before publishing. This ensures that the contents of the application can be viewed, regardless of character sets used in gateways and the phone. All characters are not supported in all phones. The software version depends on which market the phone is associated to. Also, please note that the phone may not support input on a WAP Service which uses certain characters (languages), even if those characters are supported for browsing in the phone. |
| WAP browser | WAP 2.0 baseline |
| WAP profiles | Dynamic - up to 5 WAP profiles, each with its own settings |
| WTLS (security) | Yes,<br><br>WTLS Class 1 - Encoding<br><br>WTLS Class 2 - Encoding + Server Authentication. Root Certificates needed in phone<br><br>WTLS Class 3 - Encoding + Server Authentication + Client Certification. Root Certificates needed in phone + special SIM cards<br><br>Sign text |

# WAP operator technical data

| Feature | Support in the T310/T312 for WAP |
|---|---|
| WAP Browser | |
| Version | 2.0 baseline, xHTML mobile profile |
| HTML | xHTML, mobile profile |
| WAP Provisioning | |
| Total Parameter sets | 5 |
| Parameter set list | Name<br><br>Startpage<br><br>IP settings:<br><br>CSD phone no., CSD Data rate, CSD dial type<br><br>GPRS APN, password request, allow calls, authentication, data compression, header compression, quality of services<br><br>IP address, datamode (conn.less or oriented)<br><br>UserId and password<br><br>Security on/off<br><br>Show images on/off<br><br>Response timer |
| Manual selection | Yes, between Analog (V32) and Digital (V110) |
| Parameter sets include | WAP/CSD, WAP/GPRS (different sets) |
| Factory pre-configuration | WAP/CSD (possibility to lock a setting), WAP/GPRS |
| OTA | WAP/CSD, WAP/GPRS configuration possible |
| Simultaneous OTA | WAP/CSD, WAP/GPRS configuration possible |
| Single OTA | WAP/CSD, WAP/GPRS is not possible |
| Bookmarks | Not empty by default |
| URL format | Underlined |
| Security mechanism | |
| OTA provisioning (if empty) | Operator verification through a code, included in the OTA data. This code is shown to the user who can choose installation or not. |

| Feature | Support in the T310/T312 for WAP |
|---|---|
| Interface (if empty) | An Install question is asked with the code, if available.<br><br>The user has to choose if a new WAP profile shall be created or an existing profile shall be replaced. |
| Re-provisioning (Set 1 filled) | As above |
| Interface (Set 1 filled) | As above |
| Carrier reset/provisioning | Yes, but not if the set is pre-configured in the factory and locked. |
| SWIM | Not used for provisioning.<br><br>The SWIM is only used for WAP security, both WTLS connections and digital signatures. |
| SWIM certificate | Both client and trusted certificates can be used for WTLS connections and digital signatures. |
| Applicative provisioning | |
| Preferred bearer customization | Yes |
| Email customization | No |
| Other applications/features | Yes, MMS |
| Technologies | |
| WAP Forum OTA provisioning | Yes |
| Openwave OTA | No |
| Other | Yes. The Ericsson-Nokia solution. |
| Provisioning bearer | SMS |
| Parameter sets available | 5 |
| Parameter sets for OTA modification | 5 |

| | |
|---|---|
| PUSH | |
| Content types | |
| Service Indication (SI) | Yes |
| Service Loading (SL) | Yes |
| Cache Operation (CO) content type | Yes |
| Session Initiation Application (SIA) | Yes |
| Man Machine Interface | |
| SI/content retrieval postponing | Yes |

| Feature | Support in the T310/T312 for WAP |
|---|---|
| SI menu structure accessability | WAP services, Push inbox |
| SL reception warning | The user can make a choice if a dialog is wanted or not before loading the SL.<br><br>WAP services/options/common/Push access/prompt |
| SIA reception warning | Yes |
| Cache size limitations | If the inbox is full and a new push is received, the oldest push in the inbox will be discarded. |
| Number of push messages | Depending on the size of the push messages. Around 20 push messages with a size of 500 bytes can be stored. |
| Push de-activate | Yes. WAP services/options/common/Push access/Off |
| Dynamic push menu changes | No. There are no changes in the menus when activating/ deactivating push |
| Security | |
| Mechanisms for push | None |
| Trust with PPG | Sending a SIA is the most trustful. |
| WSP push sessions | 1 |
| Denial of service/spoofing | |
| User agent profile | |
| UA profile content sent at beginning of WSP session | No |
| OA profile content size | |
| URL sent pointing to the UA profile at the beginning of WSP session | Yes |
| URL location | On the manufacturer web site. |
| WTAI | |
| WTA Make Call | Yes |
| WTA Send DTMF | Yes |
| WTA Add Phone Book | Yes |
| Other WTA/WTAI | No |

