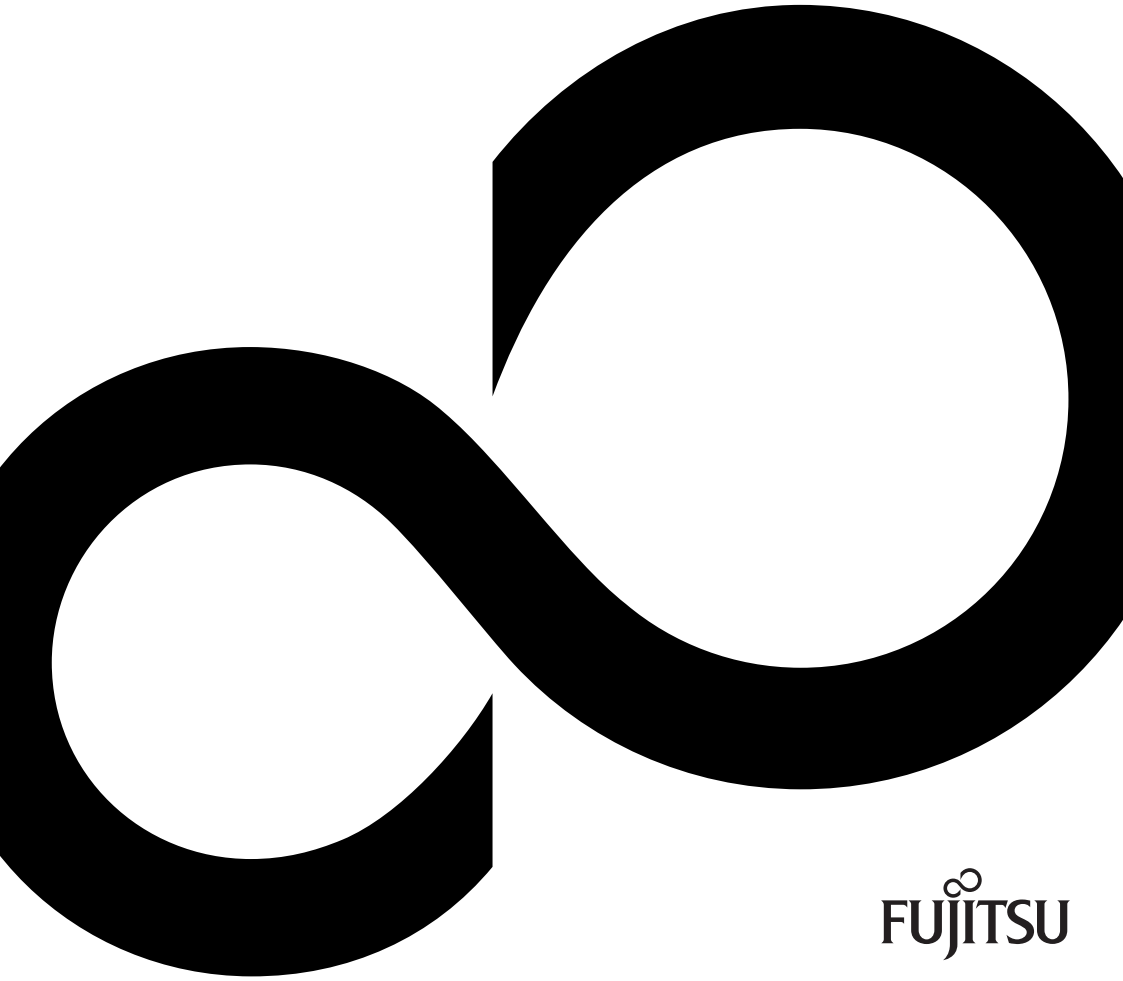
LIFEBOOK T5010



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- your sales partner
- Your sales office

Additional information is contained in the Service Desk list and the "Warranty" manual. You will find the "Warranty" manual on the "Drivers & Utilities" CD/DVD supplied and on the Internet at *http://ts.fujitsu.com/support*

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LIFEBOOK T Series

Operating Manual

Introduction

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Edition 2, August 2009

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Your LIFEBOOK T...

... is a convertible notebook which works just as well and reliably as a notebook as it does as a tablet PC. You can put the convertible notebook on the table as a notebook or hold it in your hands as a tablet PC. Use the keyboard to type or write directly on the display with the pen. The convertible notebook is always there to support you when you are working on the move.

Your operating system is pre-installed on the hard disk to facilitate the procedure when you use your notebook for the first time. In addition to the well-known Windows functionality, this operating system also has handwriting recognition as well as other settings that are specific for its use as a Tablet PC.

Depending on the model, your notebook may be equipped with the new technology "Turbo Memory" from Intel®. The additional memory guarantees that your notebook will provide faster loading times (system start-up) and lower power consumption. This memory can be configured using the User Interface from Intel®.

If you connect the notebook to a port replicator (which is available to order as an optional accessory) you can enjoy the benefits of a number of additional connection options. The port replicator provides you with LAN and monitor ports (analogue and digital) and HDMI connection, as well as four USB 2.0 interfaces. Here you can connect peripheral devices such as a scanner, loudspeakers, gamepads, keyboard, or mouse.

Your notebook has a number of security functions to ensure that no unauthorised persons can access your data. For example, you can protect access to your data with the security functions in the *BIOS Setup* or with the fingerprint sensor.

This operating manual shows you how to start using your notebook and how to operate it in daily use.

Further information on this device is provided:

- in the "Safety" manual
- in the documentation of the operating system
- in the information files (e.g. **.TXT*, **.DOC*, **.WRI*, **.HLP*, **.PDF*, **.HTML*)

Some of the manuals listed can be found on the "Drivers & Utilities" CD/DVD and on the Internet at: *http://ts.fujitsu.com/support*. You can access and view the required information using the *Acrobat Reader* program, which is also on the CD/DVD. If necessary, you can also make a print version of the manual.

Notational conventions

The following notational conventions are used in this manual:

Indicates information which is important for your health, the operability of your notebook or the safety of your data. Faults on the notebook caused by your failure to follow the instructions will invalidate your warranty.

Indicates important information which is required to use the system properly.

► Texts which follow this symbol describe activities that must be performed.

`This font` indicates screen outputs.

This font indicates programme names, commands, or menu items.

"Quotation marks" indicate names of chapters, data carriers, and terms that are being emphasised.

Important notes

Here you will find essential safety information regarding your notebook. The other notes provide helpful information on your notebook.

Safety notes

Pay attention to the information provided in the "Safety" manual and in the following safety notes.

Observe the sections in the manual marked with the symbol on the left.

- When connecting and disconnecting cables, observe the relevant notes in this operating manual.
- When cleaning the device, please observe the relevant notes in the section "Cleaning".
- If you have a device with radio components, please also note the information in the “Additional safety notes for devices with radio components” section of the “Safety” manual.
- Do not drop the device. Make sure that the display does not come into contact with hard objects which could destroy it. Otherwise the display could shatter into splinters which could cause injury.

This notebook complies with the relevant safety regulations for data processing equipment. If you have questions about using your notebook in a particular area, please contact your sales outlet or our Hotline/Service Desk.

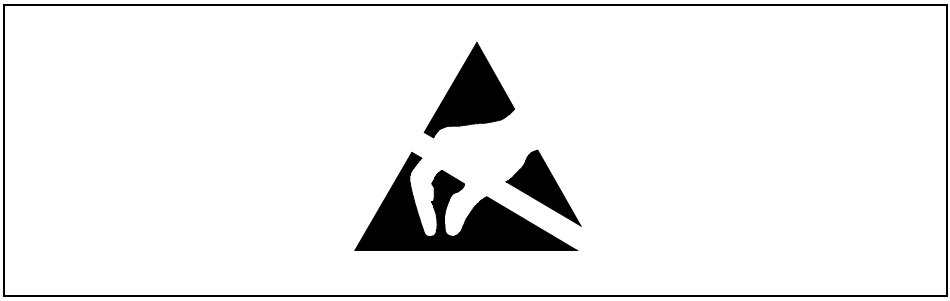
Additional safety notes for devices with radio components

- Switch off the radio components (the ON/OFF switch for the radio components must be in the "OFF" position) when you are at an airport or driving in a car.
- Switch off the radio components (the ON/OFF switch for radio components must be in the "OFF" position) when you are in a hospital, an operating theatre or near electronic medical equipment. The transmitted radio waves can impair the operation of medical devices.
- Switch off the radio components (the ON/OFF switch must be in the "OFF" position), when you take the device close to flammable gases or into hazardous environments (e.g. petrol station, paintshops), as the transmitted radio waves can cause an explosion or a fire.
- Always hold the device so that the antenna, which is built into the display frame and unfolded, does not touch the body.

Notes on installing and removing boards and components

Only qualified technicians should repair the device. Unqualified users who open the notebook's case expose themselves to electric shock and fire hazards.

Boards with electrostatic sensitive devices (ESD) are identifiable by the label shown.



When you handle boards fitted with ESDs, you must, under all circumstances, observe the following points:

- You must statically discharge yourself before working with boards (e.g. by touching a grounded object).
- The equipment and tools you use must be free of static charges.
- Pull out the power connector and remove the battery before you install or remove boards.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.

Travelling with your notebook

Please observe the points listed below when travelling with your notebook.

Before you travel

- Back up important data stored on your hard disk.
- Switch off the radio component (Wireless LAN/Bluetooth) for data security reasons. With data traffic via a wireless connection, it is also possible for unauthorised third parties to receive data.

  i Information on activating data encryption is provided in the documentation for your radio component.

- If you wish to use your notebook during a flight, first check with the flight attendants if it is OK to do so.

When travelling in other countries

- If you are travelling abroad, check that the mains adapter can be operated with the local mains voltage. If this is not the case, obtain the appropriate mains adapter for your notebook.
  Do not use any other voltage converter!
- Do not use a connection adapter for electrical devices to connect the notebook.
- Enquire with the corresponding government office of the country you will be travelling in as to whether you may operate the radio component integrated in your notebook there (also see "CE marking").

Transporting your notebook

- Remove all data carriers (e.g. CD) from the drives.
- Use the on/off switch to turn the notebook off (see Notebook: Switching off) and make sure that it is completely switched off.
- Unplug the mains adapter and all external devices from the power socket.
- Disconnect the mains adapter cable and the data cables for all external devices.
- Close the connector covers.
- Close the LCD screen so that it locks into place.
- If the device needs to be shipped, use the original packaging or other suitable packaging to protect it from damage caused by mishandling.
- To protect the notebook against damaging jolts and bumps, use a notebook carrying case to transport your notebook.
- Current offers can be found on the Internet under *http://ts.fujitsu.com/accessories*.
- Protect the notebook from severe shocks and extreme temperatures (e.g. direct sunlight in a car).

Cleaning

► Switch the notebook off.

► Pull the power plug of the network adapter out of the mains outlet.

► Remove the battery.

Do not clean any interior parts yourself; leave this job to a service technician.

Do not use any cleaning agents that contain abrasives or may corrode plastic. The use of improper cleaning agents can damage the markings on the keyboard and the notebook, the paintwork of the device or the device itself.

Ensure that no liquid enters the notebook.

Cleaning the surface of the casing and the fingerprint sensor

Wipe the casing with a dry cloth.
If particularly dirty, use a cloth that has been moistened in mild domestic detergent and then carefully wrung out.

Cleaning the touchpad

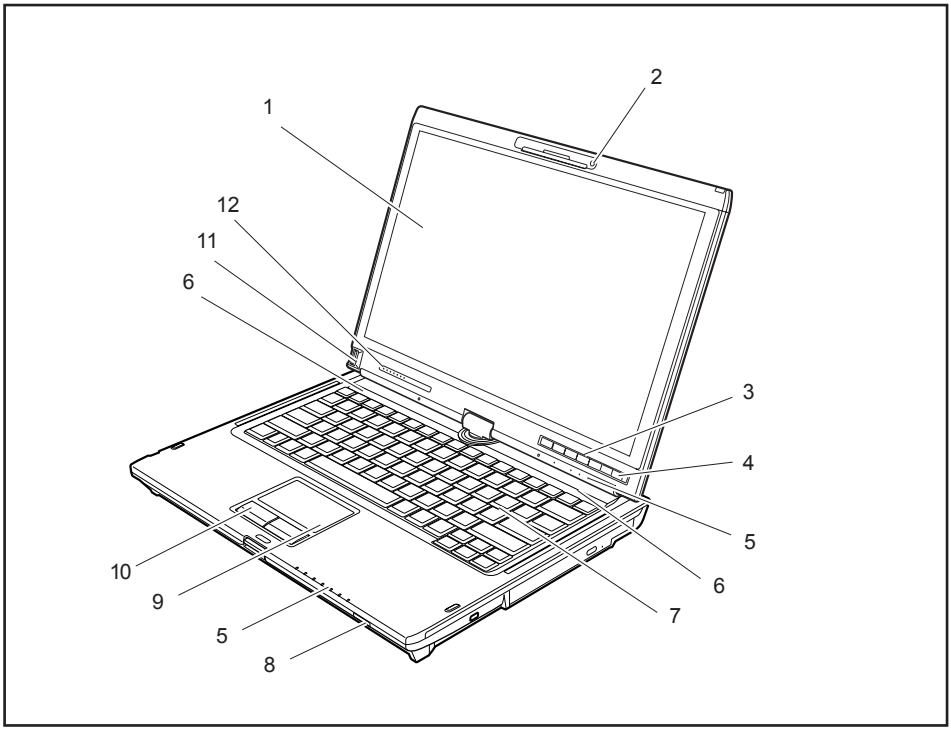
To clean the touchpad, you can use disinfectant wipes.

Cleaning the screen

To clean the screen, gently wipe its surface with a soft Microfiber® cloth.

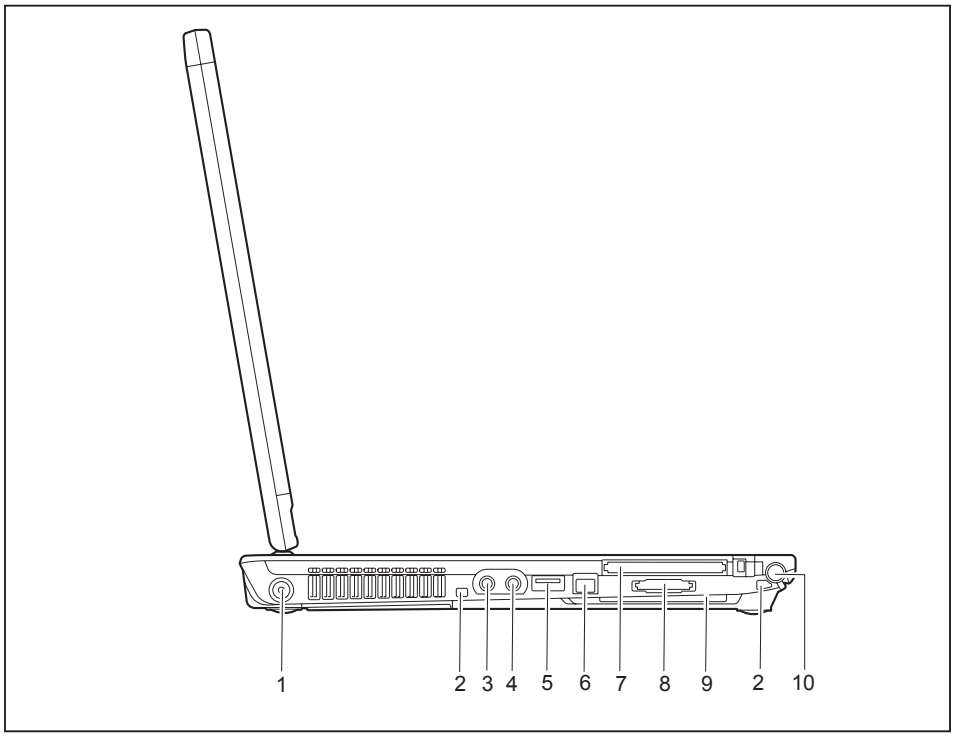
An overview of your notebook

Notebook open



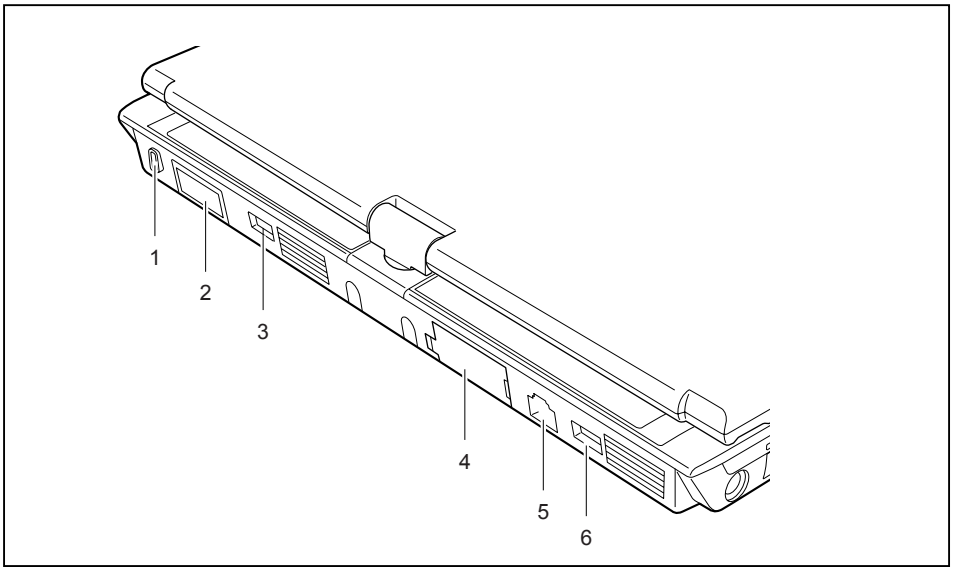
1 = LCD screen
2 = Webcam
3 = Tablet buttons
4 = ON/OFF switch
5 = Status indicators
6 = Loudspeakers
7 = Keyboard
8 = ON/OFF switch for radio components
9 = Touchpad
10 = Touchpad buttons
11 = Fingerprint sensor
12 = Scroll sensor

Left side



1 = DC input connector (DC IN)
2 = Attachment eye for the pen cord
3 = Microphone port
4 = Headphone port
5 = USB port
6 = FireWire connection (IEEE1394)
7 = ExpressCard slot
8 = Memory card slot
9 = SmartCard reader
10 = Pen slot

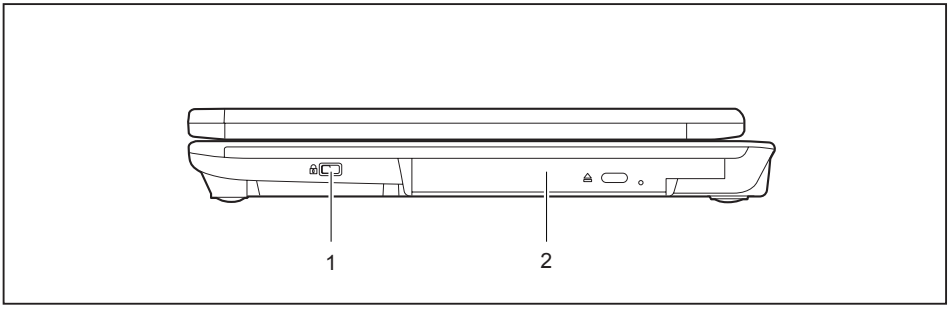
Rear



1 = Kensington Lock
2 = SIM card slot
3 = USB port
4 = VGA monitor port (analogue)
5 = LAN port
6 = USB port

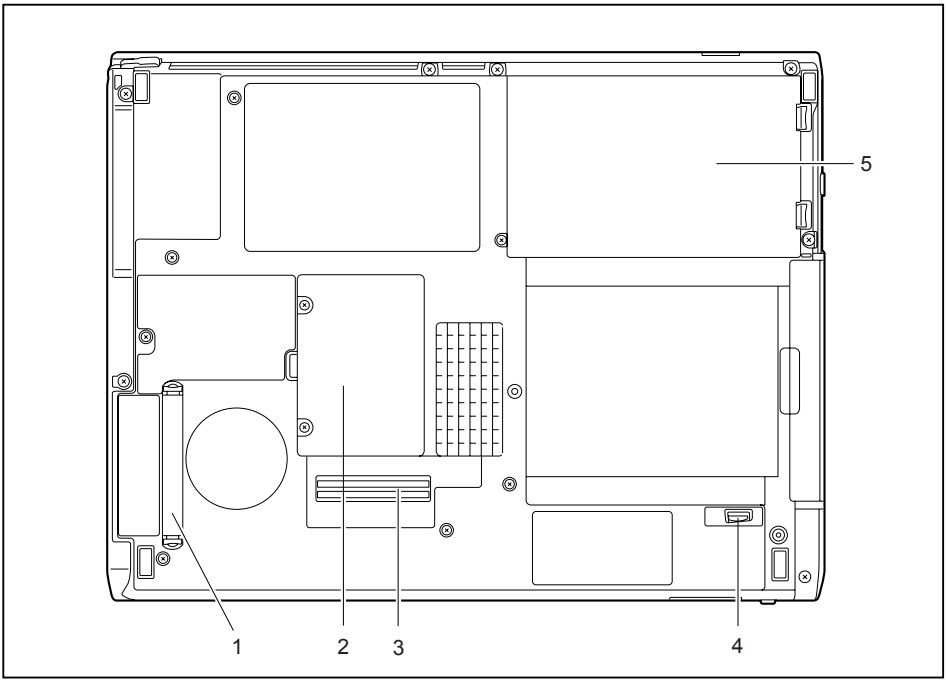
The SIM card slot, LAN port and VGA monitor port are protected with covers.

Right side



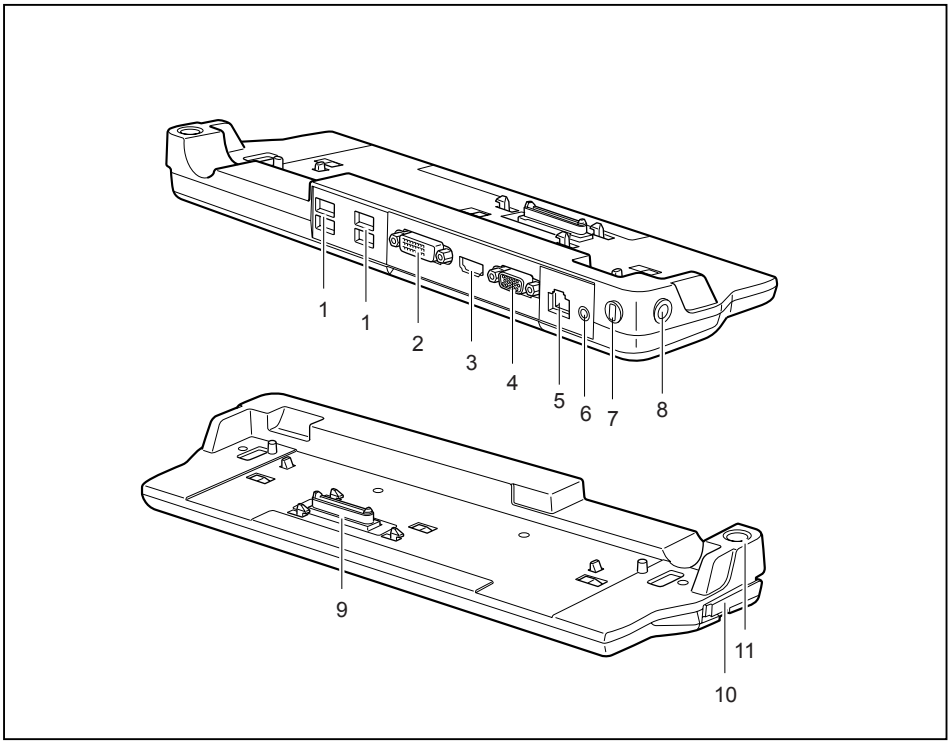
1 = Kensington Lock
2 = Module bay for drive or second battery

Underside



1 = Air filter
2 = Memory service compartment
3 = Connection for port replicator
4 = Eject lever for module in module bay
5 = Battery compartment

Ports on the port replicator (accessory for LIFEBOOK T5010)



1 = USB ports
2 = DVI-D monitor port (digital)
3 = HDMI port
4 = VGA monitor port (analogue)
5 = LAN port
6 = Headphone port
7 = Kensington Lock
8 = DC input connector (DC IN)
9 = Connection for LIFEBOOK T5010
10 = Unlock
11 = ON-/OFF switch

i

Some of the devices that you connect require special drivers (see the operating system and device documentation).

