White Paper

October, 2001

T65

Takes you straight to where the action is

Sony Ericsson

Contents

Preface

Purpose of this document

The Sony Ericsson T65 White Paper is designed to give the reader a deeper technical understanding of how the T65 is designed, and of how it interacts with other media. This document will make it easier to integrate the T65 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 on the Ericsson Mobilityworld. The site at http://www.ericsson.com/mobilityworld/ 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 0
www.SonyEricssonMobile.com

First edition (October 2001)
Publication number: EN/LZT 1084962R1A

Product overview

The T65 is a dedicated mobile Internet phone. One long press on the Access key and the user is instantly connected to news, entertainment and e-shopping. A WAP 1.2.1 browser makes Internet connection available and safe, and GPRS makes it fast.

With its built-in antenna, round shapes and a large display, the T65 together with the T68 has a smooth design that fits perfectly in the hand.

The T65 will be available on all GSM 900 and 1800 markets in the fourth quarter of 2001.

For a list of the features that differs the sc version from the s version, please see "Chinese version" on page 26.

Key functions and features

One-button access to the mobile Internet

With the T65, the mobile Internet is always at hand. One long press on the Access button and you are there – instantly. The T65 takes care of the connection so that users can concentrate on what they are looking for – news, entertainment or the latest fashionable sites.

The Access key is assigned to a WAP address. The default address for non-customized products is the address for Ericsson Mobile Internet. This address can be changed by the user.

Ericsson customers can choose to have the address to their own WAP site assigned instead.

The Access key is also an option key, similar to the option key on the R520. This key gives you the most common options for the function currently in use.

GPRS

The success of the mobile Internet is dependent on a wide range of services, easy-to-use products, large displays and speed. The T65 is a GPRS phone, supporting GPRS 3+1 timeslots. Consequently, by receiving data on 3 radio channels, the speed can be up to 43.2 kbps when browsing the mobile Internet. Basically, this is as fast as the modem many people have at home today when using their PC for browsing the Web.

In short, GPRS…

- Uses Internet-style packet based technology.
- Lets you stay permanently connected to the mobile Internet, but only uses the radio link for the time it takes to transfer data (you only pay for what you get).
- Gives you constant connection with speedy data transfer.
- Allows you to receive calls and messages during GPRS activities without interrupting the transmission. The data session is simply paused while the call is in progress.

Secure WAP

M-commerce is expected to be a growing part of the mobile Internet. Trading, banking and shopping have been possible via the Internet for quite some time, building upon the foundation of the built-in security features. It is these features that have been adapted to and implemented in the WAP protocol and the layer called WTLS, Wireless Transport Layer Security. WTLS consists of three security classes, where class 3 provides the highest security.

The T65 supports WAP 1.2.1, the latest version of the Wireless Application Protocol that includes WTLS class 3. With the most advanced version of WTLS, full security is guaranteed when trading, banking or shopping online. WTLS class 3 includes the following security features:

- Encryption of a message, ensuring that only the sender and the recipient can read the contents of a message.
- Server authentication, meaning that the message is encrypted and users can verify that they really are communicating with the WAP gateway they believe they are connected to.
- Client authentication, ensuring that users are who they claim to be.

Messaging – EMS, Mobile chat and e-mail

EMS lets users send greyscale pictures, animations, sound effects, ring signals and formatted text to each other. With Mobile chat, text messaging is made easier since a chat session opens up immediately when a text message is received from a phone. Using the T65, e-mail is no longer tied to a computer on a desk at home, but lets the user receive, read, write and send e-mail when on the move.

T9™ Text Input for quicker messaging

The T65 supports the predictive text input method T9™ Text Input. Predictive text input makes it fast and easy to write text messages. It works by searching a word database to anticipate which word you are writing. You only have to press each key once, even if the letter you want is not the first letter on the key. You can also add new words to the database.

Functions and features for productivity

The smart phone book

The phone book is one of the most used features of mobile phones. That is why a lot of work has been put into developing a phone book that is easy to use, quick to access and flexible enough to let users store different kinds of information depending on each user's preferences.

Two-in-one - reduced and extensive

The phone book of the T65 has two modes, reduced and extensive. The reduced mode, which is default, makes it quicker and easier to use the phone book. It displays the most essential information about a person - first and last names, phone numbers and e-mail. If the user wants to add or see more information about a person in the phone book, the extensive mode should be chosen.

The phone book of the T65 lets you save up to 250 contacts.

Short-cuts

It is easy to access contacts in the phone book when you make a call. Just press and hold down the button with the letter that the name you are looking for starts with. You instantly enter the phone book and find the first name that starts with that letter. Then you just scroll to find the name you are looking for.

Picture phone book - see who's calling

The T65 lets you assign a picture or an icon stored in the phone to an entry stored in the phone book. When a person calls or sends an SMS, a picture or an icon of your choice will be shown in the display as well as the name. You can also assign a ring-signal to an entry in the phone book. When a person calls or sends an SMS, that particular ring-signal will be heard, together with the name in the display.

The pictures used for Caller ID can be…

- Any of the EMS pictures stored in the phone from the start
- Pictures that have been received via EMS messages
- Pictures created by the user using the picture editor of the T65
- Any operator defined picture.

Naturally, the T65 also supports name and number presentation as well as CLI restriction. It also allows the user to assign a ring signal to a certain number in the phone book.

Up-to-date with the calendar and SyncML

The calendar of the T65 keeps the user on the right track. It has different views: month, week, day and a tasks list. It also supports week numbering and lets you create, edit and delete both appointments and tasks.

The T65 supports SyncML, a synchronization standard developed by Ericsson in co-operation with companies in the telecom and computer industry. SyncML enables remote synchronization of devices from different manufacturers, irrespective of make and model.

The T65 calendar can be synchronized with other devices, such as a laptop, using Ericsson's RS232 Cable.

Option key

The Access key is also an option key, similar to the option key of the R520. This key gives you the most common options for the function currently in use.

Profiles

The profile feature: a group of settings preset to suit a certain environment. The profiles are also related to intelligent accessories such as a desktop charger, a portable or vehicle handsfree; useful for company integration with call forwarding etc. Some phone accessories select a profile automatically. For example, when you place your phone in a car handsfree unit, the "In car" profile is chosen. There are seven pre-programmed profiles: *Normal*, *Meeting*, *In car*, *Outdoors*, *Port h-free (portable handsfree)*, *Home*, *Office*.

You cannot create more profiles, but you can change the settings for a profile. A profile with no accessories associated, such as *Meeting* or *Normal*, must be chosen manually.

Code memo

The Code memo function helps you remember all your different codes. To enter the Code memo, you need to enter a password. To confirm that you have entered the correct password for the Code memo and to prevent unauthorized access to your codes, you must enter a checkword. When you enter your password to open the Code memo, the checkword is shown for a short time. If the password is correct, the correct codes are shown. If you enter the incorrect password, the checkword and the codes that are shown are also incorrect.

