SIMpad SL4

Technical Description

Version V2.0

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Version of 20.08.01

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Table of Contents

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1 Use and operation

1.1 Housing and construction

The housing consists of two black plastic shells which are screwed together. The underside rests on rubber feet. For charging the battery in the charging tray, two contacts are fitted on the underside of the housing.

The front is painted dark silver. On the right-hand side is an unpainted black vertical strip. For simple, basic operations there are three buttons and a concave, round wobble plate with four contact points (top, bottom, left and right, non-rotating) at top right. Two LEDs inform the user about the operating state and charge state.

Dimensions	263 x 181 x 30 mm (WxHxD)
Weight	1 kg
Front colour	dark silver (display silver)
Colour of back housing shell and side strip	black
Upper and lower shell	plastic, screwed
Pin	Black plastic pin with plastic tip (can be pushed into shell, latches)
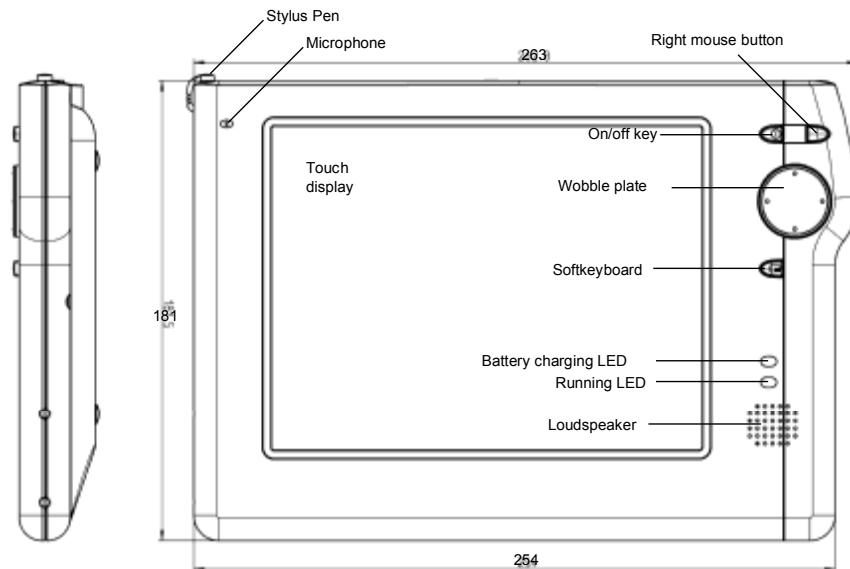
Fig. 1   Device design and controls

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Universal interface: RS-232, Headset
("Lumberg" connector)

PC Card

USB client

SmartCard

DC in

IrDA

29.7
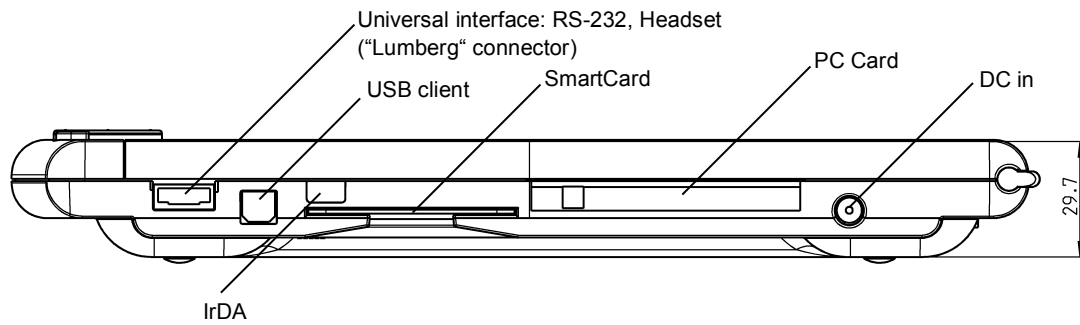
Fig. 1 Top edge with interfaces

Thumbplate for removing the
SmartCard

Housing screw

Label panel

48

Rubber feet

Reset switch

90

Contacts for charging tray

Cover for test probe (non-removable)
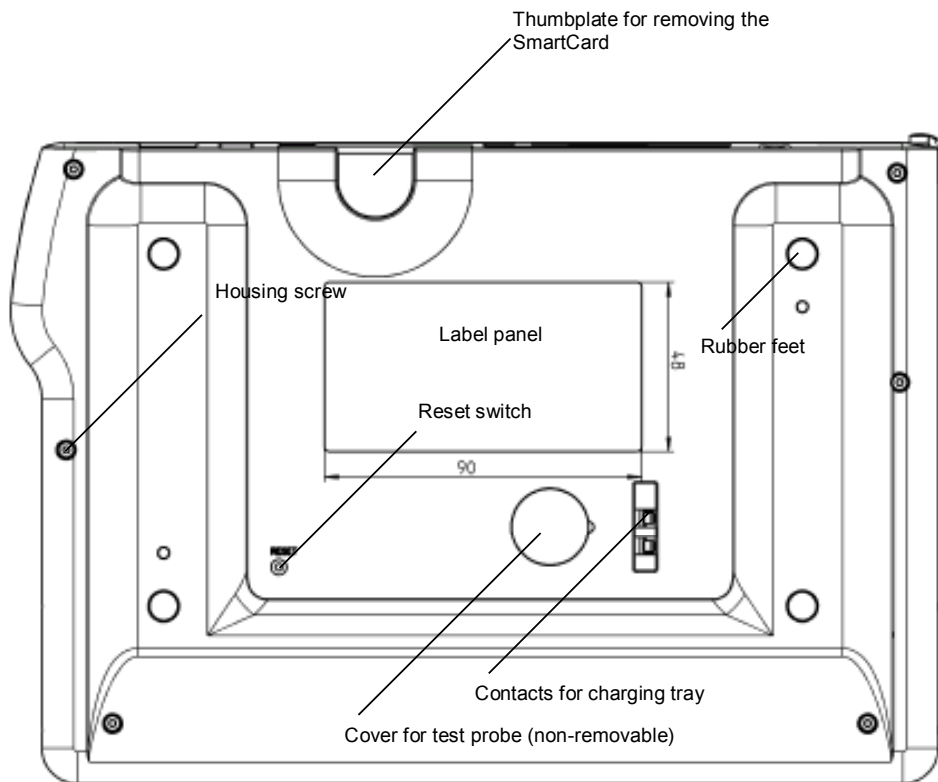
Fig. 2 Back of housing

1.2 Operation, controls

The SIMpad SL4 is a small, convenient, ergonomically shaped data terminal which is particularly easy to operate. The Windows CE3.0 operating system uses menus and windows as the user interface, and is very similar to other Windows operating systems. For users, this means an easier, familiar method of operation.

Instead of a mouse, the one uses a pin to do input directly on the screen. The usual functions such as "single-click" (to select an object), "double-click" (to execute an object) and "drag and drop" (to move an object) are supported.

Some PC applications and websites react when the mouse position indication goes over an active object, e.g by highlighting the object. As there is no mouse position indication on the screen of the SIMpad the "mouse-over" function is not supported.

The user can do text input using an optionally displayed keyboard field or handwriting recognition.

By using the wobble plate, the user can move the picture vertically. Horizontal movement of the picture is unnecessary with most web pages and other applications, thanks to the high screen resolution. The left-hand position of the wobble plate corresponds to the "Escape" key for leaving a function. The right-hand position of the wobble plate causes an input ("Enter" key).

The user can navigate in the pull-down menus via the wobble plate by using the right mouse button.

Two LEDs inform the user about the state of the device. The top, yellow LED is used to indicate that the battery is being charged. When it is switched off during charging the battery is fully charged.

The bottom, green LED lights if the device is operating (operating states "running" or "idle", see 1.3).

1.3 Operating states

In normal operation, the SIMpad SL4 is switched on and off using the on/off button. When the user switches on again, he or she is back in the same place as before the SIMpad SL4 was switched off. Switching off does not cause data to be lost or programs to be left. In fact, the SIMpad SL4 is never really switched off but in sleep mode.

Operating states	
Running	full operation, normal power consumption
Idle	reduced operation, reduced power consumption
Sleep	device off, memory is supported, low power consumption
Off	Device off, memory is not supported, no power consumption (state as supplied, empty batteries)

1.4 Resets

The various types of reset are listed in the table below. For instance, the soft reset is done after new software is installed.

Reset	Triggered by	Effect
Software reset	application; can be triggered from start menu (see 5.4.11)	Initialised system processes (running programs are ended) Object store and RAM registry are not affected
Hardware reset: **Warm start**	reset switch (see 1.1)	Persistent registry loaded Object Store and Program Memory are retained
Hardware reset: **Cold start**	reset switch plus right mouse button (see 1.1)	The whole of RAM is deleted, including Object Store and Program Memory Persistent registry loaded
Hardware reset: **"Factory reset"** (state as supplied)	reset switch plus right mouse button plus soft keyboard button. Keep the two buttons pressed at least 5 seconds (see 1.1)	RAM and persistent registry are deleted Image is rebooted (see 2.4.1) SIMpad is back in state as supplied[1] and will restart with a first start (see 5.2.3)

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[1] Unless the Image was changed by a software update (see 5.5).

2 Hardware

2.1 Block diagram
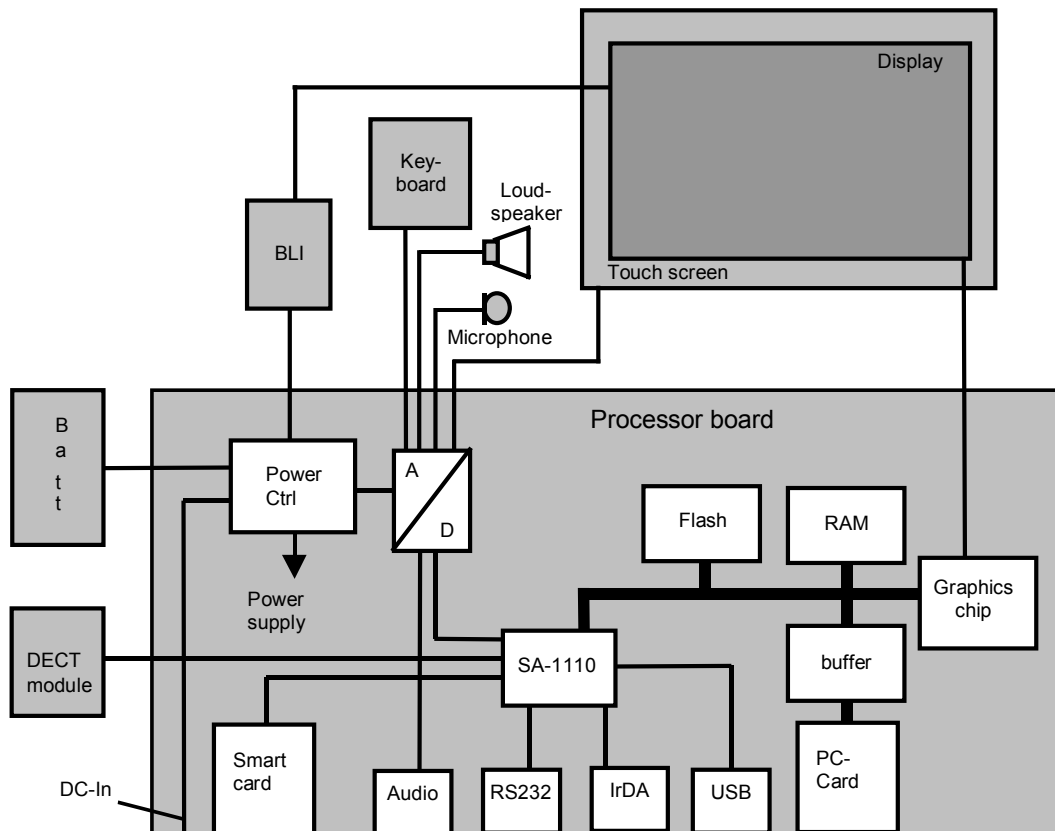
Fig. 3 SIMpad SL4 block diagram

2.2 Processor, graphic chip

In the SIMpad SL4, an Intel® StrongARM® SA-1110®, 32-bit RISC processor with a nominal clock frequency of 206 MHz is used. This processor provides very high computing power combined with very low power consumption, unlike conventional x86 processors.

To achieve optimum control of the high-resolution SVGA screen with its 16-bit colour depth (65536 colour levels, "high colour" resolution with photo quality), an additional graphics chip is used. This makes the screen set-up faster and the computing power higher because of the reduced load on the processor.

2.3 Screen, touch panel

Most pages in the World Wide Web are 800 pixels wide. To show a picture always at full width, the SIMpad SL4 has an 8.4" screen with SVGA resolution (800 x 600 pixels). This is a screen with TFT technology, which gives a flicker-free and smear-free picture with higher colour saturation.

Controlling the illumination unit (BLI) makes practically continuous adjustment of the screen brightness possible. The software allows the user to choose from 7 illumination levels (see 5.4.13.5).

An 8.4" 4-wire analog resistive touch panel is fitted over the screen. The touch signals are analysed by the A/D converter (see 2.1).

2.4 Memory

2.4.1 Organisation of memory

The division and organisation of memory is shown in Fig. 2 . The memory consists of two parts:

- 32MB flash memory (read, restricted write, no execution in place)
- 64MB SDRAM (read, write, execution in place)

The flash memory retains the data even without a power supply. It contains the Image with the operating system (OS) and the standard programs in compressed form (configuration programs, Pocket Word etc.), as well as the persistent memory (Persistent storage file system, Persistent registry) and the Bootloader/BOST.

The flash memory allows for a maximum 5000 write procedures. Therefore it must not be used as a hard-disk-like memory for data files.

The remaining RAM (approx. 60 MB) is divided into Object Store and Program Memory. Data (texts, images, parameters etc.) which is used by the executed programs is stored in the Object Store. This is also used as a RAM file system, in which additional programs which have been downloaded from the Internet or loaded via the serial interface can be stored.

On initial start (see 5.2.3) of the SIMpad SL4, required parts of the operating system and standard programs are decompressed and transferred to the RAM by the Dial-up Bootloader (boot from flash). This safes a lot of memory space in RAM which can be used for the Object store and the Program Memory.

The Program Memory is the working memory for executing programs. Additional programs which are already stored in the Object Store must be copied to the Program Memory to be executed, and therefore require twice the RAM of their size.

The user can choose the division of the remaining memory into Object Store and Program Memory (see 5.4.13.15). The Object Store must have a minimum size, even if no additional programs are loaded, because this part is also used for data of standard programs and the operating system.

The Persistent Storage file system cannot be used for storing data in the flash memory, since extra software is required for this purpose.