Preparing the notebook for use

Observe the relevant notes in the "Important notes" chapter and in the manual about your radio component.

You must charge the battery and install the application programmes before you can work with the notebook. The operating system and drivers required are preinstalled.

When not plugged into a mains outlet, the notebook runs on its built-in battery. You can increase the battery's life by enabling the system's energy saving functions.

If you use the notebook in a normal office situation, run it from the mains using the mains adapter.

Please refer to “Connecting external devices" for instructions on how to connect external devices such as a mouse or a printer to the notebook.

Unpacking and checking the delivery

- ► Unpack all the individual parts.
- ► Check the delivery for damage incurred during transportation.
- ► Check whether the delivery agrees with the details in the delivery note.

Should you discover that the delivery does not correspond to the delivery note, notify your local sales outlet immediately.

Do not discard the original packing material of the devices. You may need the packaging in the future if you need to transport your device.

Spare tips and the pen tip removing tool are included in the pen package.

Selecting a location

Select a suitable location for the notebook before setting it up. Consider the following points when looking for a location:

- Never place the notebook on a soft surface (e.g. carpeting, upholstered furniture, bed). This can block the air vents and cause overheating and damage.
- Do not place the notebook on your legs for a long period of time. The underside of the notebook heats up during normal operation. Long periods of contact with the skin can become unpleasant or even result in burns.
- Place the notebook on a stable, flat, nonslippery surface. Please note that the rubber feet may mark certain types of surfaces.
- Never place the notebook and the mains adapter on a heat-sensitive surface.
- Never cover the ventilation slots or the mains adapter of the notebook.
- Do not expose the notebook to extreme environmental conditions.
  Protect the notebook from dust, humidity, and heat.

Connecting the mains adapter

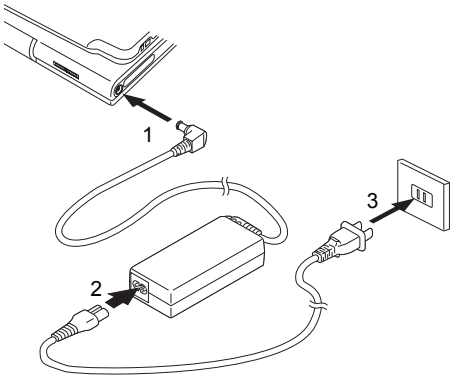
Follow the instructions in "Selecting a location".

The power cable supplied conforms to the requirements of the country in which you purchased your notebook. Make sure that the power cable is approved for use in the country in which you intend to use it.

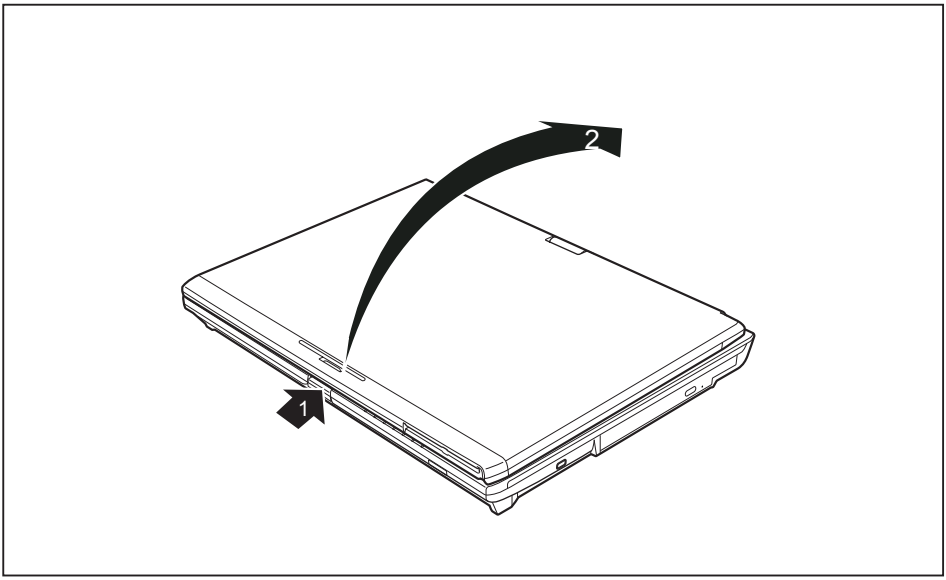
The mains adapter's power cable must only be connected to a mains socket if the notebook is connected to the mains adapter.

Do not use the mains adapter for other devices.

Do not use a mains adapter that is not specially intended for this notebook.



- ► Connect the mains adapter cable to the DC jack (DC IN) of the notebook (1).
- ► Connect the power cable to the mains adapter (2).
- ► Plug the power cable into a mains outlet (3).



► Press the release button (1), and unfold the LCD screen upwards (2).

The power-on indicator of the notebook is lit.

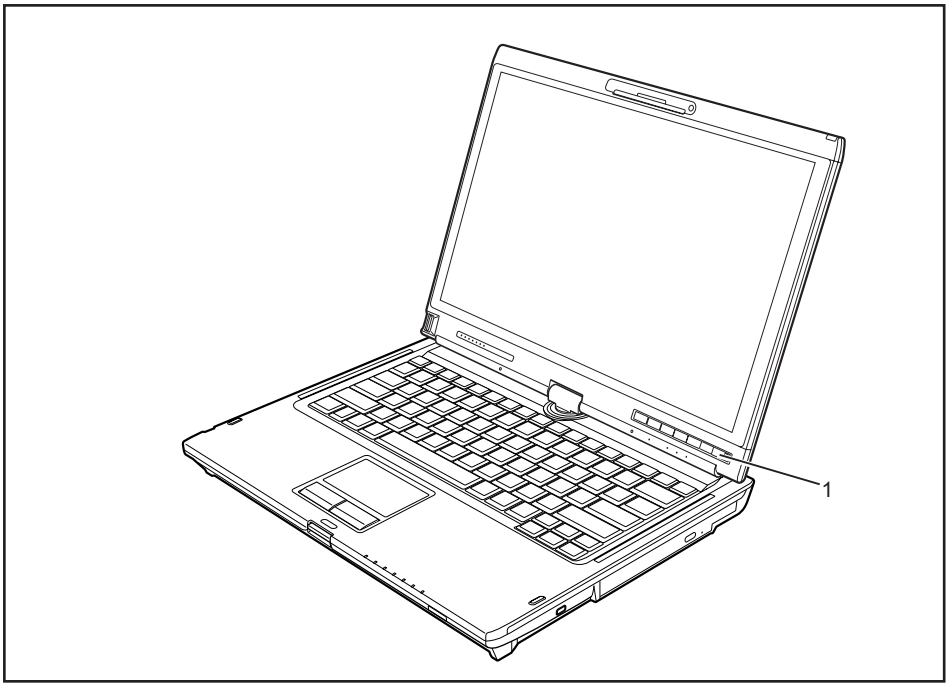
The battery will charge. On or both battery charge indicators light-up.

i The meaning of the various displays can be found in the section "Status indicators".

Switching the notebook on for the first time

When you switch your notebook on for the first time, the supplied software is installed and configured. Due to the fact that this installation procedure must not be interrupted, you should set aside enough time for it to be fully completed and connect the notebook to the mains outlet using the mains adapter.

During installation, the notebook may only be rebooted when you are requested to do so!



► Slide the ON/OFF switch (1) to the right to switch on the notebook.

The ON/OFF switch returns automatically to its original position.

► During installation, follow the instructions on screen.

Consult the operating system manual if anything is unclear about the requested input data.

On the "Drivers & Utilities" CD/DVD or on the Internet at: *http://ts.fujitsu.com/support* you will find further information about your system, as well as drivers, tools, updates, manuals, etc.

If you want to use the pen, you will find further information in chapter "Using your notebook".

Using your notebook

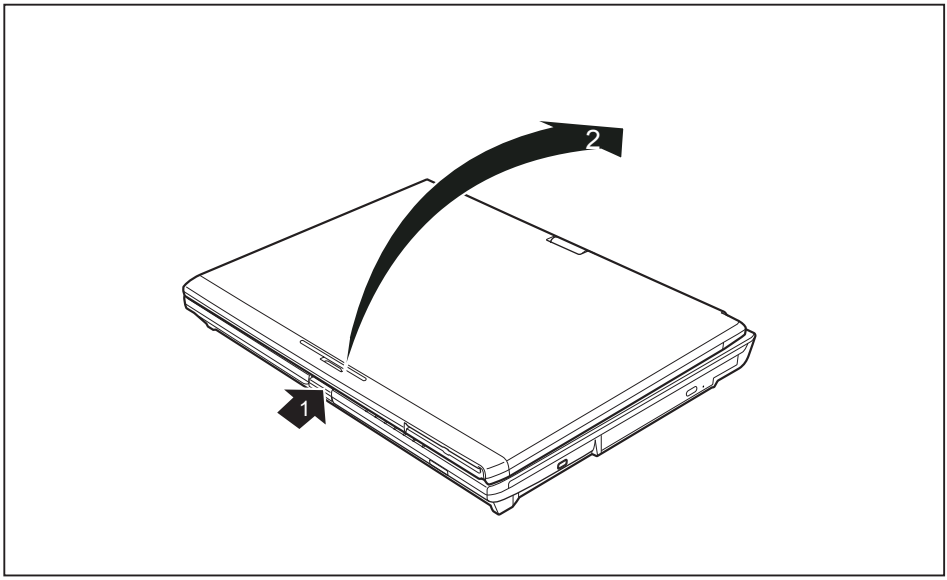
This chapter describes the basics for operating your notebook.

Please refer to "Connecting external devices" for instructions on how to connect external devices such as a mouse or a monitor to the notebook.

Please refer to the notes in the "Important notes" chapter.

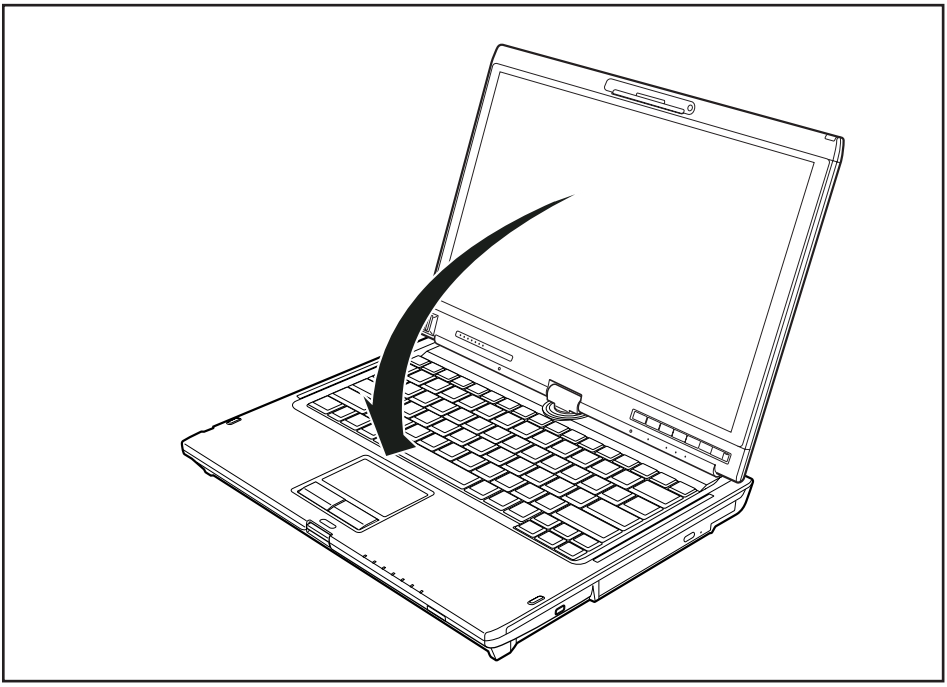
Opening and closing the notebook

Opening the notebook



► Press the release button (1), and unfold the LCD screen upwards (2).

Closing the notebook



► Close the LCD screen onto the bottom half of the notebook with the glass facing inward until you can feel it lock into place.

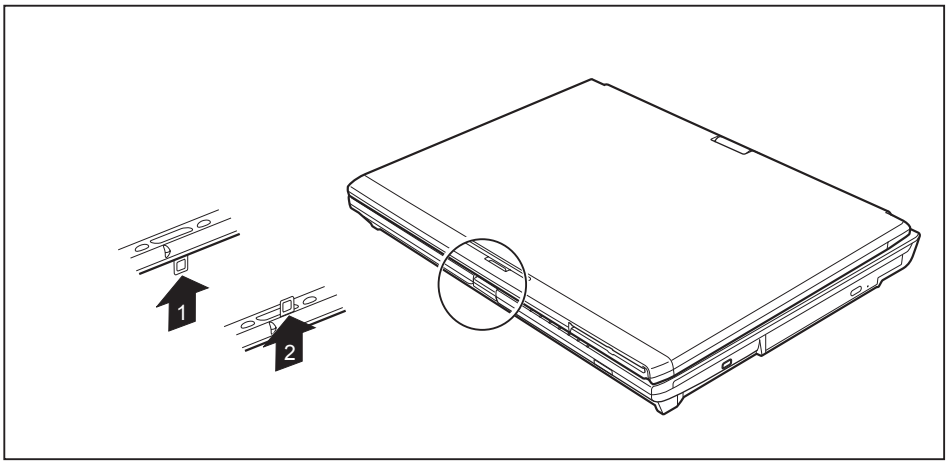
Different ways to use your notebook

During your daily work, you can use your notebook as a tablet PC or as a notebook, just as you wish. The "conversion" is lightning fast and effortless.

Note the direction of rotation in the following description! No guarantee claims can be met for damage caused by turning in the wrong direction.

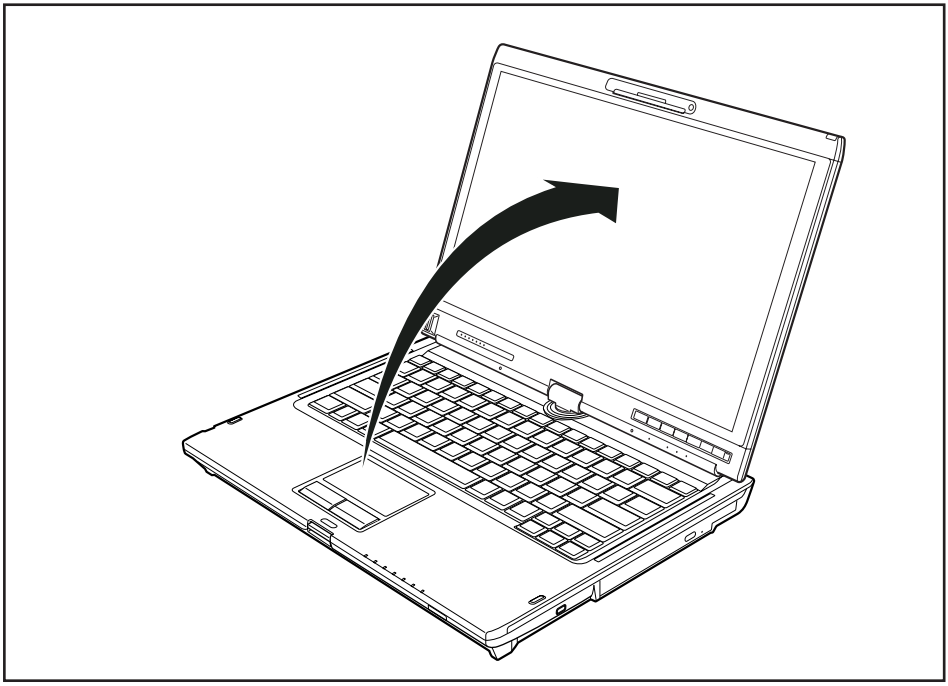
You must note that the display cannot be turned completely on its own axis!

From notebook to Tablet PC

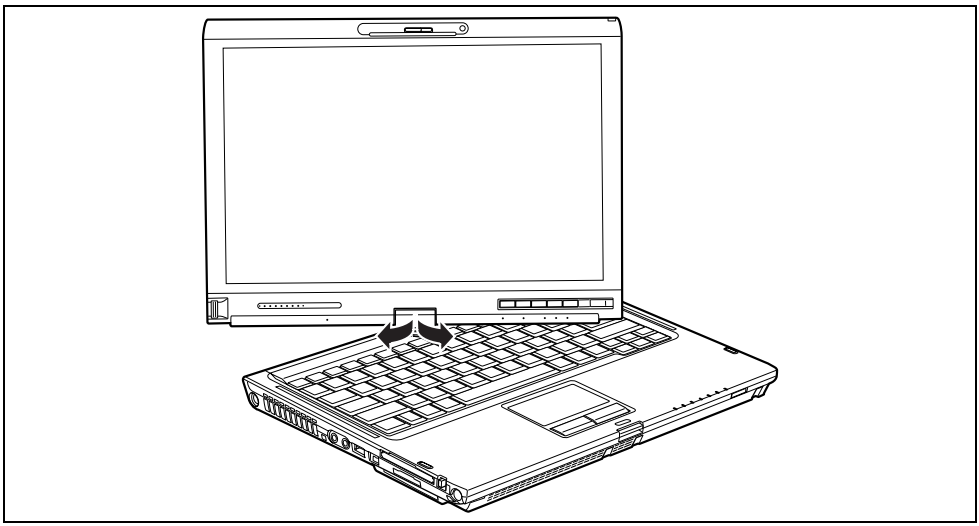


► Press the release button, and unfold the LCD screen somewhat upward.

► Rotate the hook from position 1 to position 2.

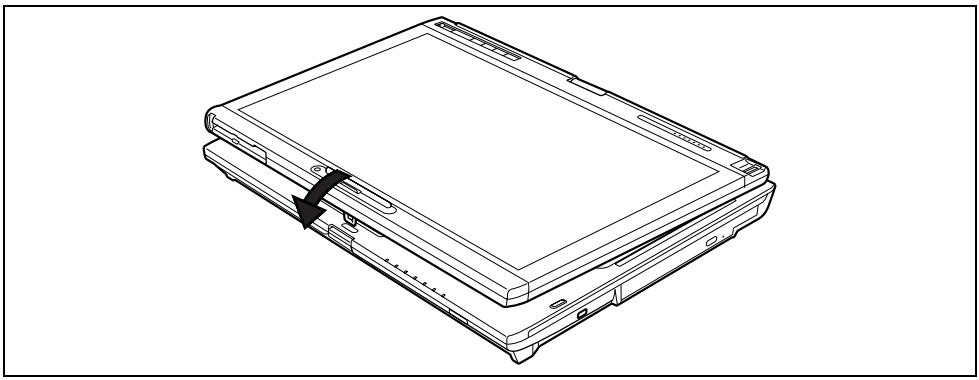


► Raise the display into a vertical position.



► Hold the screen as low as possible on both sides. Turn the screen to the left or right in the direction of the arrow. At first you will feel slight resistance and then the display will turn easily and without friction.

► Turn or twist the display further until it has turned 180° and the hinge latches in.



► Now fold the screen down until the back of the screen is flat on top of the keyboard and the hook latches in.

The display is now secured in the tablet position.

Please note the following points to protect the display from scratches:

- Only use the pen provided with your notebook.
- Replace the pen tip if it is worn (see "Setting the pen").
- Avoid contact with any sharp edges such as wrist watches or finger nails.
- Do not lay anything on the display.

Select display orientation (portrait or landscape orientation)

You can choose to use either portrait or landscape orientation for the display. Press the Tablet button to switch from one display orientation to the other.

The display switches automatically to portrait layout when the device is used as a Tablet PC and to landscape layout when it is used as a notebook.

Windows XP

You can change these settings in the Fujitsu menu or under *Start – (Settings –) Control Panel – Tablet and Pen Settings*.

Windows Vista

You can change these settings in the Fujitsu menu or under *Start – (Settings –) Control Panel – Mobile PC – Tablet PC – Settings*.

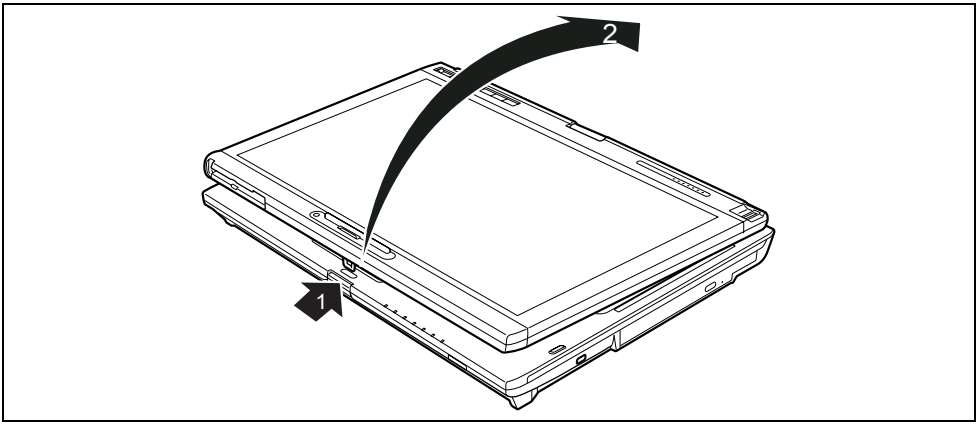
Windows 7

You can change these settings in the Fujitsu menu or under *Start – (Settings –) Control Panel – Hardware and Sound – Display – Settings*.

Profiles for operating with various different screen modes can be selected via the *Fujitsu Tablet Control* menu. These profiles have preset standard configurations that can be modified as desired.

These settings do not just affect the monitor settings on the Tablet PC, but also any external monitors that may be connected.

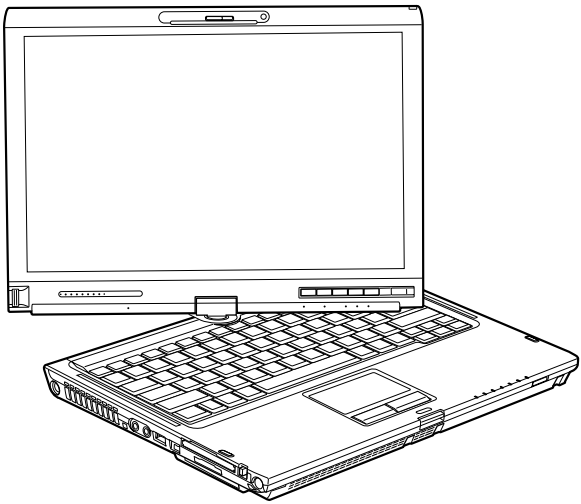
From Tablet PC to notebook



► Press the release button (1), and unfold the LCD screen upwards (2).

