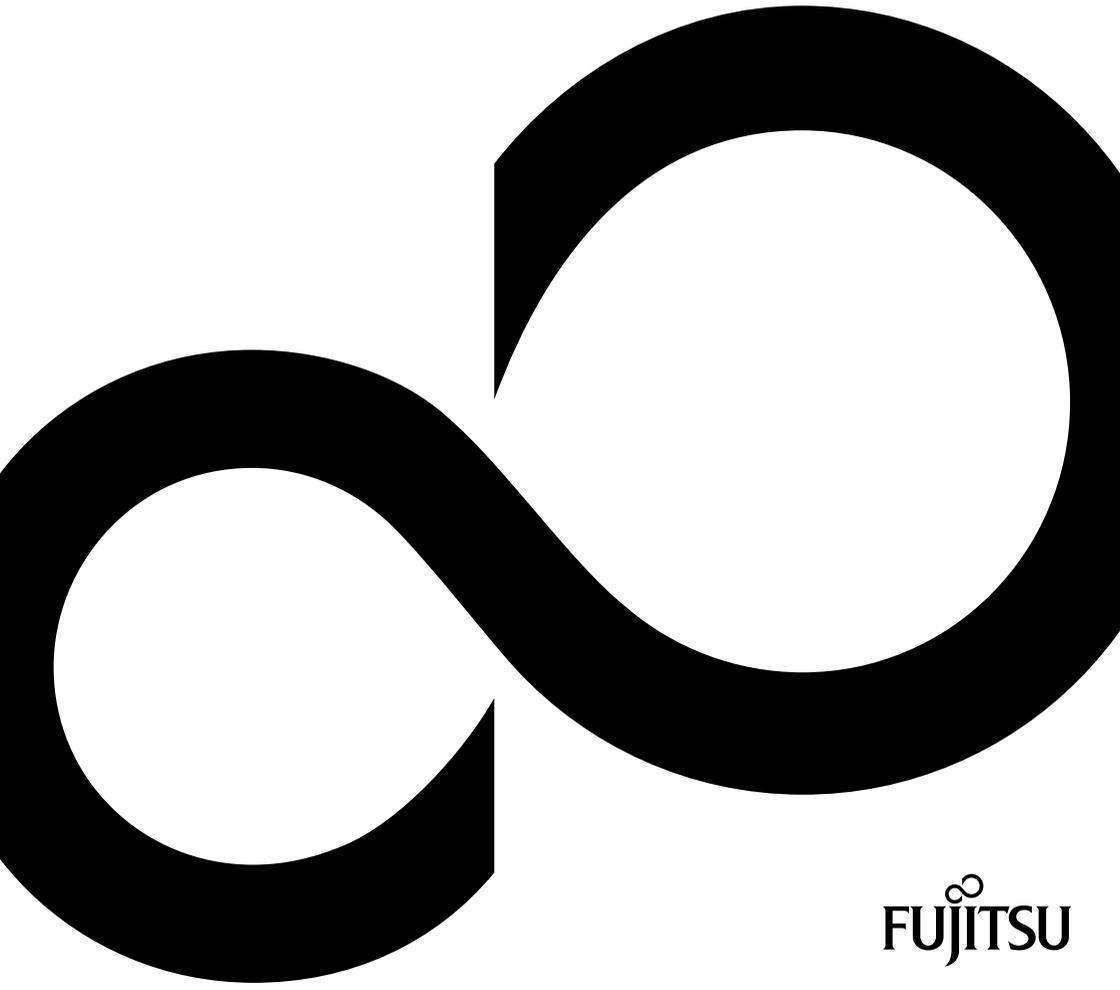


FUJITSU LIFEBOOK T725



Congratulations on your purchase of an innovative product from Fujitsu.

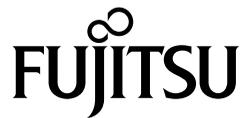
The latest information about our products, tips, updates etc. can be found on the Internet at: ["http://www.fujitsu.com/fts/"](http://www.fujitsu.com/fts/)

You can find driver updates at: ["http://support.ts.fujitsu.com/download"](http://support.ts.fujitsu.com/download)

Should you have any technical questions, please contact:

- our Hotline/Service Desk (see the Service Desk list or visit: ["http://support.ts.fujitsu.com/contact/servicedesk"](http://support.ts.fujitsu.com/contact/servicedesk))
- Your sales partner
- Your sales office

We hope you enjoy working with your new Fujitsu system!



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FUJITSU LIFEBOOK T725

Operating manual

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Innovative technology

... and ergonomic design make your device a reliable and convenient companion.

The device boots very quickly, is ready for immediate use and offers a particularly long operating time because of its high capacity battery.

With the user-friendly "BIOS Setup Utility" you can control your notebook's hardware and better protect your system against unauthorised access by using the powerful password properties.