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Flash Memory
32 MB

RAM
64 MB

approx. 1/2 MB — persistent registry

OS

Image:
Operating System and
Standard Applications
(compressed)

approx. 15 MB

boot from Flash →

ROM File System

approx. 30 MB

Free memory

approx. 16 MB

Object Store:
RAM File system, data,
registry

approx. 17 MB

Boot-Loader / BOST

approx. 1/2 MB — Angel

Program Memory

approx. 17 MB
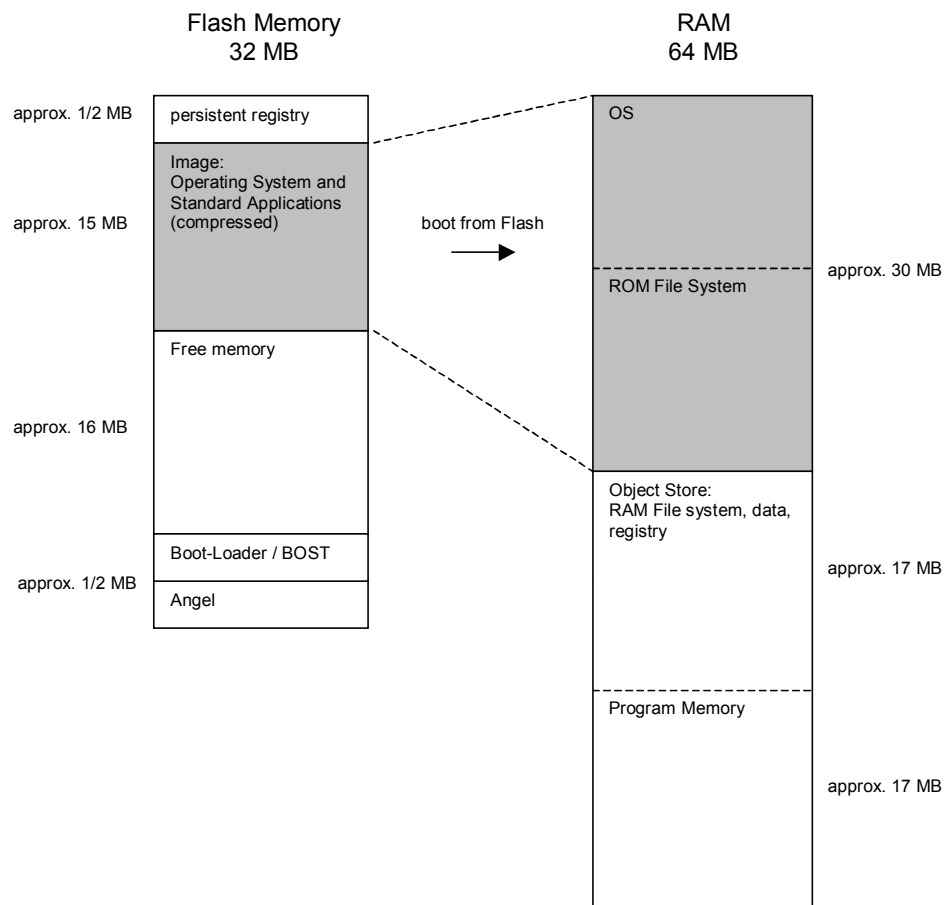
Fig. 2 Organisation of memory

2.4.2 Saving settings in persistent memory

The user has the option of saving the registry in the persistent memory. The registry contains:

- System parameters
- Customer specific settings
- Mail addresses (see 5.3.2.1)
- Favourites (links, see 5.3.3.2)

As the registry is saved in the persistent flash memory, the data is retained even if the battery is completely discharged, neither will it be affected by a hard reset or cold start, except for the "Factory reset" (see 0). The "Store settings" program can be started in the start menu (see 5.2.1).

2.5 Audio, microphone, loudspeaker

The function of the audio codec (coder/decoder) is carried out by the A/D converter. This codec supports duplex speech quality. The mono digital audio signal has a resolution of 12 bits (linear) or 8 bits (non-linear), corresponding to telephone quality.

The music quality is limited by the size of the loudspeaker, but the effect is better via a headset (see 4.1).

The microphone is tested with regard to the hardware functionality. For any application using the microphone, a corresponding driver will have to be installed.

Loudspeaker	
Frequency range	FO-4.5kHz
Sound pressure	86dB
Diameter	20mm

2.6 Power supply

The permanently fitted battery can be charged by being connected directly to a power supply unit, or in the charging shell, which is itself connected to the power supply unit. The maximum operating time depends on the operating state (see 1.3).

Power consumption in the various operating states	
Running	500 – 600mA; frequent transmission and high screen brightness increase power consumption; up to about 4 hours with fully charged battery, depending on how often transmission takes place
Idle	Reduced operation, reduced power consumption (no data)
Sleep	device off, memory is supported, low power consumption approx. 5mA, at least 20 days with fully charged battery
Charging current	Charging time to 90% capacity: approx. 2 hours
Battery cells	
Number and type	4 lithium ion cells
Nominal voltage	7.2V
Capacity	2800mAh
Overcharge and exhaustive discharge protection	Integrated in battery pack
Temperature sensor	Integrated in battery pack
Power supply unit	
Plug type	Hollow, cylindrical plug, polarity: + inner inner diameter: 2.1mm outer diameter: 5.5mm length: 9.5mm
Input voltage	12VDC
Charging shell	Contacts for charging shell on underside of housing (Fig. 2)

3 Communications

The SIMpad SL4 has a very flexible communication interface: the PC-Card interface. Optional PC-Cards can be used, provided that the appropriate driver software running on the SIMpad SL4 operating system (see 5.1.1).

3.1 WLAN (optional)

The SIMpad SL4 can be used as a client in a WLAN. This requires the appropriate WLAN-PC-Card and the driver software running on the SIMpad SL4 operating system (see 5.1.1).

WLAN	
Standard	IEEE 802.11b
Frequency	2.4GHz (ISM)
Bandwidth	11Mbps
Range	About 30m indoor
Type of communication	• Wireless network (ad hoc or infrastructure) • Point-to-point or point-to-multipoint • TCP/IP: connection oriented, packet switched
Roaming	Yes
Hand over	Yes
Driver software	Siemens Mobile port I-Gate 11M PC-Card, driver integrated For other products: Download of specific driver software for CE3.0 for StrongARM required

3.2 HomeRF (optional)

The SIMpad SL4 may communicate using the HomeRF standard. This requires the appropriate WLAN-PC-Card.

Home RF	
Standard	HomeRF
Frequency	2.4GHz (ISM), Frequency hopping spread spectrum
Bandwidth	• 1.6Mbps
Range	• up to 50m indoor
Maximum number of clients	8
Type of communication	
Roaming	no
Hand over	no
Module	HomeRF-PC-Card
Driver software	Symphony HomeRF PC-Card, driver integrated For other products: Download of specific driver software for CE3.0 for StrongARM required

3.3 Bluetooth (optional)

The SIMpad SL4 may communicate with other Bluetooth products, if the appropriate Bluetooth-PC-Card is used and the driver software is running on the SIMpad operating system (see 5.1.1).

Bluetooth	
Standard	IEEE 802.15
Frequency	2.4GHz (ISM)
Bandwidth	• 720kbps / 57kbps (asymmetrical) • 430kbps (symmetrical)
Range	• About 10m indoor • About 100m with internal amplifier
Type of communication	• Wireless ad hoc network • Point-to-point • Packet switched
Roaming	no
Hand over	no
Module	Bluetooth-PC-Card
Driver software	Download of specific driver software for CE3.0 for StrongARM required

3.4 GSM/HSCSD (optional)

The SIMpad SL4 can establish a GSM data link with an appropriate GSM-phone card (PC-Card) and the driver software running on the SIMpad operating system (see 5.1.1).

Another possibility is to use a GSM mobile phone connected to the SIMpad SL4 via IrDA link or serial link.

HSCSD allows the channel bundling of up to 4 GSM time slots. This gives a maximum bandwidth of approximately 40kbps.

GSM	
Standard	GSM or HSCSD
Frequency	900MHz / 1800MHz
Bandwidth	About 10kbps (GSM), up to about 40kbps (HSCSD)
Range	GSM network
Type of communication	• Point-to-point connection • Always on
Roaming	yes
Hand over	yes
Module	• GSM- or HSCSD-PC-Card • GSM-/HSCSD mobile phone via IrDA • GSM-/HSCSD mobile phone via Bluetooth to Bluetooth PC-Card
Driver software	Download of specific driver software for CE3.0 for StrongARM required

3.5 GPRS (optional)

The SIMpad SL4 can establish a GPRS data link with an appropriate GPRS-phone card (PC-Card) and the driver software running on the SIMpad operating system (see 5.1.1).

Another possibility is to use a GPRS mobile phone connected to the SIMpad SL4 via IrDA link or serial link.

GPRS	
Standard	GPRS
Frequency	900MHz / 1800MHz
Bandwidth	28 - 171kbps
Range	GSM network
Type of communication	• Point-to-point connection • Always on • Packet switched
Roaming	yes
Hand over	yes
Module	• GPRS-PC-Card • GPRS mobile phone via IrDA • GPRS mobile phone via Bluetooth to Bluetooth PC-Card
Driver software	Download of specific driver software for CE3.0 for StrongARM required

3.6 Other Connections (optional)

Other wired connections can be established with an appropriate PC-Card and the driver software running on the SIMpad operating system (see 5.1.1).

standard	
Ethernet (IEEE 802.3)	With specific PC-Card, download of specific driver software for CE3.0 for StrongARM required
SCSI	Connection to mass storage systems (harddiscs, CD-ROM/DVD drives etc.) With specific PC-Card, download of specific driver software for CE3.0 for StrongARM required
VGA	Connection to an external monitor or projector, eventually with specific PC-Card, download of specific driver software for CE3.0 for StrongARM required
IEEE 1394	High-data rate connection, mostly used for video applications (e.g. DV Camcorder), also suitable for mass storage devices. With specific PC-Card, download of specific driver software for CE3.0 for StrongARM required

4 Interface

4.1 Serial/headset interface("Lumberg" plug)

The universal interface ("Lumberg" plug) is used in Siemens mobile telephones (from S25 and higher) and provides the following part interfaces for the SIMpad SL4:

- serial interface (RS-232; V.24 level conversion 12 V)
- audio headset interface

Via the serial interface, the SIMpad SL4 can communicate with a PC for data exchange (see 5.4.5), or with peripherals (external keyboard, modem, mobile telephone). For this, a crossed (9-pin) serial cable is used (see 6.1.3). Data transmission is possible in one direction at a time only (no duplex).

The serial cable for Siemens mobile phones has an integrated level conversion. Therefore it cannot be used for the SIMpad SL4 which requires a simple cable without level conversion (see 6.1.3).

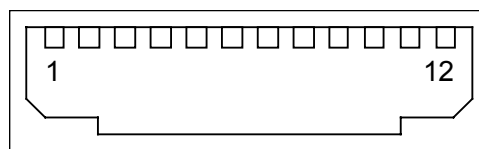| Standard	
Plug type	"Lumberg" plug; Siemens proprietary
Pin assignment	
Pin 1	GND
Pin 2	TXD, Output
Pin 3	RXD, Input
Pin 4	DTR, Output
Pin 5	RTS, Output
Pin 6	DSR, Input
Pin 7	CTS, Input
Pin 8	DCD, Input
Pin 9	Microphone -, Input
Pin 10	Microphone +, Input
Pin 11	Ear +, Output
Pin 12	Ear -, Output

Fig. 3 Universal interface: "Lumberg" plug with pin numbering

4.2 USB-Client interface

The USB-Client interface is not supported due to a defect of the StrongARM SA-1110 processor (see 2.2).

4.3 IrDA interface

Via the IrDA interface, the SIMpad SL4 can communicate with an IrDA peripheral (external keyboard, mouse, printer, mobile telephone). The IR diodes of the two devices must be in visual contact and not more than 0.3m apart. The SIMpad SL4 supports the SIR standard (Serial Infrared), with a transmission rate of about 115kbps.

Mobile telephones with the Siemens IrDA interface (S25, S35) and those of the most important manufacturers with such an IrDA interface can communicate with the SIMpad SL4. However, they also require an integrated modem. Between the SIMpad SL4 and the mobile telephone, only a pure data transmission connection can be set up, for dialling to an ISP or another server. Other types of data exchange (SMS, telephone directory entries) are not supported by software.

Printers of the most important manufacturers with an integrated IrDA interface can be controlled. For printers without an IrDA interface, an appropriate IrDA adapter can be connected to the parallel interface of the printer.

IrDA	
Version	V1.3
Transmission type	infrared
Data rate	up to approx. 115kbps (for mobile telephone and printer)
Standard	SIR (serial infrared)
Roaming/Handover	No
Range	max. 0,3m visual contact
GSM via IrDA	minimal, data transmission connection only

4.4 SmartCard

The SmartCard makes personal identification (electronic, personal key) possible, and gives the option of encrypting and decrypting the data stream with higher-order asymmetrical encryption. The SmartCard interface is provided according to the ISO 7816 (Part 1-3) standard, and includes a bi-directional data line and a clock line. No application for using the SmartCard is offered initially.

Caution: In France a different standard called AFNOR-Standard is in use. These card types do not work on the SIMpad smart card reader.

Pin assignment	
Pin 1	VCC
Pin 2	RESET, Output
Pin 3	CLK, Output
Pin 4	NC
Pin 5	GND
Pin 6	VPP
Pin 7	I/O, bi-directional
Pin 8	NC

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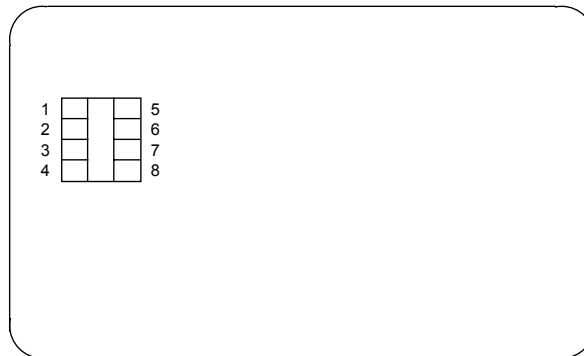
Fig. 4 Pin numbering of SmartCard chip according to ISO 7816

4.5   PC-Card

The PC-Card interface is according to the PC-Card standard, release 2.1, type II. Information about the PC-Card standard can be found in:

http://www.pc-card.com/pccardstandard.htm

Features	
PC-Card slot	Protecting cover, closing with a spring
PC-Card dimensions	Length: (variable), typical: 85,6mm Width: 54,0mm Thickness: 5mm (type II)
Number of pins	68
Operation voltage	3,3V +/- 5% (the use of 5V cards is also possible)

5   Software

5.1   Operating System

5.1.1   Windows CE3.0

The operating system of the SIMpad SL4 is Handheld PC 2000 with parts of platform builder both based on Windows CE3.0. The platform builder is a development platform for putting together a tailor-made operating system for the desired application. The Platform Builder itself is only the framework, and provides neither application programs nor a graphic user interface.

Also based on Windows CE3.0, the Handheld PC 2000 platform has a complete set of APIs and connectivity options. For a detailed description of Handheld PC 2000 see 5.3 or check on:

http://www.microsoft.com/mobile/handheldpc/features/

In accordance with the modular concept of the Platform Builder, the operating system is adapted to the hardware in use, particularly to the processor type. Executable software for the SIMpad SL4 must therefore be written for Windows CE3.0 for Handheld PC and for the StrongARM SA-1100 processor family.