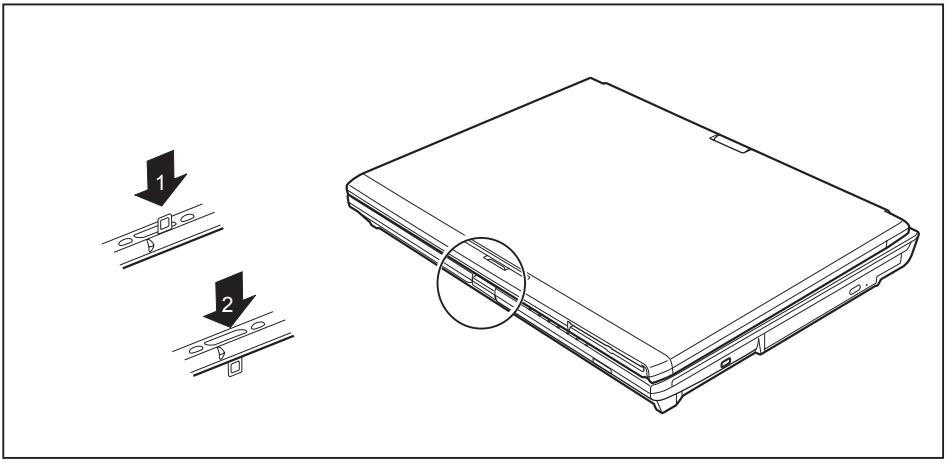
► Open the display until it is in the vertical position.

Note the direction of rotation in the following description! No guarantee claims can be met for damage caused by turning in the wrong direction.



- ► Hold the display on both sides as far down as possible and then turn the display. It turns easily and without resistance.
- ► Turn or move the display further until it has turned 180° and the hinge latches in.

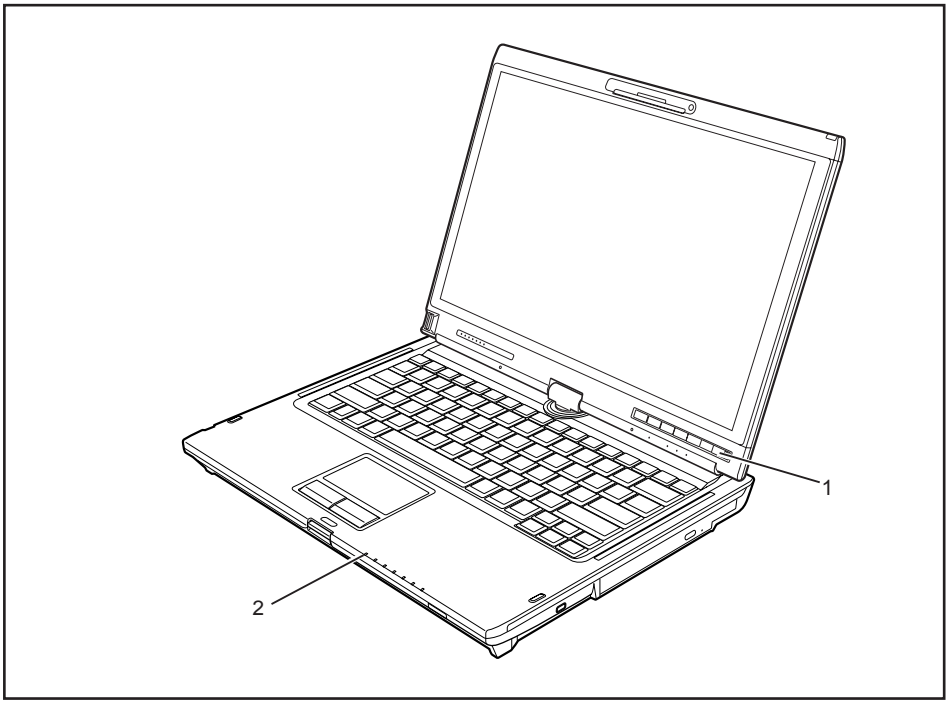
To be able to close the notebook again:



► Rotate the hook from position (1) to position (2).

Switching the notebook on and off

Switching on the notebook



► Slide the ON/OFF switch (1) to the right to switch on the notebook.

The ON/OFF switch returns automatically to its original position.

The power-on indicator (2) lights.

After switch-on a self-test (POST, Power On Self Test) is automatically carried out. Never switch the notebook off during the self-test.

Windows XP

You can configure the ON/OFF switch under *Start – (Settings) - Control Panel - Performance and Maintenance - Power Options - Advanced*.

Windows Vista

You can configure the ON/OFF switch under *Start - (Settings) - Control Panel – Mobile PC - Power Options*.

Windows 7

You can configure the ON/OFF switch under *Start - (Settings) - Control Panel – System and Security - Power Options*.

If you have assigned a password, you must enter this when requested to do so, in order to start the operating system. Detailed information on this can be found in the chapter "Safety notes".

Switching the notebook off

► Close all programmes and shut down your operating system (please see operating system manual).

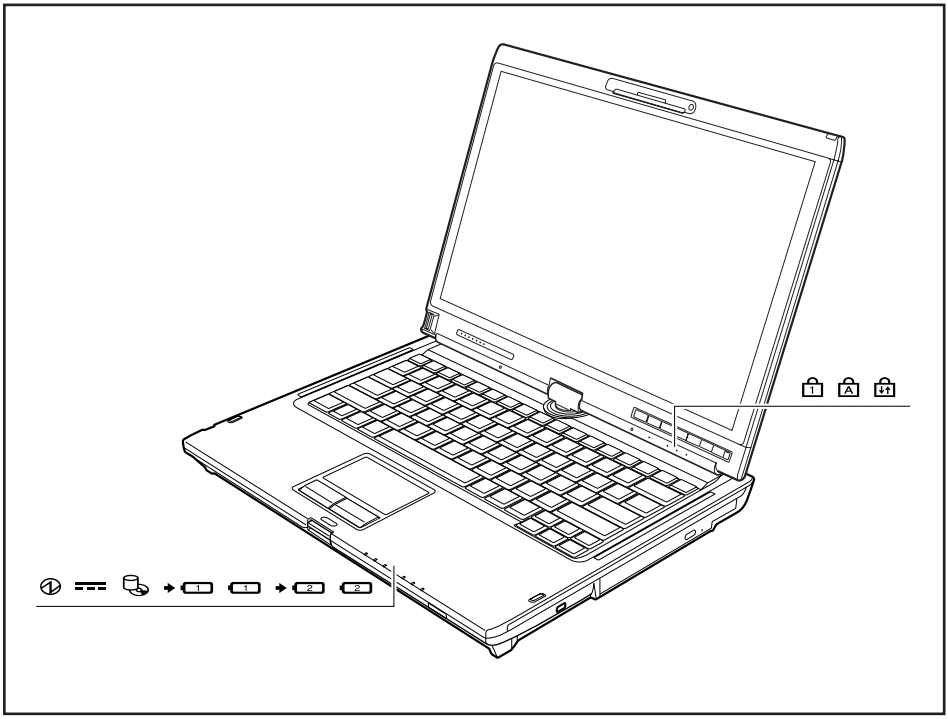
► Slide the ON/OFF switch (1) to the right.

The ON/OFF switch returns automatically to its original position.

► Close the notebook (see "Closing the notebook").

Status indicators

The status indicators provide information about the status of the power supply, the drives and the keyboard functions etc.



Power indicator

- Indicator is illuminated: The notebook is switched on.
- Indicator flashes: The notebook is in sleep mode (Save-to-RAM).
- The indicator is not illuminated: The notebook is switched off or in Save-to-Disk mode.

Power supply indicator

Indicator is illuminated: The mains adapter is supplying power to the notebook.

Hard disk indicator

Indicator is illuminated: The hard disk drive or the CD/DVD in the optical drive of the notebook is being accessed.

Battery charging indicator

This description applies for both batteries.

The battery charging indicator shows whether a battery is installed and being charged.

Battery indicator

This description applies for both batteries.

The battery indicator shows the state of charge of the two installed batteries.

- The indicator lights up blue: The battery is between 50 % and 100 % charged.
- The indicator lights up orange: The battery is between 13 % and 49 % charged.
- The indicator lights up red: The battery is between 0 % and 12 % charged.
- Indicator flashes orange: The battery state of charge is being checked (for four seconds after battery installation).
- Indicator flashes red: The battery is faulty.
- The indicator is not illuminated: There is no battery installed.

If you use batteries with a capacity of 5800 mAh, you can also check the state of charge on the battery itself (see “Batteries with a capacity of 5800 mAh“).

Num Lock indicator

Indicator is illuminated: the Num key has been pressed. The virtual numeric keypad is activated. You can output the characters located at the upper right on the keys.

Caps Lock indicator

Indicator is illuminated: the Caps Lock key has been pressed. All letters will be output in uppercase. If a key has several symbols on it the upper left character will be output.

Scroll Lock indicator

Indicator is illuminated: the key combination Fn + Scr has been pressed. The effect that this key has varies between applications.

Language selection (Windows XP only)

Your notebook is supplied with the Windows XP Tablet PC Edition operating system as a single or multi-language version (according to your preference).

In the single language version, you are presented with two handwriting recognition input areas, one for the operating system language and one for English.

In the multi-language version, you have the option of setting the language of the menu texts and the keyboard as well as that of the handwriting recognition.

With the multi-language models, the default language set for the menu texts, keyboard and handwriting recognition is English.

Specifying the language variant for multi-language models

Selecting the language variant for menu texts

- ► Click on *Control Panel - Date, Time, Language and Regional Options - Language and Regional Options*.
- ► Set the desired language on the *Regional Options* tab.

Selecting the language for handwriting recognition and keyboard

- ► Click on *Control Panel - Date, Time, Language and Regional Options - Language and Regional Options*.
- ► Select the *Languages* tab.
- ► Click on the *Details* button in the *Text services and input languages* field.
- ► In the next dialog window, select the *Settings* register card and click the *Add* button in the *Installed services* field.
- ► In the next dialog window, select the desired *Input area schema*.

You can now decide which functions (keyboard layout, handwriting recognition, etc.) the selected input area schema is to be activated for.

- ► Mark the desired functions and then confirm your entries by clicking the *OK* button.

You will find further information in the Windows XP Tablet PC Edition operating system help.

Handwriting recognition under Windows Vista

At present, handwriting recognition under Windows Vista supports the following languages:

English, German, French, Italian, Japanese, Korean, Chinese (traditional and simplified), Dutch, Spanish, Portuguese and Brazilian.

Handwriting recognition under Windows 7

At present, handwriting recognition under Windows 7 supports the following languages:

English, German, French, Italian, Japanese, Korean, Chinese (traditional and simplified), Dutch, Portuguese, Spanish, Brazilian, Norwegian (Bokmål and Nynorsk), Swedish, Finnish, Danish, Polish, Rumanian, Serbian (Cyrillic and Latin script), Catalan, Russian, Czech and Croatian.

LCD screen

Notes about the LCD screen

If you use the device as a tablet PC, you can also use the LCD screen as a touch screen. Detailed information on this can be found in the chapter Using the Touch Screen.

High-quality TFT displays with especially bright background lighting are installed in notebooks from Fujitsu Technology Solutions GmbH. For technical reasons, TFT monitors are manufactured for a specific resolution. An optimal, clear picture can only be ensured with the correct resolution intended for the relevant TFT monitor. A monitor resolution which differs from the specification can result in an unclear picture.

The monitor resolution is understood to be the number of horizontal and vertical pixels (i.e. picture elements) which make up the monitor display. For example, "UXGA" stands for 1600 x 1200 pixels. Each pixel consists of three so-called subpixels of the colours red, green and blue. As a result, a UXGA monitor consists of 1600 x 1200 x 3 = 5.760.000 subpixels.

Frequently used monitor resolutions	**Number of pixels**
XGA	1024 x **768**
WSXGA (Wide SXGA)	**1280 x 768**
WXGA	**1280 x 800**
SXGA	**1280** x 1024
HD	1366 x 768
SXGA+	**1400** x **1050**
UXGA	1600 x 1200
WUXGA	1920 x 1200

The correct screen resolution for your notebook is specified in the corresponding section in the chapter "Technical data".

Current production technology cannot guarantee an absolutely fault-free screen display. A few isolated constantly lit or unlit pixels (picture elements) may be present. The maximum permitted number of such faulty pixels is specified in the international standard ISO 9241-3 (Class II).

Example:

A screen with a resolution of 1280 x 800 has 1280 x 800 = 1024000 pixels. Each pixel consists of three subpixels (red, green and blue), so there are over 3 million subpixels in total. According to ISO 9241-3 (class II), a maximum of 2 light and 2 dark pixels and in addition 5 light or 10 dark subpixels or an equivalent mix (1 light subpixel counts as 2 dark subpixels) are allowed to be defective.

Pixel	A pixel consists of 3 subpixels, normally red, green and blue. A pixel is the smallest element that can be generated by complete functionality of the display.
Subpixel	A subpixel is a separately addressable internal structure within a pixel that enhances the pixel function.
Cluster (= group of faults)	A cluster contains two or more defective pixels or subpixels in a 5 x 5 pixel block.

Background lighting

TFT monitors are operated with background lighting. The luminosity of the background lighting can decrease during the period of use of the notebook. However, you can set the brightness of your monitor individually.

Screen settings (when using the device as a notebook)

Adjusting the resolution under Windows XP

You can change the screen resolution under *Start – (Settings)* - *Control Panel* - *Display* - *Settings* in the *Resolution* field.

Adjusting the resolution under Windows Vista

You can change the screen resolution under *Start – (Settings)* - *Control Panel – Mobile PC* - *Personalization* - *Settings* in the *Resolution* field.

Adjusting the resolution under Windows 7

You can change the screen resolution under *Start – (Settings)* - *Control Panel – Hardware and Sound – Display* - *Settings* in the *Resolution* field.

Adjusting the font size

Under *Start – (Settings) – Control Panel – Mobile PC – Customization* you can choose between a larger and a smaller font.

Adjusting the brightness of the display

You can adjust the brightness of your LCD display with the keys Fn + F6 or Fn + F7 : You can reduce screen brightness with Fn + F6, or increase it with Fn + F7.

Synchronising the display on the LCD screen and an external monitor

Your notebook supports simultaneous display on the LCD screen and an external monitor. If the picture does not appear correctly on the LCD monitor, press the key combination Fn + F10 several times, or switch the external monitor off and then on again. This achieves good picture synchronisation.

Screen settings (when using the device as a Tablet PC)

Adjusting the brightness of the display

You can adjust the maximum and minimum screen brightness directly via the F8 menu under *Screen Brightness*.

Synchronising the display on the LCD screen and another monitor

Press the key combination Fn + .

Using a notebook as a tablet PC

You can execute commands as follows:

- Using the stylus pen (supplied with your device).
- Using your finger (only with Dual Digitizer technology).

Using your finger (only with Dual Digitizer technology)

i Everything which you can select or activate using your finger tip can also be selected or activated using the stylus pen.

You can execute certain commands by using your finger tip on the touchscreen of your device.

Selecting menu items (click with the left mouse button)

► Touch the menu item with your finger tip.

Starting programs (double-click with the left mouse button)

► Briefly touch the program icon twice with your finger tip.

Moving objects/windows (drag while holding the left mouse button pressed)

► Place your finger tip directly on the object/window, hold it pressed against the screen and move the desired object/window.

Opening a context menu (click with the right mouse button)

► Touch the desired item once with your finger tip.

The context menu appears.

Moving the cursor

► Place your finger tip on the screen and move your finger in the direction required.

Scrolling

► Use one finger to quickly stroke across the screen upwards, downwards, left or right to navigate through the document or to quickly page through the document.

Dragging

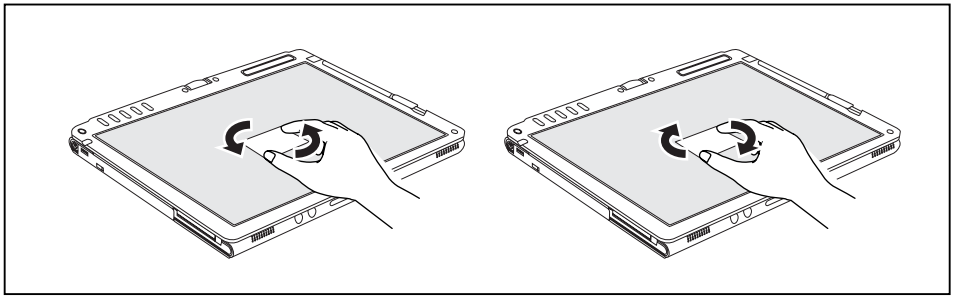
► Place your finger on an item on the screen and then move your finger without removing it from the display; this will drag the item to another position. You can also use this movement to page slowly through documents.

Contracting and extending

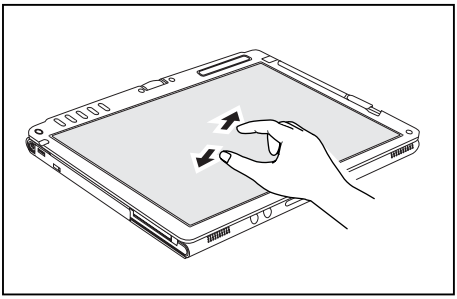
► Touch the screen at two edges of an area with two fingers spread apart, then slide the fingers together to make the area smaller. Spread the fingers to make the area larger.

Rotating

► Touch two corners of a picture on the screen, then turn the picture clockwise or counter-clockwise at the corners by using your fingers.

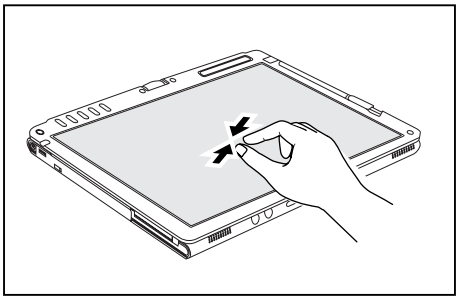


Enlarging a view



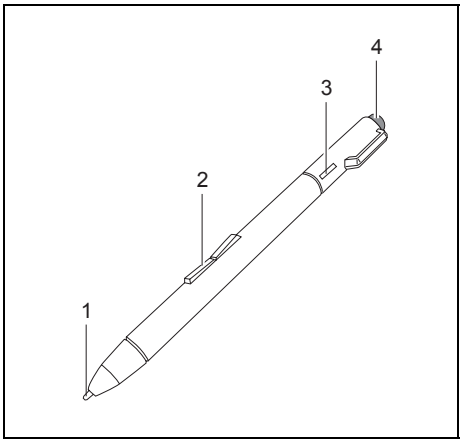
► Put two fingers on the touch screen and move them apart.

Reducing a view



► Put two fingers on the touch screen and move them towards each other.

Using the pen



1 = Pen tip
2 = Rocker button
3 = Eyelet for pen cord
4 = Eraser

You can use the pen on your notebook as an electronic writing implement to select items and to navigate through menu options and programs. Programs that support handwriting recognition also allow you to write characters directly on the screen with the pen. You can also use the pen as a drawing tool. You can use the eraser (1) on the pen to delete previously written or drawn inputs.

The notebook pen is retained securely in the pen slot. This ensures that the pen cannot be lost, regardless of whether you use the notebook as a Tablet PC or as a notebook, or transport it while travelling. Always replace the pen in its slot when you are not using it.

The notebook is supplied with a pen cord which you can attach to the eyelets on the pen and on the notebook.

Only use the pen provided with your notebook. Do not use substitute pen tips that were not specially designed for your notebook. Replace the stylus tip if it is worn. The warranty does not cover a scratched screen.

While writing, you should watch out that you do not scratch the surface of the display (e.g. with a wristwatch or bracelet).

The LIFEBOOK T Series pen of your notebook is an electronic instrument which can be damaged if used improperly. Handle the pen with care.

The following list contains guidelines for proper pen handling:

- Do not gesture with the pen.
- Do not use the pen as a pointer.
- Never use the pen on any other surface than the screen of your notebook.
- Do not try to turn the thumb grip on the pen. The thumb grip is used to place the pen in its slot and to take it out of the slot.
- Never store the pen with the tip bearing the weight of the pen (e.g., sitting tip down in a pencil cup). If the pen is stored with the tip pointing down, this may have an adverse effect on the pen mechanism (particularly under high temperatures). In this case the pen tip may react as though it is constantly being pressed down. To avoid damage, the pen should be stored in the pen garage when not in use.

The pen can be influenced by electromagnetic fields (cursor quivers or jumps). There may be a few areas on the screen where the cursor quivers slightly in spite of pressing the pen down firmly.

The screen reacts to pen input when the distance between the pen tip and the screen is less than 3 to 5 mm.

With the pen you can run all functions for which you otherwise use a mouse. In addition, you can very conveniently delete hand-written pen entries using the pen.

Select menu entries (click with the left mouse button)

► Touch the menu entry with the pen tip.

Start programs (double-click with the left mouse button)

► Briefly touch the program symbol twice consecutively with the pen tip.

Move objects/windows (drag with left mouse button pressed)

► Place the pen tip directly on the object/window, hold the pen tip pressed against the screen and move the desired object/window.

Open context menu (click with the right mouse button)

► Touch the desired element with the stylus and leave the stylus on the element for a moment.

Or

► Press the front part of the rocker button (facing toward the pen tip) and simultaneously touch the corresponding position with the pen tip.

Moving the cursor

► Hold the pen tip less than 3 to 5 mm from the screen and move the pen.

Setting the pen

Windows XP

Under *Fujitsu Pen Settings* or *Tablet and Pen Settings* in the control panel you can change various settings for the pen (pressure sensitivity, assignment and function of the rocker button).

Windows Vista

Under *Start – (Settings) – Control Panel – Mobile PC – Pen Settings* or *Tablet PC Settings* in the control panel you can change various settings for the pen (pressure sensitivity, assignment and function of the rocker button).

Windows 7

Under *Hardware and Sound – Pen and Input Devices* in the Control Panel you can change various settings for the pen (assignment and function of the rocker button).

Calibrating the pen

Before using the pen for the first time, you should calibrate it so that the cursor follows the movements of the pen as accurately as possible. You should also always repeat the calibration if the co-ordination between the pen and cursor movement deteriorates.

Windows XP

To calibrate, run the *Tablet and Pen Settings* function in the Control Panel. You need to calibrate both portrait and landscape formats.

Windows Vista

To calibrate, run the *Tablet PC Settings* function in the Control Panel. You need to calibrate both portrait and landscape formats.

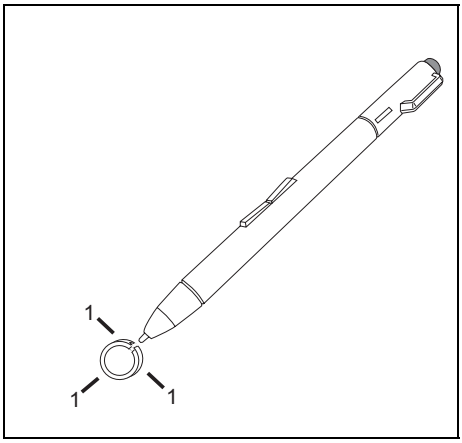
Windows 7

To calibrate, run the *Hardware and Sound / Tablet PC Settings* function in the Control Panel. You need to calibrate both portrait and landscape formats.