If a password is lost, there is absolutely no technical possibility of retrieving the password or the hidden information from the phone's Code Memo. Therefore, it is recommended that you keep a code in more than one place (in more than one Code Memo), if the code is critical to an organization or to a work group.

Accessories

A wide range of Ericsson **accessories** are available, such as *ComuniCam MCA-10, MP3 Handsfree HPM-10,* to enhance productivity further.

Services on the network

The T65 supports the **SIM Application Toolkit (online services)**, which makes it possible for operators to provide new services to existing users over the air, including new menus and functions in the phone.

Dual band support

Dual band support means that you can use the phone on GSM 900 and1800 networks.

Extras for fun

Background pictures

The user can have a background picture in the display, to bring extra life to the phone when it is in standby mode. The background pictures can be…

- one of five pre-defined pictures
- an operator defined picture
- a user-defined picture

The user-defined picture can be an EMS picture stored in the phone from the start, operator-defined, received via EMS or downloaded from a WAP page, and stored by the user or created by using the picture editor. Another way to find a suitable background picture is to use Ericsson's RS 232 Cable and transfer it to the phone from the My Animation PC software, found at http://www.mobileinternet.ericsson.com/.

Start-up and shutdown shows

Another way to make the T65 more personal is to have a user-defined start-up and shutdown show. Every time the phone is turned on or off, an animation, with or without sound, appears in the display. There is one Ericsson-defined show and one operator-defined show stored in the phone. As with the background picture, the user-defined show can use any of the EMS pictures or it can be a show downloaded to the phone via the RS232 Cable from the My Animation software, found at http://www.mobileinternet.ericsson.com/.

Games

For some people, playing a game is a good way to relax. The T65 includes games for different moods and skills.

Ring signals

There are four ways to find a catchy ring signal for the T65. One way is to choose any of the pre-programmed ring signals in the phone. Another way is to compose up to eight new ring signals and choose one of them. It is also possible to download a ring signal from a WAP site or receive a catchy tune in an EMS message from a friend or a company that sells ring signals.

Messaging

More than 15 billion text messages are sent world-wide between mobile phones each month (January, 2001). The consumers' needs to express themselves in ways beyond voice were highly underestimated by the industry when SMS was introduced in the late 90s. The success of SMS, however, is the springboard for existing and coming messaging services, such as Enhanced Messaging Service (EMS), Mobile chat and e-mail.

EMS – Enhanced text messaging

EMS lets users send greyscale pictures, animations, sound effects, ring signals and formatted text to each other. EMS is based on SMS text messaging and is a GSM standard developed by 3GPP, Third Generation Partnership Programme. Unlike Nokia's Picture Messaging, EMS works with phones that do not support EMS, simply by allowing the receiving phone to ignore the EMS items and only display the text.

The T65 supports most of the features specified in the EMS standard. It has a number of pre-defined EMS pictures stored in the phone, plus space for user-defined pictures that can be sent to other phones in EMS messages. Moreover, there are pre-programmed animations and sound effects that can be used to enhance a message and make it more personal.

The T65 also has a picture editor that lets users create a new picture based on a pre-defined one, or change a picture they have received in a message or create new ones.

Mobile chat

Mobile chat is an SMS-based chat function, which is different from ordinary SMS messages in that the old messages stay in the display, similar to chat sessions on the Internet. Each writer is distinguished by a nickname.

Mobile chat makes text messaging easier since a chatsession opens up immediately when a text message is received from a phone. Chat sessions are automatically saved for an hour, letting the user resume the communication when interrupted.

The Mobile chat function of the T65 works with phones made by other manufacturers.

E-mail

E-mail is no longer tied to a computer on a desk at home, as the T65 lets the user receive, read, write and send e-mail when on the move. The T65 supports POP3 (Post Office Protocol 3), a standard mail server commonly used on the Internet. POP3 consists of a message store that holds the incoming e-mail until users log on and download it. The T65 cannot, however, handle attachments.

The e-mail function requires that the user has an Internet e-mail account

.

Synchronize calendar and phone book

In everyday life, access to an updated calendar and addresses of friends and business colleagues is greatly appreciated. To be truly mobile, users must be able to carry their important information with them. Equipping mobile phones with Personal Information Manager (PIM) programs like calendars, to-do lists and address books gives users access to their most important data anywhere and anytime. The information is kept updated by synchronizing with the information at the office or at home. The growing use of groupware such as Microsoft Outlook and Lotus Notes means that more and more meetings are booked electronically in daily business life.

Hierarchical phone book with contacts

The T65 features a hierarchical phone book. For every contact, you can store name, home, work and mobile numbers, pager number, e-mail address and other information. The hierarchical phone book in the T65 is compatible with most groupware and agenda programs, such as Microsoft Outlook. Via cable, this enables a smooth local synchronization (IrMC) of contact names, numbers and addresses in the phone and contacts on the user's PC. For remote synchronization over WAP, the T65 supports SyncML.

SyncML, an open standard

SyncML – background

Leading the way in providing remote synchronization capability, Ericsson realizes that interoperability of remote synchronization is of utmost importance if mobile data usage is to become as widespread as generally predicted.

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

What is SyncML?

SyncML is the common language for synchronizing all devices and applications over any network. SyncML leverages Extensible Markup Language (XML), making SyncML a truly future-proof platform. With SyncML any personal information, such as e-mail, calendars, to-do lists, contact information and other relevant data, will be consistent, accessible and up to date, no matter where the information is stored. For example, a calendar entry made to a mobile device on a business trip is equally available to a secretary in a network calendar. Sync ML is the ultimate choice for remote synchronization.

In the T65, SyncML supports remote syncronization of the calendar and phone book.

.