Fig. 5   Structure of Windows CE

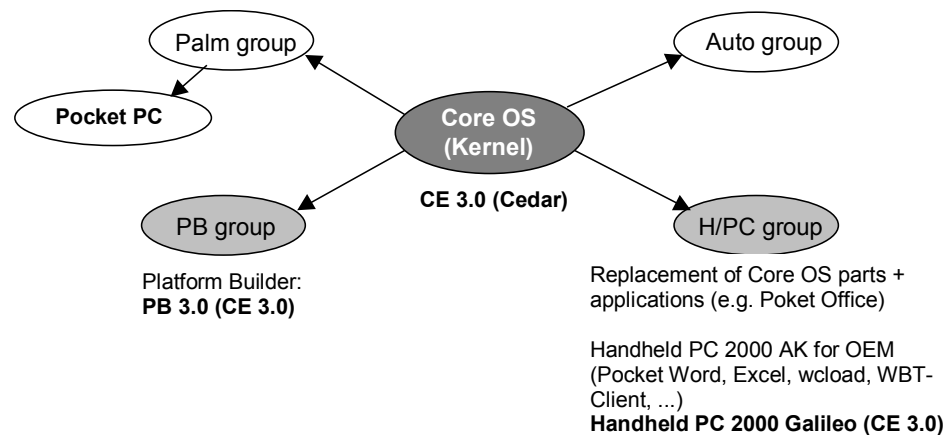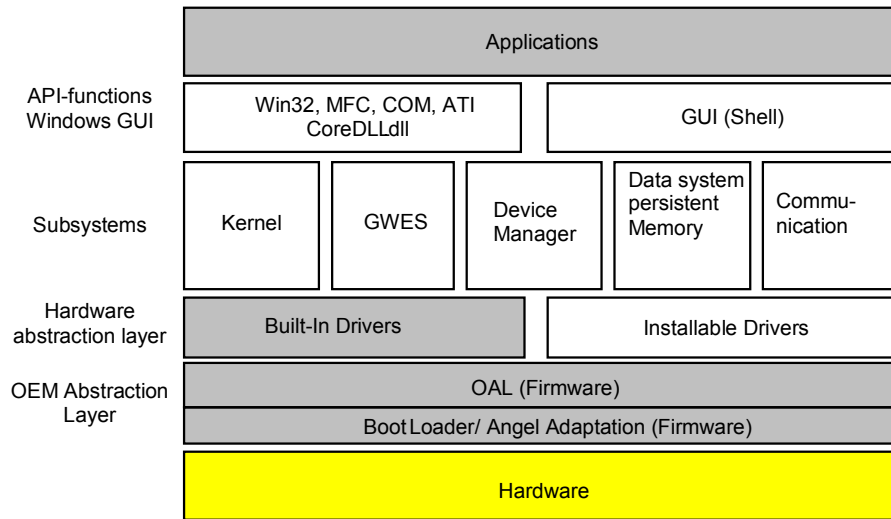**Fig. 6** Operating system components/layers

5.1.2   Language version

The operating system, the programs and the start centre have one language version. Only one single language version can be loaded into a SIMpad SL4 at one time. To change the language version it is necessary to completely update the software image (see 5.5).

5.1.3   File Structure
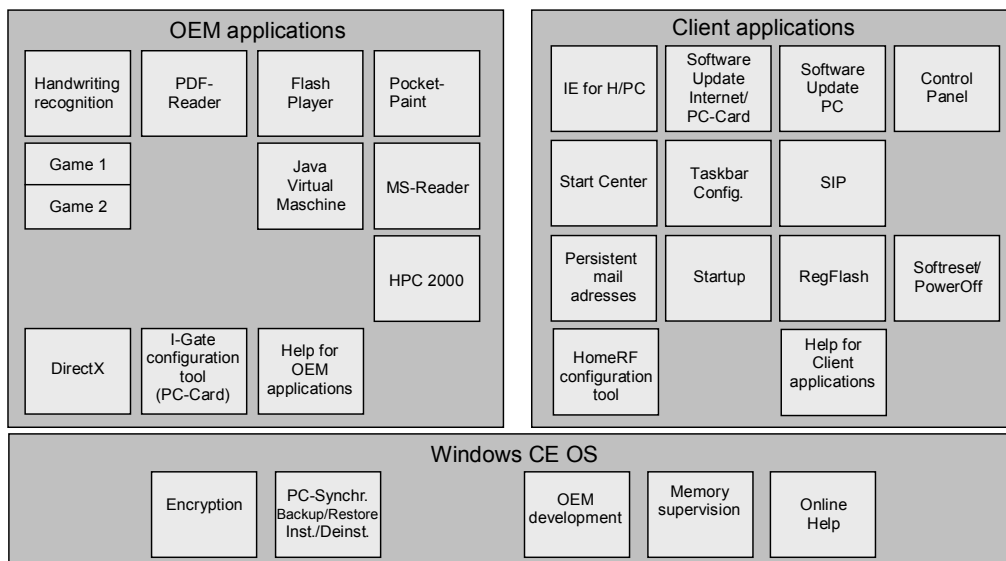
Fig. 4   File structure

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5.2 User Interface, First Start

5.2.1 CE desktop

The CE desktop consists of a background picture with icons placed on it. The background picture is delimited at the bottom by the program line with the start menu.

The background picture is monochrome. The colour can be chosen from a 16-colour palette. Additionally, either a picture in bit map format (*.bmp) can be placed in the centre of the desktop, or the desktop can be filled with repetitions of this picture.

The icons represent links to programs. They have the same icon as the program itself. The name of the link can be freely chosen. The icons are automatically placed in columns from top to bottom, arranged from left to right, beginning in the top left-hand corner. The user can remove them, add to them or move them.
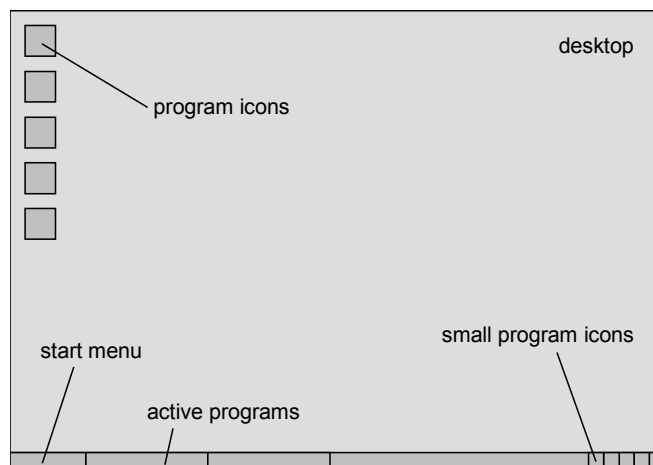
Fig. 7   Windows CE desktop: basic structure

The SIMpad SL4 has the following icons by default:
- Handheld PC workplace
- own documents
- waste paper basket
- Internet Explorer
- Inbox
- Pocket Word
- Pocket Excel
- Pocket Access
- Pocket PowerPoint
- Start Centre
- Windows Media Player
- Tasks
- Contacts
- Calendar

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Technical Description
SIMpad SL4
Version V2.0

The purpose of the start menu is to make programs, tools and documents available to the user in a tree structure, to make access to them by the user as fast as possible. The user has the option of adapting the content of the start menu, i.e. making new entries, deleting old entries or moving entries.

The default start menu of the SIMpad SL4 has the following structure:
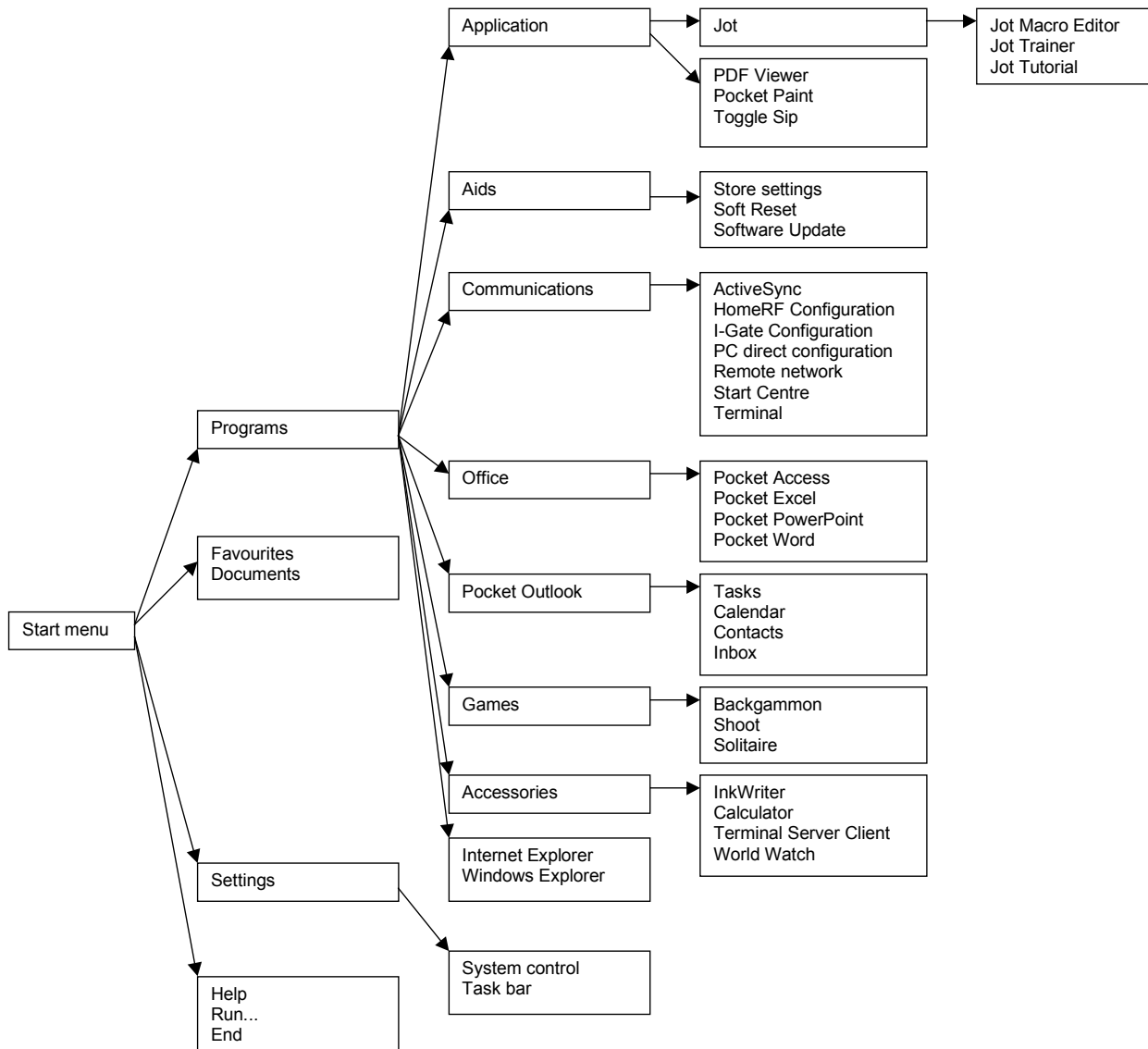
Fig. 5 Start menu structure

Small program icons are displayed in the bottom left corner of the program line. These programs or control panels can be activated by double-click on the appropriate icon.

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ICM CP

24/74
20.08.01, David Brunner

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5.2.2 Start Centre

Fig. 6 shows an overview of the programs and execution sequence. Programs which are marked in grey can be in customer-specific form.
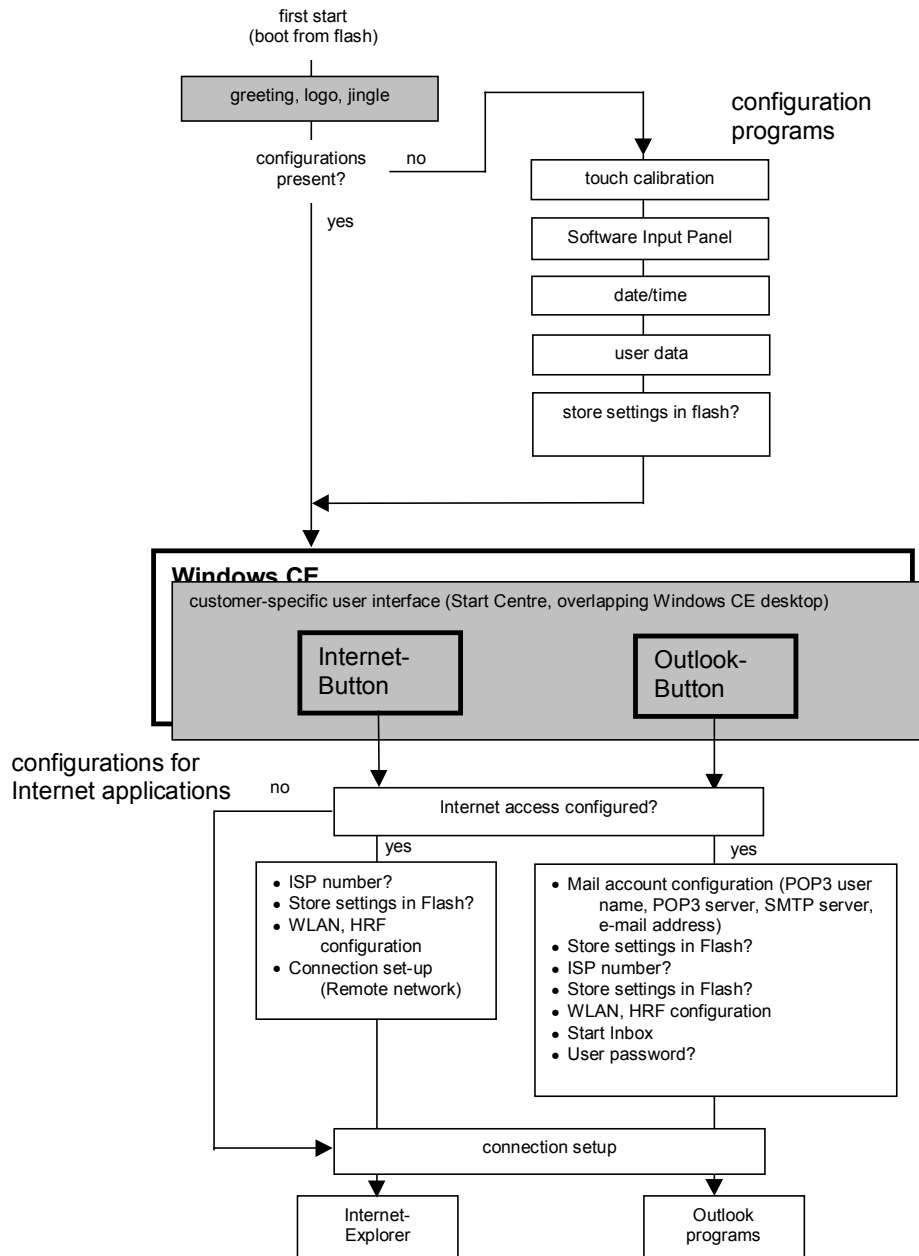
Fig. 6   Overview of program architecture

The customer-specific user interface, called start centre (graphic user interface) below, is an application in its own right, and the operating system treats it as a program. At the first start, the start centre is started automatically. It is possible to choose the size of the start centre. It can cover only a part of the CE desktop, or fill the screen so that the CE desktop is covered completely, as desired. Like a program, the start centre can be ended, or started by a double-click on a link icon or selection from the start menu. Optionally, the possibility of leaving the start centre can be prevented.