Information on the connections and user components of your notebook can be found in ["Ports and controls", Page 9.](#)

Further information



The Windows drivers for your device can be found on our Internet site. The factory installation of your device does not support any other operating system. Fujitsu Technology Solutions accepts no liability whatsoever if any other operating system is used.

Software oriented components of these instructions refer to Microsoft products, if they come within the scope of the delivery.

If you install other software products, pay attention to the operating instructions of the manufacturer.

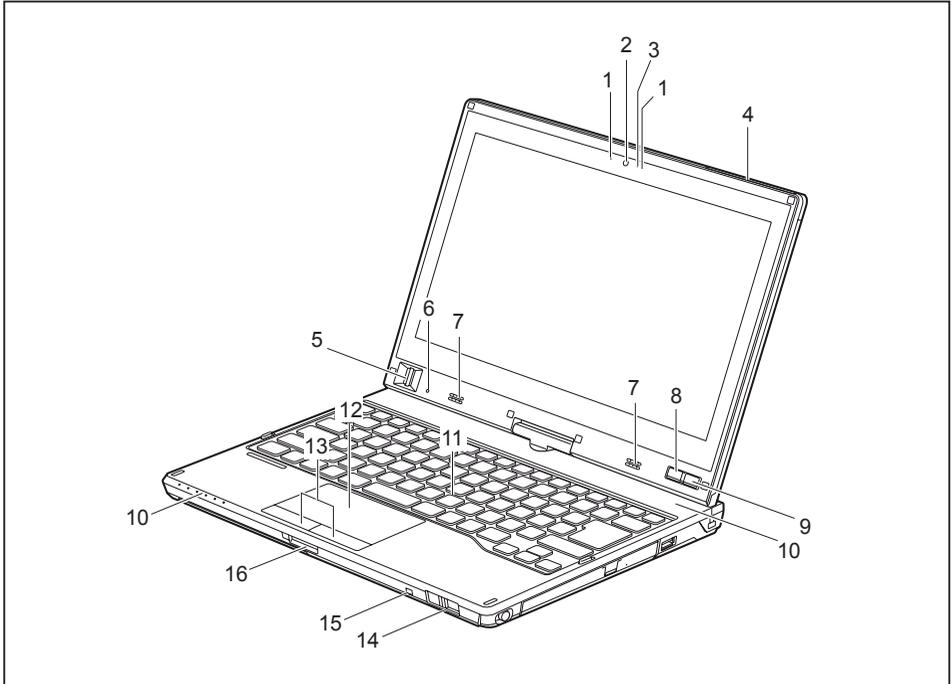
Notational conventions

| | |
|--|--|
|  | <p>Pay particular attention to text marked with this symbol. Failure to observe these warnings could pose a risk to health, damage the device or lead to loss of data. The warranty will be invalidated if the device becomes defective through failure to observe these warnings.</p> |
|  | <p>Indicates important information for the proper use of the device.</p> |
|  | <p>Indicates an activity that must be performed</p> |
|  | <p>Indicates a result</p> |
| <p>This font</p> | <p>indicates data entered using the keyboard in a program dialogue or at the command line, e.g. your password (Name123) or a command used to start a program (start.exe)</p> |
| <p>This font</p> | <p>indicates information that is displayed on the screen by a program, e.g.: Installation is complete.</p> |
| <p><i>This font</i></p> | <p>Indicates</p> <ul style="list-style-type: none"> • terms and texts used in a software interface, e.g.: Click on <i>Save</i> • names of programs or files, e.g. <i>Windows</i> or <i>setup.exe</i>. |
| <p>"This font"</p> | <p>Indicates</p> <ul style="list-style-type: none"> • cross-references to another section, e.g. "Safety information" • cross-references to an external source, e.g. a web address: For more information, go to "http://www.fujitsu.com/fts/" • Names of CDs, DVDs and titles or designations for other materials, e.g.: "CD/DVD Drivers & Utilities" or "Safety/Regulations" manual |
| <p>Key</p> | <p>indicates a key on the keyboard, e.g: F10</p> |
| <p>This font</p> | <p>indicates terms and texts that are emphasised or highlighted, e.g.: Do not switch off the device</p> |

Ports and controls

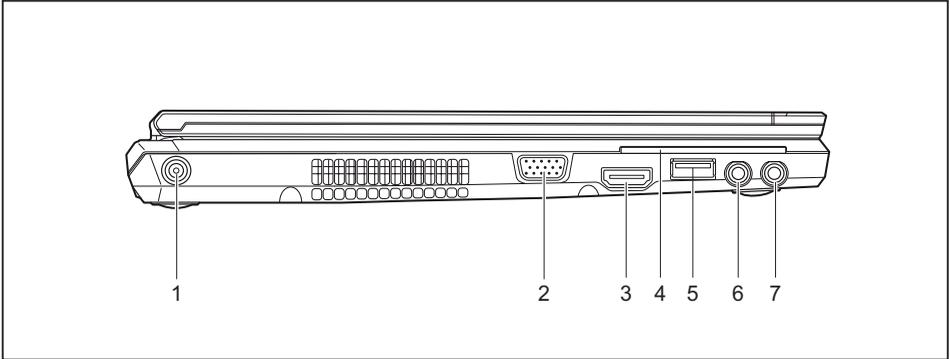
This chapter presents the individual hardware components of your device. It gives you an overview of the device's indicators and connections. Please familiarise yourself with these components before you start to work with the device.