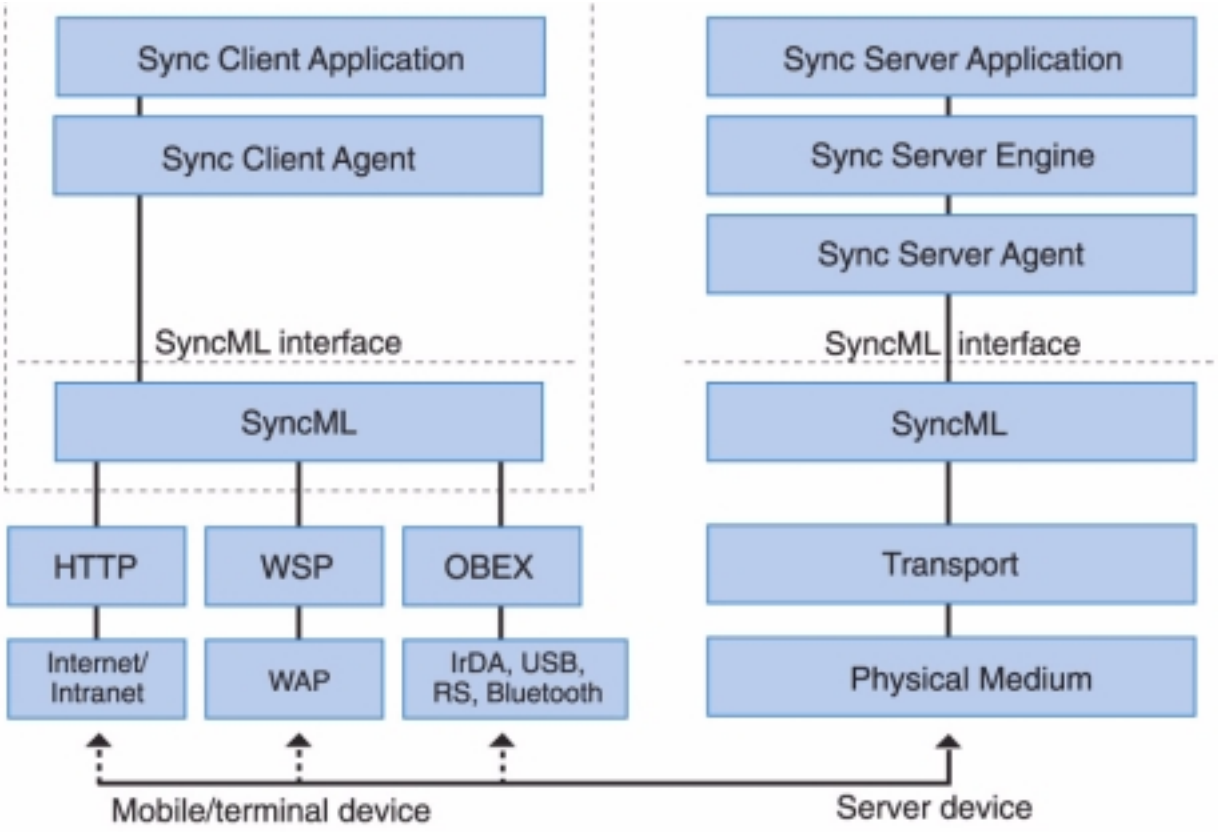

Figure 1 SyncML architecture

Designed for the requirements of the wireless world

SyncML is designed specifically with the wireless world's tight requirements in mind. SyncML minimizes the use of bandwith and can deal with the special challenges of the wireless synchronization like relatively low connection reliability and high network latency. Sync ML supports synchronization over WAP, fixed networks, infrared, cable or Bluetooth. As an open, future-proof standard, SyncML is the synchronization choice for any device or application of the mobile information society. For more information on SyncML, see www.syncml.org

In the T65, SyncML enables synchronization over WAP – an ultimate solution for travellers.

Benefits of a common synchronization protocol

- **End users**
  Today's user of mobile devices is probably using a different synchronization product with every device. Each technology can synchronize only a few applications, or is limited to a particular type of network connection. This arrangement is expensive to install, confusing to configure and operate, and costly to administer. With SyncML, users will be able to buy devices that synchronize with a broader range of data.

- **Device manufacturers**
  Device manufacturers will benefit from a common protocol that will make the device interoperable with a broader range of applications, services, and network and transmission technologies.

- **Service providers**
  Service providers moving into the growth arena of application hosting are particulary concerned that a proliferation of synchronization technologies will make it impossible to deploy and support their customers in a cost-effective manner. To support the range of data types and devices in use, today service providers must install and configure multiple server infrastructures, maintain and support that infrastructure, and maintain compatibility and performance. The alternative now available, to use a single solution for data

connectivity, involves the risk of a tight coupling to a propriety solution. With SyncML, they will be able to provide connectivity to a wider selection of applications.

- **Application developers**
  Choosing to support multiple synchronization technologies enables an application to support more types of devices and networked data, but that choice comes at a cost. With SyncML, application developers will be able to develop an application that can connect to a more diverse set of devices and network data.

- **Network operators**
  As multiple applications that need remote synchronization over WAP are developed, there will be an automatic growth of revenue for network operators.

Local Synchronization

Open standard

Communication is possible with almost any groupware or office program, since the synch method complies with the open standard IrMC 1.1, as specified by the Infrared Data Association – reference http://www.irda.org. IrMC 1.1 brings together the following standards:

- vCard 2.1 for address book information
- vCalendar 1.0 for appointment and to-do information
- ObEx (Object Exchange) for data exchange

Intelligent process

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

Local synchronization software and the T65

An efficient enterprise solution is to use the T65 together with PCs equipped with XTNDConnect PC For Ericsson. By using the RS 232 Cable, you can easily perform a fast, local synchronization.

Integration between XTNDConnect PC For Ericsson and Microsoft Outlook provides an embedded menu for one-key synchronization.

- A mobile worker typically uses SMS and Phone Book Manager
- An office worker typically uses XTNDConnect PC For Ericsson and Phone Settings

To enhance functionality and compatibility further, the synchronization software can easily be upgraded.

The number of units that can talk to each other is unlimited. One phone can be partner with several PCs. This ensures that information from both the work PC and the home PC can be synchronized with the phone. For users that have both a desktop PC and a laptop or a PDA, it is an efficient way to synchronize data with the phone. This way, data can also be transferred between PCs to keep them in synch.

If the synchronization software is upgraded to XTNDConnect PC, one PC can be partnered with several different phones. This is vital if, for example, each member in a work group has his/her own T65, and needs to synchronize with a PC. It makes it easy, for example, to download a common company phone directory to the phone book in each company mobile phone. With the full version of the synchronization software, other phone types and handheld devices, such as PDAs and Windows CE computers, can also be synchronized.

XTNDConnect PC For Ericsson

This synchronization software can be found and downloaded at http://www.mobileinternet.ericsson.com. It provides a powerful set of functions:

- Phone book and calendar synchronization for the T65.
- A synchronization menu is embedded inside Microsoft Outlook. It provides one-key synchronization and allows the user to control the synch process by easy-to-use settings.
- PC applications supported by XTNDConnect PC For Ericsson:
  Microsoft Outlook 97, 98, 2000
  Platforms for using XTNDConnect PC For Ericsson: Windows 98, 2000, Me (Millennium Edition), Windows NT 4.0
  Pentium PC recommended (minimum 386)
  32 MB RAM recommended (minimum 16 MB)
  10 MB free hard disk space
  Cable connection
- Support is handled by Ericsson.

XTNDConnect PC

All users of the T65 can easily upgrade to the full version of the synchronization software. A number of features and supported applications will then be added, including XTNDConnect Phone Viewer.

- Phone book and calendar synchronization for the T65.
- XTNDConnect Phone Viewer makes phone data easy to enter. Use your computer to view, create and edit all data stored on your Ericsson phone.
- PC applications supported by XTNDConnect PC (full upgraded version):

  Microsoft Outlook 97, 98, 2000
  Lotus Notes 4.5, 4.6, R5
  Lotus Organizer 4.1, 5.0, 97, 97 GS, 6.0
  Symantec ACT! 3.05, 4.0, 2000
  NetManage Ecco Pro 4.0
  GoldMine 3.0, 4.0 (Standard-Edition)

Platforms for using XTNDConnect PC:

  Windows 98, 2000, Me (Millennium Edition), Windows NT 4.0
  Pentium PC recommended (minimum 386)
  32 MB RAM recommended (minimum 16 MB)
  10 MB free hard disk space
  Cable connection

- A synchronization menu is embedded inside Microsoft Outlook. It provides one-key synchronization and allows the user to control the synch process by easy-to-use settings.
- Handheld devices supported include the T65, palm-sized and handheld devices using Windows CE and PalmOS/ Casio Personal Organizers.
- All support for the full version is handled by Extended Systems Inc.