| | |
|---|---|
| DOWNLOAD | |
| WAP solutions | |
| SAR/WSP/HTTP GET solution to download content over WAP | Yes |

| Feature | Support in the T310/T312 for WAP |
|---|---|
| Download Fun from Openwave | No |
| Other download content over WAP | Yes. Content limited to 3 KB is downloaded without using SAR |
| Features | |
| Download application/product memory check | Yes |
| Downloaded object solution | Yes. The user is asked if the content is to be saved. |
| DRM download support | Yes, level 1. |
| UAP indication for downloading | Yes |
| Other features | Yes. Store, delete, forward, use, manage. |
| Object formats | |
| Ringing tones | audio/iMelody, other/eMelody, vMel, MIDI. |
| Wallpapers | Image/WBMP, GIF, JPG. |
| Pictures | Image/WBMP, GIF, JPG. |
| Games | Mophun, .mpn. |
| JAVA applications | application/JAR not used, JAD not used |
| Screen savers | Image/GIF, JPG |
| Audio files | used: i-Melody, e-Melody, MIDI, AMR<br>not used: audio/MPEG4, MP3, WAV |
| Skins | Application/Themes |
| Video | Video/MPEG4 not used |

| GRAPHICAL USER INTERFACE | |
|---|---|
| Man Machine Interface | |
| Soft keys | None |
| Separate/dedicated back or erase keys | No |
| Screen backlight on when browsing | Yes |
| Predictive writing for WAP sessions | Yes |
| “http://” string displayed automatically when entering URLs | Not displayed but the "http://" is added automatically to the URL. |

| Feature | Support in the T310/T312 for WAP |
|---|---|
| Elements | |
| Number of display lines for a WAP connection | 4 to 7 plus Title, depending on the selected font size. |
| Pop-up menus | Yes. Single select list to conserve space. |
| Radio buttons | Yes. Single select list to conserve space. |
| Check boxes | Yes. Boolean selection. |
| Push buttons | No |
| Horizontal rules | Yes. Separate sections of WML card. |

# GPRS technical data

| Dimension | Support in the T310/T312 |
|---|---|
| Compatible GPRS and SMG specifications | ETSI R97 SMG 31 bis |
| Data rates | Multi slot class 4 supported (3+1)<br>CS-1, CS-2, CS-3, CS-4<br>9,050 bps, 13,400 bps, 15,600 bps, 21,400 bps supported (network-dependent) |
| Indicator of attachment to the GPRS service | Yes, an icon in the bottom left corner, a filled triangle if attached  |
| Indicator of PDP context activation | Yes, an icon on the right side. Animated globe  |
| Data volume counter | The Data volume counter details the volume of data exchanged in bytes for the up/down link for last call for each PDP context.<br><br>The Total data counter details the sum of all GPRS sessions (i.e. not the sum of total data received + sent during the last GPRS session.) The total data counter can be reset by the user. |
| Medium Access Modes | Fixed and 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 |
| 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 |

| Dimension | Support in the T310/T312 |
|---|---|
| Support of compression algorithms | No |
| Support of the QoS modification procedure | Yes, when initiated by the network<br>(not by the handset) |
| Interfaces to external devices supported by the phone and available for a GPRS link | IrDA, AT commands. IrDA,<br>Datarate = SIR & MIR, max 115,2<br>kbps |
| Downlink data rate | Up to 64,200 bps for packet data communication, using 3 time slots in coding scheme CS-4 |
| Uplink data rate | Up to 21,400 bps for packet data communication, using 1 time slot in coding scheme CS-4 |
| Mode of operation | Class B and Class C modes of operation supported. It is possible for the user to choose if the Circuit Switched services should be favoured. |
| R Reference point | Physical layer: PPP is supported as L2 layer in the R reference point<br>Authentication algorithms PAP, CHAP supported |
| IP connectivity | PDP type IP is supported<br>IP termination in mobile or TE (laptop, PDA) supported |
| Application | WAP over GPRS supported (UDP/IP and GPRS-SMS)<br>SMS over GPRS (SMS-MT, SMS-MO) supported |
| QoS | QoS negotiation supported. Default requested QoS sent by the handset at PDP context activation is reliability Class 3. Peak/Mean/Delay/Precedence Class: subscribed.<br><br>Precedence class supported (1,2,3)<br><br>Reliability class 1-5 supported<br><br>Delay classes supported (1,2,3,4)<br><br>Mean and peak throughput rate limited by multi slot class 4 and CS-4 |
| PDP context | 10 PDP context descriptions stored in mobile<br>PDP context description is edited via application in mobile, AT-command or via OTA<br>Simultaneous PDP contexts not supported<br>Network requested PDP context not supported |
| SIM | GPRS aware, as well as non GPRS aware SIMs are supported |

| Dimension | Support in the T310/T312 | |
|---|---|---|
| AT commands supported | AT+CGDCONT - DEFINE PDP CONTEXT | AT+CGACT - PDP CONTEXT ACTIVATE OR DEACTIVATE |
| | AT+CGQREQ - Quality of Service Profile (REQUESTED) | AT+CGDATA - ENT |
| | AT+CGQMIN - Quality of Service Profile (Minimum Acceptable) | |
| | AT+CGATT - PACKET DOMAIN SERVICE ATTACH OR DETACH | |