Notebook open



- | | |
|---|---|
| 1 = Microphone | 9 = ON/OFF switch |
| 2 = WebCam | 10 = Status indicators |
| 3 = WebCam LED | 11 = Keyboard |
| 4 = UMTS/LTE antenna | 12 = Touchpad |
| 5 = Fingerprint sensor (device dependent) | 13 = Touchpad buttons |
| 6 = Ambient light sensor | 14 = Eject button for pen |
| 7 = Loudspeakers | 15 = Eyelet for the optional pen tether |
| 8 = Windows button | 16 = Memory card slot |

Left panel



1 = DC input connector (DC IN)

2 = VGA monitor port

3 = HDMI port

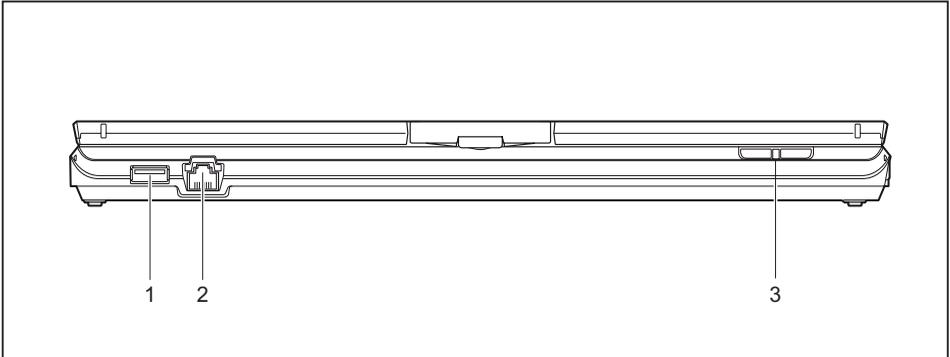
4 = SmartCard reader (device-dependent)

5 = USB port 3.0 with charging function
(Anytime USB charge)