WAP services

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

The WAP browser in the T65 is compliant with WAP 1.2.1, including security according to WTLS class 3. It is designed for WML and cannot read ordinary HTML pages, but it is suitable for interaction with customer services, e. g. ticket reservation. It is also handy when you want to access text-based information, such as timetables, share prices, exchange rates, Internet banking and other interactive services.

Using WAP in the T65

The built-in WAP browser gives the user portable, fast and secure access to a wide variety of services, with the possibility of personalized services. WAP in the T65 offers new opportunities to companies and service providers:

Push service

A useful feature for companies and service providers to push contents or service indications to work groups or customers. This is used for notifications, mail alerts, messaging, news, stock quotes, contacts, meeting requests, games etc.

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.

Adapt to phone type

When creating a WAP service, you want to make sure that the user experience is what you intend, regardless of client device type. The function User Agent Profile is supported by the T65 to allow the contents to be automatically optimized for the phone.

Several bearer types

The T65 accesses WAP over a standard GSM Data connection as well as over a GPRS connection. SMS is available as bearer type also. (Network-dependent services.)

Options button

During WAP browsing, the options button on the T65

gives the user immediate access to a dynamic option menu when using WAP services, similar to a mouse right-click in PC programs.

Bandwidth efficiency

One of the key advantages WAP has over text-based HTML pages on mobile devices, is the bandwidth efficiency for communication. This is due partly to the fact that the WAP application is communicated to the wireless devices in the form of binary encoded data. Over a GPRS connection, bandwidth is used even more efficiently.

Easy create for WAP

Creating a WAP service is no harder than creating an Intranet/Internet service today since WML and WMLScript are based on well-known Internet technology. New market segments can be addressed by launching innovative mobile Value Added Services.

Using standard tools

It is possible for the service creator to use standard tools like ASP or CGI to generate content dynamically. You can utilize existing investments in databases etc. that are the basis of existing Internet services. Create a service once and make it accessible on a broad range of wireless networks.

Maintain customer base

You can adapt existing Internet services to WAP. The actual binary encoding can be handled by the WAP Gateway which makes it possible to create WAP applications using the text-based language WML and other tools. In fact, existing HTML-based applications on the Internet can be viewed in the WAP browser, if an automatic conversion is performed in the WAP Gateway.

Improve productivity

Improve and simplify the communication flow within an organization by making information available to mobile users. A company or organization can use a WAP gateway to provide a secure connection to the company network for their users.

The WAP profiles

The T65 holds a number of WAP profiles, each with a group of network settings and a home page. If you provide a corporate WAP service on your Intranet, it is useful to enter an Intranet WAP profile in user phones. The WAP profile holds network settings and user identification. Users can switch easily between corporate services and WAP services on the Internet, simply by switching WAP profile.

Bearer type characteristics

The phone accesses WAP services over SMS or IP, where 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

- Connection is maintained “constantly”, as required by the application, and data is transmitted in packets. This means that the phone is connected almost all the time without using network capacity.
- Higher transmission speed than with GSM Data and SMS access.
- Pricing of GPRS can be dependent on the actual use of bandwidth, which means very low cost when no data is sent or received, while the phone remains connected to the WAP service.
- When transmitting large amounts of data, bandwidth can be increased automatically to allow faster transmission speed.
- GPRS is ideal for Complex Pull services, Browsing, Data transfer, Provisioning, Pager service, Messaging services, Info services, Push initiations.

GSM data access

- Circuit connection of data call, which means that the phone is connected during the entire WAP session.
- Comparably higher transmission speed than with SMS access.
- Pricing of GSM Data access can be compared to pricing of data calls in the network.
- GSM Data is suitable for Complex Pull services, Browsing and Data transfer.
- GSM Data is not suitable for Provisioning, Pager service.

SMS access

- SMS point-to-point is used and not SMS Cell Broadcast.
- Connection is maintained by the automatic exchange of ”messages” between the phone and the SMS Service Centre.
- Comparably lower transmission speed than with GSM Data access.
- Pricing of SMS access can be compared to pricing of the normal SMS service in the network.
- MS is suitable for Messaging services, Info services, Push initiations, Provisioning.
- MS is not suitable for Browsing, Data transfer.

The WAP Gateway provides services in the company's Intranet, a banking or stock trading service on the Internet, or access to other WAP applications on web addresses anywhere on the Internet. A Gateway is identified by an IP number or by a phone number, depending on access type.

Security using WAP

The T65 supports WAP 1.2.1, the latest version of the Wireless Application Protocol that includes WTLS class 3.

When using certain WAP services,the user may want more security than normal, for example when using banking services.The user establishes a secure connection between the phone and the WAP gateway.

To use such connections, certificates have to be saved in the phone.The certificates are made available so that users can download them from certain WAP sites. An access key is needed when accessing certain WAP sites or when reviewing certificates.The user is asked to enter it before a secure WAP connection is established.

WTLS class 3 includes the following security features:

- Encryption of a message, ensuring that only the sender and the recipient can read the contents of a message.
- Server authentication, meaning that the message is encrypted and users can verify that they really are communicating with the WAP gateway they believe they are connected to.
- Client authentication, ensuring that users are who they claim to be.

Configuration of WAP settings

An easy way to perform the WAP configuration of a single phone is by using the step-by-step WAP configurator provided on the Ericsson Mobile Internet. The configurator utilizes OTA provisioning, and it is available on http://mobileinternet.ericsson.com, no login required.

Another way to perform the WAP configuration of a single phone is by using the Ericsson Phone Settings program which can be found and downloaded at http://www.mobileinternet.ericsson.com/. You can find all configuration settings needed for the phone to access the WAP services.

A manual configuration is made using the menu system in the phone. This is described in the User's Guide.

Push services

These are useful for sending updated WAP site contents or WAP links to mobile users. Examples of services that can be implemented using push services:

- Notification of new e-mails, voice mails, etc. Instant messaging and chat.
- News, sport results, weather forecasts, financial information (stock quotes etc).
- Personal Information Manager (PIM) - delivery of contacts, meeting requests etc.
- Fill up a smart card with e-cash.
- Interactive games, e.g. play poker with a friend.

In the T65, the user selects whether to allow push messages or not. There are two different forms of Push services:

Service Indication (SI)

This is basically a text message to the user containing a link to a URL carried by the SI. If the user decides to load the suggested URL, normal WAP browsing commences.

Service Loading (SL)

This means that the WAP site content is immediately loaded and executed on the client, or alternatively is loaded and stored in the cache for later use. In both cases, the SL is loaded without any user intervention.