Replacing the pen tip

With use, the pen tip may become worn or may pick up foreign particles that can scratch the screen. A damaged or worn tip may not move freely, causing unpredictable results when using the pen.

If your pen exhibits these problems, you should replace the pen tip. To do so, use the pen tip removal tool included with your pen.



► To remove the tip; position the tip in the gap between the two ends of the tip changer.

► Pinch the two ends of the tip changer together so that the tip is firmly clasped (1), then pull it from the barrel.

► To replace the tip, retrieve one of the new tips that accompanied your pen. Insert the flat end of the tip into the barrel and push it in firmly until it is seated.

i If the tip is worn or damaged, discard it.

Installing a pen cord

You can attach the pen with a pen cord to prevent accidentally dropping it or losing it.

► Attach the end of the pen cord with the smaller loop to your pen.

Attach the end of the pen cord with the larger loop to your notebook.

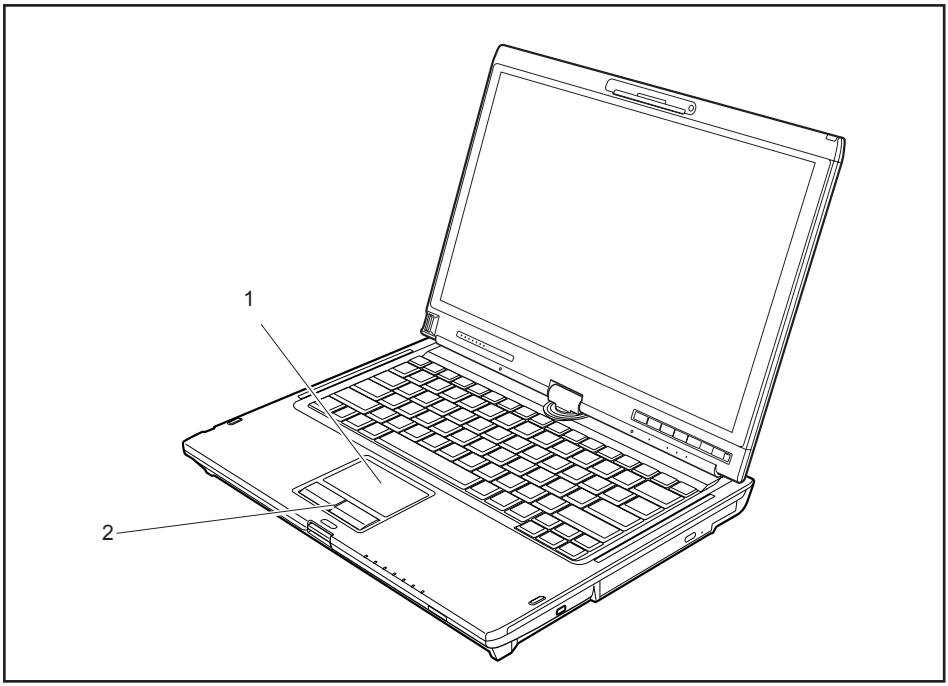
Using a notebook

Touchpad and touchpad buttons

Keep the touchpad clean. Protect it from dirt, liquids, and grease.

Do not rest heavy objects (e.g. books) on the touchpad or the touchpad buttons.

The touchpad enables you to move the mouse pointer on the screen. The touchpad buttons allow you to select and execute commands. The buttons correspond to the buttons on a conventional mouse.



1 = Touchpad

2 = Touchpad buttons

Moving the pointer

► Move your finger on the touchpad.

Selecting an item

► Move the pointer to the item you wish to select.

► Tap the touchpad once or press the left button once.

Executing a command

► Move the pointer to the field you wish to select.

► Tap the touchpad twice or press the left button twice.

Dragging an object

► Select the desired object.

► Press and hold the left button and drag the object to the desired position with the finger on the touchpad.

Switching the touchpad on and off

If you wish, you can connect a USB mouse and then navigate with it instead of the touchpad. In this case, you can disable the touchpad. This ensures that the touchpad does not react to accidental touches.

► Press the key combination Fn + F4 to switch off the touchpad.

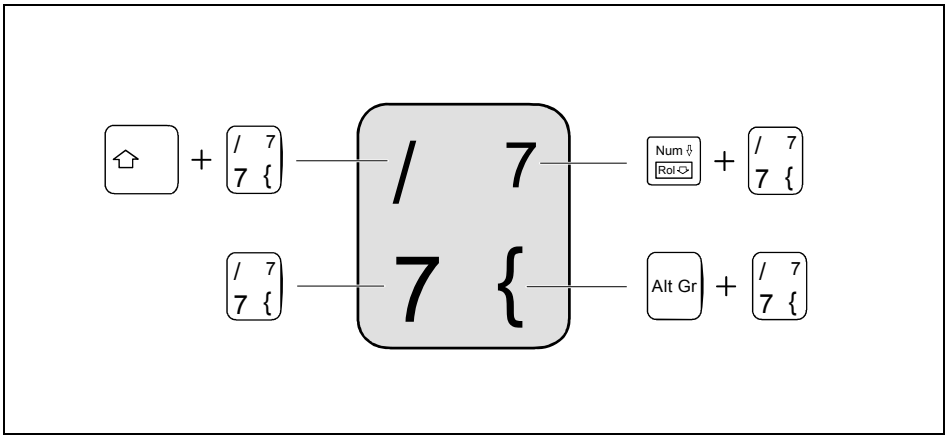
► Press the key combination Fn + F4 to switch the touchpad back on again.

Keyboard

The keyboard of your notebook is subject to continuous wear due to normal use. The keyboard markings are subjected to particularly high loads. The keyboard markings can wear off in the course of using the notebook.

The keyboard has been designed to provide all the functions of an enhanced keyboard. Some enhanced keyboard functions are mapped with key combinations.

The following description of keys and key combinations refers to Windows.



Backspace key

The Backspace key deletes the character to the left of the cursor.

Tab key

The Tab key moves the cursor to the next tab stop.

Enter key (return)

The enter key terminates a command line. The command you have entered is executed when you press this key.

Caps Lock key

The Caps Lock key activates uppercase mode (Caps Lock indicator lit). The Caps Lock function causes all the characters you type to appear in uppercase. In the case of overlay keys, the character printed on the upper left of the key appears when that key is pressed.
To cancel the Caps Lock function, simply press the Caps Lock key again.

Shift key

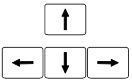
The Shift key causes uppercase characters to appear. In the case of overlay keys, the character printed on the upper left of the key appears when that key is pressed.

Alt Gr key

The **Alt Gr** key allows one to type the characters printed on the lower right of the keycaps (e.g. { in the case of the **7** key on the German keyboard).

Fn key

The **Fn** key enables the special functions indicated on overlay keys (see "Key combination").



Cursor keys

The cursor keys move the cursor in the direction of the arrow, i.e. up, down, left, or right.

Pause key

The **Pause** key temporarily suspends display output. Output will resume when you press any other key.

Start button

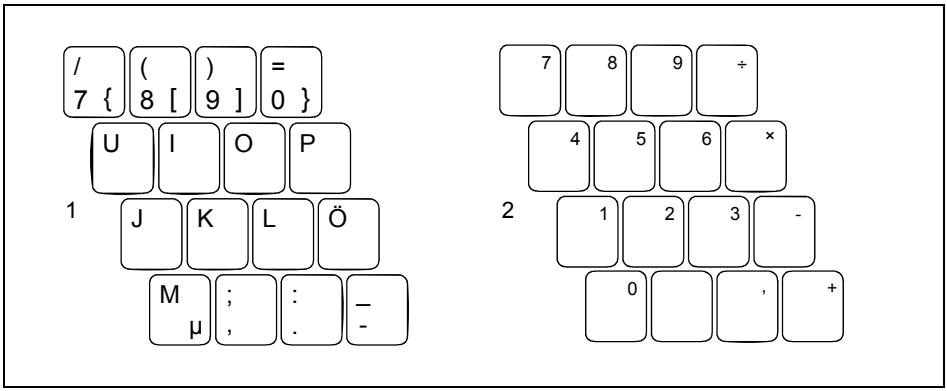
The Start key opens the Windows Start menu.

Menu key

The Menu key invokes the menu for the marked item.

Virtual numeric keypad

The keyboard of your notebook does not have a separate number block. To provide the convenience of a numeric keypad, your keyboard is equipped with a virtual numeric keypad. The special keys of the virtual numeric keypad are recognisable by the numbers and symbols printed in the upper right corner of each key. If you have switched on the virtual numeric keypad, you can output the characters shown on the upper right of the keys.



1 = Characters enabled when Num Lock indicator is not lit
2 = Characters enabled when Num Lock indicator is lit

Key combination

The following description of key combinations refers to functions when using Microsoft Windows. Some of the following key combinations may not function in other operating systems and with some device drivers.

Key combinations are entered as follows:

- ► Press and hold the first key in the combination.
- ► While holding the first key down, press the other key or keys in the combination.

Fn + F3

Switching the loudspeaker on and off

This key combination switches your device's integrated loudspeakers off and on.

Fn + F4

Switching the touchpad on/off

This key combination enables and disables the touchpad.

Fn + F6

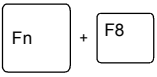
Decreasing screen brightness

This key combination decreases screen brightness.

Fn + F7

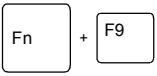
Increasing screen brightness

This key combination increases screen brightness.



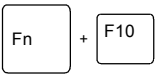
Decreasing the volume

This key combination reduces the volume of the integrated loudspeakers.



Increasing the volume

This key combination raises the volume of the integrated loudspeakers.



Switching between screen outputs

If an external monitor is connected, the monitor on which the output is to be displayed can be selected with this key combination.

You can opt to use:

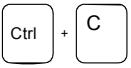
- just the notebook's LCD screen
- just the external monitor
- both the LCD screen and the external monitor.

Press the key combination several times to switch through all possible settings.

If you have connected two external monitors to the port replicator, the following display outputs are possible:

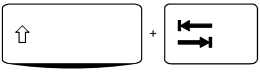
- just the notebook's LCD screen
- just the external monitor (analog)
- both the LCD screen of the notebook and the external monitor (analog)
- just the external monitor (digital)
- both the LCD screen of the notebook and the external monitor (digital)

You cannot switch output to both external monitors on the Port Replicator via the key combination.



Halt an operation

This key combination can be used to halt an operation instantly without clearing the keyboard buffer.

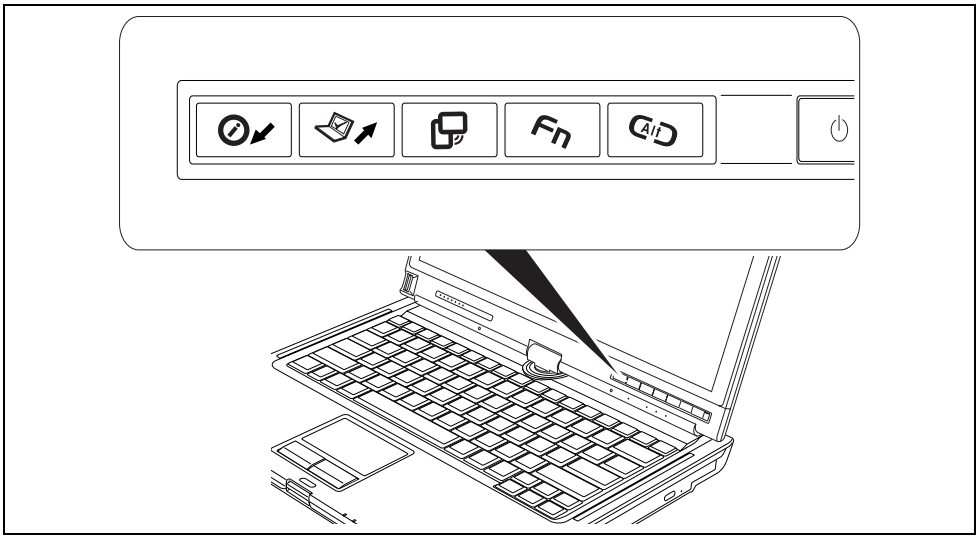


Backtab

This key combination moves the cursor back to the previous tabular stop.

Tablet buttons

Your notebook has five multifunctional tablet buttons. You can navigate on the screen with a simple press of a button, call preset applications or ones that you have set yourself.



1 = Tablet button
2 = Tablet button
3 = Tablet button
4 = Tablet button Fn
5 = Tablet button Alt

Scroll down

You scroll down in your document with this key.

Additional function, see "Key combination".

Scroll up

You scroll up in your document with this key.

Additional function, see "Key combination".

Change screen orientation

When you press the orientation button, the system screen orientation changes from portrait (vertical) to landscape (horizontal) or from landscape to portrait.
When you would like to use the Tablet PC as an eBook, for example, you would use the portrait orientation.
When accessing spreadsheets, you would more typically use a landscape orientation.

Fujitsu Menu calling

Pressing the **Fn** tablet button twice in quick succession will bring up the *Fujitsu Menu* on your screen. The *Fujitsu Menu* is used to change certain system settings.

Logon to the system or call the Windows Task Manager

If you hold the tablet button down for two seconds, you can log back onto the system again:
– after booting up the system
– after disabling the system
– when returning from power management mode

After log-on, pressing the tablet button for two seconds launches the Windows Task Manager or - on the network - opens the security window.

Key combinations

Fn +

Launch the Fujitsu Startcenter

This button starts the Fujitsu Startcenter.

Fn +

Launch the Mobility Center

This button starts the Mobility Center.

Fn +

Switch the display output to an external monitor (analog)

If you have connected a monitor to the VGA monitor port (directly on the notebook or via the Port Replicator), you can use this key combination to switch the display output between the LCD screen of the notebook and the external monitor.

i

The tablet button Fn has a practical delay function: This allows you to press the two buttons for the button combination one after the other instead of needing to press them both at the same time. After pressing the Fn tablet button, you have a short time (2 to 3 seconds) to press the second button.

Battery

The battery supplies your notebook with the necessary power during mobile use. You can increase battery life by enabling the system's power management features.

The life of the battery is dependent on its proper storage, the number of charging/discharging cycles and the operating temperature of the notebook.

Charging, caring for and maintaining the battery

Only use batteries approved by Fujitsu Technology Solutions for your notebook.

Take care not to drop batteries or otherwise damage their casing (fire risk).

If rechargeable batteries develop a fault please stop using them immediately.

Do not touch the contacts of batteries.

Never interconnect the positive and negative terminals of a battery.

Batteries are harmful to the environment. You should dispose of them following guidance from your local District Council.

Charging the battery

You can charge the battery by connecting the notebook to the mains adapter. The battery can only be recharged if the ambient temperature of the notebook falls within the permitted temperature range. The time taken to charge the battery depends on its usage. Information on the battery charging time is contained in the chapter "Technical data".

You can increase the life of your battery by allowing it to fully discharge before recharging it again. To do this, leave your notebook turned on when it is operated with the battery. Once the battery is running low you will hear a warning alarm. If you do not connect the mains adapter within five minutes of the warning alarm described above, your notebook will automatically switch off.

Set the power options for your notebook under *Control Panel*.

Storing the battery

Keep the battery pack between 0°C and +30°C (32 and 122 degrees Fahrenheit). The lower the temperature at which the batteries are stored, the lower is the rate of self-discharge.

If you store rechargeable batteries for a longer period (longer than two months), the battery charge level should be approx. 30%. To prevent exhaustive discharge, check the charging level of the batteries at regular intervals.

If you do not use batteries for long periods, remove them from the notebook.

Never store batteries in the unit.

Monitoring the battery state of charge

The state of charge of the battery is shown by the battery charging indicator. When you switch on the device, it takes a few seconds before the battery state of charge is displayed.

Windows XP

Windows XP includes a "current charge status indicator" for monitoring the battery capacity. This can be activated under *Start - (Settings) - Control Panel - Power Options*.

Windows Vista

Windows Vista includes a "current charge status indicator" for monitoring the battery capacity. This can be activated under *Start - (Settings) – Control Panel – Mobile PC – Power Options*.

Windows 7

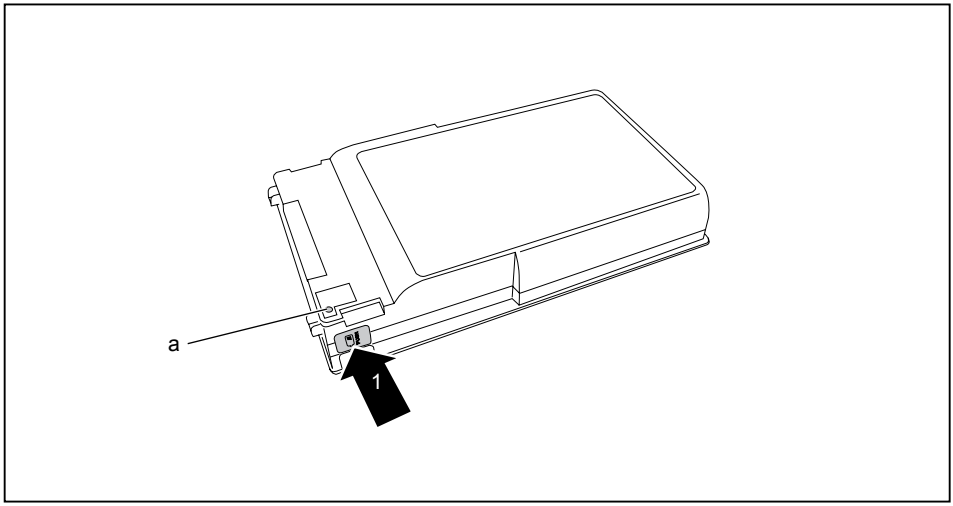
Windows 7 includes a "current charge status indicator" for monitoring the battery capacity. This can be activated under *Start - (Settings) - Control Panel – Mobile PC - Power Options*.

The indicator is then displayed in the task bar as a battery symbol. When you place the mouse pointer on the battery symbol, the system displays the state of charge of the battery. Please refer to the Help facility of the operating system for more information.

Batteries with a capacity of 5800 mAh

With these batteries you can check the state of charge directly on the battery itself.

► Remove the battery (see "Removing the battery").



► Press the button (1).

The LED (a) lights up in one of the following colours:

- The LED lights up green:The battery is between 50 % and 100 % charged.
- The LED lights up orange:The battery is between 13 % and 49 % charged.
- The LED lights up red:The battery is between 1 % and 12 % charged.

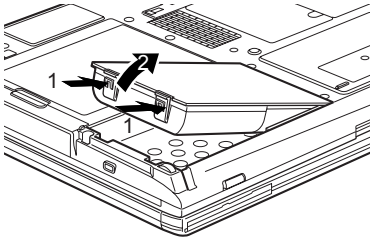
or

The LED is not lit:The battery is discharged.

Removing and installing the battery

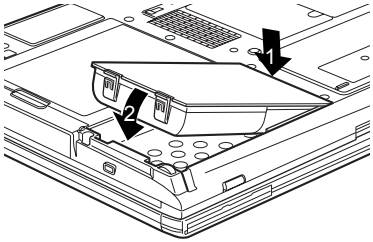
Only use batteries approved by Fujitsu Technology Solutions for your notebook.
Never use force when inserting or removing a battery.
Make sure that no foreign bodies get into the battery connections.

Removing the battery



► Press in the two catches (1), keep them pressed and lift the battery out of the battery compartment (2).

Inserting the battery



► Position the battery at the edge of the casing (1).
► Push the battery into the battery compartment until it locks into position (2).

Modules

The design of your notebook enables the flexible use of notebook batteries and drives. The following modules can be operated in the module bay of your notebook:

- Second battery
- Drive: hard disk: second
- Super multi drive
- Weight Saver

Only use modules designed for your notebook.

Do not use force when installing or removing the module.

Make sure that no foreign objects enter the module bay.

You can replace modules during operation. This means you do not need to switch off the notebook.

To replace a module, simply click on the corresponding icon in the task bar and then on *Exit* or *Select – Exit*.

Then you can simply remove the module.

If the module is locked, this can be unlocked via the Control Panel.

Removing a module

► Turn the notebook over and place it on a stable, flat and clean surface. If necessary, lay an anti-slip cloth on this surface to prevent the notebook from being scratched.

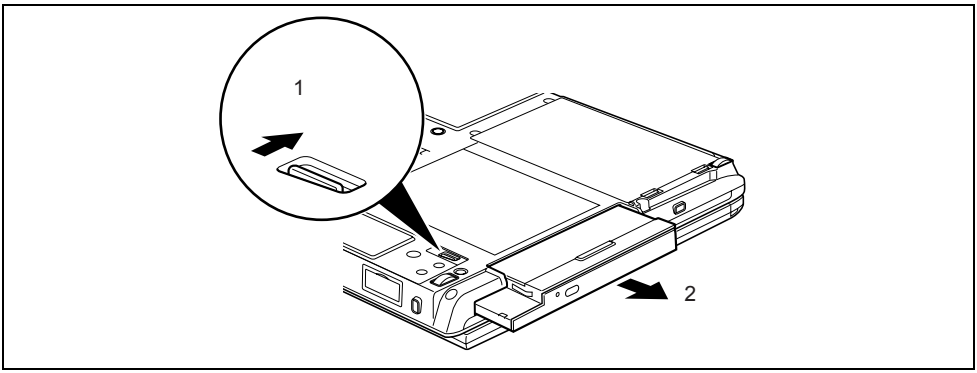
Use the corresponding icon in the task bar to stop the module:

► Left-click on the icon.

► Select the module you want to stop and remove.

► Press the Enter key.

Wait for the dialogue box which tells you that it is now safe to remove the module.

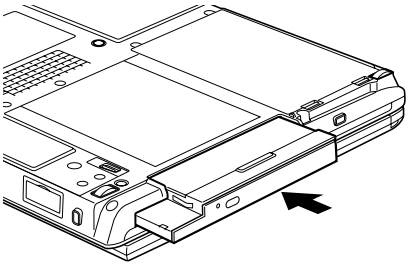


► Carefully slide the eject lever in the direction of the arrow, up to the stop (1).

The module will move out slightly.

► Pull the module out of the module bay (2).

Installing a module



- ► Place the module into the module bay so that the contacts enter first.
- ► Push the module into the module bay until you feel it locking into place.

Optical drive

You can replace your optical drive with another drive, a battery or a Weight Saver (see "Modules").

Please observe the safety information in the "Important notes" chapter.

You should not move the device as long as the CD/DVD in the optical drive is being accessed (e.g. do not carry the unit around configured as a Tablet PC). You should only use the CD/DVD drive in a horizontal or vertical orientation.

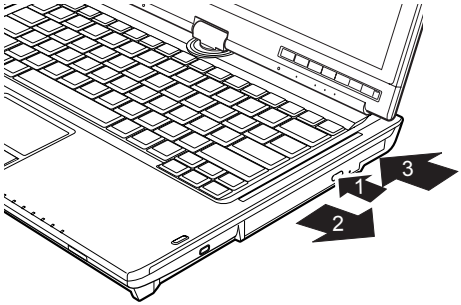
Do not hold the notebook directly by the drive module bay while the CD/DVD in the optical drive is being accessed.