6 = Microphone jack

7 = Headphone port

Rear

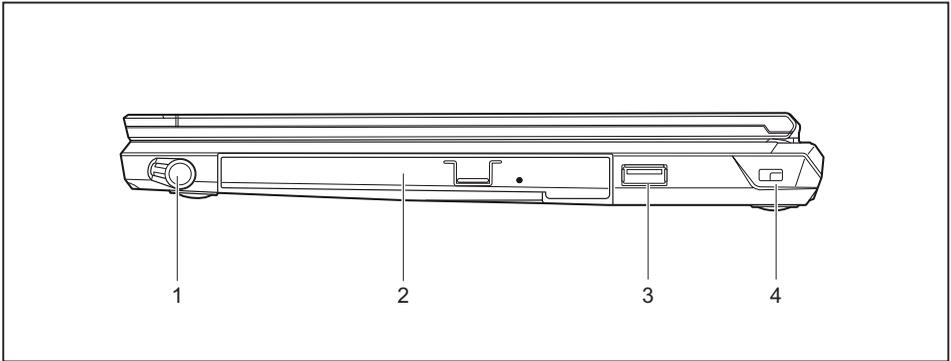


1 = USB port 3.0

2 = LAN port

3 = Volume – button, volume + button

Right-hand side



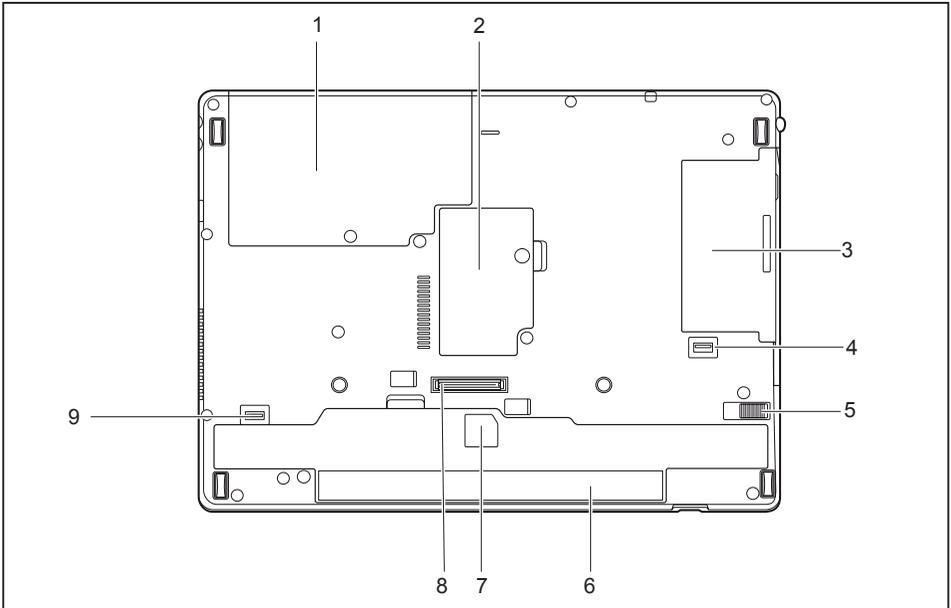
1 = Pen slot

2 = Module bay with optical drive

3 = USB port 3.0

4 = Security Lock device

Bottom



1 = Hard disk service compartment

2 = Memory service compartment

3 = Module bay with optical drive

4 = Module bay release button

5 = Battery lock slider

6 = Battery with SIM card slot under the battery

7 = Battery charge status indicator

8 = Port for port replicator

9 = Battery lock slider

Important notes



This chapter contains essential safety information which must be followed when working with your notebook. Other notes also provide useful information which will help you with your notebook.

Safety notes



Please follow the safety notes provided in the "Safety/Regulations" manual as well as the safety notes given below.

Please pay special attention to 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.

Read the information on the ambient conditions in the ["Technical data", Page 117](#) and ["First-time setup of your device", Page 16](#) before preparing your notebook for use and switching it on for the first time.

When cleaning the device, please observe the relevant notes in the section ["Cleaning the notebook", Page 15](#).

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

Please refer to the notes in the chapter ["Removing and installing components during servicing", Page 97](#).

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

If a radio component (Wireless LAN, Bluetooth, UMTS, LTE) is incorporated into your notebook, you must be sure to observe the following safety notes when using your notebook:

- Switch off the radio components when you are in an aircraft or driving in a car.
- Switch off the radio components when you are in a hospital, an operating room or near a medical electronics system. The transmitted radio waves can impair the operation of medical devices.
- Switch off the radio components when you let the device get near flammable gases or into hazardous environments (e.g. petrol station, paintshops), as the transmitted radio waves can cause an explosion or a fire.



For information on how to switch radio components on and off, see chapter ["Switching the wireless components on and off", Page 62](#).

Energy saving

Switch the notebook off when it is not in use. Switch off external, connected devices if you are not using them. If you use the energy saving functions, the notebook uses less energy. You will then be able to work for longer before having to recharge the battery.



Energy efficiency is increased and the environmental impact is reduced. You save money while protecting the environment.

Energy saving under Windows

- ▶ Make use of the power management features (see ["Using the power-management features", Page 58](#)).

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 for data security reasons. With data traffic via a wireless connection, it is also possible for unauthorised third parties to receive data.



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!
- ▶ Check whether the local mains voltage and the power cable are compatible. If this is not the case, buy a power cable that matches the local conditions.
- ▶ 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 (see also ["CE marking", Page 121](#)).

Transporting the notebook



Protect the notebook from severe shocks and extreme temperatures (e.g. direct sunlight in a car).

- ▶ If your device has an optical drive, remove all data media (e.g. CD, DVD) from the drives.
- ▶ Switch the notebook 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 LCD screen.
- ▶ To protect against damaging jolts and bumps, use a notebook carrying case to transport your notebook.

Cleaning the notebook



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

Only use cleaning products designed for computers. Normal household cleaners and polishes can damage the markings on the keyboard and the device, the paintwork or the notebook itself.

Ensure that no liquid enters the notebook.

The LCD screen very sensitive to scratches. Only clean the display surface with a very soft, slightly damp cloth.

- ▶ Switch the notebook off.
- ▶ In order to prevent accidentally switching the device on, remove the power cable from the mains adaptor and remove the battery (see ["Removing and installing the battery", Page 50](#)).
- ↳ The surface can be cleaned with a dry cloth. If particularly dirty, use a cloth which has been moistened in mild domestic detergent and then carefully wrung out.
To clean the keyboard and the touchpad, if available, you can use disinfectant wipes.
Ensure that no liquid enters the device.

First-time setup of your device



Please read the chapter ["Important notes", Page 12.](#)

If your device is equipped with a Windows operating system, the necessary hardware drivers and supplied software are already pre-installed.

Before you switch on the device for the first time, connect it to the mains voltage using the mains adapter, see ["Mains adapter connecting", Page 17.](#) The mains adapter must be connected during the entire installation process.

A system test is performed when your device is first switched on. Various messages can appear. The display may remain dark for a short time or may flicker.

Please follow the instructions on the screen.

NEVER switch off your device during the first-time setup process.

On delivery, the battery can be found in the battery compartment or in the accessories kit. The battery must be charged if you want to operate your device using the battery.

When used on the move, the built-in battery provides the device with the necessary power. You can increase the operating time by using the available energy-saving functions.