When a service indication is received in the T65, it is presented to the user in one of the following ways:

- High
  Immediately displays the message irrespective of current activity.
- Medium
  Message is immediately displayed, unless the user is engaged in another activity. In this case the message is indicated to the user, who retrieves it later from the inbox.
- Low
  Message is not immediately displayed. Instead it is put in the Inbox, and an indication is given in the standby screen.

In the T65 push message inbox, a list shows the first part of each received message, newest first. The user decides to read or delete the message, and whether to load the suggested URL in the WAP browser.

Over-the-air provisioning of WAP settings

To simplify configuring WAP settings in a number of

phones, all settings can be sent as an SMS message to each phone. This makes it easy for an operator, a service provider or a company to distribute settings for Internet/ Intranet, and WAP, without having to configure each phone manually. This also makes it easy to upgrade the services provided to the users, without the need for users to perform any manual configuration.

- The OTA configuration message is distributed via SMS point-to-point.
- The setup information is a binary encoded XML message, according to WBXML. To receive information about OTA specifications, please contact your local Ericsson representative for consumer products. A configurator that utilizes OTA provisioning can be tested on Ericsson Mobile Internet.
- The user is not alerted about new settings until the ongoing browsing session ends. Furthermore, settings are not changed during an ongoing browsing session.
- The necessary 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.

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. Services that give us access to personalized communications, information and entertainment anytime, anywhere.

With the T65, the mobile Internet is always with you. One long press on the Access key and you're there – instantly. The Access key is assigned to a WAP address. The default address for non-customized products is the address for Ericsson Mobile Internet. This address can be changed by the user. Ericsson customers can choose to have the address to their own WAP site assigned instead.

The T65 also enables new technologies such as mobile positioning to create new commercial and productivity solutions.

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. Such a connection is called a Data connection. This connection contains specific settings and parameters for the connection, for example, the address to the appropriate server. Several Data connections can be saved in the T65, with different settings. To make it easier for the user, Data connections can be provided by the operator in a message over the air, 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.
- When working with WAP or the Internet, the user simply selects which Data connection they want to use for the activity.
- Data connections are used for both GSM Data and GPRS connection settings.
- Data connections contain choice of bearer type for WAP and corresponding bearer specific parameters.
- Data connections contain all settings for the Internet access point, whether a modem pool phone number or an IP address, and the user ID and password.

Mobile positioning

The geographic location of mobile subscribers can be used to provide them with related information and a variety of services. Ericsson's Mobile Positioning System (MPS) is a network-dependent service, and gives operators a fast and cost-effective way to establish and roll out location-based services.

For users of the T65, the integration of mobile positioning with WAP services means that a complete range of service and information tools are available.

More information regarding possibilites with and technologies for mobile positioning is available at http://www.ericsson.com/mobilepositioning

.

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 to enhance the capabilities for data communication. Data traffic is increasing enormously over both wired and wireless networks. This growth in demand for Internet access and services reflects the explosion in demand for mobile communications. Users want access to the Internet while they are away from their offices and homes.

The main applications driving the wireless Internet development are e-mail access, web browsing and pull content, also known as web clipping. User surveys have found that a vast majority of executives and business professionals want wireless Internet access to both send and receive e-mail on a portable device, as well as web browsing with both text and graphic capabilities! The demand for high-speed Internet access will be the key driver for coming generations of wireless services equal to, or faster than wired, and GPRS can deliver this mobile Internet function. GPRS will allow innovative services to be created, enabling new and previously inaccessible market segments to be addressed, increasing customer loyalty and reducing churn. Machine-to-machine and person-to-machine communications will become possible.

GPRS applications can be developed both as horizontal and vertical applications. Vertical applications can, for example, be operations like police and emergency, taxi, and delivery or automated services such as vending machines, supervision and vehicle tracking. Horizontal applications are generic, such as Internet access, e-mail, messaging, e-commerce and entertainment. One of the advantages of GPRS is that it will profit from the global coverage of exisiting GSM networks. Therefore, applications developed for GPRS can be deployed on a large scale, increasing revenues for network operators and service providers. GPRS also provides an ideal secure medium for connections to private networks, banking and financial services.

The T65 supports GPRS, which means that the data is sent in packages at a very high speed. The phone remains connected to the network all the time without using any transmission capacity, until data needs to be sent or received. The illustration below gives a comparison.

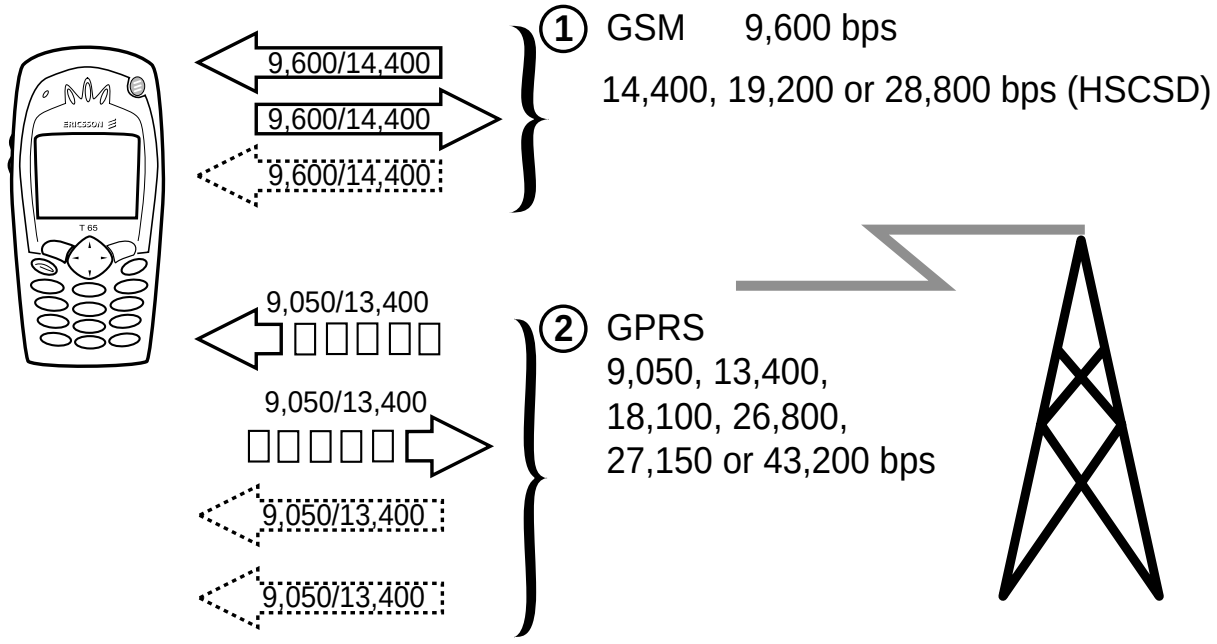

Figure 2 A comparison between GSM and GPRS

1. A normal GSM voice or data call only uses one of eight repeating time slots in the GSM channel. Data speeds are therefore limited to 9,600. A higher data speed, High Speed Circuit Switched Data (HSCSD), can be acheived by the T65, by using a 14,400 bps coding scheme and the possibility of using two time slots for receiving data. This can increase the data speed up to 28,800 bps.