You may use both 8-cm and 12-cm CDs/DVDs in the combo drive.

When using CDs/DVDs of poor quality vibrations and reading errors may occur.

Inserting or removing a CD/DVD

The notebook must be switched on.



► Press the insert/eject button (1).

The drive tray will open.

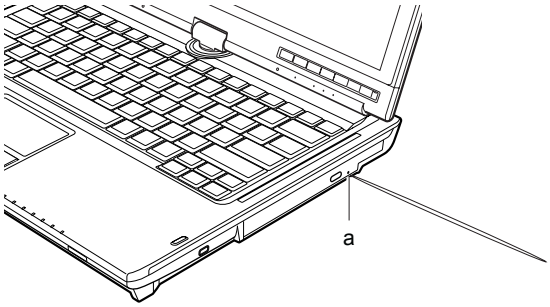
► Pull the drive tray all the way out (2).

► Place the CD/DVD in the drive tray with the label facing upwards or remove an inserted CD/DVD.

► Push in the drive tray until you feel it lock into place.

Manual removal (emergency removal)

In the event of a power failure or damage to the drive it may be necessary to manually remove the CD/DVD.



► Press a pen or a piece of wire (e.g. a paperclip) into the opening (a).

The drive tray is unlocked and opens. You can now pull out the drive tray completely.

ExpressCards

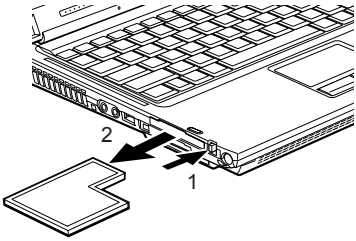
An ExpressCard slot permits operation of an ExpressCard.

Consult the documentation supplied by the ExpressCard's manufacturer and follow the instructions provided.

Never use force when installing or removing an ExpressCard.

Make sure that no foreign objects enter the ExpressCard slot.

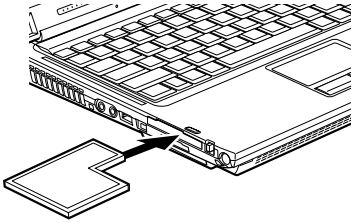
ExpressCard inserting



► Press the eject button (1), so that the placeholder for the ExpressCard protrudes slightly from the notebook.
If the eject button is flush, you must first cause the eject button to release from the notebook casing. To do this, press the eject button so that it unlatches.

► Pull the placeholder for the ExpressCard (2) out of the slot.

i Keep the placeholder for the ExpressCard in a safe place. If you remove the ExpressCard, you should reinsert the placeholder into the slot. This prevents foreign matter from getting into the ExpressCard slot.

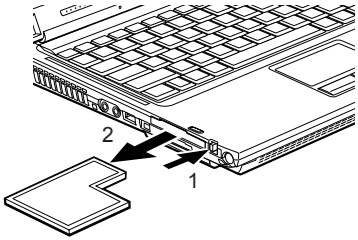


► Insert the ExpressCard in the slot guide with the connection contacts first.

► Gently push the ExpressCard into the slot until you feel it click into place.

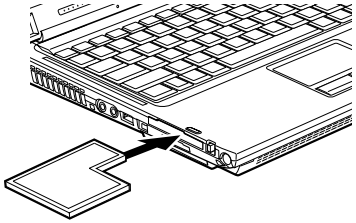
i Please refer to the documentation for the ExpressCard for driver installation instructions.

Ejecting a PC card



► Press the eject button (1) so that the ExpressCard slightly protrudes from the notebook. If the eject button is flush, you must first cause the eject button to release from the notebook casing. To do this, press the eject button so that it unlatches.

► Pull the ExpressCard (2) out of the slot.



► Insert the placeholder for the ExpressCard into the slot guide.

► Gently slide the placeholder for the ExpressCard into the slot until you feel it click into place.

Memory cards

The slot is suitable for memory cards of the type "Secure Digital I/O", "Memory Stick" and "Memory Stick PRO".

Inserting a memory card

► Gently push the memory card into the slot until it clicks into place.

Removing a memory card

► Press on the edge of the memory card so that the memory card jumps out of the slot slightly.

► Pull the memory card out of the slot.

Data transfer

UMTS and SIM card (optional)

Depending on the particular equipment of your notebook, it may be equipped with a UMTS module which you can use with the aid of a SIM card.

The UMTS module can be switched on and off using the switch for the wireless components – see "Wireless LAN/Bluetooth/UMTS radio components (optional)". You can also use the UMTS Watcher software to define profiles and switch individual wireless components on or off.

If UMTS reception is not sufficient when using the device as a Tablet PC you can use it is as a notebook instead – see "Select display orientation (portrait or landscape orientation)".

Follow the instructions supplied by the provider of the SIM card.

Inserting the SIM card

► Switch your notebook off.

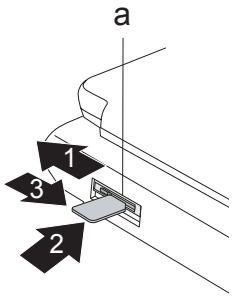
► Close the LCD screen.

► Unplug the mains plug of the mains adapter from the mains socket.

► Disconnect all cables connected to the notebook.

► Open the protective rubber cover over the SIM card slot.

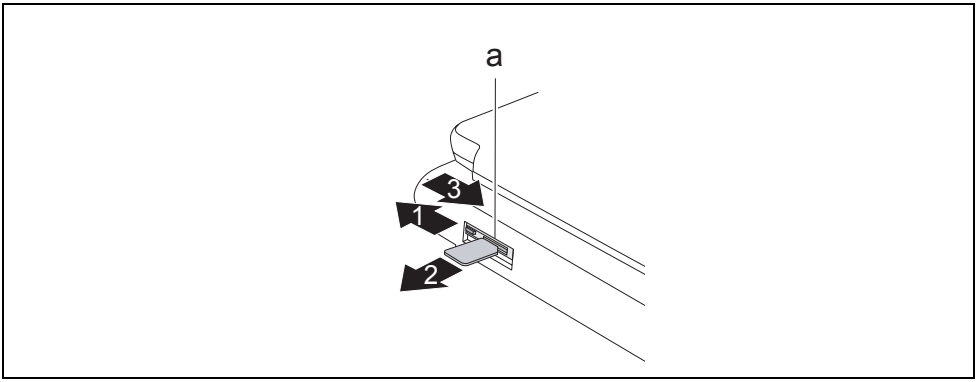
Do not pull on the SIM card lock! The lock could otherwise break off. Always slide the lock in the direction of the arrow as shown.



- ► Slide the SIM card lock (a) in the direction of the arrow (1).
  The lock (a) controls the power supply for the UMTS module. As long as the lock is open, the UMTS module is switched off.
- ► Slide the SIM card as shown into the slot (2) until it engages.
- ► Slide the SIM card lock (a) in the direction of the arrow (3).
- ► Close the protective rubber cover over the SIM card slot.
- ► Reconnect the cables that you disconnected before.

Removing the SIM card

- ► Switch your notebook off.
- ► Close the LCD screen.
- ► Unplug the mains plug of the mains adapter from the mains socket.
- ► Disconnect all cables connected to the notebook.
- ► Open the protective rubber cover over the SIM card slot.



- ► Slide the clip (a) of the SIM card in the direction of the arrow (1).
  The clip (a) controls the power supply for the UMTS module. The UMTS module is switched off while the clip is open.
- ► Push the SIM card inwards slightly to eject it from the slot.
- ► Pull the SIM card out of the slot in the direction of the arrow (2).
- ► Close the protective rubber cover over the SIM card slot.
- ► Reconnect the cables that you disconnected before.

Wireless LAN/Bluetooth/UMTS radio components (optional)

Depending on the model, radio components (wireless LAN/ Bluetooth/UMTS) may be integrated in your notebook. The radio components are enabled on delivery.

The UMTS module can also be switched on and off with the switch for the wireless components – see "Wireless LAN/Bluetooth/UMTS radio components (optional)".

While the SIM card clip is open the power supply to the UMTS module is interrupted, which means that the UMTS module is deactivated. It is possible that an error message may appear on the screen.

The installation of a wireless LAN module not approved by Fujitsu Technology Solutions GmbH voids the permits (CE!, FCC) issued for this device.

If you switch off the radio components, the Bluetooth module and the wireless LAN transmission unit (antenna) are also switched off.

You can also use the *Wireless Selector* software to define profiles and switch individual wireless components on or off.

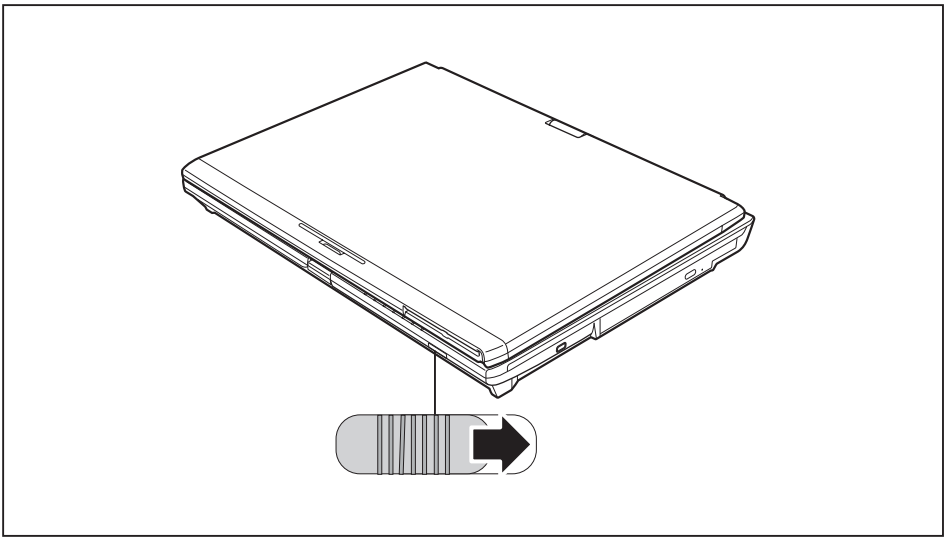
You can also deactivate the wireless components individually in the *BIOS Setup*.

Pay attention to the additional safety notes for devices with radio components provided in the "Safety" manual.

Details on using Wireless LAN can be found in the online help system included in the Wireless LAN software.

You can find more information on how to use Bluetooth on the CD you received with your Bluetooth software.

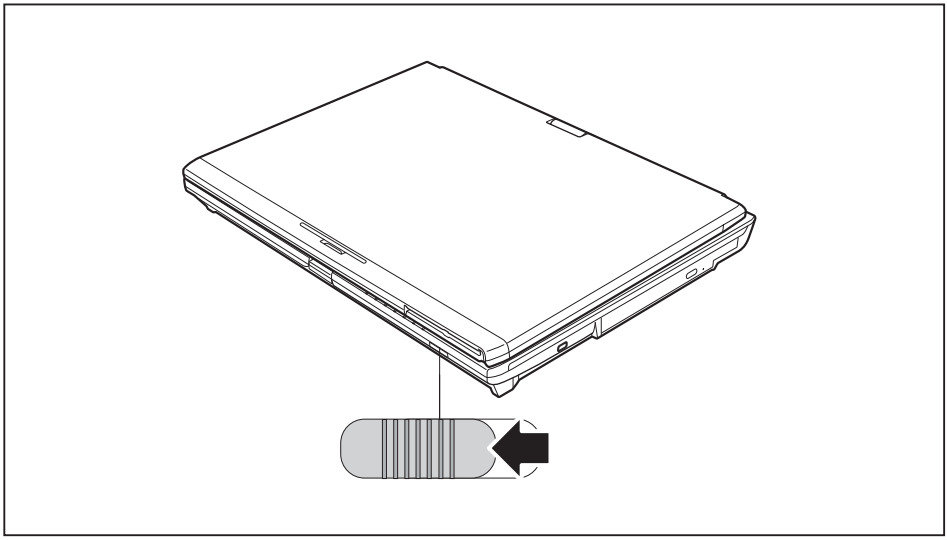
Switching on the wireless component



► Slide the switch in the direction of the arrow to switch the wireless component on.

The Wireless LAN/ Bluetooth indicator is shown in the status indicator panel.

Switching off the wireless component



► Slide the switch in the direction of the arrow to switch the wireless component off.

Port Replicator

The port replicator (available as an accessory) is a docking device with which you can quickly connect your notebook to your peripheral devices. For this purpose, the port replicator has standard ports for monitor, HDMI, LAN and USB devices.

Only use the supplied 100 W mains adapter from Fujitsu Technology Solutions to run the port replicator.

Additional information on the port replicator and on the various external devices that can be connected to it is contained in the chapter "Connecting external devices".

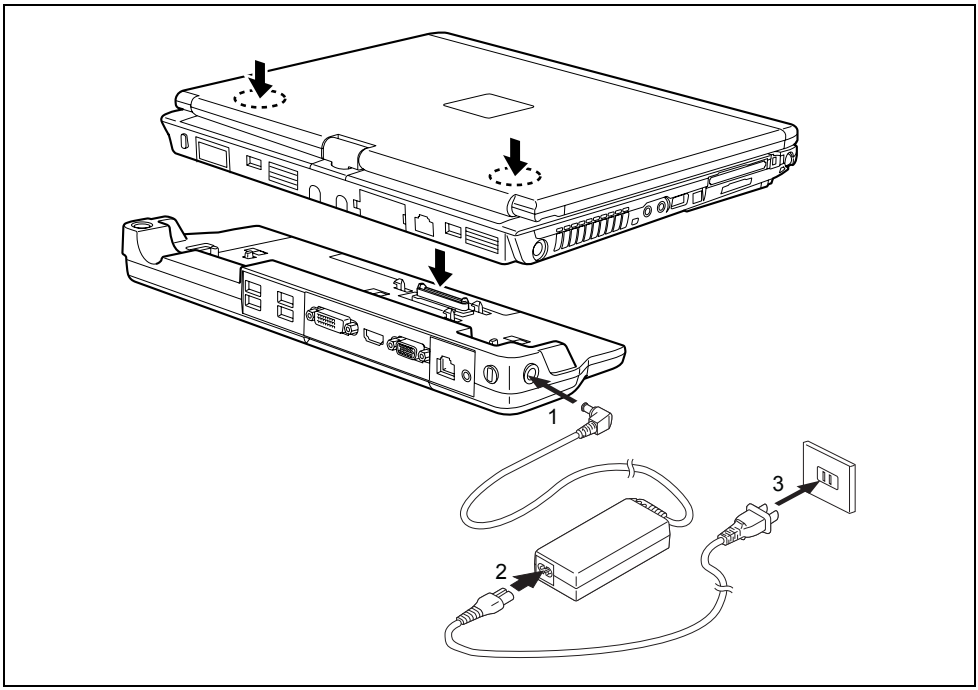
Setting up the Port Replicator

Select a suitable location for the Port Replicator before setting it up. Consider the following points when looking for a location:

- Never place the Port Replicator on a soft surface (e.g. carpeting, upholstered furniture, bed). This can block the air vents of the notebook and cause overheating and damage.
- Place the Port Replicator on a stable, flat and nonslippery surface. Please note that the rubber feet may mark certain types of surfaces.
- Never place the Port Replicator and the mains adapter on a heat-sensitive surface.
- Do not expose the Port Replicator to extreme environmental conditions.
  Protect the Port Replicator from dust, humidity and heat.

Connecting the notebook to the Port Replicator

► Disconnect the mains adapter cable from the DC socket (DC IN) of the notebook.



► Align the docking connectors as shown.

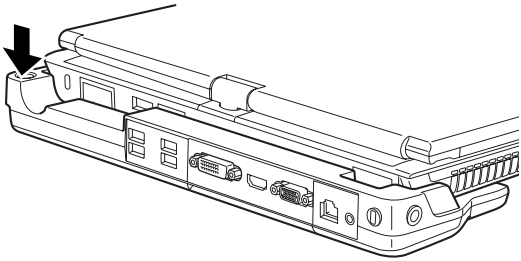
► Press down on the notebook's rear corners so that it locks into position.

► Connect the mains adapter cable to the DC jack (DC IN) of the Port Replicator (1).

► Connect the power cable to the mains adapter (2).

► Plug the power cable into the mains socket (3).

Switching on the notebook via the Port Replicator



► Press the ON/OFF switch on the port replicator to switch the notebook on.

Switching off the notebook via the Port Replicator

► Close all programmes and shut down your operating system (please see operating system manual).

i If the notebook cannot be shut down properly, press the ON/OFF button on the port replicator for about four seconds. The notebook will switch off. Any unsaved data may however be lost.

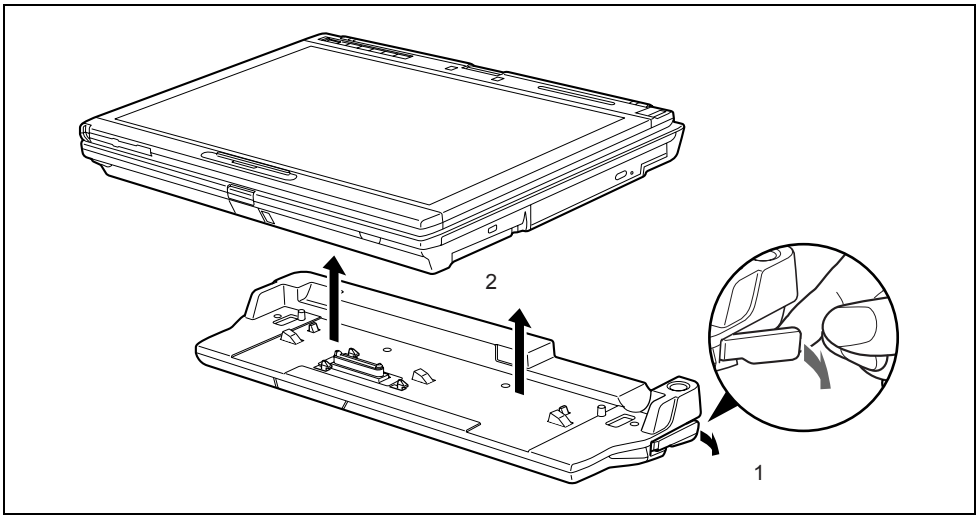
Disconnecting the notebook from the port replicator

Windows XP

If you disconnect the notebook from the Port Replicator during operation, problems can occur. We recommend that you switch off the notebook beforehand or use the Windows function *Start – Undock*.

Windows Vista and Windows 7

If you disconnect the notebook from the Port Replicator during operation, problems can occur. We recommend that you switch off the notebook beforehand or use the Windows function *Start (Arrow icon)* – *Undock*.



► Pull the release button in direction of the arrow (1).

► Lift off the notebook (2).

Security functions

Your notebook enables you to protect your system and personal data in a number of ways against unauthorised access. By combining these options, you can achieve maximum protection for your system.

In this chapter you will learn which security functions your notebook is equipped with, which advantages these functions offer you and how to configure and use them.

Please consider that in the case of improper use, you yourself will also be unable to access your system and your data. Therefore, please note the following hints:

- Back up your data on external data carriers at regular intervals.
- Some security functions need you to choose passwords. Please be sure to note these passwords, as otherwise you will no longer be able to access your system. We recommend that you make a note of the passwords and keep them in a safe place.

If you lose both the user and the supervisor passwords you will need to contact the help desk. The telephone numbers are contained in the "Service Desk" supplement. Passwords are not covered by your warranty and a charge will be made for assistance.

A system which was protected using SystemLock can no longer be released.Always create a backup copy of the SmartCard used.

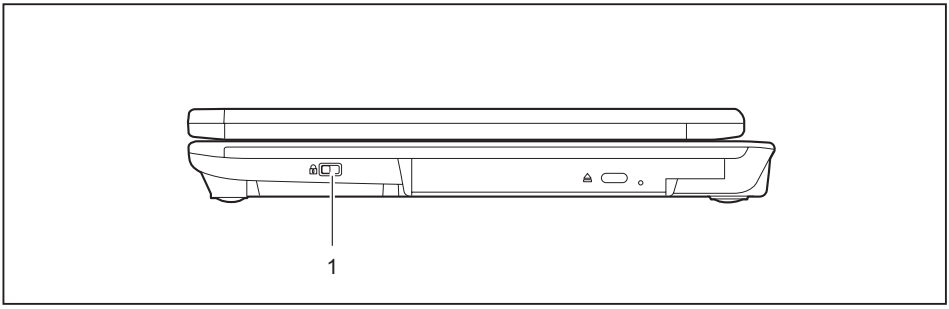
Brief overview of security functions

You will find comprehensive information on the security configuration of your device in the "Professional Notebook" manual on the "Drivers & Utilities" CD/DVD or on the Internet under *"http://ts.fujitsu.com/support/"*.

Security functions	Type of protection	Preparation
Kensington Lock	Mechanical	Fit and lock Kensington MicroSaver (accessory).
Fingerprint sensor (device dependent)	Biometric	Install the supplied fingerprint software.
BIOS password protection	Password protection for *BIOS Setup*, operating system and hard disk with supervisor and user password. The passwords consist of a maximum of eight alphanumeric characters.	Specify at least one Supervisor password in the *BIOS Setup* and activate the password protection for the operating system and hard disk as required.
Boot from Removable Media	Prevent unauthorised boot of an operating system from external media (e.g. USB stick, USB-CD-ROM drive, etc).	In BIOS Setup, in the menu *Security* the option *Boot from Removable Media* is processed.
Owner Information	Overlay information from Service desk or owner during the boot process	In BIOS Setup, in the menu *Security,* the option *Owner Information* is processed.
System Lock	The BIOS and the system can only be started with SmartCard and PIN.	Initialise the SmartCard in the BIOS.
SmartCard reader (device dependent)	PIN and SmartCard protection for operating system	Install software e.g. *SmartCase Logon+* (accessory). Specify a password when the *SmartCase Logon+* software is used.
Trusted Platform Module (device dependent)	Identification and authentication of the notebook	In *BIOS Setup* a supervisor password is configured and the TPM (*Security Chip*) is switched on.

Using the Kensington Lock

The notebook has a Kensington Lock device for the Kensington MicroSaver. With the Kensington MicroSaver, a sturdy steel cable, you can protect your notebook and Port Replicator from theft. The Kensington MicroSaver is available as an accessory.

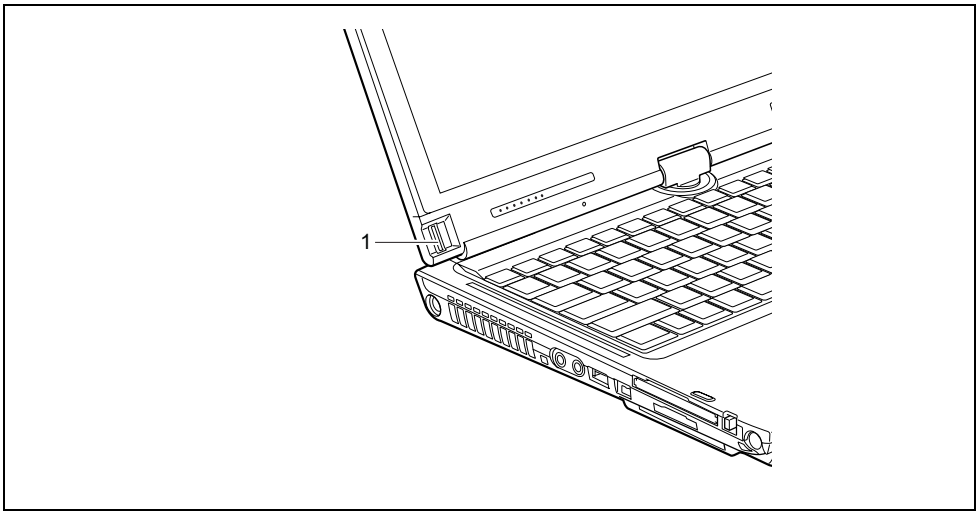


► Mount the Kensington MicroSaver on the Kensington Lock device (1) of your notebook.