For instructions on how to connect external devices (e.g. mouse, printer) to your device, please refer to the operating manual for your device.

Unpacking and checking the device



Should you discover any damage that occurred during transportation, notify your local sales outlet immediately!

- ▶ Unpack all the individual parts.
- ▶ Check your device for any visible damage which may have occurred during transportation.



You may need the packaging in the future, if you need to transport your device.

Selecting a location



Select a suitable location for the device before setting it up. Follow the instructions below when doing so:

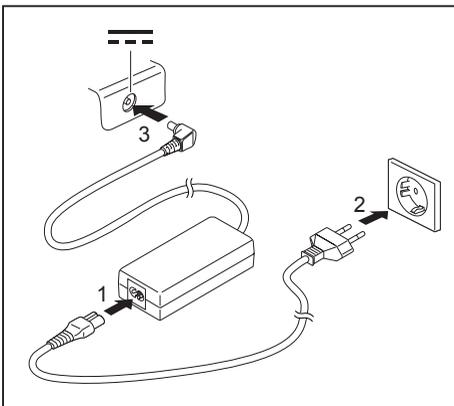
- Never place the device or the mains adapter on a heat-sensitive surface. The surface could be damaged as a result.
- Never place the device on a soft surface (e.g. carpeting, upholstered furniture, bed). This can block the air vents and cause overheating and damage.
- The underside of the device heats up during normal operation. Prolonged contact with the skin may become unpleasant or even result in burns.
- Place the device on a stable, flat, non-slippery surface. Please note that the rubber feet of the device may mark certain types of delicate surfaces.
- Keep other objects at least 100 mm / 3.97" away from the device and its mains adapter to ensure adequate ventilation.
- Never cover the ventilation slots of the device.
- Do not expose the device to extreme environmental conditions. Protect the device from dust, humidity, and heat.

Mains adapter connecting



Observe the safety notes in the enclosed "Safety/Regulations" manual.

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



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

Switching on the device for the first time

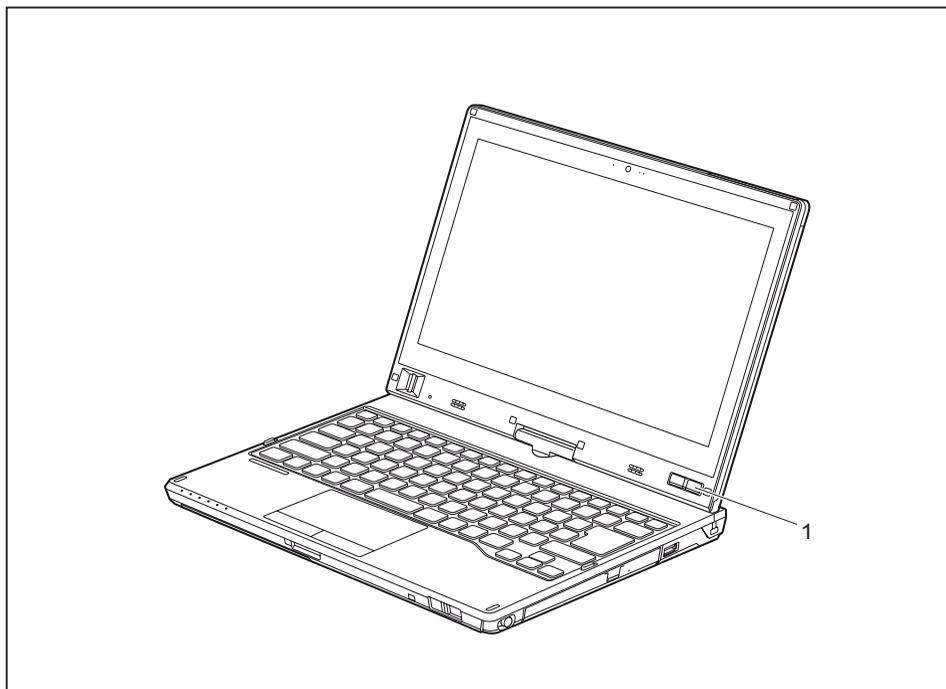


On devices with ON/OFF switch for wireless components: Slide the ON/OFF switch for wireless components to the ON position before switching on the device.

When you switch on the device for the first time, the supplied software is installed and configured. Because this procedure must not be interrupted, you should set aside enough time for it to be fully completed and connect the device to the mains using the mains adapter.

During the installation process, **DO NOT** restart the device unless you are requested to do so!

To make it easier to use your device for the first time, the operating system is pre-installed on the hard disk.



- ▶ 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.



If a Windows operating system is installed on your device, you will find more information on the system and drivers, help programmes, updates, manuals etc. on the device or on the Internet under "<http://www.fujitsu.com/fts/support/>".

You can find information and help on the Windows operating system functions on the Internet at "<http://windows.microsoft.com>".