2. In GPRS, data is sent in packets, and up to three time slots can be combined to provide the necessary bandwidth in the T65 – up to 43,200 bps for receiving data, depending on coding scheme.

Using GPRS in the T65

Instead of occupying a whole voice channel for the duration of the call, data is sent in small packets as needed, just like IP on the Internet. Capacity is used only when data is being sent or received, which means that it is possible to be "constantly" connected, as required by the application in use. If the user wants to send e-mail, it may be sufficient to share a channel with several other users. On the other hand, the phone has access to several time slots if a higher capacity is needed.

The GPRS specification includes four coding schemes that allow data speeds of 9,050 bps, 13,400 bps, 15,600 bps and 21,400 bps respectively. The T65 works with the first two coding schemes, but data speed will naturally vary according to network configuration.

The GSM system's design limits the ability to use all eight time slots. Instead, the T65 uses up to three time slots for receiving data, and one slot for transmitting. This means the speed for receiving data is up to 43,200 bps and for sending data up to 13,400 bps.

Information about the identity of the phone and the characteristics of the connection are described in the PDP context (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. In the T65, multiple PDP context settings can be set via the menu system, or by OTA provisioning.

Using GPRS with the T65 has several advantages, for example:

- Constant connection
  Keep an open connection to the e-mail system or the company network, staying online to receive and send messages at all times. All connection settings can be managed by using the Data connections feature.
- High speed
  Gain access automatically to increased bandwidth when downloading large files, images etc.
- Cost efficient
  As GPRS is an IP-based connection, this means that a high transmission capacity is only used when needed. This makes it possible to stay connected via GPRS, whereas keeping a constant circuit switched connection would be more expensive.

- WAP over GPRS
  Access the Internet via WAP at high speed and be constantly connected. The user can run WAP functions such as browsing.
- E-mail over GPRS
  This means that the user can be connected to the e-mail system while reading and preparing messages, and that the messages are sent at a high speed.
- Data communication
  Using GPRS, this provides data and Internet/Intranet access, for a PC, PDA or handheld device connected via the RS 232 Cable.
- Data and voice
  The T65 can maintain a data connection when conducting a voice call. For example, the user can conduct voice calls while maintaining an uninterrupted connection to an e-mail system.
- Provide settings
  The GPRS configuration settings can be sent from the provider over the air, OTA. This way, the user can use GPRS without making any settings in the phone.
- User controlled settings
  Full user control is enabled in the T65. In the Data connections menu, the user can set up multiple descriptions and access advanced settings for GPRS, for example Data compression and Quality of Service.

Modem and AT commands

The T65 contains a complete GSM 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 a cable, 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 T65, AT commands are used both 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 T65 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

High Speed Data, fast 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, interworking with ISDN. This also provides additional features, such as quick call set-up capability.

GPRS enables constant connection and high speed

With GPRS, the connection is maintained “constantly”, and data is transmitted in packets. Pricing of GPRS can be dependent on the actual use of bandwidth, which means very low cost when no data is sent or received, while the phone remains connected. When transmitting large amounts of data, bandwidth can be increased automatically to allow faster transmission speed, up to 43,200 bps download speed.

AT commands support

This section outlines the AT commands supported by the T65. The information here can be of use for advanced users, to indicate the possibilities they have to:

- develop new communications software
- add the T65 to an application's list of compatible modems
- adjust the settings of their mobile telephone and modem

The modem in the T65 supports the V.25ter command set, which is the standard communication set used by modems.

The T65 is compatible with industry de facto extensions, ETSI 07.05, 07.07 and 07.10.

Overview of AT command functions

You use AT commands to configure your mobile telephone, to request information about the current configuration or operational status of your 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 built-in modem is placed in off-line command mode when first started and is ready for entry of AT commands.

On-line data mode

Allows "normal" operation of the built-in modem, exchanging data or facsimile with the remote modem.

On-line command mode

You can switch to on-line command mode when you want to send AT commands to the built-in modem while still remaining connected to the remote modem.

The AT commands in the T65 are grouped as follows:

- Control and Identification
- Call Control
- Interface Commands
- Data Compression
- Mode Management
- Audio Control
- Accessory Menus
- Accessory Authentication
- Voice Call Control
- GSM 07.10
- Accessory Identification
- VAD Support for External VAD
- 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 Phonebook
- GSM Clock, Date and Alarm Handling
- GSM Subscriber Identification
- Ericsson Specific AT Commands for GSM
- MMI Settings
- Voice Control
- OBEX
- WAP Browser

In-phone functions and features

**Subscription and/or network-dependent*

In-phone functions and features		
A	Alarm clock with snooze function	Yes
B	Background light	Yes, 1
	Background pictures	Yes
	Bluetooth wireless technology support	No
	Bookmarks (URL memory)	Yes, (number TBD)
	Business card exchange	No
C	Calculator	Yes
	Calendar	Yes
	Call barring*	Yes
	Call divert*	Yes
	Call hold*	Yes
	Call screening*	Yes
	Call list (last dialled, answered and missed calls)	Yes, 30 entries
	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, with name or number, personal ring signal and pictures
	Clock	Yes, with automatic Time Zone*
	Closed User Groups (CUG)*	Yes
	Code memo	Yes
	Conference calls*	Yes
	CSD, Circuit Switched Data*	Yes
D	Date	Yes
E	EDGE (enhanced Data rates for Global Evolution)*	No
	E-mail address storage	Yes, one per contact
	EMS (Enhanced Messaging Service)*	Yes
	External antenna connector	No
F	Fixed Dialling Numbers (FDN)*	Yes

In-phone functions and features		
G	Games	Yes, 4 games (Chinese version: 1 game)
	GPRS (General Packet Radio Services)*	Yes, up to 43.2 kbps (3+1 timeslots)
H	High Speed Data (HSCSD)*	Yes
I	Infrared port	No
	Input methods	T9™ Text Input, multitap alphabetic (GSM standard), Bopomofo, Pinyin and Stroke
	Keypad lock	Yes
L	Languages	41
M	Memory check	Yes
	Mobile chat	Yes
	Modem	Yes, built-in
P	Phone book	250 contacts in phone + SIM
	Phone lock	Yes
	Picture editor	Yes, stand-alone picture editor facility
	Profiles	Yes, 7
R	Re-dialling, automatic	Yes
	Ringsignals, pre-programmed	Yes
	Ring signals, own	8
	Ring signals, exchange	Yes, via EMS
S	Screensaver	No
	Shortcuts	Yes
	SIM Application Toolkit*	Yes
	SIM card lock	Yes
	Sleeping display	Yes
	SMS (Short Message Service)*	Yes
	SMS, long messages (a.k.a. concatenated SMS)*	Yes, up to 6 messages of 160 characters each
	SMS Cell Broadcast*	Yes
	SMS counter	Yes
	SMS templates	Yes, 10 templates of 30 characters each
	Speaker phone	No
	Speech coding	Enhanced, Full and Half Rate
	Speed dialling	Yes
	Start-up/Shutdown shows	Yes, 3
	Status menu	Yes

In-phone functions and features		
	Stopwatch	Yes
	Swatch Internet Time	No
	Synchronization with PC	Yes, via RS232 cable
	SyncML	Yes
T	Timer	Yes
	Two Line Service* (a.k.a Alternate Line Service, ALS)	Yes
V	Vibrating alert	Yes
	Voice control (dialling plus answering and rejecting with HF)	Yes
	Voice memo	No
W	WAP browser	Yes, WAP 1.2.1 browser
	WTLS for added WAP security*	Yes, WTLS class 3

Network-dependent features

SMS and EMS messaging

The T65 is capable of sending and receiving SMS, EMS messages and linked messages.