If you use the rear Kensington Lock device then the eject lever of the module bay is also locked.

Configuring the fingerprint sensor

Your notebook is equipped with a fingerprint sensor. The fingerprint sensor can record the image of a fingerprint. With the fingerprint software *SmartCase Logon+*, this image can be processed and used instead of a password.



1 = Fingerprint sensor

► Install the fingerprint software (e.g. *SmartCase Logon+*) from the supplied CD/DVD in order to use the fingerprint sensor (1).

Configuring password protection in the BIOS Setup

Before using the various options of password protection for your data security in the *BIOS Setup*, please note the following hints:

- Please make sure that you always remember your passwords, as you will not be able to access your *BIOS Setup* and/or your system any longer if you forget both the user password and the supervisor password.
  Passwords are not covered by your warranty and a charge will be made for assistance.
- Back up your data on external data carriers at regular intervals.

Passwords can be up to eight characters long. You can use all alphanumeric characters and need not distinguish between uppercase and lowercase characters.

Password protection for BIOS Setup (supervisor and user password)

We recommend that you print out the following instructions, as these cannot be displayed while setting the password.

You prevent unauthorised opening of the *BIOS Setup* with both the supervisor and the user password. With the supervisor password you have access to all functions of the *BIOS Setup*, and with the user password only to part of the functions. You can only set a user password if a supervisor password has already been assigned.

Please refer to section "Settings in the BIOS Setup" for a description of calling and operating the *BIOS Setup*.

Set the supervisor and user passwords

► Call up *BIOS Setup* and select the *Security* menu.

► Mark the *Set Supervisor Password* field and press the Enter key.

With *Enter new Password:* you are asked to enter a password.

► Enter the password and press the Enter key.

With *Confirm new Password* you are asked to confirm the password.

► Enter the password again and press the Enter key.

With *Notice:* With *Changes have been saved* you receive confirmation that the new password has been saved.

► To assign the user password, mark the field *Set User Password* and proceed exactly as when configuring the supervisor password.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the *Exit Saving Changes* option in the *Exit* menu.

The notebook is rebooted and the new password is effective. If you now want to open the *BIOS Setup*, you must first enter your supervisor or user password. Please note that you only have access to a few BIOS settings with the user password.

Changing the supervisor or user password

► Call up the *BIOS Setup* again and select the *Security* menu.

► Highlight one of the fields *Set Supervisor Password* or *Set User Password* and press the Enter key.

► Enter your current supervisor or user password.

► Enter your new supervisor or user password.

With *Confirm current Password* you are requested to confirm the password.

► Enter the password again and press the Enter key.

With *Notice: Changes have been saved* you receive confirmation that the new password has been saved.

You can only change the supervisor password when you have logged into the *BIOS Setup* with the supervisor password.

Cancelling passwords

To cancel a password (without setting a new password) run the following steps:

► Call up *BIOS Setup* and select the *Security* menu.

► Mark the *Set Supervisor Password* or *Set User Password* field and press the Enter key.

With *Enter current Password* you are asked to enter your present password.

► When you receive this request, press the Enter key three times.

► Select the *Exit Saving Changes* option in the *Exit* menu.

Your notebook will now restart and the password is cancelled.

With the supervisor password you simultaneously deactivate the user password.

Password protection for starting the operating system

With the supervisor password or the user password you have assigned in the *BIOS Setup* (see "Set the supervisor and user passwords"), you can also prevent the operating system from being started up.

Activating system protection

► Call up *BIOS Setup* and select the *Security* menu.

► If you have not yet assigned the BIOS passwords, you can define the supervisor and the user password now if you wish (see "Set the supervisor and user passwords").

► Mark the *Password on Boot* field and press the Enter key.

► Select the *Every Boot* entry and press the Enter key.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the *Exit Saving Changes* option in the *Exit* menu.

The notebook reboots and you are asked to enter your password (the supervisor or user password).

Deactivating system protection

► Call up *BIOS Setup* and select the *Security* menu.

► Mark the *Password on Boot* field and press the Enter key.

► Select *Disabled* and press the Enter key.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the *Exit Saving Changes* option in the *Exit* menu.

The notebook reboots and there is no longer any password protection for the operating system.

Password protection for hard disk

The had disk password prevents unauthorised access to the hard disk drives and is checked internally each time the system is booted. The condition for this is that you have assigned at least the supervisor password.

Activating hard disk protection

► Call up *BIOS Setup* and select the *Security* menu.

If you have not yet assigned the BIOS passwords, you can define the supervisor and the user password now if you wish (see "Set the supervisor and user passwords").

► Mark the *Hard Disk Security* field and press the Enter key.

► In the area *Drive0* highlight the field *Set Master Password* and press the Enter key.

With *Enter new Password:* you are asked to enter a password.

► Enter the password and press the Enter key.

With *Confirm new Password* you are asked to confirm the password.

► Enter the password again and press the Enter key.

With *Notice:* With *Changes have been saved* you receive confirmation that the new password has been saved.

► If you wish to enter a password for a second fixed disk *(Drive1)* , in the area *Drive1* highlight the field *Set Master Password* and proceed in exactly the same way as for the set-up of the password for the first fixed disk (*Drive0)*.

The field *Password Entry on Boot* is set to *Enabled* in the default setting.

If you do not want to make any other settings, you can exit *BIOS Setup*.

► Select the *Exit Saving Changes* option in the *Exit* menu.

The notebook reboots and your hard disk is now protected with a password. The password request becomes active as soon as the hard disk is installed in another computer and the computer is started.

Deactivating hard disk protection

To cancel a password (without setting a new password) proceed as follows:

- ► Call up the *BIOS Setup* and select the *Security* menu.
- ► Mark the *Hard Disk Security* field and press the Enter key.
- ► In the area *Drive0* mark the field *Set Master Password* and press the Enter key.

With *Enter current Password* you are requested to enter your present password.

- ► When you receive this request, press the Enter key three times.
- ► From the *Exit* menu, choose the option *Exit Saving Changes*.

Your notebook will now restart and the password is removed.

- ► If you wish to remove the password for the second fixed disk (*Drive1*), in the area *Drive1* mark the field *Set Master Password*.
- ► Proceed exactly as for the removal of the password on the first fixed disk (*Drive0*).
- ► From the *Exit* menu, choose the option *Exit Saving Changes*.

The notebook reboots and there is no longer any password protection for the hard disk.

Using the SmartCard reader

A SmartCard reader is integrated in your notebook. With the appropriate software you can use your SmartCard as an alternative to password protection, but also as a digital signature, for encrypting your e-mails or for homebanking.

SmartCards

SmartCards are not supplied as standard equipment. You can use all SmartCards that comply with the ISO standard 7816-1, -2, -3 and -4. These SmartCards are available from various manufacturers.

We recommend that you always use two SmartCards. Always keep one of the SmartCards in a safe place if you carry the other SmartCard with you.

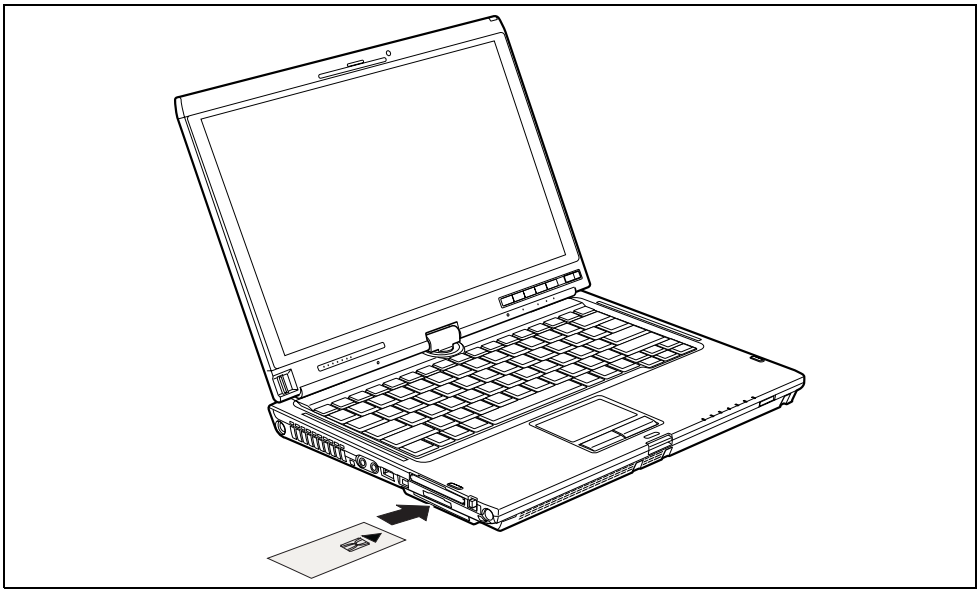
The SmartCard can only be used with a PIN so protection is maintained even when the SmartCard is lost. In order to maximise your security, the SmartCard, which is available as an accessory, is disabled if three incorrect attempts are made to enter the PIN.

The first time you use your SmartCard you must enter the preset PIN provided by the SmartCard manufacturer or your system administrator.

Please refer to the software documentation for information about which SmartCards are supported by the software.

Inserting the SmartCard

Do not use force when inserting and removing the SmartCard.
Make sure that foreign objects do not fall into the SmartCard reader.



► Slide the SmartCard into the SmartCard reader with the chip facing upward and at the front.

When the SmartCard is properly inserted, it protrudes by approximately 1.5 cm.

You will find further operating information in the documentation of your SmartCard software (e.g. *SmartCase Logon+*).

SmartCard SystemLock (optional)

With *SystemLock*, the device can only be started with an initialised SmartCard (CardOS) and personal identification number (PIN).The SmartCard and PIN are already checked in the BIOS during system booting, i.e. before the operating system is booted.

SmartCard SystemLock		
SmartCard SystemLock	Not Installed	Item Specific Help
Install Single PC:	[Enter]	Installs the security for this PC, and creates a new SystemLock Admin SmartCard dedicated to this PC. SmartCard data will be overwritten. A correct SmartCard is required for a permanent installation
Install Group PC:	[Enter]	

All new SmartCards have a preset PIN (Personal Identification Number) and PUK (Personal Unblocking Key).

On CardOS SmartCards, the PIN and PUK are preset to *12345678*.

Additional software such as SmartCase Logon+ is needed so that the system will also check that the correct SmartCard is inserted while the system is running.

Information on how to deinstall *SystemLock* can be found under “Uninstall SystemLock“.

A system which was protected using SystemLock can no longer be released.Always create a backup copy of the SmartCard used.

Access rights of SmartCards

A new SmartCard initially only has a preset PIN and PUK. Access rights and the customised PIN and PUK are not assigned until the SmartCard is initialised. The SmartCard type depends on the access rights assigned to the card, as described below:

- User-SmartCard - system start-up, changing PIN
- Super User SmartCard – Start up system, make changes in *BIOS Setup*, change PIN
- Service SmartCard – changes in BIOS Setup, operating system boot-up not possible
- Admin SmartCard – Start up system, make changes in *BIOS Setup*, change PIN, uninstall *SystemLock*, initialise SmartCards, unblock SmartCards

The following table shows an overview of the rights associated with each SmartCard type when a PIN or PUK is entered:

	User SmartCard		**Super User SmartCard**		**Service SmartCard**		**Admin SmartCard**	
	PIN	**PUK**	**PIN**	**PUK**	**PIN**	**PUK**	**PIN**	**PUK**
System start-up	X		X				X	
call-up *BIOS-Setup*			X		X		X	
Changing own PIN	X		X		X		X	X
Unblocking own blocked SmartCards		X*		X*		X*		X
Unblocking all blocked SmartCards								X
Generate user cards								X
Deinstalling *SystemLock*								X

* In BIOS-Setup preset (Unblock own SmartCard)

Usually there is always an admin SmartCard and at least one User or Super User SmartCard that will allow a system to be operated.

SmartCard user groups

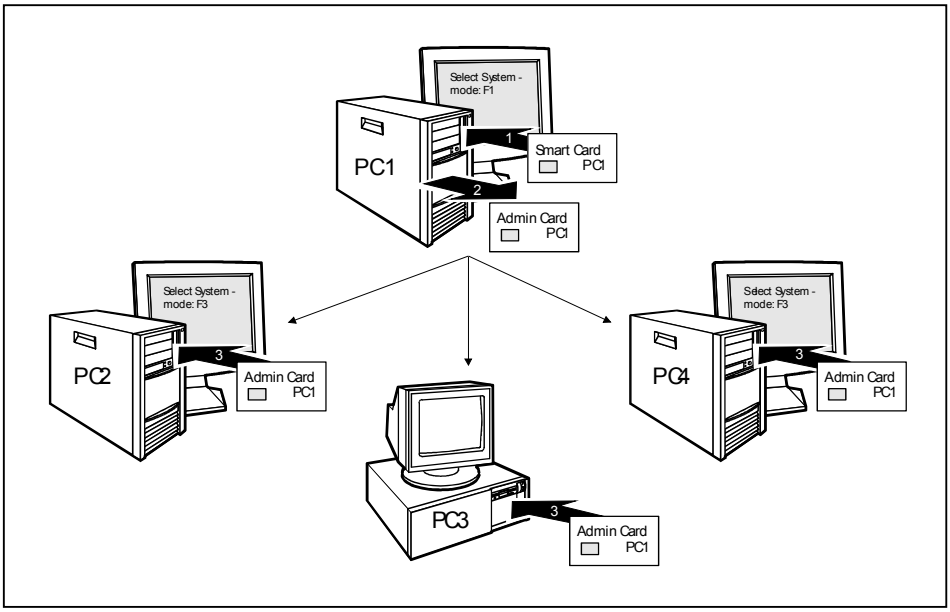
With *SystemLock* , user groups can be created. This makes it possible to use a SmartCard to start several systems. A user group consists of at least two systems. Each user that is allowed to start the systems is provided with a SmartCard. With this SmartCard the user can select a system to start.

Basic information on setting up user groups

During installation of *SystemLock* the first device in the user group is set up as "Single PC". The Admin SmartCard generated during this process is used for the user group generation. During installation, *SystemLock* sets up each further device as "Group PC". The existing Admin SmartCard is plugged in, the information is read in and the device is added to the user group. The Admin SmartCard decides which user group the device belongs to.

If you use CardOS SmartCards, then *SystemLock* can be administrated with the Windows Program "SystemLock Admin". With "SystemLock Admin" you can conveniently manage *SystemLock* at the operating system level, construct SystemLock organisational units and groups, create SmartCards for the organisational units or groups, issue access rights at different levels for user cards, as well as remotely recreate access rights. The PIN or PUK of your SmartCard or the SmartCards of other users can be changed by you, and you can also reactivate blocked cards.

For a detailed description, see the "SystemLock Admin" help manual.



In order that the users receive access to the systems within a user group, *SystemLock* must now be used to create User SmartCards or Super-User SmartCards. By using a User SmartCard or Super-User SmartCard, a user can log into any system within the user group.

Installing SystemLock

During initial installation, the first SmartCard becomes the Admin SmartCard. It has, in combination with the PUK, all the access rights and should therefore be stored in a safe place. Only an authorised user (Administrator) may use it, for example to initialise user cards.

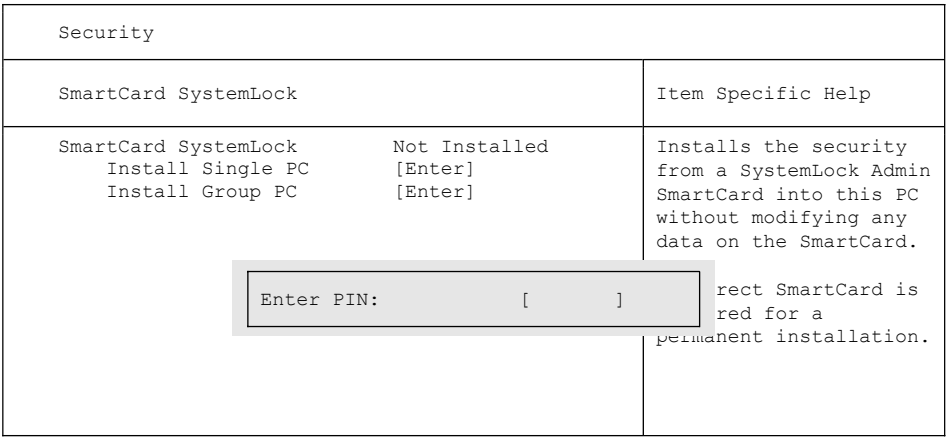
If you want to set up a user group, you need an Admin SmartCard. This Admin SmartCard will be used by you to add further systems to the user group.

Setting up the first system in a user group or a stand-alone system for use with SystemLock

► Start the device and call up BIOS Setup.

► From the *Security* menu, choose the option *SmartCard SystemLock*.

The following SmartCard SystemLock menu will be displayed:



► Insert a new SmartCard in the reader and press Enter.

New SmartCards have a preset PUK (see above).

You will need to know the PUK assigned to the SmartCard if you want to re-initialise a previously initialised SmartCard.

► Enter the PUK.

The following appears: *ACCESS DENIED* = You have entered the wrong PUK. After six failed attempts, the SmartCard will be blocked and can no longer be used.

► Enter a new PIN at the following prompt:

Enter new PIN:

Confirm new PIN:

Numbers with four to eight digits are acceptable for the new PIN.For security reasons, we recommend that you change the PIN for every SmartCard and use an eight digit number each time.

► Re-enter the new PIN to confirm.

The following message will be displayed: *PIN/PUK do not match* = You have confirmed the PIN incorrectly. You will be requested to re-enter the new PIN and reconfirm.

Please wait a few seconds after confirming the new PIN: *SystemLock* will be installed.

The following message will be displayed if installation is successful:

```
Setup Notice

Changes have been saved

[Continue]
```

► Now press the Enter key. The SystemLock administration menu will be displayed:

```
Security

SmartCard SystemLock                                  Item Specific Help

SmartCard SystemLock          Installed               Allows to deactivate
    Uninstall:                [Enter]                 The smartcard security.
    BIOS Recovery:            [Allowed]
    SmartCard and Pin         [Always required]       ATTENTION:
                                                      Always check the BIOS
SmartCard Initialization                              password settings after
    Admin SmartCard           [Enter]                 uninstalling
    SuperUser SmartCard:      [Enter]                 SystemLock.
    User SmartCard:           [Enter]
    Service SmartCard:        [Enter]                 NOTICE:
                                                      Reinstalling a SinglePC
SmartCard Configuration                               implies re-initializing
    Change PIN:               [Enter]                 all of your smartcards
    Change PUK:               [Enter]
    Unblock SmartCard:        [Enter]
```

► For security reasons, the preset PUK should always be changed before removing the new SmartCard. To do this, under *SmartCard Configuration* select the Option *Change PUK*, press the Enter key and type in a new PUK.

► First enter the preset PUK.

Enter the PUK:

New SmartCards have a preset PUK (see above).

You will need to know the PUK assigned to the SmartCard if you want to re-initialise a previously initialised SmartCard.

► Enter the PUK.

The following message will be displayed: *ACCESS DENIED* = You have entered the wrong PUK. After six failed attempts

the SmartCard will be blocked and can no longer be used.

► Enter the new PUK as follows.

Enter new PUK:

Confirm new PUK:

For the new PUK, 4 to 8-digit numbers are acceptable. We recommend for security reasons that you change the PUK of every SmartCard and to use an eight digit number.

► Re-enter the new PUK to confirm.

The following appears: *PIN/PUK do not match* = You have confirmed the PUK incorrectly. You will then be requested to re-enter and reconfirm the new PUK.

Instructions on how to initialise additional SmartCards can be found in Section "Carrying out administrator functions".

► If you do not want to initialise any further SmartCards, press Esc and remove the Admin SmartCard. NEVER write the PIN or PUK on the SmartCard under any circumstances!

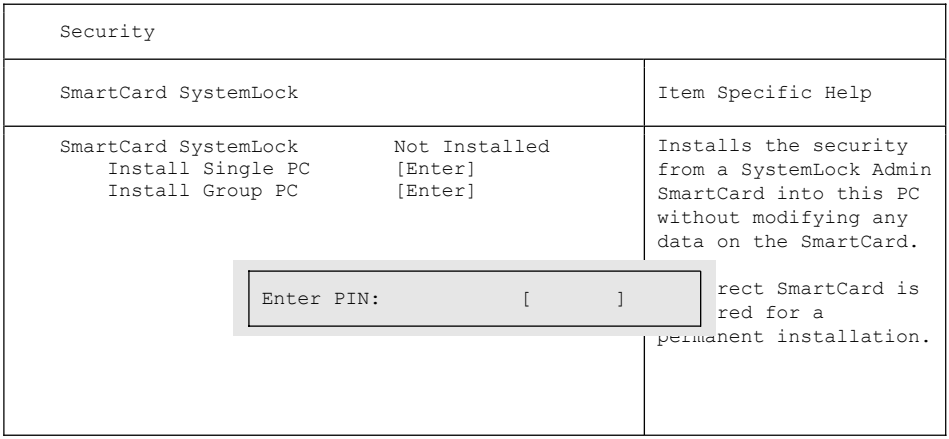
Store the SmartCard and PIN/PUK in a secure place and protect them from unauthorised access.

Adding a system to a user group

► Start the device.

► Call up *BIOS Setup* and select the *SmartCard SystemLock* page from the *Security* menu.

The following SmartCard SystemLock menu will be displayed:



► Insert the Admin SmartCard for the user group.

Enter PIN:

► Enter the PIN.

The following message will be displayed: *ACCESS DENIED* = You have confirmed the PIN incorrectly. You will then be requested

to re-enter the new PIN and to confirm. After three failed attempts

the SmartCard will be blocked and can only be reactivated using the PUK.

Enter the PUK:

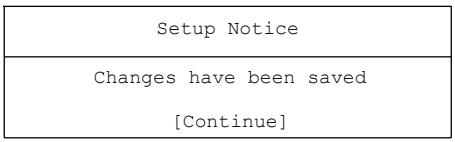
► Enter the PUK.

The following message will be displayed: *ACCESS DENIED* = You have entered the wrong PUK. After six failed attempts

the SmartCard will be blocked and can no longer be used.

Please wait a few seconds after entering the PIN and PUK: *SystemLock* will be installed.