The user is provided with graphic buttons, which are integrated in the user interface. The buttons are rectangular from the program's point of view, but can be represented, for instance, as circles, in which case the area which triggers the function is always rectangular.

The program line is always visible, even with a screen-filling start centre. The start centre itself appears in the program line.

Fig. 7   Start centre for the SIMpad SL4 (German version)

Start centre button	Function
Internet	Starts the browser with the ICM start page (see 5.3.3.2)
Outlook	Opens another selection of outlook programs (see 5.3.2)
Office	Opens another selection of office programs (see 5.3.1)
Notes	Starts InkWriter (electronic notepad) (see 5.3.4.1)
Set-up	Opens File Explorer with the window for settings programs
Help	Starts the online help (see 5.4.6)
Close	Closes the start centre, back to the Windows CE desktop

5.2.3 First start

The first start is executed after a hard reset and cold start, or hard reset to state as supplied (see 0), or after the battery is fully discharged, so that the RAM is empty. Accordingly, the newly bought SIMpad SL4, after the battery is charged when it is first switched on, does a "first start". After a greeting (logo) with jingle, the configuration programs (see 5.1.3) are started. The configuration parameters which are held in them, and are entered in the registry, can then be stored in flash memory as a precaution. For this purpose, the "Store settings" program (see 2.4.2) is called up, to store the registry in the flash memory.

For a "first start" where the configuration is already present, the configuration part is skipped (see 5.2.4). This is particularly useful if the battery has been run down by mistake or it has been necessary to trigger a hard reset.

5.2.4 Configuration programs

5.2.4.1 Touch calibration

The touch panel must be calibrated after a first start. This is necessary as the factory touch point on the touch panel can easily be displaced compared to the screen.

For this purpose, the touch calibration control panel (see 5.4.13.13) is called up. It instructs the user to select 5 positions, which are displayed with cross hairs, using the pin.

5.2.4.2 Date/time

The user is requested to enter the current date and time. For this purpose, the date/time control panel (see 5.4.13.5) is called up. setting

5.2.4.3 User data

The user can register his or her name and additional notes. For this purpose, the owner control panel (see 5.4.13.2) is called up.

5.3   Handheld PC 2000

5.3.1   Pocket Office

The Pocket Office applications are simplified versions of the well-known Office applications for PC. They allow the exchange of files with the PC (see 5.4.5) and the main viewing, editing and updating functions.

5.3.1.1   Pocket Access

Database application with basic editing, updating, searching, filtering and viewing functions. Access 97 (or later) .mdb files can be exchanged with drag and drop. Newly updated data can be synchronised with the corporate database via a number of connectivity options.

5.3.1.2   Pocket Excel

Pocket Excel has many features, optimised for the mobile user, that are known in the Microsoft Excel spreadsheet program for PCs. Spreadsheets using a Microsoft Excel format are automatically converted on the Handheld PC to the Pocket Excel format. Pocket Excel can save spreadsheets in a number of different formats including Excel 95 and 97.

- Basic spreadsheet capabilities with 108 functions
- Sort and AutoFilter
- Insert symbols, define names
- Set up and use file-level password protection
- save in different formats including Excel 95 and 97
- Split window, freeze panes
- Zoom (50 to 200%)
- Full screen (hide scroll and tool bars)
- Sort (data in cells by rows or columns, ascending or descending)
- database functions: 12 new functions for sorting and organizing
- AutoFilter: view of selected data according to user's criteria
- Document-level password protection
- Automatic and custom number formatting
- Format font (style, colour, true type font list)
- Format border and fill
- Print options, portrait and landscape orientation
- AutoFit
- AutoCalculate
- compatible with Pocket Excel 1.0 for H/PC
- improved compatibility with Excel 95 and 97 including 12 new Dfunctions
- show and hide scroll bars
- adjustable toolbar
- cascading menus
- templates
- last operation undo and redo
- multiple open workbooks (up to 16)
- clear function (formats, contents or all)

- Fill function, AutoFill
- GoTo function by typing the coordinates of the cell
- Insert functions (12 new Dfunctions)
- Find and replace
- Insert cells, rows and columns
- Define name
- Recent file list
- Cut, Copy, Paste, Paste Special (formulas, values, formats, all except borders or all)

5.3.1.3 Pocket Powerpoint

With Pocket PowerPoint, it is possible to give on-the-spot professional presentations from the Handheld PC, giving a new measure of mobility. A presentation created with PowerPoint presentation graphics program can be transferred to the H/PC from the Windows-based computer. The show can be customised by changing the title slide and the slide order, and display it either on the SIMpad SL4, on an external VGA monitor or on TV in 256-color, 640 x 480 resolution (an optional third-party PC-Card is required, see 3.6).

- Edit speaker notes, create title slides
- slide sorter: rearrange or hide slides
- display on external VGA monitor or TV in 8 bit colour, VGA resolution (optional
- third-party PC-Card for VGA interface required)
- draw annotations-live
- Slide advance: automatic or manual
- Zoom
- Adjustable toolbar
- Cascading menus
- Recent file list

5.3.1.4 Pocket Word

Pocket Word provides many features, optimised for the mobile user to create documents in Microsoft Word, that are already known using on your desktop computer, including spell checking, full-screen editing, and more. Documents using a Microsoft Word format are automatically converted on the Handheld PC to the Pocket Word format. Pocket Word can save documents in a number of different formats including Rich Text Format and Word 97.

- Various character formats (font, size, style: bold, italic, underscored, colour palette of 16 colours)
- Definition of a default character format
- Various paragraph formats (alignment: left, right, centreed, bulleted lists, numbered lists, indents, tabs)
- Insertion of special characters from various character selection sets
- Icon bar for the most frequently used functions
- Common tools (cut, insert, copy delete, mark all)
- Password protection for documents
- List of most recently edited files
- Undo/repeat for a command or input
- Find and replace functions for text (whole words or parts of them, with or without regard for upper/lower case fonts)

- Normal and structure views with tools for the administration of hierarchies
- Option to view the whole page
- Create, read and edit documents
- Spell checking
- Zoom (50 to 200%)
- full screen view (hide all toolbars and scrollbars)
- show or hide toolbars and scrollbars
- wrap to window (display all of an extra-wide document)
- Print options (formatting, set margins, portrait or landscape orientation)
- Improved compatibility with Word for Windows95, Word 97 and other formats
- Cascading menus
- Templates
- compatible with Pocket Word 1.0

5.3.2 Pocket Outlook

5.3.2.1 Inbox

The e-mail program "Inbox" offers the ability to receive, administer and send e-mails. The user's local mailbox is subdivided as follows:

- Inbox
- Outbox
- Sent
- Deleted

The user can created sub-folders and request a display of the tree structure. Apart from compiling new e-mails, the user can also make use of the functions "Reply to sender", "Reply to all" and "Forward mail".

Selecting Send/Receive Mail in the Services menu establishes the link to the server, and incoming and outgoing e-mails are exchanged. The Inbox program contains simple address administration procedures for e-mail addresses: new addresses, edit and delete. Attachments can be appended to e-mails, or can be opened by a double click.

The protocols POP3 and IMAP4 for incoming e-mails and SMTP for outgoing e-mails are supported:

POP3 is the simpler predecessor of IMAP4. POP3 allows a complete message or alternatively just a part of it to be downloaded. All incoming e-mails are held in the Inbox. E-mails which have been deleted locally are also deleted from the server when the link is closed.

When the newer IMAP4 is used, then when the link is established to the server the mailbox is updated. That is to say, only changes are incorporated (messages and directories which are new, or have been deleted, changed or moved). Operations like the deletion or moving of e-mails into other directories are not copied to the server until after the link has been closed. When e-mails are downloaded, the messages are retained on the IMAP4 server, and copies of them are stored locally. It is possible to download a complete message or alternatively just a part of it. Changes in the directory structure are transmitted immediately if there is already a link in existence, or at the latest when a new link is established.

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The user also always has an option to make use of web-based e-mail services. Here, the application runs as an HTML page on the browser.

The following features are included:

- Create, send, and receive e-mail, along with attachments, and schedule meetings remotely
- Pull up and use e-mail addresses with just one tap
- Dial-up e-mail using the built-in modem
- View e-mail with headers only or full message. Choose to download and view attachments
- Edit text with the standard cut, copy, paste, and text selection capabilities
- Synchronise automatically with Exchange Server (using IMAP4 or SMTP, POP3 protocols) or directly with the desktop
- Message synchronisation
- Attachment support
- Send and receive schedule requests and team manager tasks
- SMTP/POP3 protocol support
- Download options
- message options
- online and offline message creation
- Quickly enter an address without typing the whole address
- Print options
- automatic disconnect
- message viewing and sorting
- adjustable toolbar
- message editing: cut, copy, paste, select all, undo, redo

5.3.2.2 Calendar

Electronic agenda with the following features:

- View daily, weekly, monthly, and yearly views of your schedule
- Schedule group meetings or recurring meetings just as easily as meetings with one individual
- Get reminders about appointments
- Receive meeting requests that include time zone support
- Change appointments with drag and drop ease
- Move about your calendar by days, weeks, months, or year
- ActiveSync automatic synchronisation with Outlook 97 or Schedule+ 7.0a
- Group scheduling with time-zone support, automatic meeting requests sent out by Inbox
- Ink notes (handwrite notes)
- In-place appointment entry (quickly create a simple appointment)
- Find function
- Print options
- Filtering on categories
- Cascading menus
- Adjustable toolbar
- Active task list
- Notification options
- Drag-and-drop appointments
- Navigation aides

- Customisable display (day, week and agenda views; number of days; first day of the week; one or one-half hour time slots; wide day view)
- Go (open other Inbox, Contacts, Calendar or Tasks with just two taps)
- Cut, Copy, Paste
- Choose Font

5.3.2.3 Contacts

Contacts stores business and personal information about the users contacts. There is no need to maintain two contact lists. By simple connection to the office or home computer and, with the help of ActiveSync technology, automatically synchronise your information with Microsoft Outlook messaging and collaboration client, Microsoft Schedule+ 7.0a, or with other personal information management programs by using third-party translator software.

- Use Contacts to find, add, or edit contact information
- Create new contact cards on the spot
- Hand-write notes, maps, or directions in your Contact cards using the stylus
- Transfer notes to the desktop as text when you synchronise
- Customise the information you view to suit your needs
- ActiveSync automatic synchronisation
- Address e-mail to a contact with just a tap
- view a contact's webpage
- Ink notes
- Print options
- Customise columns
- Find function
- Filtering on categories
- Adjustable toolbar
- Send and receive contact cards over infrared
- Go (open other Inbox, Contacts, Calendar or Tasks with just two taps)
- Cut, Copy, Create Copy, Paste and Select all
- Quickly find a contact name
- Choose font

5.3.2.4 Tasks

Task Manager with the following features:
- Focus on the most important tasks, first, with priority settings
- Synchronise automatically and continuously each time you connect
- Hand-write notes, and automatically transfer them when you sync up
- Copy, Cut, and Paste data from one task to another
- ActiveSync automatic synchronisation
- Ink notes
- Filter on categories
- Find function
- Customise columns
- Print options
- Adjustable toolbar
- team manager support (view team manager tasks)
- notification options
- Go (open other Inbox, Contacts, Calendar or Tasks with just two taps)

- Cut, Copy, Paste, Select all
- Choose font

5.3.3 New Applications

5.3.3.1 Terminal Server Client

This client program enables the SIMpad to become a Windows Based Terminal for a Windows 2000 terminal server. The server sends the display data to the client and the client sends the touch panel entries (selections, double clicks, drag and drops) back to the server. The user can remote control the Windows 2000 application on the SIMpad SL4.

While the Terminal Server client software is provided with the SIMpad SL4, one does need to purchase a Client Access License (CAL) to access the server-side software. This would include the license associated with the Terminal Server itself as well as for other licensed software running on the server. For details check at the Microsoft site:

http://www.microsoft.com/windows2000/guide/server/pricing/terminal.asp
- Windows-based Mobile Terminal
- connection to Microsoft Windows 2000 Terminal Services
- LAN/WLAN or dial-up connection
- Access to local data when disconnected

5.3.3.2 Internet Explorer for H/PC

The Internet Explorer for H/PC is an internet browser which is significantly more powerful than its predecessors under CE2.11. It is distinguish by the following features:
- compatible to IE4.0
- H/PC file explorer integration
- HTML 4
- XML/XSL support for data-based web applications
- DHTML support for forms-based applications
- Support for CSS (cascading style sheet)
- Caching (storage of the content of pages with the ability to browse back through them)
- Memory management options
- AutoDial: automatic connection to the Internet
- Support for frames
- Jscript support (corresponds to the ECMA-262 standardisation of script languages)
- Java Virtual Machine support
- Favourites
- History list (previously visited URLs)
- Default Home and Search Page
- URL management, administration of favourites with a list of them: add, save, delete
- WinInet with FTP, HTTP and HTTPS support
- HTTP and FTP protocols
- HTTPS support for secure communication (PCT/SSL 2 & 3) with web servers (128-bit encryption): indicated by a "lock" symbol
- International language support (Unicode characters)

- ActiveX data objects (no download)
- Support for *.jpeg *.bmp, *.xbm and animated *.gif images
- Support for *.wav files
- Capability to download programs and files. Only programs which are compatible with the SIMpad SL4 operating system (see 5.1) can be executed.
- Alternation between offline and online operation
- File formats which can be opened: HTML files (*.htm, *.html), Text files (*.txt), Image files (*.gif, *.jpg, *.jpeg)
- Capability to save HTML pages
- Page editing: cut, copy, insert
- Text search function (searches through the HTML page): whole words or parts of them, optional distinction between upper/lower case, search in the forward or backward direction
- Page printing
- flexible printer connectivity options
- Adjustable toolbar
- Font button
- Five different font size: largest, large, medium, small and smallest
- Capability for encoding: user-defined, universal alphabet, universal alphabet (UTF-7), universal alphabet (UTF-8) and USA/West Europe
- Navigation functions: forward, back, start page, search page
- Control of the loading operation: update (reload), stop (stop loading)
- Options or settings (can be reset by the user): Start page (URL), Find page (URL), Cache size (in kbytes)
- Underscore links (never, always, alternating)
- Link: name of the link which has been configured
- Capability for using a proxy server (server address, port)
- Stop button
- Appearance options: control of download of pictures and sounds
- Cut, Copy, Paste, Select All

5.3.3.3 Windows Explorer

File handling program similar to Windows Explorer for PCs. However, it is not possible to access files from a Windows network. The only possibility to exchange files with another computer is with ActiveSync described in 5.4.5 or from a FTP server in the browser (see 5.3.3.2).