- With the Short Message Service, a user can send text messages containing up to 160 characters to and from GSM mobile stations
- With the linked SMS, the user can link several SMS messages together to create a longer message (network-dependent service)

A Service Centre (SC) acts as a a storage and forwarding centre. The T65 also supports using SMS as a bearer type for connecting to WAP.

SMS consists of two basic services:

- Mobile Originated SMS (from a mobile station to an SMS-C)
- Mobile Terminated SMS (from an SMS-C to a mobile station)

For Mobile Originated SMS, an SMS message is sent from a Mobile Station to the SMS-C where it is forwarded to its destination. This can be another Mobile Station, or a terminal in the fixed network.

A Mobile Terminated SMS is when an SMS message is forwarded from the SMS-C to a Mobile Station. When the Mobile Station receives the message, it returns a delivery report saying the transfer was successful.

Fixed dialling and Restricted calls

For a company or an organization, it can be useful to restrict phone calls. Fixed Dialling allows you to preset a number of digits, for example area codes. This restricts the user to making calls only to numbers which use the preset digits as leading digits. Fixed Dialling makes use of the PIN2, and it requires fixed dial fields on the SIM card. Check with your operator about this feature.

The Restrict Calls service allows you to block outgoing or incoming calls in certain situations, for example international calls.

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 underway 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 T65, a separate menu is available for functions residing on the SIM card. These can include submenus 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 T65

Service		Mode	Support in T65
CELL BROADCAST DOWNLOAD			Yes
DISPLAY TEXT		General: Support for packed and unpacked format in SMS default alphabet as well as UCS2 alphabet	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	No
		1 = character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested	No

Service		Mode	Support in T65
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	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	No
		'03' = Date, time and time zone (DTTinPLI)	No
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 SHORT MESSAGE	bit 1:	0 = packing not required	Yes
		1 = SMS packing by the ME required	Yes
SEND SS			Yes
SEND USSD			Yes

Service	Mode	Support in T65
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 redial	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 redial	Yes
	'04' = set up call, disconnecting all other calls (if any)	Yes
	'05' = set up call, disconnecting all other calls (if any), with redial	Yes
SET UP MENU		Yes
SMS PP DOWNLOAD		Yes

User interaction with SIM AT

DISPLAY TEXT

Text of up to 160 characters (80 UCS coded) is supported.

Text clearing times

- 10-20 seconds. 60-second timeout 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) – 20 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 for 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 'Extras' 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).

Chinese version

The T65 is available in two versions, with one version supporting a complete Chinese interface with three input methods, Bopomofo, Pinyin and Stroke. The model designations “s” and “sc” is not used. Instead, the type number, printed on the back, shows the model designation. The s-version has a type number followed by the letters “BV”. The sc-version has a type number followed by the letters “CN”.

EMS is supported in all versions.

The Chinese version does not support T9™ Text Input, it supports eZiText™.

The Chinese version has one game, named *Game*.

Terminology and abbreviations

3GPP

3rd Generation Partnership Project.

API

Application Programming Interface.

Bearer

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

bFTP

binary File Transfer Protocol.

Bluetooth

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

Bookmark

A URL and header/title stored in the phone.

Browsing session

From the first access of content until the termination of the connection.

Calling Line Identification (CLI)

Shows the number of the person calling you in your mobile phone display. You can then make an informed choice as to whether or not to take the call. Bear in mind that not all numbers can be displayed. To use this service, it must be supported by your network.

Card

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

CGI

Common Gateway Interface.

CS

Circuit Switched.

CSD

Circuit Switched Data.

Deck

A collection of WML cards.

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. Your phone is a dual band phone, which means that you can use your phone on the GSM 900 and the GSM 1800 network.

e-GSM

Extended GSM, e-GSM, are new frequencies specifiied 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, which favours both the user and the operators.

EFR

Enhanced Full Rate, speech coding.

EMS

Enhanced Message 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 900

The GSM systems 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.

HDML

Handheld Device Markup Language.

HDTP

Handheld Device Transport Protocol.

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.

LAN

Local Area Network.

ME

Mobile Equipment.

Micro browser

Accesses and displays the Internet contents in your mobile phone, just as an ordinary browser does in your computer. The micro browser uses small file sizes and the bandwidth of the wireless-handheld network.

MMI

Man-Machine Interface.

MMS

Multimedia Messaging Service. A 3GPP standard that allows the user to send messages including text, graphics, audio, images and video. MMS include SMIL (Synchronized Multimedia Integration Language), allowing the user to create messages appearing like PowerPoint-style presentations on the mobile.

MS

Mobile Station.

MT

Mobile Termination.

OTA

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

PDA

Personal Digital Assistant.

PDP

Packet Data Protocol.

Phone book

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

Picture phone book

Lets you assign a picture or an icon stored in the phone to an entry stored in the phone book.

PIM

Personal Information Management.

SC

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. Your phone uses the small plug-in card.

SMIL

Synchronized Multimedia Integration Language. Allows the user to create MMS messages appearing like PowerPoint-style presentations on the mobile.

SMS

Short Message Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to your mobile phone. Messages are stored if the phone is off or out of reach ensuring that they reach you. To use this service, it must be supported by your network.

SS

Supplementary Services.

SyncML

An open standard for synchronization of all devices and applications over any network.

TCP/IP

Transmission Control Protocol/Internet Protocol.

TE

Terminal Equipment.

TLS

Transport Layer Security.

URL

Uniform Resource Locator.

USSD

Unstructured Supplementary Services Data.

VAD

Voice Activated Dialling.

VAS

Value Added Service.

vCalendar

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

vCard

vCard automates the exchange of personal information typically found on a traditional business card, for use in applications such as Internet mail, voice mail, Web browsers, telephony applications, call centres, video conferencing, 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.

Wireless Session Protocol.

WTLS

Wireless Transport Layer Security.

WWW

World Wide Web.

XML

Extensible Markup Language.

Related information

Documents

- The T65 User's Guide
- Ericsson T65 FAQ
- AT Command Reference Manual
- WAP June2000 (WAP 1.2.1) Specification

Software

- XTNDConnect PC For Ericsson, this synchronization software can be found and downloaded at http://www.mobileinternet.ericsson.com/
- XTNDConnect PC, upgraded version from Extended Systems Inc.