The following message will be displayed if installation is successful:



► Now press the Enter key. The SystemLock administration menu will be displayed:

Security		
SmartCard SystemLock		Item Specific Help
SmartCard SystemLock Uninstall: BIOS Recovery: SmartCard and Pin SmartCard Initialization Admin SmartCard SuperUser SmartCard: User SmartCard: Service SmartCard: SmartCard Configuration Change PIN: Change PUK: Unblock SmartCard:	Installed [Enter] [Allowed] [Always required] [Enter] [Enter] [Enter] [Enter] [Enter] [Enter] [Enter]	Allows to deactivate The smartcard security. ATTENTION: Always check the BIOS password settings after uninstalling SystemLock. NOTICE: Reinstalling a SinglePC implies re-initializing all of your smartcards

► Generate a user card for the device as described in Section "**Carrying out administrator functions**".

► If you do not want to initialise any further SmartCards, press Esc and remove the Admin SmartCard.

Carrying out administrator functions

If you have an internal SmartCard reader, you can also switch on the device by inserting the SmartCard. The following prompt will appear after starting the device:

Insert a SmartCard.

► Insert the Admin SmartCard. The following prompt will be displayed:

Enter PIN.

Select between the options shown:

F2=Setup, F3=Change PIN

► Press the F2 function key to enter BIOS Setup.

► From the *Security* menu, choose the option *SmartCard SystemLock*.

The SystemLock administration menu will be displayed:

Security		
SmartCard SystemLock		Item Specific Help
SmartCard SystemLock	Installed	Allows to deactivate The smartcard security.
Uninstall:	[Enter]	
BIOS Recovery:	[Allowed]	ATTENTION: Always check the BIOS password settings after uninstalling SystemLock.
SmartCard and Pin	[Always required]	
SmartCard Initialization		
Admin SmartCard	[Enter]	
SuperUser SmartCard:	[Enter]	
User SmartCard:	[Enter]	
Service SmartCard:	[Enter]	NOTICE: Reinstalling a SinglePC implies re-initializing all of your smartcards
SmartCard Configuration		
Change PIN:	[Enter]	
Change PUK:	[Enter]	
Unblock SmartCard:	[Enter]	

The other SmartCards should either be generated as User SmartCards (System) or as extended User SmartCards (System and Setup). These then have a restricted access to the device (see chapter "Uninstall SystemLock").

► Select the required function. The following prompt will be displayed:

Remove your Admin Card.

Keep the Admin SmartCard in a safe place and protect it from unauthorised access.

► Remove the Admin SmartCard.

Insert a SmartCard.

► Insert the next SmartCard and initialise this as required.

The following prompt will be displayed:

Remove the SmartCard.

Always change the PIN and PUK for each additional SmartCard. The PUK of a SmartCard will be needed if a blocked SmartCard needs to be unblocked using the Unblock SmartCard function.

► Remove the user SmartCard and label it, e.g. with the name of the user. But NEVER write the PIN on the SmartCard under any circumstances!

Remote unlock – F4

Requirement:

The device is centrally administered as part of an Organisation Unit and is registered in a SystemLock admin database. The SmartCard used for the group installation must have been initialised beforehand using the *SystemLock Admin.EXE* Windows program (see chapter "**SmartCard user groups**").

In order to enable remote access to a device for a user, or to grant one-time remote access to a device for a guest or service technician, proceed as follows:

► Start the device.

The *Insert a SmartCard* prompt will appear.

► Press the **F4** key.

The following dialogue box will appear:

```
SmartCard SystemLock

Org Unit:       Company Department 1
PC Group:       Group 1
I-CODE 1:       0123456789ABCDEF
I-CODE 2:       0123456789ABCDEF
```

The user must now contact their administrator or their administration hotline

and pass on the data and codes which are displayed.

The administrator then specifies the type of once-only access rights:

User access	The user can boot the system once.
Service access	One-time access to the BIOS for service purposes, without access to the SystemLock functions.
Admin access	Access to the BIOS and the SystemLock functions, e.g. to unlock the device when the associated SmartCard has been lost.

Depending on the definition of the access permissions, an activation code will be created and communicated to the user over the Hotline. The user must first press the Enter key on the system to be activated, type in the first half (code 1) of the activation code and confirm with the Enter key. The dialogue box for entering and confirming the second half (Code 2) of the activation code will appear. There is no limit to the number of incorrect entries that can be made. If all 32 characters of the activation code are correctly entered, then the device starts with the rights assigned by the administrator, as if a corresponding SmartCard were inserted.

The activation code can only be used once to start the device;
it becomes immediately invalid, once the device starts to run. If you switch off the device and want to start it again without your SmartCard, you must first repeat the procedure described above each time.

Switching on the device with SystemLock

If you have an internal SmartCard reader, you can switch on the device by inserting the SmartCard. If you use the ON/OFF switch to switch on the device, the following message appears:

Insert a SmartCard.

► Insert your SmartCard.

Enter PIN:

► Enter your PIN.

The following appears: *ACCESS DENIED* = You have entered an incorrect PIN. After three failed attempts, the SmartCard will be blocked and can only be enabled again by entering the PUK.

Depending on the rights assigned to your SmartCard, you can select the following functions when this message is displayed on the screen:

F2=Setup, F3=Change PIN

If your SmartCard has the appropriate rights, you can:

- **F2** – Start BIOS Setup.
- **F3** – Change the PIN.

If you do not select a function, the system will boot up.

Start BIOS Setup – F2

A SmartCard with the appropriate rights must be inserted (SuperUser, Service or Admin).

Change PIN

Possible for every initialised SmartCard.

► Press function key **F3** .

► Enter the old PIN.

► Enter the new PIN.

For the new PIN, 4 to 8-digit numbers are acceptable.
For security reasons, we recommend that the PIN of every SmartCard should be changed and an eight digit number should be used.

► Confirm the new PIN.

Uninstall SystemLock

► Start the device.

► Follow the instructions as described in Section "Carrying out administrator functions". Select "Uninstall" to uninstall SystemLock.

You can now use the device again without the need for a SmartCard.

Error messages

This chapter contains error messages generated by the mainboard.

SystemLock – error messages

This chapter describes error messages generated by the SmartCard reader (chipcard reader).

The SmartCard has no access rights to the system.

Boot access denied	The SmartCard has no access rights to the system.
Check your SmartCard	The SmartCard is either inserted incorrectly or it is not a suitable SystemLock SmartCard.
SmartCard reader FAILURE	An error has occurred on the serial port for the SmartCard reader (chipcard reader). If this error occurs frequently, the connection between the SmartCard reader and the mainboard must be checked, or the SmartCard reader must be replaced. While the error is present, access to the system is blocked.
Non authorized SmartCard	The SmartCard cannot be used on this device. The SmartCard has been configured for a different device.
SystemLock installation FAILED:	An error occurred while installing *SystemLock*. Do not switch off the device; instead insert the "Flash-BIOS diskette" perform a BIOS-Update and retry the installation once more.
The SmartCard is blocked.	You have exceeded the maximum allowed number of incorrect PIN entries. The SmartCard is blocked. Enter the administrator PUK to re-activate the SmartCard. You must then enter a new User PIN to restart the system.

Enter the PUK:

Trusted Platform Module

i This installation need only be performed under Windows XP. TPM is already built into Windows Vista.

To use the TPM, you must **be sure to activate the** TPM in the *BIOS Setup* **before the software**

installation. The condition for this is that you have assigned at least the supervisor password (see "Set the supervisor and user passwords").

► Call up *BIOS Setup* and select the *Security* menu.

► Select the entry *Enabled* for *Embedded Security Chip* to activate the TPM.

If you have activated the TPM, the *Clear Security Chip* option appears.

You can use this menu item to delete the holder in the TPM. However, you can then no longer access the data you have encrypted on the holder-based keys.

For example, with the TPM activated, data can be generated which can only be read or run on this device. Support for security protocols, such as SSL (Secure Socket Layer) for Internet connections, IPSec (LAN encryption), S-MIME (e-mail encryption, WLAN encryption and others) is also possible.

Connecting external devices

Please observe the safety information in the "Important notes" chapter.

Read the documentation on the external device before connecting it.

Do not connect or disconnect cables during a thunderstorm.

Do not pull on the cable when disconnecting a cable. Always take hold of the actual plug.

Follow the steps below in order, when connecting or disconnecting devices to your notebook:

Connecting devices to notebook

1. Turn off all power and equipment switches.
2. Remove all power plugs from the grounded mains outlets.
3. Connect all the cables to the notebook and the external devices.
4. Plug all data communication cables into the designated utility sockets.
5. Plug all power cables into the mains supply.

Disconnecting devices from notebook

1. Turn off all power and equipment switches.
2. Remove all power plugs from the grounded mains outlets.
3. Unplug all data communication cables from the utility sockets.
4. Disconnect all the cables from the notebook and the external devices.

Connecting an external monitor to the notebook

An external monitor can be connected to the notebook.

► Switch off the notebook and the external monitor.

► Connect the data cable of the external monitor to the monitor port of the notebook.

► First switch on the monitor and then the notebook.

Switching between screen outputs

You have two options for switching backwards and forwards between the external monitor and the LCD screen of the notebook:

- In notebook mode: Vie the key combination Fn + F10.
- In Tablet-PC mode: Via the key combination of the tablet buttons Fn + (unless the monitor is connected to the DVI-D monitor port of the port replicator).

Setting the refresh rate for your external monitor

The refresh rate must be correctly set so that the image does not flicker.

Windows XP:

► Set a suitable screen refresh rate for your monitor in *Control Panel – Display*.

Windows Vista:

► Set a suitable screen refresh rate for your monitor in *Control Panel – .Appearance and Personalization*.

If the refresh rate set is too high, the monitor may be damaged. Please see the documentation included with your monitor for the maximum possible refresh rate.

Connecting an external monitor to the Port Replicator

► Switch off the notebook and the external monitor.

► Connect the external monitor's data cable to the monitor port (analogue) an on the Port Replicator.

or

► Connect the external monitor's data cable to the DVI port (digital) on the Port Replicator.

► First switch on the monitor and then the notebook.

Using the **Fn** + **F10** key combination you can switch back and forth between the external monitor and the LCD screen.

Connecting USB devices

USB devices are hot-pluggable. This means you can connect and disconnect devices while your operating system is running.

Additional information can be found in the documentation for the USB devices.

► Connect the data cable to the external device.

► Connect the data cable to the USB port of the notebook.

or

Connect the data cable to the USB port on the Port Replicator.

Device drivers

The devices you connect to the USB ports usually require no driver of their own, as the required software is already included in the operating system. However, if the USB device requires its own software, install it from the data carrier provided with the USB device.

Connecting external audio devices

Microphone port

Via the microphone port you can connect an external microphone to your notebook.

Headphones port

Via the headphone port you can connect either headphones or external loudspeakers to your notebook.

Memory expansion

Your notebook has 256 MB – 4 GB of main memory installed, depending on the upgrade level. The notebook will not start without memory modules, as no fixed main memory is installed.

With a memory configuration of 4 GB, the visible and usable main memory can be reduced to 3 GB (depending on notebook configuration).

Installing and removing the memory extension

Please note the information provided in "Notes on installing and removing boards and components" section in "Important notes".

The notebook must be switched off when installing/removing memory modules, and must not be in Suspend mode.

Only use memory expansions supplied by the manufacturer, which have been approved for your device (1 GB modules or 2 GB modules DDR3).

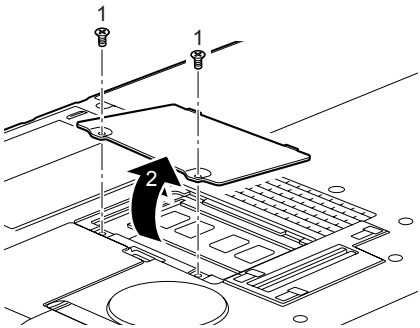
Never use force when installing or removing memory modules.

Make sure that foreign objects do not fall into the memory extension compartment.

Your notebook supports Dual Channel Technology if two DDR3 memory modules are installed. Fujitsu Technology Solutions recommends the installation of two identical memory modules, in order to achieve maximum system power.

- ► Switch your notebook off.
- ► Close the LCD screen onto the bottom half of the notebook with the glass facing inward until you can feel it lock into place.
- ► Unplug the mains adapter from the mains socket.
- ► Disconnect all cables connected to the notebook.
- ► Turn your notebook over and place it on a stabile, sturdy, flat surface. If necessary, lay an anti-slip cloth on this surface to prevent the notebook from being scratched.
- ► Remove the battery (see "Removing the battery").

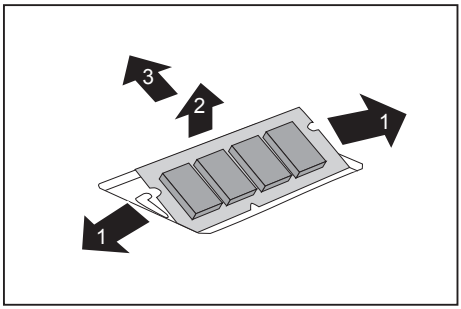
Cover removal



► Remove the screws (1).

► Pull off the cover from the notebook in the direction of the arrow (2).

Removing the memory module



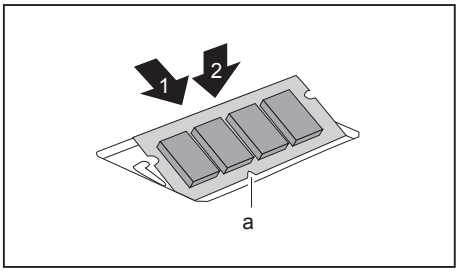
► Carefully push the two mounting clips outwards (1).

The memory module will flap upward.

► Pull the memory module out of its slot in the direction of the arrow (2).

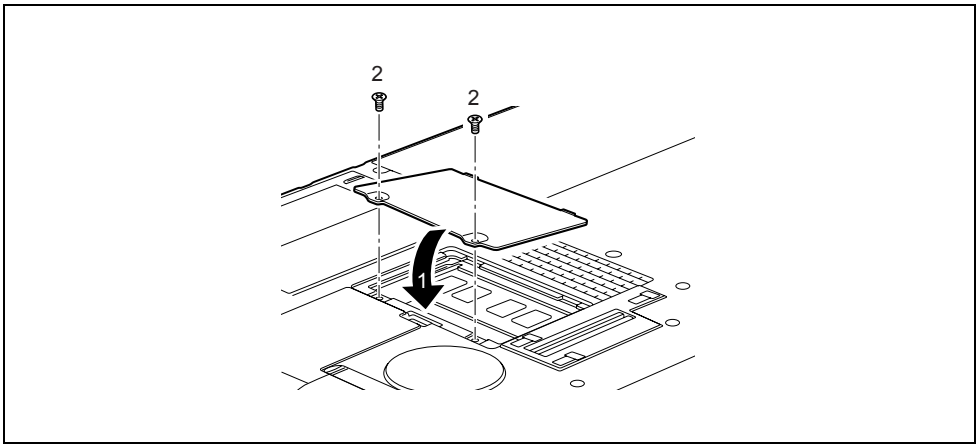
Memory bank 0 must always be populated.

Installing memory module



- ► Insert the memory module with the contacts and the recess (a) forward in the slot (1).
- ► Carefully push the memory module downwards until it engages noticeably (2).

Mounting the cover



- ► Position the cover on its slot in the direction of the arrow (1).
- ► Fasten the cover with the screws (2).
- ► Install the battery (see "Inserting the battery").
- ► Turn the notebook over and place it on a flat surface.
- ► Reconnect the cables that you disconnected before.

Testing memory modules after the installation

► Switch the notebook on and check whether the changed memory size is detected.

The operating system automatically indicates the changed memory capacity.

Energy saving function

Windows XP

You can set the power-management settings for your notebook under *Start – Control Panel – Power Options*.

Windows Vista

You can set the power-management settings for your notebook under *Start – Control Panel – Mobile PC – Power Options*.

Windows 7

Under *Start - Control Panel - System and Security/Power options*, you can set the power saving features for your notebook.

Additional information is contained in your operating system help files.

The notebook uses less energy when the possible energy saving functions are enabled. You will then be able to work for longer before having to recharge the battery.

Never switch off the notebook with the ON/OFF switch while the notebook is in one of the energy-saving modes.

When not using the notebook for long periods of time, first end the energy saving mode, then switch off the notebook.

If your notebook is in an energy-saving mode:

- Do not connect any external devices.
- Do not disconnect any external devices.
- Do not disconnect the notebook from the Port Replicator.
- Do not attempt to switch the notebook on if the built-in battery is flat.
- Do not add or remove RAM.
- Do not insert or remove an ExpressCard.
- Do not replace or remove the battery.

If you use an integrated LAN, a LAN card or a modem card, standby mode can lead to interruption of the network connection.

Settings in the BIOS Setup

In *BIOS Setup* you can set the system functions and the hardware configuration of the notebook. The settings can only be changed via the keyboard.

When it is delivered, the notebook is set to factory default settings. You can change these settings in *BIOS Setup*. Any changes you make take effect as soon as you save and quit the *BIOS Setup*.

The *BIOS Setup* programme contains the following menus:

Info:	for displaying the system configuration (e.g. processor and memory configuration)
Main/System:	for system settings as time, date, hard disk and monitor selection
Advanced:	for system settings such as ports and keyboard
Security:	for password settings and safety functions
Boot:	for configuring the boot sequence
Exit:	to exit the *BIOS Setup*

Starting the BIOS Setup

► Restart the notebook (switch it OFF and back ON again or perform a warm boot).

The following display briefly appears on the screen during start-up:

```
<ESC> Diagnostic screen   <F12> Boot Menu   <F2> BIOS Setup
```

► When this message appears, press the function key **F2**.

If a password has been assigned:

► Enter the password and press the Enter key.

If you have forgotten the password, contact your system administrator or contact our Hotline/Service Desk.

Operating BIOS Setup

Press the **F1** key to display help on the operation of *BIOS Setup*.
The description of the individual settings is shown in the right-hand window of the *BIOS Setup*.

You can revert to the default settings for the *BIOS Setup* menu you are currently in, by using the **F9** function key.

► Use the cursor key ← or → to select the menu you wish to access to make changes.

► Press the Enter key.

The menu is displayed on the screen.

► Use the cursor key ↑ or ↓ to select the field you wish to change.

► Press the Enter key to confirm your selection.

► Press the **ESC** key to exit the selected menu.

► Note the changed entries.

Exiting BIOS Setup

To exit *BIOS Setup*, select the *Exit* menu from the menu bar. You can then decide which settings you want to save. The *Exit* menu offers the following options.

You must mark the required option and activate it with the Enter key.

Exit BIOS Setup Saving Changes

Select *Exit Saving Changes* and *Yes* to save the current settings and exit the *BIOS Setup*. The device is rebooted and the new settings come into effect.

Exit Bios Setup Discarding Changes

Select *Exit Discarding Changes* and *Yes* to discard the changes you have made. The settings which were in force when *BIOS Setup* was called remain effective. *BIOS Setup* is terminated and the device is rebooted.

Load Setup Default

To revert all the menus of *BIOS Setup* to the default entries, select *Load Setup Default* and *Yes*.

Discard Changes

To load the values of all the menus of *BIOS Setup* that were in effect when *BIOS Setup* was called, select *Discard Changes* and *Yes*. If you want to exit *BIOS Setup* with these settings, select *Exit Saving Changes* and *Yes*.

Save Changes

To save settings without exiting *BIOS Setup*, select *Save Changes* and *Yes*.

Troubleshooting and tips

Take note of the safety notes in the "Safety" manual, when you connect or disconnect cables.

Help if problems occur

Should you ever have a problem with your computer that you cannot solve yourself, in many cases you can solve it quickly using the *SystemDiagnostics* program pre-installed on your computer.

- ► To start the *SystemDiagnostics* program, click *Start* - *Programs* - *Fujitsu* - *SystemDiagnostics*.
- ► If a problem is detected during the test run, the *SystemDiagnostics* program outputs a code (e.g. DIFS code YXXX123456789123).
- ► Take a note of this DIFS code and the ID number of your device. The ID number can be found on the type rating plate on the back of the casing.
- ► If you still need assistance resolving the problem, contact the relevant Service Desk for your country (see the Service Desk List or go to *http://ts.fujitsu.com/support*). Have the ID/serial No. of your system and the DIFS code ready.

Troubleshooting

The notebook's date or time is incorrect

Cause	Troubleshooting
Time and date are incorrect.	► Double-click on the clock in the task bar and adjust the time. or ► Set the time or date in the *BIOS Setup* menu *Main*.
The backup battery installed in the notebook is flat.	If the time and date are repeatedly incorrect after switching on the notebook: ► If that problem exists further more please contact our service.

Battery indicator does not illuminate

Cause	Troubleshooting
The battery is not installed correctly.	► Switch the notebook off. ► Check whether the battery is installed correctly in its compartment. ► Switch the notebook on.
The battery is dead.	► Charge the battery. or ► Install a charged battery. or ► Connect the notebook via its mains adapter to the mains outlet.

The LCD screen of the notebook remains blank

Cause	Troubleshooting
LCD screen is switched off.	► Press a key or enter the password
The notebook is set so that the picture only appears on the external screen.	► Press the key combination Fn + F10 (switch screen output).
External monitor or television set is connected.	► In the *BIOS Setup* in the *Advanced - Video Features* menu set the *Display Settings* setting to *Internal Flat Panel*.

The LCD screen is difficult to read

Cause	Troubleshooting
Reflection	► Turn the notebook or alter the tilt of the LCD screen.
Brightness control is set to dark.	► Turn the brightness of the LCD screen up (e.g. with Fn + F7).
Incorrect screen setting	► Check and make sure that you have set the correct resolution for the LCD screen.

The external monitor remains blank

Cause	Troubleshooting
Monitor is switched off	► Switch the external monitor on.
Power saving has been activated (monitor is blank).	► Press any key to continue.
Brightness control is set to dark.	► Adjust the brightness control.
Screen output is set to the notebook's LCD screen	► Press the key combination Fn + F10 (switch screen output).
The external monitor's power cable or data cable is not connected properly	► Switch off the external monitor and the notebook. ► Check whether the power cable is plugged properly into the external monitor and into the power socket. ► Check whether the data cable is properly connected to the notebook and the external monitor (if it is plugged in with a connector). ► Switch on the external monitor and the notebook.

The external monitor is blank or the image is unstable

Cause	Fault elimination
An incorrect type has been selected for the external monitor or an incorrect screen resolution has been set for the application programme.	► Terminate the application program in Windows by pressing Alt + F4. ► If the fault continues to occur after ending the programme, switch to the notebook's internal LCD screen with Fn + F10 and make the following settings: ► Adjust the screen resolution as described in the Help facility for your operating system. ► Select the correct monitor as described in the Help facility for your operating system.

The cursor does not correctly follow the pen movements

Cause	Fault elimination
Pen incorrectly calibrated.	**Windows XP** ► Calibrate the pen as shown under *Tablet and Pen Settings* in the Control Panel, see "Setting the pen" and "Calibrating the pen". **Windows Vista** ► Calibrate the pen as shown under *Tablet PC Settings* in the Control Panel, see "Setting the pen" and "Calibrating the pen". **Windows 7** ► Calibrate the pen as shown under *Hardware and Sound / Tablet PC Settings* in the Control Panel, see "Setting the pen" and "Calibrating the pen".

Pen input not working

Cause	Fault elimination
Incorrect driver installed.	► If your device is one which can only be operated using the pen, install the driver for the standard model. or ► If your device is one which can be operated using pen or finger, install the driver for the "Dual Digitizer" model.