Working with the notebook

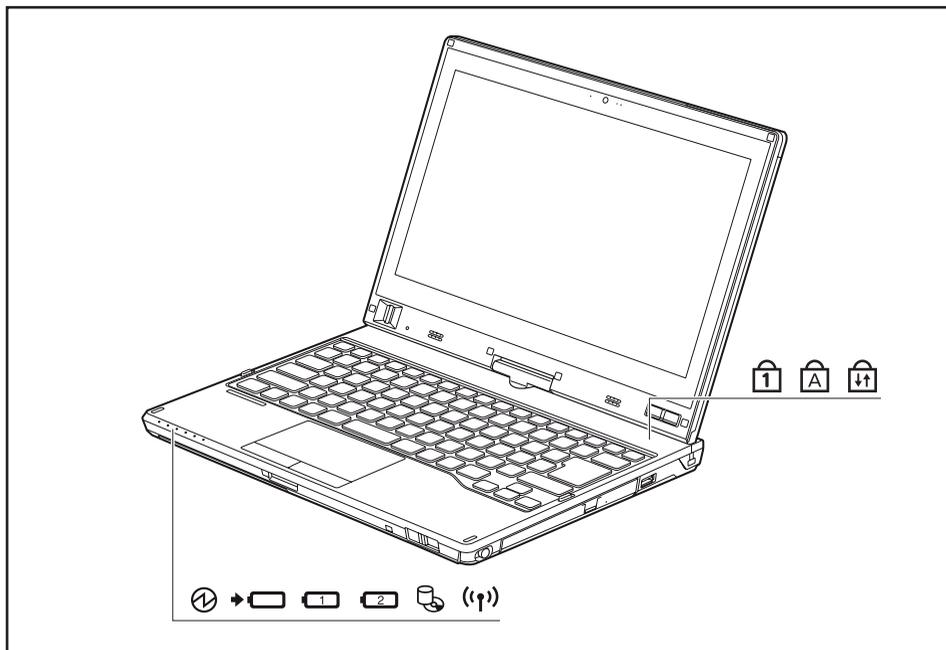
This chapter describes the basics for operating your notebook. Please read the chapter entitled "[Connecting external devices](#)", [Page 91](#) for instructions on how to connect devices such as a mouse and a printer to the notebook.



Please refer to the notes in "[Important notes](#)", [Page 12](#).