- Create, modify and delete folders/files
- Indication of file properties (type, location, size, date of last change, attributes: write protection, archive, hidden)
- Sending of files to desktop, my documents or IrDA interface
- Connection to IrDA device
- Undo function
- Basic handling funtions: cut, copy, paste, paste link, select all
- 3 types of display: big icons, small icons and list (details)
- Sorting of the files by: name, type, size, date, automatic
- Actualise window
- Options: show all files or hide hidden files (activated by default), show extensions (activated by default)
- Basic navigation functions: forward, backward, my documents, start page
- Search in web, Handheld PC Web

- History list and direct go to previous windows
- Favourite management: create and handle favourites

5.3.4 Other

5.3.4.1 Ink Writer

Notepad program for text and freehand drawings:
- Mix hand-written notes or drawings and typed text in the same document
- Apply font formatting
- Resize and reshape drawings, and group them with others

5.3.4.2 Calculator

- Basic operations (addition, subtraction, multiplication, division)
- Basic mathematical functions (square root, percentage, radical)
- Memory (store, add, read, clear)
- 12-line display with calculation history
- standard or small window
- copy and paste functions

5.4 Standard programs

5.4.1 MS Reader

Microsoft Reader is a free software application for eBooks (electronic books) designed to deliver an on-screen computer reading experience approaching the convenience and quality of paper. It includes the ClearType display technology greatly improving resolution on LCD screens to deliver a print-like display. Furthermore, Microsoft Reader offers a clean, uncluttered layout; ample margins; proper spacing, leading, and kerning; plus tools for book marking, highlighting, and annotation. For more information consult http://www.microsoft.com/reader/default.asp.
- ClearType display technology (provides improved display clarity by 300%)
- Library for the acquired books (and other content). Simple click to open a title.
- The items of the library can be organised to appear by title, author, last read, book size, or date acquired.
- Edit or delete personal annotation (highlights, bookmarks, notes and drawings)
- Easy sharing and organisation of the personal annotations by type, by page number, by date created, or by last modified
- View all annotations from one place (no flipping through pages to find margin notes or highlights)
- Highlights of a word or passage (several colours, edit or delete directly on the page)
- Add electronic bookmarks: shown in the right margin. Go to a page by a simple click. (can be easily deleted or changed in colour)
- Add notes to any page (written comments)
- Circle words, underline text, or add any other type of mark to a page (several colours)
- Easy navigation: Right-click the page number to view the relative location in a book, go directly to a particular page, or quickly page backward or forward.

- Find for words
- .lit format

Digital Rights Management (DRM) are supported up to level 5. DRM refers to the various technologies that use encryption to protect digital intellectual property such as music, movies, and books. Today the Microsoft eBook system is using three levels of DRM:

DRM1 - Sealed	The content is encrypted to ensure the authenticity of the content. Text inside the eBook can't be modified. A sealed eBook can be read with any copy of Microsoft Reader. This is the basic level of security given to each .lit file.
DRM3 - Inscribed	The content is encrypted to ensure the authenticity of the content. Sealed titles with the content user/creator's name appear on the front page of the eBook. This reinforces honest usage by consumers. Anyone can read the content.
DRM5 - Owner Exclusive	Fully secure. Only the device with the license file can decrypt and read the content. Owner Exclusive eBooks can be read on all computers or devices activated by the owner. This security level requires that the consumer's copy of Microsoft Reader be activated.

The activation process downloads to your computer a software module unique to you and your computer called a "Secure Repository." This module uses your Microsoft Passport account number and information unique to your computer to protect eBook titles against unauthorised copying.

Also downloaded during this process is an Activation Certificate, which certifies that your copy of Microsoft Reader is enabled for viewing protected content. This security provides you with access to many premium eBook titles that have been copy protected for distribution. The Activation Certificate is encrypted for the user's privacy and is only used at the moment of a download.
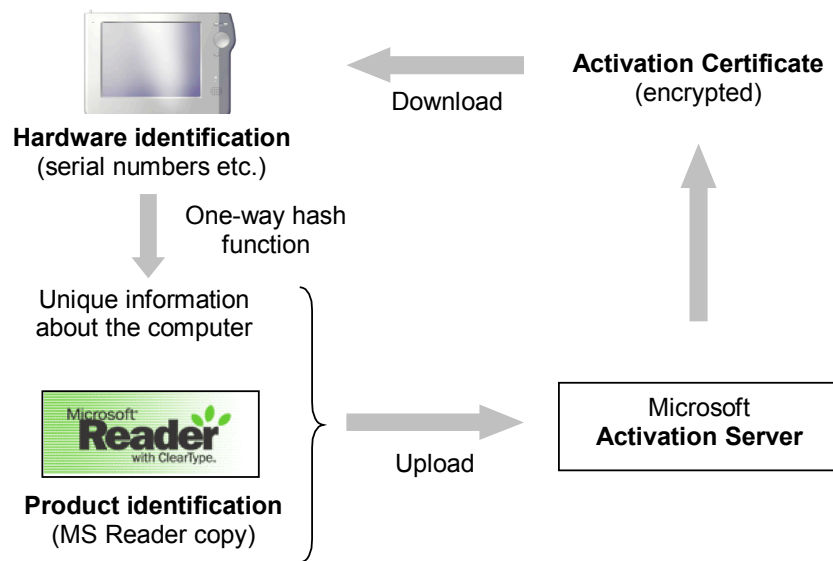
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Fig. 8   Activation process in DRM 5 for Microsoft Reader

5.4.2   Pocket Paint

The drawing and painting program "Pocket Paint" can be used to produce graphics and drawings from scratch, or to load and modify existing images and then save them again. Pocket Paint has the following features:

- Editing of existing bit-map format sketches and creation of new ones
- Save formats: *.bmp, *.gif, *.jpg, *.jpeg, *.xbm
- Cut and paste for rectangular extracts
- View at normal size or in enlarged form
- Page size and background colour can be freely set, to the maximum screen size (800 x 600 pixels)
- Rotation (90 degree steps) and mirroring of extracts
- Color palette of 16 colours, which can be freely assembled from 65536 colours
- Symbol list for useful tools and functions
- Undo function

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Tool	Possible settings			
Selector (copy, insert)	Transparent	Overlapping	Transparent, variable size	Overlapping, variable size
Eraser	Small	Medium	Large	Very large
Pen	Small	Medium	Large	Very large
Text	Small	Medium	Large	Very large
Ruler	Thin line	Medium line	Thick line	Very thick line
Rectangle	Dotted border	Continuous border	Shaded rectangle (with no border)	Shaded rectangle (with border)
Ellipse	Dotted border	Continuous border	Shaded rectangle (with no border)	Shaded rectangle (with border)
Shading colour	(No settings)			
Pipette	(No settings)			

5.4.3 Games

5.4.3.1 Backgammon

Well-known board game, presented in a nice, coloured design:
- Entry of player's names
- Game with another player or against the computer
- 3 modes: no time limit, Expert (20 seconds) and Master (5 seconds)
- Indication of possible moves
- Help menu, game explanation, tips and hints

5.4.3.2 Shoot

Shooting game where two parties try to hit each other with a canon.
- 3 settings: "biomechanica", "desert shoot" and "desert storm"
- Adjustable elevation from horizontal to vertical
- Adjustable fire power (scale from 1 to 20)
- Automatically changing wind conditions
- Flying bird causing air turbulence

5.4.3.3 Solitaire

Well-known card game, presented in a nice, coloured design:
- Drag and drop of the cards
- Indication of time and points (can be counted in two ways: "Standard" or "Vegas")
- Undo function
- Remix of cards
- Take one or three cards at a time
- 6 different card backside designs
- Help option

5.4.4 Browser Plug-Ins

5.4.4.1 PDF Viewer

With the PDF viewer called "Primer" the user can view and navigate PDF files. More information can be found at http://www.ansyr.com
- Display of native PDF files: no conversion required
- Standard 40-bit PDF security and encryption
- Display of 'Note' type annotations
- Font support and handling:
  - Type 1, True Type, Type 3 substitution
  - Partial Type 1C support
  - Embedded Type 1 and Type 3
  - Partial Symbol font substitution
- Access standard document, font substitution and security information
- Find on page
- Go to page
- Select and copy text
- Display quality options to control display quality (balance of speed and document appearance)
- Custom memory settings to maximise performance
- Hide images for faster rendering
- Support of intra-document links
- Support of hyperlinks within the document
- Possibility to read PDF files from external memory cards
- Custom Primer bookmarks for easy reference to key information
- Definable default zoom level for customisation to user's device and documents
- Basic printing

5.4.4.2 Flash Player

Windows CE version of the Macromedia Flash Player 4. More information on Flash Player can be found at: http://www.macromedia.com

5.4.4.3 Java Virtual Machine

The Java Virtual Machine is the runtime environment of the Jeode Platform called Jeode*Runtime*. It consists of the configurable Jeode Embedded Virtual Machine™ (EVM™), Jeode*Class* embedded class libraries and Sun's byte code verifier. More information on Flash Player can be found at: http://www.insignia.com
- Full-featured implementation compatible with Sun's 1.2 PersonalJava and 1.0.3 EmbeddedJava specifications (this is roughly equivalent to Sun's 1.1.8 JDK)
- Sun Authorised Virtual Machine
- Dynamic adaptive compilation for accelerated performance in a small memory footprint
- Responsiveness and efficient memory usage via precise, concurrent garbage collection and dynamic class loading
- Support for Java class libraries
- Standard debugging interfaces to support third party tools (e.g. JNI, JDPA, JVMDI/JDWP)
- AWT support

- Invocation API that allows the Jeode EVM to be called from any application
- Support for Zip and JAR compressed files

The Jeode platform includes the following Java class libraries that are defined in the 1.0.3 EmbeddedJava and 1.2 PersonalJava specifications:

- java.io package (input and output, using standard i/o, memory buffers and files)
- java.util and sub-packages: Manipulation of dates, random numbers and data. Data compression and decompression structures (dictionaries, stacks, hash tables, vectors)
- java.lang and sub-packages: Core Java API classes and the Reflection API (allows the Java program to inspect and manipulate its structure and classes)
- java.net package (infrastructure for networking)
- java.math package (arbitrary precision integer and floating point arithmetic)
- java.text package (locale-specific format conversions for numbers, date and time)
- java.rmi package (remote method invocation)
- java.security package (encryption and computation of digital signatures)
- java.sql: Java Database Connectivity (sending SQL queries and result retrieval)
- java.beans package: Creation and usage of embeddable, reusable software components
- java.applet package: Support for implementation of applets in PersonalJava (Java programs integrated into web pages)
- java.awt and sub-packages: Abstract Window Toolkit (numerous classes that support graphical program development)

5.4.5   ActiveSync

Applications

The ability to exchange data between the SIMpad SL4 and a PC may be required in the following situations:
- Loading data from the PC to the SIMpad SL4 (images, texts, etc.)
- Backing up data/programs from the SIMpad SL4 to the PC
- Loading programs into the SIMpad SL4 where the programs must first be processed on the PC (e.g. decompressed)

Many programs for CE3.0 (see 5.1.1) on StrongARM (see 2.2) are offered on the internet in a form which does not permit direct downloading onto the SIMpad SL4. In these cases, the program must be downloaded onto the PC, and if necessary then decompressed. Only then can ActiveSync be used to load the program into the SIMpad SL4 in its correct, executable, form.

Synchronisation

The Windows CE technology allows to always have the same information on the Handheld PC as on an office and/or home computers using ActiveSync (see 5.4.5)

The following data will be automatically synchronised:
- Microsoft Pocket Outlook data (schedule, to-do lists, contacts and e-mail)
- Microsoft Pocket Word
- Microsoft Pocket Excel
- Microsoft Pocket PowerPoint files

The synchronisation takes place on connect, continuously, or manually.

It is possible to synchronise a Handheld PC with up to two Windows-based computers (e.g. office and home computer) or synchronise one Windows-based computer with

multiple Handheld PCs (e.g. one central office computer with several field Handheld PCs).

The program

Installing the ActiveSync program on the PC makes it possible to communicate with the SIMpad SL4 via the serial interface (see 4.1) or via the USB interface (see 4.2). This enables files (programs, images, texts) to be exchanged. The ActiveSync program can be downloaded from the internet without charge:

http://www.microsoft.com/mobile/downloads/activesync/activesync.asp

During the installation of the ActiveSync program, a link to ActiveSync is entered in the Autostart folder, so that the program is automatically active in the background.

Linking up

The connecting cable is plugged into both computers after they have been switched on. The link is then immediately and automatically established. ActiveSync on the PC asks whether "partnering" is to be set up. However, the SIMpad SL4 does not yet support this function.

The link can be terminated either by selecting the corresponding function in ActiveSync or by simply unplugging the connecting cable.

For the configuration of the automatic set-up link see 5.4.13.4.

Data exchange

After the ActiveSync program has been installed on the PC, a new data device, "Mobile Device", appears in the contents of "Workplace" in the Explorer. When a link has been established to the SIMpad SL4, a double click on the "Mobile Device" icon can be used to display a window showing the files on the SIMpad SL4. Using move or copy/insert, files can be exchanged in both directions with the PC.

Backup

ActiveSync offers an option to create a backup copy of the SIMpad SL4's entire Object Store (see 2.3) on the PC. The user also has the option to do a partial backup by saving only the most important files individually on the PC.

5.4.6 Communication

5.4.6.1 Remote Network

This program is the connection wizard that supports all communications via the various interfaces: PC-Card, IrDA and RS-232. A connection set-up can be created, edited or deleted. It appears as an icon or as an entry in a list. The connection set-up contains all pre-configured parameters (interface, calling number etc.). The required connection is set up by a double click on the appropriate entry.

There are two fundamentally different types of connection:
- Dial-up connections: via a modem, which must dial into an ISP
- Direct connections

Ports for selection	
Dial-up connection	• Hayes-compatible on COM1 (RS-232)

	• COM2 (not used)
	• COM3 (not used)
	• Generic IrDA modem
	• IR on SP2
Direct connection	• COM2
	• Infrared Port
	• Serial cable on COM1

The following parameters can be configured:

	Parameter	Default value
Device properties		
Port settings	Manual dial (user supplies dial strings)	(not selected)
	Use terminal window before dialing	(not selected)
	Use terminal window after dialing	(not selected)
	Baud rate	115200
	Data bits	8
	Parity	none
	Stop bits	1
	Flow control	none
Call Options	Cancel the call if not connected within ... seconds	selected, 120
	Wait for dial tone before dialing	selected
	Wait for credit card tone ... seconds	0
	Extra settings (special modem commands may be inserted into the dial string)	(none)
TCP/IP settings		
General	Use server-assigned IP address	selected
	IP address:	(none)
	Use Slip	(not selected)
	Use software compression	selected
	Use IP header compression	selected
Name servers	Use server-assigned addresses	selected
	Primary DNS	(none)
	Secondary DNS	(none)
	Primary WINS	(none)
	Secondary WINS	(none)
Dial-up connection		
	Country code	(none)
	Area code	(none)
	Telephone number	(none)
	Force long distance	(not selected)
	Force local	(not selected)

5.4.6.2 HomeRF Configuration

The following parameters of HomeRF terminal can be configured:

	Parameter	Default value
Internet access	PPPoE (direct connection):	(not selected)
	User-ID	(none)
	Password	(none)

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	DHCP (e.g. with a WLAN):	selected
	Host name	(none)
	Network password	(none)
Connection set-up	Enable automatic connection	selected
	Automatic connection when receiving e-mails	(not selected)
	Disable automatic connection	(not selected)
Disconnection	When inactive automatically disconnect after ... minutes	selected, 0
	Do not disconnect automatically	(not selected)

Indicated parameters (only when PPPoE active):
- IP address
- Subnet mask
- Standard gateway
- First DNS server
- Second DNS server
- Connection time

5.4.6.3   I-Gate Configuration

This program allows the configuration of the I-Gate NIC with the possibility to rescan the WLAN (in order to find an access point) and to write and clear of the WEP key.