Links

- http://SonyEricssonMobile.com/mobileinternet
- http://www.ericsson.com/wap/
- http://www.ericsson.com/mobilityworld
- http://www.gprsworld.com/
- http://www.extendedsystems.com/
- http://www.bluetooth.com/
- http://www.imc.org/
- http://www.3gpp.org/
- http://www.irda.com/
- http://www.etsi.fr/
- http://www.wapforum.org/
- http://www.imc.org/pdi/
- http://www.syncml.org/

Trademarks and acknowledgements

Technical specifications

The consumer pack includes

- 1 Mobile phone T65
- 1 In-built battery Li-Ion (600 mAh)
- 1 Standard Charger, CST-10, or CST-13
- 1 User documentation, including Ericsson Service and Support Leaflet and Battery Information
- 1 Accessory leaflet

General

Product name	T65
System	GSM phase 2 recommendations. GSM 900 (CTR 19 and CTR 20), GSM 1800 (CTR 31 and CTR 32), 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	1101901-BV

Exterior description

Size	105x49x21 mm
Weight	94 grams (with built-in battery)
Display size	101 pixels wide, 67 pixels high
Graphic display	grey scale
Text size	selectable text size
Text rows	up to 6 rows of text, depending on text size
Colour	Cosmic Blue Polar Blue Stardust Yellow
Keypad	17 keys and 2 volume keys (4 different keypads: Latin, Arabic, Hebrew, Chinese)

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:

Arabic (AR), Brazilian Portuguese (PB), Bulgarian (BG), Canadian French (CF), Czech (CS), Chinese traditional (ZH), Chinese simplified (ZS), Chinese Taiwan (ZT), Croatian (HR), Danish (DA), Dutch (NL), English (EN), Estonian (ET), Farsi (FA), Finnish (FI), French (FR), German (DE), Greek (EL), Hebrew (IW), Hindi (HI), Hungarian (HU), Indonesian-Bahasar (IN), Italian (IT), Latin American Spanish (XL), Latvian (LV), Lithuanian (LT), Malay (MS), Norwegian (NO), Philippine-Tagalog (TL), Polish (PL), Portuguese (PT), Romanian (RO), Russian (RU), Serbian (SR), Slovakian (SK), Slovenian (SL), Spanish (ES), Swedish (SV), Thai (TH), Turkish (TR), US English (AE), Vietnamese (VI).

Current consumptions, talk and standby times

Dimension	Value in GSM 900	
Transmission current	54.9 mA (min) 215 mA (max)	
Standby current	1.95 mA (min), (paging rate 9, 1 neighbour present) 3.75 mA (max), (paging rate 2, 16 neighbours present)	
Built-in Li-Ion, 720 mAh	Talk time	Up to 11 hours
	Standby time	Up to 300 hours

Speech coding

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

Performance and technical characteristics

Dimension	GSM 900/E-GSM 900	GSM 1800
Frequency range	TX: 880 – 914 MHz RX: 925 – 959 MHz	TX: 1710 – 1785 RX: 1805 – 1880
Channel spacing	200 kHz	200 kHz
Number of channels	174 Carriers *8 (TDMA)	374 Carriers *8 (TDMA)
Modulation	GMSK	GMSK
TX Phase Accuracy	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)
Duplex spacing	45 MHz	95 MHz
Frequency stability	+/- 0.1	+/- 0.1
Voltage operation (nominal)	3.6 Volts	3.6 Volts
Transmitter RF power output	33 dBm Class 4 (2W peak)	30 dBm Class 1 (1W peak)
Transmitter Output impedance	50 ¾	50 ¾
Transmitter Spurious emission	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to GSM spec.)	< - 30 dBm (according to GSM spec.)
Receiver RF level	Better than – 102 dBm	– 102 dBm
Receiver RX Bit error rate	< 2.4%	< 2.4%

WAP browser technical data

Feature	Support in the T65 WAP browser
Back to previous page	Yes
Bearer type GPRS (IP)	Yes
Bearer type GSMData (IP)	Yes, ISDN and analog
Bearer type SMS	Yes (point-to-point)
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
Cache	Yes (size 8 kbyte)
Character sets *	UTF8 (Default), USAASCII, Latin1, UCS2
Clear cache	Yes
Colour	High resolution grey scale display (four grey scales)
Home page	Yes, up to 5 different, one for each WAP profile
Hyperlinks in Text	Yes, highlighted by inverse video

Feature	Support in the T65 WAP browser
Hyperlinks in Images	Yes, indicated by a frame
Image Animation	No
Image Formats	GIF (interlaced and non-interlaced), WBMP, no transparent layers
Network Settings	Up to 5 different settings available by selecting WAP profile (Intranet, Internet, Banking, Gateway etc)
OTA Support	Yes
PPP Authentication	PAP, CHAP and MS-CHAP
Reload page	Yes
Tables	Yes
User Agent Profiles	Yes, list of client characteristics - e.g. display size
WAP/WML	WAP June2000 (WAP 1.2.1)
	*) 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 profiles	5 WAP profiles, each with its own settings
WTLS (security)	Yes, WTLS Class 1 - Encoding WTLS Class 2 - Encoding + Server Authentication. Root Certificates needed in phone WTLS Class 3 - Encoding + Server Authentication + Client Certification. Root Certificates needed in phone

GPRS technical data

Dimension	Support in T65
Data rates	Multislot class 8 supported CS-1, CS-2 9,050 bps, 13,400 bps supported (network-dependent)
Downlink data rate	Up to 40,200 bps for packet data communication, using 3 time slots in coding scheme CS-2
Uplink data rate	Up to 13,400 bps for packet data communication, using 1 time slot in coding scheme CS-2
Mode of operation	Class B and Class C modes of operation supported Network Operation Modes I, II and III handled by mobile It is possible for the user to choose which of the Circuit switched and GPRS services should be favoured
R Reference point	Physical layer: Support of RS232 PPP is supported as L2 layer in the R reference point Authentication algorithms PAP, CHAP and MS-CHAP supported
IP connectivity	PDP type IP is supported IP termination in mobile or TE (laptop, PDA) supported TCP/IP header compression supported
Application	WAP over GPRS supported (UDP/IP and GPRS-SMS) SMS over GPRS (SMS-MT, SMS-MO) supported
QoS	QoS negotiation supported Reliability class 1-5 supported Mean and peak throughput rate limited by multislot class 8 and CS-4
PDP context	10 PDP context descriptions stored in mobile PDP context description is edited via application in mobile, AT-command or via OTA Simultaneous PDP contexts not supported Network requested PDP context not supported
SIM	GPRS aware, as well as non GPRS aware SIMs are supported

Built-in GSM data modem technical data

Dimension	Support in the T65	
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) no compression, with V.42bis compression up to four times higher transmission rates depending on the data type

Dimension	Support in the T65	
	Upload data rate	Up to 9,600 or 14,400 bps (depending on base rate) for GSM Data communication, no compression with V.42bis compression up to four times higher transmission rates depending on the data type
Data rates, GPRS	See GPRS Technical data	

Index