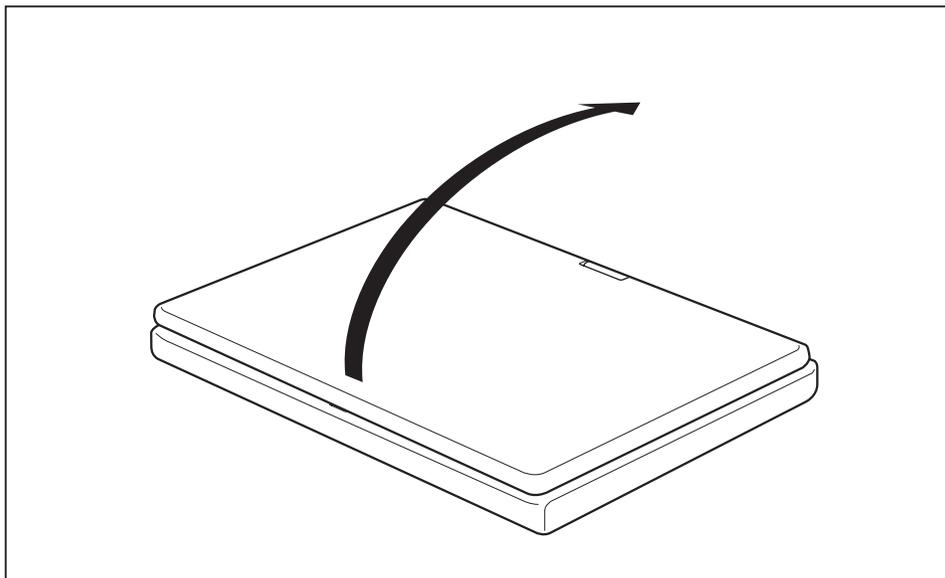
Status indicators

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



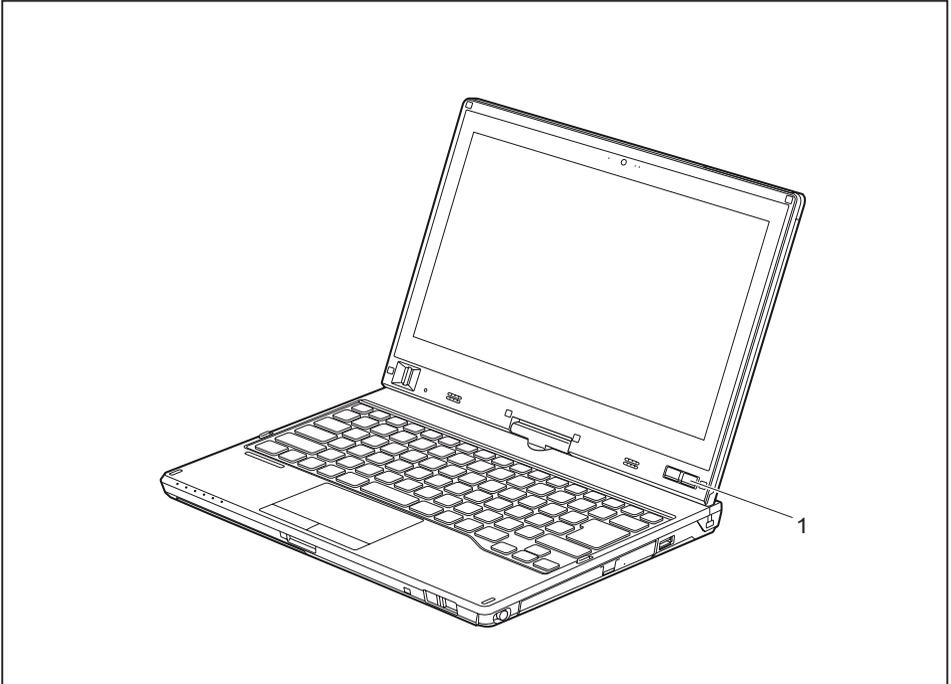
| Status displays | Description |
|---|---|
|  | <p>Power-on indicator</p> <ul style="list-style-type: none"> Indicator is illuminated: The notebook is switched on. Indicator flashes: The notebook is in sleep mode (Save-to-RAM). The indicator is not illuminated: The notebook is switched off or in Save-to-Disk mode. |
|  | <p>Battery charging indicator</p> <p>The battery charging indicator shows whether a battery is installed and being charged.</p> |
|  | <p>Battery indicator</p> <p>This description applies for both batteries.</p> <p>The battery indicator shows the state of charge of the installed battery.</p> <ul style="list-style-type: none"> The indicator is lit green: The battery is between 51 % and 100 % charged. The indicator is lit orange: The battery is between 13 % and 50 % charged. The indicator is lit red: The battery is between 0 % and 12 % charged. The indicator flashes orange: The battery state of charge is being checked (for four seconds after battery installation). The indicator flashes red: The battery is faulty. The indicator is not lit: There is no battery installed. <p>Note: You can also check the state of charge directly at the main battery.</p> |
|  | <p>Drive indicator</p> <p>Indicator is illuminated: The hard disk drive or the CD/DVD in the optical drive of the notebook is being accessed.</p> |
|  | <p>Radio components indicator</p> <ul style="list-style-type: none"> The indicator is lit: The radio components are switched on. The indicator is not lit: The radio components are switched off. |
|  | <p>Num Lock indicator</p> <p>Indicator is lit: The [Num] key has been pressed. The virtual numerical keypad is activated. You can output the characters indicated on the upper right of the keys.</p> |
|  | <p>Caps Lock indicator</p> <p>Indicator is lit: The Caps Lock key has been pressed. All letters will be output as uppercase letters. In the case of keys labelled several times, the character printed on the upper left of the key will appear when that key is pressed.</p> |
|  | <p>Scroll Lock indicator</p> <p>Indicator is lit: The key combination [Fn] + [Scr] has been pressed. The effect that this key has varies between applications.</p> |

Opening the notebook



- ▶ Open the LCD screen.

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 lights up.

Programming the ON/OFF switch

You can program the ON/OFF switch:

| Operating system | Menu |
|------------------|---|
| Windows 7 | <i>Start - (Settings) - Control Panel - System and Security - Power Options</i> |
| Windows 8.1 | <i>Windows 8.1 Desktop - Control Panel - Hardware and Sound - Power Options</i> |



If you have assigned a password, you must enter this when requested to do so, in order to start the operating system. Detailed information can be found in the chapter ["Security functions", Page 69](#).

Different ways to use your notebook

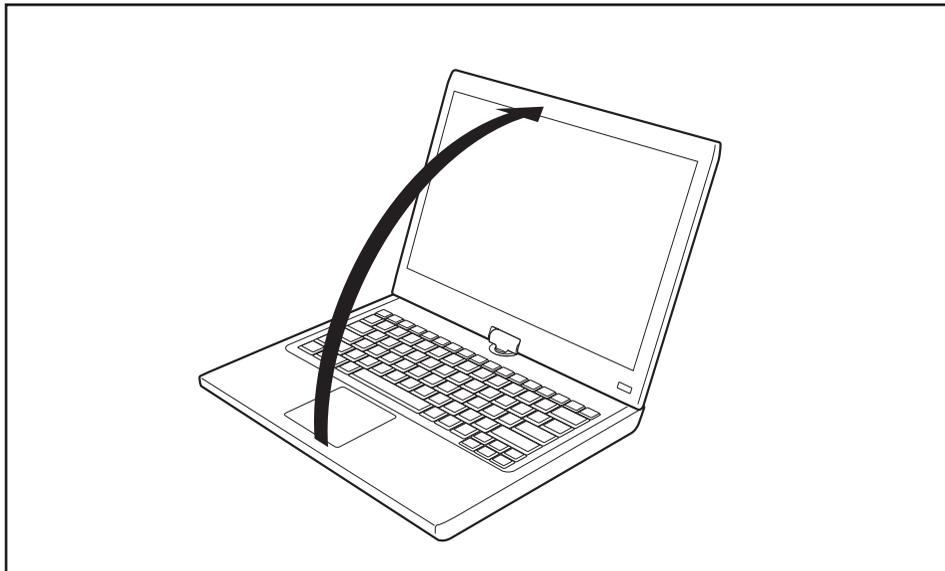
During your daily work, you can use your notebook as a Tablet PC or as a notebook, just as you wish.