The access point parameter cannot be configured here. For I-Gate access points (minimum firmware version 2.1.5) it is possible to establish a HTTP connection with the access point. The configuration menu is displayed in the Internet Explorer (see 5.3.3.2).

The following parameters can be configured with the I-Gate NIC configuration program:

	Parameter	Possible values/Range	Default value
Configuration			
	Mode	• AdHoc, 802.11 • AdHoc • Infrastructure	Infrastructure
	SSID	(any)	(none)
	TxRate	• Fully automatic • 1 Mbps • 2 Mbps • Auto 1 or 2 Mbps • 5.5 Mbps • 11 Mbps	Fully automatic
	PS Mode	• Disabled • Enabled	Disabled
	WEP	• Disabled • 64 bit • 128 bit	Disabled
Encryption	Passphrase	(any)	(none)
		• 64 bit: 4 keys with 10 characters • 128 bit: 1 key with 26 characters	(none)

The following link information is indicated:
- State (indication of the MAC address of the access point PC-Card if in infrastructure mode, in ad hoc mode no MAC address is indicated)
- Current Channel
- Current TxRate [Mbps]
- Link quality [%]
- Signal strength [%]

5.4.6.4   PC Direct Connection

Manual activation of a PC direct connection as defined with the program Remote Network (see 5.4.6.1) and activated as default PC direct connection in the Communication setting program (see 5.4.13.2).

5.4.6.5   Terminal

Terminal emulation program supporting TTY and VT-100 terminal emulation. As for the program Remote Network (see 5.4.6.1) various connection set-up can be created, edited or deleted. The communications can be defined for all available modem interfaces:
- Hayes-compatible on COM1 (RS-232)
- COM2 (not used)
- COM3 (not used)
- Generic IrDA modem
- IR on SP2

A connection set-up appears as an icon or as an entry in a list. It contains all pre-configured parameters (interface, calling number, server name etc.). The required connection is set up by a double click on the appropriate entry.

The following parameters can be configured:

	Parameter	**Default value**
Data transfer	Session name	(none)
	Modem connection	(none)
	Telephone number	(none)
	Country code	(none)
	Force long distance	(not selected)
	Force local	(not selected)
Dial-up parameters	Dial-up from "office" or "home"	office
	Actual country code	(none)
	Actual local code	(none)
	Dial-up with tone of pulses	tone
	Knocking block by dialing: ...	(not selected), (none)
Dial-up pattern	Local calls	number
	Long distance calls	Local code, number
	Calls abroad	Country code, local code, number
Emulation	Emulation type: DEC VT-100 or TTY (generic)	DEC VT-100
	Code: Automatic search, US-ASCII, JIS, SJIS or Unicode	
	Local echo	(not selected)

	Small characters to use as standard	(not selected)
	CR -> CR/LF: incoming	(not selected)
	CR -> CR/LF: outgoing	(not selected)
	Automatic display scrolling: vertical	Selected
	Automatic display scrolling: horizontal	(not selected)
Dial-up configuration		
Port settings	Manual dial (user supplies dial strings)	(not selected)
	Use terminal window before dialing	(not selected)
	Use terminal window after dialing	(not selected)
	Baud rate	19200
	Data bits	8
	Parity	none
	Stop bits	1
	Flow control	none
Call Options	Cancel the call if not connected within ... seconds	selected, 5
	Wait for dial tone before dialing	selected
	Wait for credit card tone ... seconds	0
	Extra settings (special modem commands may be inserted into the dial string)	(none)

5.4.7 Keyboard

The Software Input Panel (SIP) is a keyboard which can be called up on the display, either with the keyboard key (see 1.1) or by double-clicking on the keyboard symbol in the bottom-right corner of the Windows CE desktop. The user can vary the size of the keyboard.

Optionally, the following keyboard parts can be activated:
- Standard keys (QWERTY keyboard with additionally: Esc, Tab, Caps lock, shift, control, Windows, Alt, right click, International, Enter and Backspace key)
- Function keys (F1..F12)
- Numeric keys (numeric block with mathematical operators and Enter key, changeable to cursor block with cursor keys, home, end, page up, page down, insert and delete key)

5.4.8 Handwriting Recognition

The "Jot" handwriting recognition program permits the user to write inputs directly onto the screen, without using the Software Input Panel. It can be activated and deactivated in the program line of the CE desktop at any time.

The letters, numbers and special characters must be written individually one after another, with the pen being lifted between each one. Each character is written using one or two continuous lines in succession. To do this, the user must learn a particular representation of the characters.

This means that the program does not have to be initially taught the user's handwriting. The advantage of this is that several users can make their inputs without the handwriting recognition program having to relearn the user's writing each time.

The input field is subdivided into three zones. This subdivision is indicated by the arrow-shaped mode mark on the right side of the screen. The mode mark can be moved up and down by the user. Numbers are drawn above the mode mark.

Uppercase letters have to be drawn on mode mark level. Lowercase letters and special characters are drawn below the mode mark.

In addition, the Jot handwriting recognition program includes the following subroutines

- Tutorial: a short lesson
- Macro editor: configuration of the user's own characters
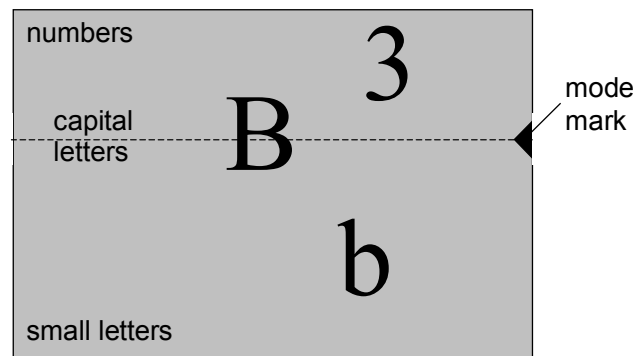- Training Tool: a short Jot trainer

Fig. 9   The three areas of the input field used for inputting numbers, upper- and lower-case letters

5.4.8.1   Jot Macro Editor

The Jot Macro Editor allows the definition of abbreviations (macros) which automatically insert text or execute specific actions. The editor shows the list of the active macros.

The text macros are automatically replaces with the full text as defined. Action macros automatically execute the defined action.

The following list contains the possible actions to choose from:

- Cut
- Copy
- Paste
- Undo
- Delete
- Time
- Date: Wed, Jan 1, 1997
- Date: 1/1/97
- Date & Time
- Page Up
- Page Down
- Home
- End
- Esc

5.4.8.2   Jot Trainer

Jot Trainer enables the user to fine tune the character recognition for the following specific problematic characters: 'J', 'K', 'P' , 'Q', 't', 'f', 'Y', 'i' and '$'. There is the possibility to reset to default character recognition.

5.4.8.3   Jot Tutorial

This program demonstrates how to write letter, numbers and symbols with the Jot Handwriting Recognition. The user can choose one of the five categories (lowercase, uppercase and accented letter, numbers and symbols) and select the letter of number to be shown. The "Show All" key will show all characters of the category.

The program shows all possible "drawing sequences" for the particular character with adjustable speed.

5.4.9   Online Help

The online Help is a program to provide answers to questions which the user may encounter in the course of using the SIMpad SL4. It opens a windows showing the contents of the Help tool, which is a list of topics designed to take the user to the required subject area. The user can select a subject area using the pen, and this takes him/her to a sub-list, or directly to the description of how to deal with the problem.

The online Help can be started from the desktop, in the Start menu. However, it can also be called up from most of the programs. In the latter case, the subject area for the program concerned will already be pre-selected.
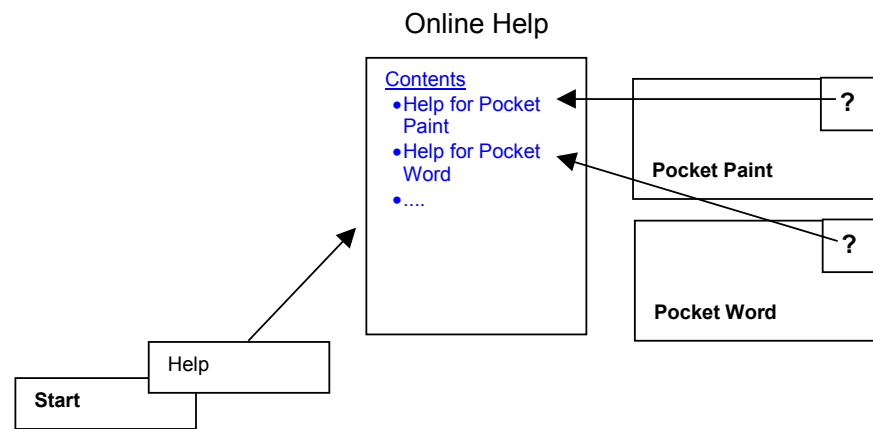
Online Help

Fig. 10   Overview of the access to the online Help from the desktop (Start menu) or from the programs

The individual Help texts are HTML-based, and are automatically shown in the contents for the Help tool. If a new program is later installed on the SIMpad SL4, then provided the Help file for the new program is included in the Windows directory for this program, the file will be incorporated into the contents for the online Help.

5.4.10   Store Settings

This little program will copy the registry (see 2.4.2) into the (persistent) flash memory.

5.4.11   Soft Reset

This little program activates a soft reset. It is specially useful when the SIMpad SL4 gets very slow due to internal loops created by crashed programs. The soft reset does not affect the memory content (see 0).

5.4.12   Run...

The Run program opens a file, document or program. The user can enter the program name or browse in the file structure and select the required object.

5.4.13   Control panels (settings)

New programs loaded onto the SIMpad SL4 by the user may in some cases have their own control panel. This would be added in to the existing selection of control panels during installation.

5.4.13.1   Task Bar Settings

The taskbar settings can be changed in the Start menu, under Settings/Taskbar. It is also possible to delete the contents of the document menu in the Start menu, using a key.

Setting	Description
Always on top	Ensures that the taskbar continues to be displayed in a program.
Auto hide	Moves the taskbar on the CE desktop to the bottom so that only a narrow strip of it remains visible. Moving the cursor over this strip calls up the taskbar. Moving the cursor back above the taskbar causes it to disappear again.
Show clock	Displays the internal clock

5.4.13.2 Screen

This control panel can be used to set the desktop background and the colour combinations for the windows and menus. For the desktop background the user can choose one of 3 options:

- single colour
- list of 26 pre-loaded icons or logos
- own bitmap image (*.bmp)

The icon, logo or bitmap image may either be set in the middle of the desktop or can be set as a repeated pattern of adjacent copies.

For the windows and menus the user can choose from a list of 13 ready prepared colour combinations. It is possible to add new pre-configured colour combinations.

Window or menu elements can be coloured individually from a palette with 48 pre-configured colours. Each colour can be chosen and added to the palette from a "rainbow"-coloured box showing all 65536 possible colours and adapted with the following parameters:

- Red, blue and green intensity (0..255)
- Colour code (0..239), contrast (0..240) and brightness (0..240)

5.4.13.3 Owner

The user can input his/her own data (name, company and address, private and business number with dialling prefix). As an option, these items of data can be displayed when the SIMpad SL4 is switched on. It is also possible to input notes, to be displayed when it is switched on.

5.4.13.4 Communication

This control panel enables the user to give an identifying name to the SIMpad SL4, so that it can appear in a network under this name. In addition, the device type can be specified.

For links to a PC for the purpose of data exchange (see 5.4.5), this control panel can be used to activate the automatic set-up of a link when a connection is made. In addition, the user can select the type of link.

5.4.13.5 Device settings

This control panel has been specially developed for the SIMpad SL4; it has 4 tabs: Display/Sound, Battery, Memory and Device Info. It also appears as a small icon in the task bar and can be directly started from there (see 5.2.1).

Display/Sound:

- Screen brightness setting: the back light inverter (BLI, see 2.3) can be set to any of 8 levels, from dark up to 100%.
- Loudness setting (6 levels)
- Switching the headset on and off
- Switching the loudspeaker on and off

Battery:

- Indication of the battery charge (in %) and status (good, weak or minimum charge)

Memory:
- Setting of the memory split: program memory and data memory (see 2.4)
- Indication of the reserved memory sizes
- Indication of the used memory (both parts)
- This control panel is identical with the memory control panel described in see 5.4.13.15

Device Information:
- Device type (related to hardware version)
- Software version (hardware version - OEM/Siemens variant - software language - version number)
- Serial number
- Bootloader version

5.4.13.6   Internet options

The control panel Internet options covers the main parameters for the Internet Explorer (see 5.3.3.2). It is structured into 4 tabs: General, Connections, Advanced and Security.

The following actions can be carried out:
- Empty cache
- Empty history list
- Restore default advanced settings

	Parameter	Default value
General	Starting page	http://www.my-siemens.com/simpad
	Search page	http://www.google.com
	Cache	Activated
	Empty cache on exit	Activated
	Delete cookies	(not activated)
	Cache size (1..99%)	6%
	Number elements in history list (0..999)	10
Connections	Automatic dialling-in when access to Internet required by application	(not activated)
	Connection to be used: List of possible connections (see 5.4.6.1)	(none)
	Proxy server to used	(not activated)
	Avoid proxy server for local addresses	(not activated)
	Proxy server address (URL)	(none)
	Proxy server port	80
Advanced:		

(Browsing)	Underline on the left: • Always (Alt+I) • Hover (Alt+H) • Never (Alt + N)	Always
(Media)	Display images (Alt+B)	Activated
	Play sound (Alt+O)	Activated
(Security)	Activate cookies (Alt+C)	Activated
	Authorise SSL 2.0 (Alt+L)	Activated
	Authorise SSL 3.0 (Alt+U)	Activated
	Warn user when leaving secure mode (Alt+Z)	Activated
Security Levels:		
(Send data)	• High: always warn • Medium: warn only when more than 1 text field • Low: never warn	Medium
	Check security certificate before sending	Activated
(Data indication)	• High: warn before indicate • Low: never warn	High
	Check security certificate before indication	Activated

5.4.13.7 Jot

The following parameters can be configured:

	Parameter	Default value
General	Character set preference: • Character set that uses natural character shapes • Simplified uppercase characters	• Character set that uses natural character shapes
Appearance:		
(Ink style)	Ink width: • Thin • Medium • Thick	Medium
	Ink colour: Choice from colour palette with 48 basic colours, 16 predefined colours, possibility to define own colour	Black
	Smooth ink	Activated
(Mode mark)	Mode mark size: • small • Medium • big	Big
	Hide mode mark	(not activated)

5.4.13.8 Password

The user can apply password protection to the SIMpad SL4. This password must initially be input twice. When the password protection has been activated, the user will be asked for the password when the SIMpad SL4 is switched on.

The password protection can only be deactivated after entering the password. If the user forgets the password the only way to re-use the SIMpad SL4 is a factory reset (see 0).

5.4.13.9 Regional settings

The regional settings comprise the formats of numbers, amounts of money, date/time etc.