# Built-in GSM data modem technical data

| | | |
|---|---|---|
| Dimension | Support in theT310/T312 | |
| Standards | AT commands industry standard, ETSI 07.05 and 07.07 and 07.10, V.25ter command set supported | |
| Data rates, Circuit Switched (CSD) | Download data rate | Up to 19,200 or 28,800 bps (depending on base rate) |
| | Upload data rate | Up to 9,600 or 14,400 bps (depending on base rate) for GSM Data communication, no compression |
| Data rates, GPRS | See GPRS Technical data | |

# E-mail client technical data

| Feature | Support in the T310/T312 e-mail client |
|---|---|
| Attachment | Yes (outgoing, images only) |
| Bearer type GPRS (IP) | Yes |
| Bearer type GSM Data (IP) | Yes, HSCSD, ISDN and analog |

| Feature | Support in the T310/T312 e-mail client |
|---|---|
| Character sets * | US ASCII (All variants) |
| | ISO8859-1 (All variants) |
| | ISO8859-2 (All variants except China, Taiwan & Hong Kong) |
| | ISO8859-5 (All variants except China, Taiwan & Hong Kong) |
| | ISO8859-10 (All variants except China, Taiwan & Hong Kong) |
| | KOI8-R (All variants except China, Taiwan & Hong Kong) |
| | WIN1251 (All variants except China, Taiwan & Hong Kong) |
| | WIN1252 (All variants except China, Taiwan & Hong Kong) |
| | UTF7 (All variants) |
| | UTF8 (All variants) |
| | GB2312 (Chinese Simplified, only in China variant) |
| | BIG5 (Chinese Traditional, only in Taiwan/Hong Kong variant) |
| | GB18030 (Chinese Simplified, only in China variant) |
| OTA Support | Yes |
| Supported protocols | POP3, IMAP4, SMTP |

# USSD technical data

| Feature | Support in the T310/T312 |
|---|---|
| USSD support | GSM Phase 1/ 2 (Cross-phase compatibility). GPRS behaviour according to class B |
| Mode support -mode | MMI-mode supported.<br><br>No application mode support (not needed for any application). |
| MMI-mode details | USSD messages displayed until removed by user<br><br>It is possible to scroll up and down the text in USSD messages |

# Image format technical data

| Format | Visible | Max | Animation | Colours | Visible colours | Transparency support |
|---|---|---|---|---|---|---|
| GIF | 101 x 80 pics | 160 x 120 pixels | 50 frames (1 frame/ 100ms) | 256 | 256 (3:3:2=RGB; less blue colours) | Yes |
| JPEG | 101 x 80 pics | 640 x 480 pixels | No | 16.8 mil. | 256 | No |
| WBMP | 101 x 80 pics | 320 x 320 pixels | No | Black/ White | 2 | No |

# Images – downloading to phone

| Feature | File type | Max. size | PC/ IrDA | Phone-to-phone | WAP | MMS |
|---|---|---|---|---|---|---|
| EMS icons | WBMP | WxH<=1024 pixels | Yes | Yes | Yes | Yes |
| Images | GIF, WBMP; JPG | Limited by the memory | Yes | Yes | Yes | Yes |

| Feature | File type | Max. size | PC/ IrDA | Phone-to-phone | WAP | MMS |
|---|---|---|---|---|---|---|
| MMS template | Proprietary TPL | Limited by the memory | Yes | No | Yes | No |
| Animations | Animated GIF | Limited by the memory | Yes | Yes | Yes, 1) | Yes |
| Themes | GIF Proprietary THM | Limited by the memory | Yes | Yes | Yes | Yes |
| Screensaver | Animated GIF | Limited by the memory | Yes | Yes | Yes | Yes |

Exceptions:

EMS icons: WBMP max WidthxHeight<=1024 pixels (eg 32 x 32=1024)

Themes: GIF max, 160 x 120 pixels

WAP: Can not show animations in the WAP Browser. The maximum file size when downloading via WAP is 60 KB if the gateway supports LDT. On a WAP page, the maximum size of one object is 3 KB. The animation will be shown in the Image Browser if it is saved in the phone.

GIF: Animations used as background images or user greetings displays first frame only.

# Index