The notebook cannot be started

Cause	Troubleshooting
The battery is not installed correctly.	► Switch the notebook off. ► Check whether the battery is installed correctly in its compartment. ► Switch the notebook on.
The battery is dead.	► Charge the battery. or ► Install a charged battery. or ► Connect the notebook via its mains adapter to the mains outlet.
The mains adapter is not connected correctly.	► Switch the notebook off. ► Check whether the mains adapter is connected correctly to the notebook. ► Check whether the power cable is plugged properly into the mains adapter and into the mains outlet. ► Switch the notebook on.

The notebook does not react

Cause	Troubleshooting
The notebook is in Standby or Suspend mode.	► Disable Standby mode (press a key) or Suspend mode (switch notebook on).
The application programme has caused the malfunction	► Close the application programme or restart the notebook (by switching it off and back on again or performing a warm boot).
The battery is dead.	► Charge the battery. or ► Install a charged battery. or ► Connect the notebook via its mains adapter to the mains outlet.

The mouse does not work

Cause	Troubleshooting
The touchpad has been deactivated..	► Activate the touchpad by pressing the Fn + F4 key combination.
Touchpad driver is not installed properly	► Uninstall the touchpad driver. ► Install the actual driver from the "Drivers & Utilities" CD.
Mouse driver is not loaded	► Check whether the correct mouse driver is properly installed and is present before the application programme is started. Detailed information can be found in the User guides for the mouse or application programme.
Mouse is not connected	► Check whether the mouse cable is correctly connected to the notebook. ► If you use an adapter or extension lead with the mouse cable, check the connections. ► Switch the notebook on.

The printer does not print

Cause	Troubleshooting
Printer not ready-for-use	► Make sure that the printer is switched on and is online (see the manuals supplied with the printer).
Data line interrupted between notebook and printer	► Check that the cable connecting the notebook and the printer is connected properly.
Wrong print driver installed	► Check that the correct printer driver is installed.

The notebook shuts down suddenly

Cause	Troubleshooting
If you are operating the notebook with a battery, you may have overlooked the reference to the low battery level and the notebook has switched over to Standby mode.	► Connect the mains adapter. ► Press the ON/OFF switch.

A component (e.g. optical drive) is not detected or is not ready

Cause	Troubleshooting
The component has been deactivated.	► Check whether the component has been deactivated with the *Eco Utility* (if installed). ► Re-activate the component.

The wireless components are not available

Cause	Troubleshooting
The wireless components have been deactivated.	► Check whether the wireless components have been deactivated with the *Wireless Selector* (if installed). ► Re-activate the wireless components.

The ON/OFF switch does not respond as intended

Cause	Troubleshooting
The system may be processing.	► Wait until the system has completed processing.
You have not pressed the ON/OFF switch long enough to switch off the notebook.	► Press the ON/OFF switch until the notebook is switched off.
The settings in the Windows energy saving functions are incorrect.	► Check the power-saving functions for your notebook.

The radio connection to a network does not work

Details are contained in the online Service for your wireless LAN software and in the "Wireless LAN" manual. The "Wireless LAN" manual can be found on the "Drivers & Utilities" CD/DVD.

You can find more information on how to use Bluetooth on the CD you received with your Bluetooth software.

Cause	Troubleshooting
The ON/OFF switch for the radio component is in the "OFF" position.	► Switch the radio component on (see "Switching on the wireless component").
The ON/OFF switch for the radio component is in the "ON" position. Nevertheless, the radio connection to a network does not function.	► Check whether the radio connection is switched on via the software. ► Check whether the radio components have been activated in the BIOS settings.

The battery discharges too quickly

Cause	Troubleshooting
The battery is either too hot or too cold. In this case the battery indicator flashes.	► Move the notebook so that its temperature returns to within the normal range. ► If the operating time of the battery life is extremely short, the battery is probably too old. Replace battery if necessary.
You may have an application running that consumes a great deal of power due to frequent accessing of the hard disk or optical drive.	► Use the mains adapter as frequently as possible.
The maximum brightness may have been set for the screen.	► Set the screen somewhat darker with the key **Fn** and the key **F6** to reduce the power consumption.
The power-management features have been deactivated.	► Check the settings in the *BIOS Setup* (in the *Power* menu) and under Windows *Power Options* in the *Control Panel* and match the parameters.

The CD/DVD does not work – no sound during CD/DVD playback

Cause	Troubleshooting
CD inserted incorrectly	► Check whether the CD/DVD has been properly inserted into the drive.
CD faulty or not standard	► Check whether the CD/DVD is scratched, warped, dirty or damp. ► Make sure that you use a CD/DVD that complies with the standards.
Loudspeaker	► Use the key combination Fn + F3 to check the mute status. ► Use the key combination Fn + F8 or Fn + F9 to check the volume.
Incorrect audio settings	► Check the audio settings of the sound card or the audio driver.

User and/or supervisor password forgotten

Cause	Troubleshooting
Password: forgotten	► If you have forgotten your user password, enter the supervisor password or contact your system administrator. ► If the supervisor password is also no longer available, please contact our Hotline/Service Desk. You must provide proof of ownership for the notebook. Then the Service Desk will refer you to our service partner, who will unlock your notebook (for a charge).

SmartCard reader is not recognised

Cause	Troubleshooting
Chipkarte falsch eingesteckt.	► Make sure you have inserted your SmartCard into the SmartCard reader with the chip facing upward. ► Check whether the SmartCard you are using is supported. Your SmartCard must comply with the ISO standard 7816-1, -2, -3 and -4.

SmartCard PIN forgotten

Cause	Troubleshooting
PIN forgotten	► If you work in a network, contact your system administrator, who can unlock your notebook with a Supervisor PIN.

SmartCard lost

Cause	Troubleshooting
SmartCard lost	► If you work in a network, contact your system administrator, who can boot your notebook with a Supervisor SmartCard.

User and/or supervisor SmartCard lost

Cause	Troubleshooting
User and/or supervisor SmartCard lost	► If you have lost your User SmartCard, you can continue working with the Supervisor SmartCard and can initialise a new User SmartCard or deactivate the *SystemLock* function. ► If you have lost the Supervisor SmartCard, you can also continue working, but you no longer have all rights and cannot initialise another Supervisor-SmartCard. ► If you have lost both SmartCards, you cannot boot your system. Please contact our Service desk. You must provide proof of ownership for the device. Then the Service Desk will refer you to our service partner, who will unlock your device (for a charge).

Acoustic error messages

Cause	Troubleshooting
A beep sounds every few seconds The battery is almost flat.	► Charge the battery.

Error messages on the screen

This section describes the error messages generated by the *BIOS Setup*. Error messages displayed by the operating system or programmes are described in the relevant documentation.

i If the error message appears repeatedly, despite troubleshooting measures, please contact the place of purchase or our customer service centre.

Error message/cause	Troubleshooting
`CMOS Battery Bad` If the error message occurs repeatedly, the buffer battery in the notebook is flat.	► Please contact your sales outlet or our customer service centre.
`System CMOS checksum bad – Default configuration used` The system configuration information is incorrect.	► Switch the notebook off. ► Switch the notebook on. ► Enter the *BIOS Setup* by pressing F2. ► Select the *Exit* menu in the *BIOS Setup*. ► Select the entry *Load Setup Defaults*. ► Select *OK* and press the Enter key.
`Extended memory failed at offset: xxxx Failing Bits: zzzz zzzz` When testing the extended memory an error has resulted at the address xxxx.	► Check whether the additional memory module has been inserted correctly.
`Failure Fixed Disk n` The settings of the hard disk drive are incorrect.	► Start the *BIOS Setup* (*Primary Master* submenu) and select the correct settings.
`Keyboard controller error`	► Switch the notebook off with the ON/OFF switch. ► Wait 3 to 5 seconds and switch the notebook back on again.

Error message/cause	Troubleshooting
`Keyboard error`	If you use an external keyboard: ► Check the connection and reboot the notebook.
`nn Stuck key`	► Make sure that no key is pressed.
`Operating system not found`	► Check in the *BIOS Setup* whether your hard disk has been set correctly. ► Make sure that the operating system is installed on the corresponding drive.
`Press <F1> to resume, <F2> to SETUP` This error message appears if a fault occurs during the self-test before the operating system is started.	► Press the **F1** function key to start the operating system. ► Enter the *BIOS Setup* by pressing **F2**.
`Previous boot incomplete - Default configuration used` Due to an error during the previous system boot, default values were used for certain settings. Check the settings in the *BIOS Setup*.	► Press the **F1** function key when prompted to do so.
`Real Time clock error`	► Please contact your sales outlet or our customer service centre.
`nnnnK Shadow RAM failed at offset: xxxx  Failing Bits: zzzz`	► Please contact your sales outlet or our customer service centre.
`System battery is dead - Replace and run SETUP`	► Please contact your sales outlet or our customer service centre.
`System cache error - Cache disabled`	► Please contact your sales outlet or our customer service centre.
`System timer error`	► Please contact your sales outlet or our customer service centre.

Restore operating system (Recovery CD/DVD can be ordered separately)

Please note: If you restore the operating system, all of the data on the hard disk will be deleted, including all personal data, drivers and programmes. Drivers and software utilities must be reinstalled. After restoring the operating system, you can read personal data that you saved previously to another media, back onto the hard disk. We recommend in all cases that you make regular backups!

With the "Windows Recovery CD/DVD" you can restore the operating system on your notebook. Please make sure to plan enough time for restoring the operating system.

With the "Drivers & Utilities" CD/DVD you can restore some of the programmes from the original software and your notebook's original drivers onto your hard disk.

- ► Set the notebook into the notebook position.
- ► Insert the "Windows Recovery CD/DVD" into the CD/DVD drive.
- ► Restart the notebook.
- ► Press the **F2** function key to call the *BIOS Setup*.
- ► Select the *Boot* menu in the *BIOS Setup*.
- ► Select the menu *Boot Device Priority* and set the *CD-ROM-Drive* to the first position of the startup order.
- ► Restart the notebook.
- ► Follow the instructions on the screen.

Afterwards you can install any newer driver versions contained on the "Drivers & Utilities" CD/DVD.

If necessary, reset the drive startup order in the *BIOS Setup* back to its original setting.

Technical data

Notebook

General	
Processor	Intel Core 2 Duo processor
Main memory (SO DIMM) Intel Turbo Memory (optional)	Maximum 4 GB DDR3 2 slots for 1 GByte or 2 GByte modules 4 GB
Electrical data	
Regulations complied with	CE, CE!
Protection class	II
Maximum power draw : (when the notebook is switched on and the battery is being charged)	80 W 100 W while a port replicator is being used
LCD screen	
Display	● 33.8 cm TFT WXGA ● 1280 x 800 / 32-bit ● Pixel class II ● Brightness control: 8 levels ● LED backlight ● Bright (shiny screen surface) or optional anti-glare (matt screen surface)
Digitizer	● Active Digitizer or ● Dual Digitizer
Screen controller	
Chip	GMA 4500MHD
Recommended screen resolution of the external CRT monitor (53.3 cm):	1280 x 1024 (maximum 1920 x 1200) / 16.7 million colours at 85 Hz
Dimensions	
Width x depth x height	319 mm x 244 mm x 38.5 mm
Weight depending on configuration	from 1.98 kg
Input devices	
Keyboard	85 keys
Touchpad	2 keys
Tablet buttons	5 keys
Pen	1 rocker button/eraser

Slots	
ExpressCard slot	1 x ExpressCard/34 or ExpressCard/54
Memory card slot	1 x SD or MS card
SmartCard slot	1 x
SIM card slot (optional)	1 x
Ports	
Monitor port (analogue)	15-pin socket
LAN port	Socket, RJ45
Microphone port/Line In	3.5 mm stereo mini jack
Headphones port/Line Out	3.5 mm stereo mini jack
FireWire port	S400, 4-pin
Docking port	80-pin
USB (Universal Serial Bus)	3 x USB 2.0
Kensington Lock	2 x
Environmental conditions	
Environment class DIN IEC 721	7K1
Mechanism class DIN IEC 721	7M2
Temperature:	
Operation	5 °C .... 35 °C
Transport (2K2)	–15 °C .... 60 °C

Port Replicator (optional)

Electrical data	
Regulations complied with	CE
Protection class	II
Ports	
Monitor port (analogue)	15-pin socket
Monitor port (digital)	25-pin female connector, DVI-D
HDMI port	19-pin socket
LAN port	Socket, RJ45
USB (Universal Serial Bus)	4x USB 2.0
Audio	Line out
Docking port	80-pin
Environmental conditions	
Environment class DIN IEC 721	7K1
Mechanism class DIN IEC 721	7M2
Temperature	
Operation	5°C .... 35°C
Transport	–15°C .... 60°C

Battery

Both rechargeable batteries are 6-cell batteries.

	Main battery	Optional battery (fitting in the module bay)
Rated voltage	10.8 V	10.8 V
Rated capacity	62.6 Wh	41 Wh
Nominal charge	5.800 mAh	3.800 mAh

i The operating time depends on the device equipment, the active applications and the energy saving settings.

Mains adapter

Electrical data	
Primary:	
Rated voltage	100 V to 240 V (automatic)
Frequency	50 Hz to 60 Hz (automatic)
Max. rated current	0.7 – 1.2 A
Secondary, without port replicator:	
Nominal power	80 W or 100
Rated voltage	19 V
Max. rated current	4.22 A or 5.3 A
Secondary, with port replicator:	
Nominal power	100 W
Rated voltage	19 V
Max. rated current	5.3 A

You can readily order an additional mains adapter and an additional power cable.

Manufacturer’s notes

Energy Star

Devices which are certified according to the Energy Star environmental mark help to save money and reduce greenhouse gas emissions.

Power Management settings on delivery:

- Monitor switched off after < 15 minutes of inactivity
- Automatic activation of energy saving mode (ACPI S3) after < 30 minutes of inactivity

Detailed information about the requirements of the "Energy Star" environmental mark and the products which satisfy these requirements can be found on the Internet at *https://www.energystar.gov/.*

Recycling and disposal

Further information can be found on the "Drivers & Utilities" CD/DVD.

CE marking

CE

The shipped version of this device complies with the requirements of the European Union directives 2004/108/EC "Electromagnetic compatibility" and 2006/95/EC "Low voltage directive".

Tested safety (GS)

With the AntiGlare display the device meets the requirements of the following directives:

- EN60950-1:2001
- DIN EN ISO 13406-2:2003
- EK1-ITB 2000:2008
- DIN EN ISO 9241-4:1999

CE marking for devices with radio component

This equipment complies with the requirements of Directive 1999/5/EC of the European Parliament and Commission from 9 March, 1999 governing Radio and Telecommunications Equipment and mutual recognition of conformity.

This equipment can be used in the following countries:

Belgium	Denmark	Germany	Estonia
Finland	France	Greece	UK
Ireland	Iceland	Italy	Latvia
Liechtenstein	Lithuania	Luxemburg	Malta
The Netherlands	Norway	Austria	Poland
Portugal	Sweden	Switzerland	Slovakia
Slovenia	Spain	Czech Republic	Hungary
Cyprus	Bulgaria	Rumania	

Contact the corresponding government office of the respective country for current information on possible operating restrictions. If your country is not included in the list, then please contact the corresponding supervisory authority as to whether the use of this product is permitted in your country.

Regulatory notices

If there is no FCC logo and also no FCC ID on the device then this device is not approved by the Federal Communications Commission (FCC) of the USA. Although it is not explicitly forbidden to travel the US trading area carrying this device, but to avoid trouble at customs clearance Fujitsu Technology Solutions GmbH recommends not to bring this device into the US trading area.

Regulatory information for notebooks without radio device

NOTICE:

Changes or modifications not expressly approved by Fujitsu Technology Solutions could void this user's authority to operate the equipment.

Notice to Users of Radios and Television

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet that is on a different circuit than the receiver.

- Consult the dealer or an experienced radio/TV technician for help.

Shielded interconnect cables must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device.

Notice to Users of the US Telephone Network

Your notebook may be supplied with an internal modem which complies with Part 68 of the FCC rules. On this notebook is a label that contains the FCC Registration Number and the Ringer Equivalence Number (REN) for this equipment among other information. If requested, the user must provide their telephone company with the following information:

1. The telephone number to which the notebook is connected.
2. The Ringer Equivalence Number (REN) for this equipment.
3. The equipment requires a standard modular jack type USOC RJ-11C which is FCC Part 68 compliant.
4. The FCC Registration Number.

This equipment is designed to be connected to the telephone network or premises wiring using a standard modular jack type USOC RJ-11C which is FCC Part 68 compliant and a line cord between the modem and the telephone network with a minimum of 26AWG.

The REN is used to determine the number of devices that you may connect to your telephone line and still have all of those devices ring when your number is called. Too many devices on one line may result in failure to ring in response to an incoming call. In most, but not all, areas the sum of the RENs of all of the devices should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the RENs, contact your local telephone company.

If this equipment causes harm to the telephone network, your telephone company may discontinue your service temporarily. If possible, they will notify you in advance. If advance notice is not practical they will notify you as soon as possible. You will also be advised of your right to file a complaint with the FCC.

This fax modem also complies with fax branding requirements per FCC Part 68.

Your telephone company will probably ask you to disconnect this equipment from the telephone network until the problem is corrected and you are sure that the equipment is not malfunctioning. This equipment may not be used on coin-operated telephones provided by your telephone company. Connection to party lines is subject to state tariffs. Contact your state's public utility commission, public service commission or corporation commission for more information.

This equipment includes automatic dialling capability. When programming and/or making test calls to emergency numbers:

- Remain on the line and briefly explain to the dispatcher the reason for the call.
- Perform such activities in off-peak hours, such as early morning or late evening.

FCC rules prohibit the use of non-hearing aid compatible telephones in the following locations or applications:

- All public or semipublic coin-operated or credit card telephones.
- Elevators, highways, tunnels (automobile, subway, railroad or pedestrian) where a person with impaired hearing might be isolated in an emergency.
- Places where telephones are specifically installed to alert emergency authorities such as fire, police or medical assistance personnel.
- Hospital rooms, residential health care facilities, convalescent homes and prisons.
- Hotel, motel or apartment lobbies.

- Stores where telephones are used by patrons to order merchandise.
- Public transportation terminals where telephones are used to call taxis or to reserve lodging or rental cars.
- In hotel and motel rooms as at least ten percent of the rooms must contain hearing aid-compatible telephones or jacks for plug-in hearing aid compatible telephones which will be provided to hearing impaired customers on request.

DOC (INDUSTRY CANADA) NOTICES

Notice to Users of Radios and Television

This Class B digital apparatus meets all requirements of Canadian Interference-Causing Equipment Regulations.

CET appareil numérique de la class B respecte toutes les exigence du Réglement sur le matérial brouilleur du Canada.

Notice to Users of the Canadian Telephone Network

NOTICE:

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications.

This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment. Before connecting this equipment to a telephone line the user should ensure that it is permissible to connect this equipment to the local telecommunication facilities. The user should be aware that compliance with the certification standards does not prevent service degradation in some situations.

Repairs to telecommunication equipment should be made by a Canadian authorized maintenance facility. Any repairs or alterations not expressly approved by Fujitsu or any equipment failures may give the telecommunication company cause to request the user to disconnect the equipment from the telephone line.

NOTICE:

The Ringer Equivalence Number (REN) for this terminal equipment is 0.0. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

CAUTION:

For safety, users should ensure that the electrical ground of the power utility, the telephone lines and the metallic water pipes are connected together. Users should NOT attempt to make such connections themselves but should contact the appropriate electric inspection authority or electrician. This may be particularly important in rural areas.

Avis Aux Utilisateurs Du Réseau Téléphonique Canadien

AVIS : Le présent matériel est conforme aux spécifications techniques d'Industrie Canada applicables au matériel terminal. Cette conformité est confirmée par le numéro d'enregistrement. Le sigle IC, placé devant le numéro d'enregistrement, signifie que l'enregistrement s'est effectué conformément à une déclaration de conformité et indique que les spécifications techniques d'Industrie Canada ont été respectées. Il n'implique pas qu'Industrie Canada a approuvé le matériel.

Avant de connecter cet équipement à une ligne téléphonique, l'utilisateur doit vérifier s'il est permis de connecter cet équipement aux installations de télécommunications locales. L'utilisateur est averti que même la conformité aux normes de certification ne peut dans certains cas empêcher la dégradation du service.

Les réparations de l'équipement de télécommunications doivent être effectuées par un service de maintenance agréé au Canada. Toute réparation ou modification, qui n'est pas expressément approuvée par Fujitsu, ou toute défaillance de l'équipement peut entraîner la compagnie de télécommunications à exiger que l'utilisateur déconnecte l'équipement de la ligne téléphonique.

AVIS : L'indice d'équivalence de la sonnerie (IES) du présent matériel est de 0.0. L'IES assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

AVERTISSEMENT:

Pour assurer la sécurité, les utilisateurs doivent vérifier que la prise de terre du service d'électricité, les lignes télphoniques et les conduites d'eau métalliques sont connectées ensemble. Les utilisateurs NE doivent PAS tenter d'établir ces connexions eux-mêmes, mais doivent contacter les services d'inspection d'installations électriques appropriés ou un électricien. Ceci peut être particulièrement important en régions rurales.

UL Notice

This unit requires an AC adapter to operate. Only use a UL Listed Class 2 adapter. The correct output rating is indicated on the AC adapter label. Refer to the illustration below for the correct AC Adapter output polarity:

CAUTION:

To reduce the risk of fire, use only 26AWG or larger telecommunications line cord.

For Authorized Repair Technicians Only

CAUTION:

For continued protection against risk of fire, replace only with the same type and rating fuse.

WARNING:

Danger of explosion if Lithium (CMOS) battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

FCC Regulatory information for notebooks with radio device

Federal Communications Commission statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of this device.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the equipment and the receiver.
3. Connect the equipment to an outlet on a circuit different from the one the receiver is connected to.
4. Consult the dealer or an experienced radio/TV technician for help.

Please note the following regulatory information related to the optional radio device.

FCC Radio Frequency Exposure statement

This radio device has been evaluated under FCC Bulletin OET 65C and found compliant with the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. The radiated output power of this radio device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation is minimized. When using this device, a certain separation distance between antenna and nearby persons must be maintained to ensure RF exposure compliance. In order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm (8 inches).

Regulatory Notes and Statements

Radio device, health and authorisation for use

Radio-frequency electromagnetic energy is emitted from the wireless devices. The energy levels of these emissions, however, are far much less than the electromagnetic energy emissions from wireless devices such as mobile phones. Radio devices are safe for use by consumers because they operate within the guidelines found in radio frequency safety standards and recommendations.

The use of the radio devices may be restricted in some situations or environments, such as:

- on board an airplane, or
- in an explosive environment, or

- in situations where the interference risk to other devices or services is perceived or identified as harmful.

In cases in which the policy regarding use of radio devices in specific environments is not clear (e.g., airports, hospitals, chemical/oil/gas industrial plants, private buildings), obtain authorization to use these devices prior to operating the equipment.

Regulatory Information/Disclaimers

Installation and use of this radio device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user’s authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution or attachment of connecting cables and equipment other than those specified by the manufacturer. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. The manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failure to comply with these guidelines.

Export restrictions

This product or software contains encryption code which may not be exported or transferred from the US or Canada without an approved US Department of Commerce export license. This device complies with Part 15 of FCC Rules, as well as ICES 003 B / NMB 003 B. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesirable operation.

Modifications not expressly authorized by Fujitsu Technology Solutions may invalidate the user's right to operate this equipment.

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