	Parameter	Default value
Country/Language	List of country/language variants	(depending on SIMpad variant)
Numbers		
	Decimal division sign	" , "
	Number of decimals	2
	Digit group division sign	" . "
	Number of digits in a group	3
	Sign for negative numbers	" - "
	Format negative numbers (with brackets or with minus sign in different positions)	Minus sign in front
	Zero preceding decimal division	With preceding zero
	Measures system (metric or US)	Metric
	List division sign	" ; "
Currency		
	Currency symbol/abbreviation	(depending on SIMpad variant)
	Position currency symbol	After number
	Format for negative numbers	Minus sign preceding number
	Decimal division sign	" , "
	Number of decimal digits	2
	Digit group division sign	" . "
	Number of digits in a group	3
Time		
	Time format	HH:mm:ss
	Division sign	" : "
	Symbol for a.m.	(none)
	Symbol for p.m.	(none)
Date		
	Calendar	Gregorian calendar
	Date format	TT.MM.JJ
	Division sign	" . "
	Format long date (incl. day of the week)	TTTT, T. MMMM JJJJ

5.4.13.10 Volume and sounds

With this control panel the user can set the volume of the different sounds and choose, activate or deactivate sounds for specific incidents.

Windows CE offers the following list of incidents to be accompanied with a sound (the user can choose from a list of over 20 different sounds):
* Close application
* Start record
* End record

- Maximise window
- Minimise window
- Question
- Indication
- Start infrared (communication)
- End infrared (communication)
- Infrared (communication) interruption
- Critical stop
- Menu
- Pop-up
- Start networking
- End networking
- Networking interruption
- Empty trash
- Start program
- Standard sound
- Start

	Parameter	Default value
Volume	Volume level (0..5)	1
	Incident sounds (warnings, signals and system incidents)	Activated
	Application specific sounds	Activated
	Reminders	Activated
	Touch screen sounds (loud, quiet)	Activated, loud
	Key sounds (loud, quiet)	Activated, loud

5.4.13.11 Network

The settings for the SIMpad SL4 to be a client in a network are defined here. The user can define the user name, password and domain for the network access.

The control panel has a list of the installed network drivers. The following network drivers are installed by default:

- AsyncMac1: AsyncMac1 NDISWAN adapter
- CW101: PRISM 802.11 wireless LAN driver
- NE20001: NE2000-compatible network driver
- Proxim1: HomeRF card driver

For each driver the settings for the IP address and name servers can be configured:

	Parameter	Default value
IP address		
	IP address from DHCP	Activated
	IP address fixed: • IP address • Subnet mask • Default gateway	(none)
Name servers		

Primary DNS	(none)
Secondary DNS	(none)
Primary WINS	(none)
Secondary WINS	(none)

5.4.13.12 Software

This control panel allows the de-installation of certain programs.

5.4.13.13 Touch calibration

This control panel permits the re-calibration of the touch panel. The user must use the pen to select 5 positions which are indicated by a crosshair. It is the same program as the one described in see 5.2.4.1. After the calibration has been carried out, the matrices for the screen and the touch panel will be in agreement again.

Additionally, the user can calibrate and test the "double-click" speed.

5.4.13.14 Power

The quality (good, low, minimum) and the percentage charge level of the battery is indicated. Furthermore, it is possible to specify the automatic switch-off time. This is a defined time, for which the SIMpad SL4 must remain in its idle mode (see 1.3) before it is automatically switched off. Default switch-off time is 3 minutes idle mode.

The automatic switch-off time can be activated when the SIMpad SL4 is powered from the power pack. A separate switch-off time is set for this case (default: 5 minutes).

5.4.13.15 System

This control panel shows the hardware and software versions installed, as well as the size and split of the RAM memory. The user can also set the split between Object Store and Program Memory (see 2.4.1), in virtually continuous steps. It should be noted that the two areas are always used. Hence, neither of the two areas should be excessively reduced to the benefit of the other.

- Setting of the memory split: program memory and data memory (see 2.4)
- Indication of the reserved memory sizes
- Indication of the used memory (both parts)

This control panel is identical with the memory control panel described in 5.4.13.5.

Indication of the following hardware and software version:

	Hardware/Software component	version
Device		
	Processor	StrongARM SA-1110
	Memory	62792 KB RAM
	Slot 1	(none)
	Slot 2	(none)
System		
	Microsoft® Windows® for Handheld PC 2000	

	Operating system	Version 3.0
	Internet Explorer	Version 4.01
	Pocket Outlook®	Version 3.1
Applications		
	Microsoft® Pocket Word	Version 3.01
	Microsoft® Pocket Excel	Version 3.01
	Microsoft® Pocket Powerpoint®	Version 3.01
	Microsoft® Pocket Access	Version 3.01

The last tab contains the registration information for the Microsoft software.

5.4.13.16 Input panel

This control panel handles the parameters for the input speed with the key board:

	Parameter	Default value
Repetition		
	Character repetition	Activated
	Delay (continuously from short to long)	Medium position
	Repetition rate (continuously from slow to fast)	Medium position

5.4.13.17 Dialling-in

This control panel simplifies the use of dial-in numbers, particularly the digits of the prefix code. The user can choose pre-defined profiles for various locations. The locations can created, edited or deleted. They contain the following settings:

- Local area code
- Country code
- Choice of pulse or tone dialling
- Suspend waiting calls: dialling code to be automatically dialled
- Choice of dial-in profiles (use of prefix codes for the three situations: local call, trunk call, international connection)

5.4.13.18 World Watch

- Display of date with monthly calendar
- Display of two time zones (local and Seattle, WA)
- Choice and display of the actual time zone
- List of world cities to choose the two time zones
- Display of local information:
  - Day, date, time and time shift with GMT
  - Country code
  - Airport code
  - Calculated sunrise and sunset time
  - Distance between the two chosen cities
  - Indication on the world map and highlight of the time zone
- Definition of 5 different alarms (can be activated individually):
  - Alarm description (message)
  - Alarm time
  - Alarm sound (list of sounds)

- Activation of alarm sound, sound repeat and message
- Customer defined cities or locations can be added

5.4.14 Connection to other devices

5.4.14.1 Printer

Windows CE 3.0 supports by default PCL3 printers (only black & white). Colour printing requires additional drivers to be installed on the SIMpad SL4.

A number of inkjet and laser printers have been tested. The following printers are supported:

- Canon printer, with a driver for Windows CE (WINCE31A.EXE) which can be found under: http://support.canon.de/produkte/drucker/bjc50/bjc50_sw.htm
- Mobile printers:
    - Canon BubbleJet BJC-50
    - Canon BubbleJet BJC-80
    - Canon BubbleJet BJC-85
- With the appropriate driver: Hewlett-Packard DeskJet 340c

For other printers the driver software has to be loaded on the SIMpad, e.g. the printer driver package from Westek:

http://www.westek.com/support/patches.htm

The printers are preferably connected via the IrDA interface (see 4.3). Printers without an IrDA interface can be used together with a IrDA adapter connected to the parallel interface of the printer, e.g. JetEye Printer Adapter from Extended Systems:

http://www.extendsys.de/products/mobiles/jeteyeprinter.html

Printers could be also connected over the serial interface (see 4.1). However, printers usually offer only a parallel interface. The use of an adapter from parallel to serial is possible but less convenient than the solution with an IrDA adapter for about the same costs.

Printer	Driver software	URL
HP Laserjet 4	Standard driver for laser printers (included in Windows CE 3.0)	-
HP Laserjet 5p	Standard driver for laser printers (included in Windows CE 3.0)	-
Canon BJC-85 (portable colour inkjet printer)	Driver for Windows CE 2.1X and higher	http://support.canon.de/produkte/drucker/bjc85/bjc85_sw.htm http://support.canon.de/produkte/drucker/family/WinCE/wince31a.exe
HP DeskJet 350 (portable colour inkjet printer, IrDA with adapter)	Standard driver included in Windows CE 3.0 supports only PLC 2 software. Colour printing support only with additional driver (West Tek)	http://www.microsoft.com/windows/embedded/ce/downloads/driverrep.asp http://www.westtek.com/patches/jetcet.exe

5.4.14.2 Mobile phone

A mobile phone can be connected to the SIMpad SL4 via IrDA (see 4.3) or serial interface (see 4.1):

- Connection via IrDA: pre-configured Hayes-compatible driver on COM3
- Connection via serial/headset interface: pre-configured Hayes-compatible driver on COM1

The modem must be either built in the mobile phone or be available as a soft-modem (software) loaded on the SIMpad SL4.

To connect a mobile phone via a serial link, both the SIMpad serial cable (see 6.1.3) and the mobile phone's serial cable are needed. They are connected with the adapter plug (see 6.2.2) as shown in Fig. 11 .
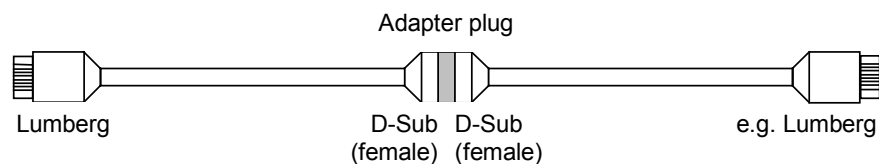
Fig. 11 Cable arrangement for a serial wired connection:
SIMpad SL4 – mobile phone

5.4.14.3 Modem

Modems are preferably connected via the serial interface (see 4.1). The following modems have been tested and are supported:

- Zyxel: Omni 56K (analog)
- Zyxel: Omni.net D (ISDN)
- 3Com U.S. Robotics: 56k Faxmodem (analog)
- 3Com U.S. Robotics: Courier I-Modem (ISDN)

The modems have can be connected with the serial cable (see 6.1.3) and the adapter plug (see 6.2.2) as shown in Fig. 12 .

Adapter plug

Lumberg   D-Sub   D-Sub
                                 (female) (male)
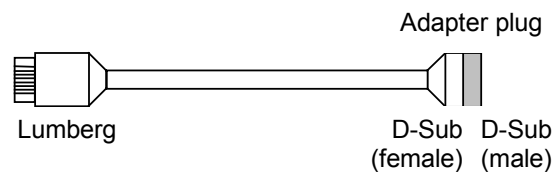
Fig. 12 Cable arrangement for a serial wired connection SIMpad SL4 – modem

5.4.14.4 PC

A connection to a PC is possible in the following ways:

- Via serial link, using the serial cable (see s 4.1 and 6.1.3)
- via IrDA (see 4.3)
- via HomeRF PC-Card (see 3.2)
- via WLAN PC-Card (see 3.1)
- via other communication PC-Card (see s 3 and **Fehler! Verweisquelle konnte nicht gefunden werden.**)

The software supporting the data exchange over the serial links is ActiveSync (see 5.4.5). Data exchange over a wireless network requires additional software enabling data handling. The Windows Explorer (see **Fehler! Verweisquelle konnte nicht gefunden werden.**) under Windows CE 3.0 does not support file handling in a network!

5.4.14.5 Headset

The following two Siemens headsets can be connected to the SIMpad SL4 on the Lumberg plug (see 4.1):

- L36880-N3015-A119
- L36880-N4001-A123

The actual software supports only audio output to the headset. Audio input from the headset is not supported.

5.4.14.6 SmartCard

The SIMpad SL4 has a PC/SC SmartCard API. Further information can be found under http://www.pcscworkgroup.com.

The SmartCard reader supports the T=1 block-oriented transmission protocol (defined in ISO7816-3). The commonly used T=0 protocol is officially not supported due to a hardware defect of the SmartCard reader chip. However, the transmission mistakes of the SmartCard reader may be compensated on the application side.

5.4.14.7 PC-Card

The following drivers are pre-installed and tested:
- I-Gate 11M PC-Card (WLAN PC-Card, see 3.1)
- Home RF PC-Card (see 3.2)

Other PC-Cards may be used but require the specific driver software to be loaded on the SIMpad SL4. Additional drivers will be held in the RAM memory (see 2.4) and therefore will be deleted on a Cold Start or a Factory Reset (see 0).

5.5 Software Update

The software image contains the operating system, the Handheld PC programs and the standard programs. It is stored in the flash memory. Software image updates can be downloaded from a server via a direct link.
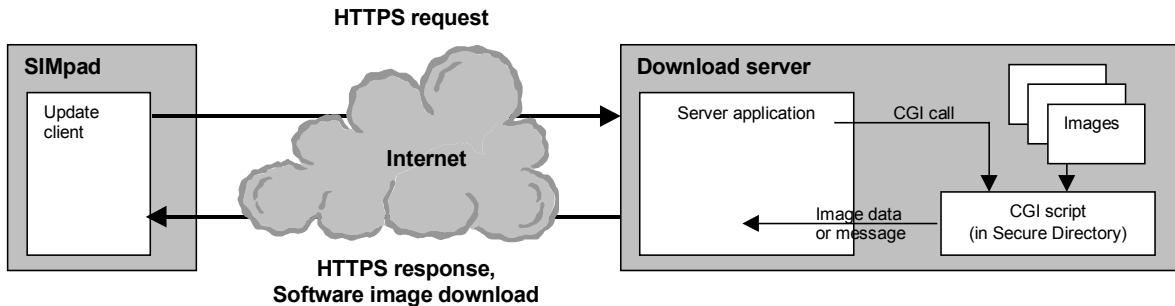
Fig. 8 Concept of the server/client interaction for an image update

The user can special software update program from the start menu. The default parameters for the link to the server are pre-configured:

Parameter	Default
Download server	www.my-siemens.com/simpadconficurator/index.html
CGI	/cgi-bin/simpadupdate.cgi

The software update program will provide a client application which communicates with the server via HTTPS (the transmission is encrypted using a 128 bit key).

The server executes a CGI script which incorporates certain interactions with the client (SIMpad SL4):

1. The authorisation for making an update is checked. It is necessary to ensure that the user is authorised and to check whether the SIMpad SL4 does indeed have an old version of the standard software.

2. If these details permit an update, the software update program then checks the available storage space in the RAM and flash store on the SIMpad SL4. If the storage should be inadequate, the user is requested to delete data or to store it in backup files on the PC.

3. The server now gives a choice of available software images that can be downloaded. The user may change the language version provided that such an image is available on the server.

4. The software image has about 22 MB and is loaded into the Object Store of the RAM memory. The duration of this loading operation depends on the transmission rate. In addition, heavy load on the server due to many clients downloading simultaneously can also delay the loading operation. Experience shows that under normal circumstances it will take about 60 minutes over an ISDN line (64 kbps) and 15 minutes over an ADSL line (256 kbps). During the loading operation, a status display keeps the user informed.

5. After the image has been successfully loaded, preparations will be made for the operation to copy it into flash memory. In order to ensure problem-free execution of the copying operation the battery charge is checked and the 'off' switch is blocked. In addition, a special warning is issued to the user, indicating the copying operation is now about to be performed. This copying operation is critical, because if it is interrupted the SIMpad SL4 could be left in an inconsistent state, from which it could no longer be started. This inconsistent state could only be remedied by downloading a new image from a service PC[2] (see Fig. 9).

6. The copying operation is started by a confirmatory input from the user. As with the loading operation, so again with the copying operation (lasting about 5 minutes), the status is displayed.

7. When the copying operation has been carried out, the update program will carry out error checks and modifications as necessary, and then finally will initiate a restart.

If the download process is interrupted it will be continued at the same stage as soon as re-connected. The client will tell its status and ask the rest from the server.

---

[2] Executed exclusively by Service

SIEMENS
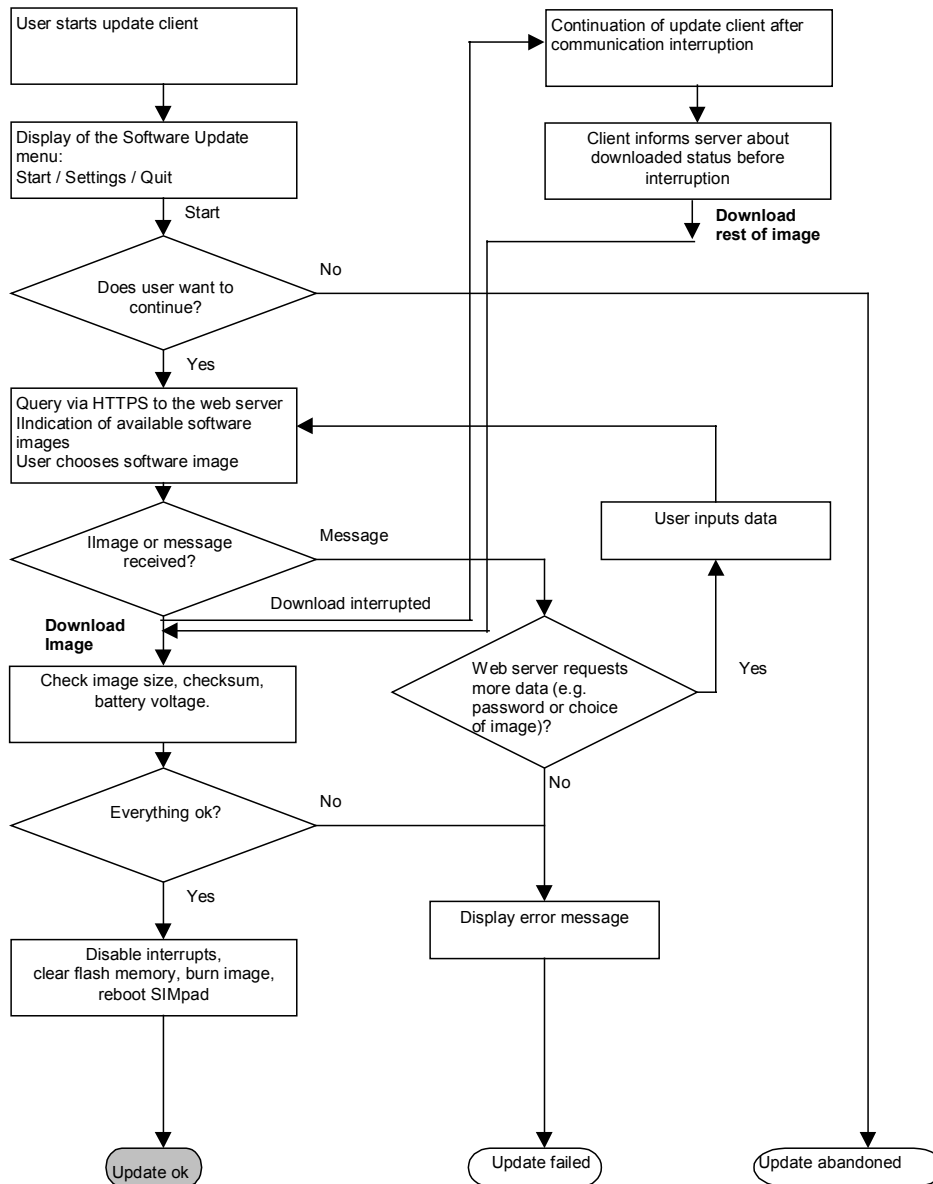
Fig. 9 Sequence of activities for an image update

The download server has the following features:

- Must recognise the HTTP protocol and Secure Sockets Layer (SSL)
- Adequate data throughput (download times, several SIMpad updates at once)
- Must contain CGI script, which correctly administers the requests defined by us
- Storage space for holding the database and the images
- Valid certificate for SSL

5.6 Software Development Kit (SDK)

Program development on the SIMpad SL4 with C (API), C++ or Visual Basic requires the following software:

- Embedded Visual Tools for CE: basis

- SDK (software development kit) for SIMpad SL4: specific environment considering the SIMpad SL4 hardware

- ActiveSync: for loading into the SIMpad SL4 (see 5.4.5)

This software must be downloaded separately on the SIMpad SL4 (see 5.4.5); it will not be part of the software image in the flash memory (see 2.4.1).

6 Miscellaneous

6.1 Scope of delivery

6.1.1 Device/Packing

When dispatched, the battery for the SIMpad SL4 is discharged, i.e. commissioning cannot be started until the battery has been charged. Ex-works, the flash memory holds the operating system and the programs and settings which are saved in the image. The personal and device-specific configurations (see 5.2.3) which would be held in the registry are not yet held there.

Scope of delivery	
Standard accessories	• Envelope with: Operating instructions, Regulation about the use of standard software • Serial connecting cable to the PC • Power pack • 2 stylus pens
Packing	
Dimensions	305 x 155 x 235mm (WxHxD)
Weight	2'130 g
Printing	
Labels	

6.1.2 Operating instructions

- Approx. 100 pages

- Format A5, bound

- Index

6.1.3 Serial connecting cable to the PC

Length: 1.8 m

Caution! This cable cannot be replaced by the serial cable for Siemens mobile phones even though it looks identically!

SIEMENS
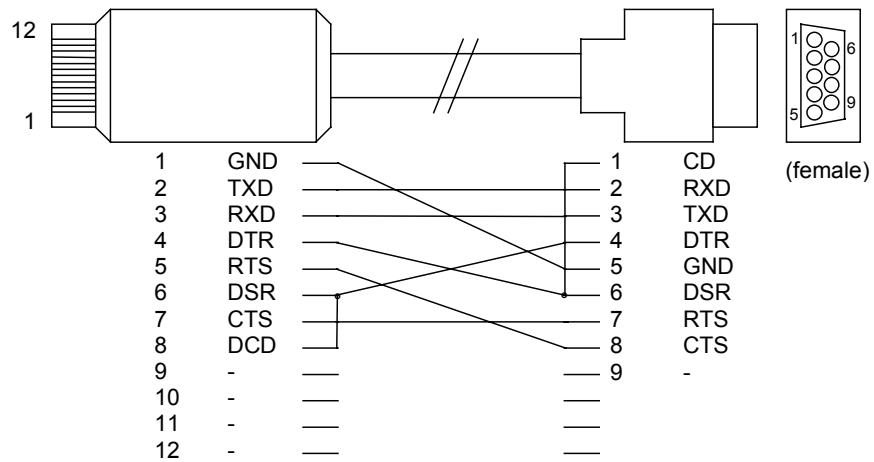
Fig. 13 Wiring of the serial connecting cable: SIMpad SL4 - PC

6.1.4   Power pack

Technical data	
Input voltage	240VAC / 50Hz
Plug type (input)	EURO
Output voltage	12VDC
Current out	Approx. 1.5A
Plug type (output)	Cylindrical plug (hollow), polarity: + inside
Dimensions of plug	Internal diameter: 2.1mm External diameter: 5.5mm Length: 9.5mm
Dimensions of power pack (LxWxH)	107 x 78.8 x 62mm

6.2   Optional accessories

6.2.1   Charging cradle

- For operation with the power pack (see 6.1.4).
- Dimensions: 212 x 46 x 180mm (WxHxD)
- Slope: 20°
- Power contacts to device backside
- Connection to conventional power pack (6.1.4)
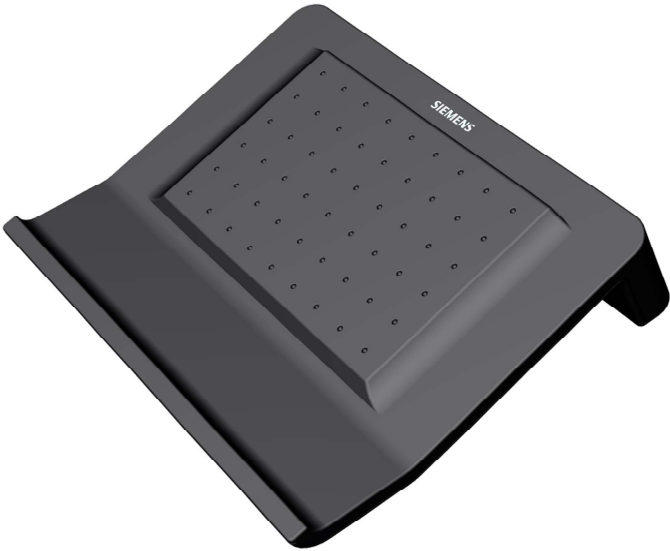
Fig. 10 Charging cradle (top view)

Fig. 11 Charging cradle (bottom view)

6.2.2 Adapter plug (modem cable)

1	CD			1	CD
2	RXD			2	TXD
3	TXD			3	RXD
4	DTR			4	DSR
5	GND			5	GND
6	DSR			6	DTR
7	RTS			7	CTS
8	CTS			8	RTS
9				9	
10				10	
11				11	
12				12	
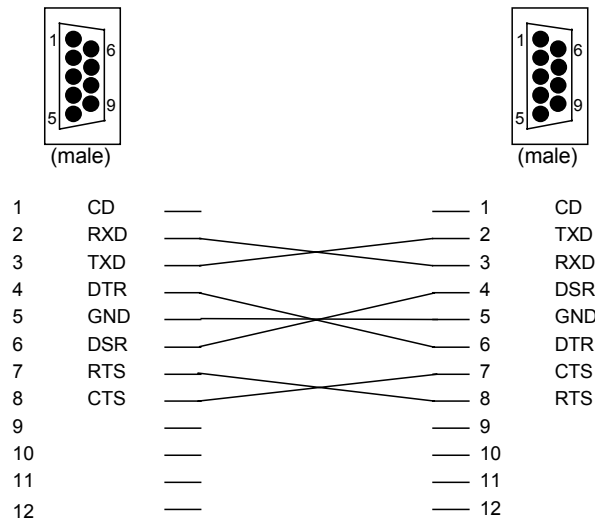
Fig. 14 Wiring of the adapter plug

6.3 Approvals, certification

6.3.1 Operating characteristics and durability

The details in the table below are based on normal usage of the SIMpad SL4:

TFT display	Max. 10,000 hours operating time
Touch panel	Max. 300,000 strokes with the pen or max. 2 million touches with a finger
Electrical safety	As per EN 60950
EMC	As per EN 55022 and EN 55024

After 400 charge/discharge cycles, the Lithium ion battery suffers a capacity reduction due to physical factors, down to a guaranteed residual capacity of not less than 50%.

The following components can be replaced by Service when a repair is carried out:

- screen and touch panel (one unit)
- battery
- board

6.3.2 Transport

Transport class	**ETS 300 019-1-2, Class 2.3** (except for temperature range!)
Transport condition	Device in its original packing, not in operation
Temperature range	-20 ° ... +60 °C (differs from ETS 300 019-1-2, Class 2.2)
Relative humidity	+40 °C / 95 % rel. humidity, 96 hours
Test conditions	
Lower temperature	-20 °C, 72 hours

Upper temperature	+60 °C, 72 hours
Temperature cycling	-20 °C / +30 °C at 1 °C/min, 5 cycles, 1 hour pause
Vibration	Noise, 1 m^2/s^3, 10 - 200 Hz, 3 x 10 min
Shock	6 x 500 shocks, 400 m/s^2, 6 ms
Free fall	1.2 m onto wood, 6 x 1 fall

6.3.3 Storage

Storage class	**ETS 300 019-1-1, Class 1.1**
Storage condition	Device in its original packing, not in operation
Temperature range	-5 ° ... +55 °C
Relative humidity	5 % ... 95 %

These requirements are less than for transport, and consequently they are satisfied.

6.3.4 Operation

Operating class	**ETS 300 019-2-3, Class 3.1**
Operating condition	Device open and in operation, but can also fail briefly
Temperature	+5 ° ... +40 °C
Relative humidity	5 % ... 85 %
Test conditions	
Lower temperature	+5 °C, 16 hours
Upper temperature	+40 °C, 16 hours
Temperature cycling	+25 °C / +40 °C at 0.5 °C/min, 5 cycles, 3 hours pause
Relative humidity	+30 °C / 85 % rel. humidity, 4 days
Humidity change	None
Vibration	None
Shock	6 x 3 shocks, 50 m/s^2, 6 ms
Free fall	20 cm onto wood

7 Appendix

7.1 Abbreviations

A/D	Analog/digital
API	Application Program Interface
BLI	Back light Inverter
BOST	Built in Onboard Self Test
CD	Compact Disk
CGI	Common Gateway Interface
CLK	Clock
COM	Communication Port
Ctrl	Control
CTS	Clear To Send
DAS	Digital Asset Server
DC	Direct Current
DCD	Data Carrier Detected
DECT	Digital Enhanced Cordless Telecommunications
DNS	Domain Name Server
DSR	Data Set Ready
DRM	Digital Rights Management
DTR	Data Terminal Ready
DV	Digital Video
ECMA	European Computer Manufacturers Association
EMC	Electro Magnetic Compatibility
EN	European Norm
ERP	Equivalent Rated Power
ETS	European Telecommunication Standards
ETSI	European Telecommunication Standards Institute
FAQ	Frequently Asked Questions
FDMA	Frequency Division Multiple Access
FTP	File Transport Protocol
GND	Ground
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
H	Handheld
H/PC	Handheld PC
HTML	Hypertext Markup Language
HTTPS	Secure Hypertext Transfer Protocol
HW	Hardware
I/O	Input/Output
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
IMAP4	Internet Message Access Protocol
IR	Infrared
IrDA	Infrared Data Association
ISDN	Integrated Services Digital Network

ISM	Industrial Scientific Medical
ISO	International Organization for Standardization
ISP	Internet Service Provider
ITU-TS	Telecommunication Standardization Sector of the International Telecommunications Union
LED	Light Emitting Diode
NC	Not connected
OS	Operating System
PBX	private branch exchange
PC	Personal Computer
PC/SC	Personal Computer/SmartCard
PCL	Printer Control Language
PDF	Portable Document Format
PIN	Personal Identification Number
POP3	Post Office Protocol
RAM	Random Access Memory
ROM	Read Only Memory
RS-232C	(low-speed serial data communication)
RTS	Ready To Send
RXD	Receive Data
SA	StrongARM
SDK	Software Development Kit
SIP	Software Input Panel
SIR	Serial Infrared
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SSL	Secure Sockets Layer
SVGA	Super Video Graphics Array
SW	Software
TBR	Technical Base for Regulation
TDMA	Time Division Multiple Access
TFT	thin film transistor
TXD	Transmit Data
URL	Uniform Resource Locator
USB	Universal Serial Bus
UTF	UCS Transformation Format (UCS=Universal Character Set
V.24	(V Series Recommendations from the ITU-TS)
VCC	power supply input
VPP	Programming voltage input
WINS	Windows Internet Naming Service

7.2 Units

A	Ampère
mA	Milliampère
B	Byte
kB	Kilobyte
MB	Megabyte
kbps	Kilobits per second
Mbps	Megabits per second
Hz	Hertz
kHz	Kilohertz
V	Volt

7.3   Index