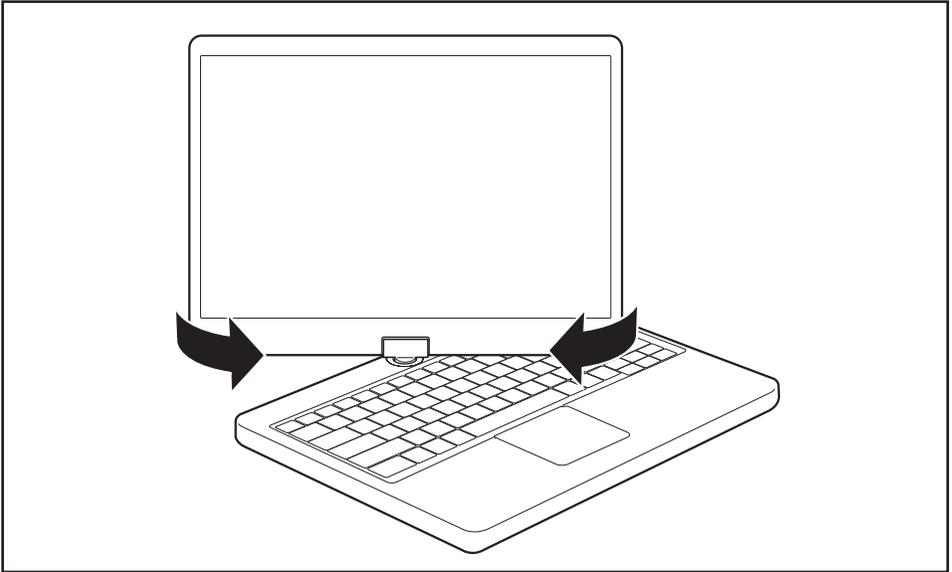
Note the direction of rotation in the following description! No guarantee claims can be met for damage caused by turning in the wrong direction.

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

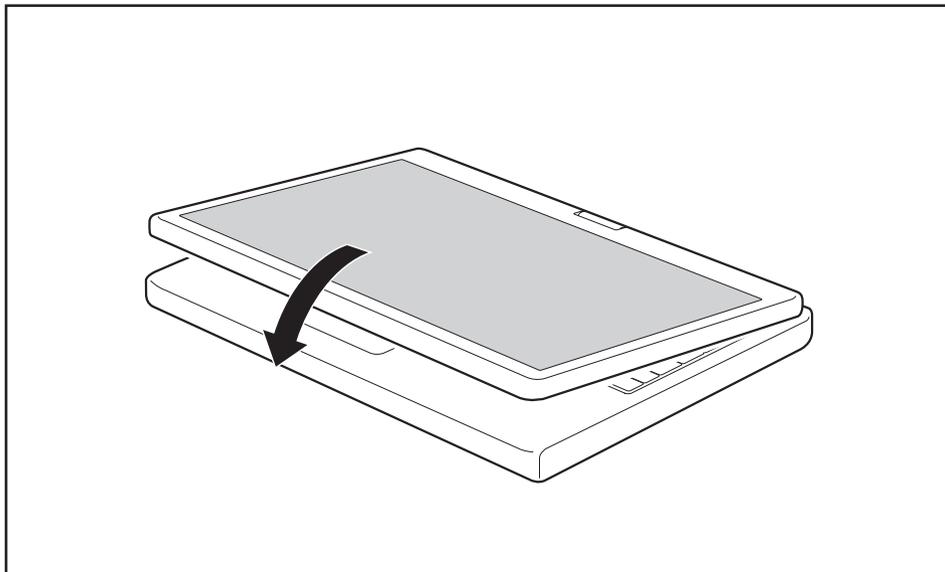
From notebook to Tablet PC



- ▶ Raise the LCD 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 some slight resistance, then it will turn easily and without friction.
- ▶ Turn 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.
- ↳ The screen is now secured in the tablet position.

Select display orientation (portrait or landscape orientation)

You can choose to use either portrait or landscape orientation for the display.



Windows 7

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



Windows 8.1

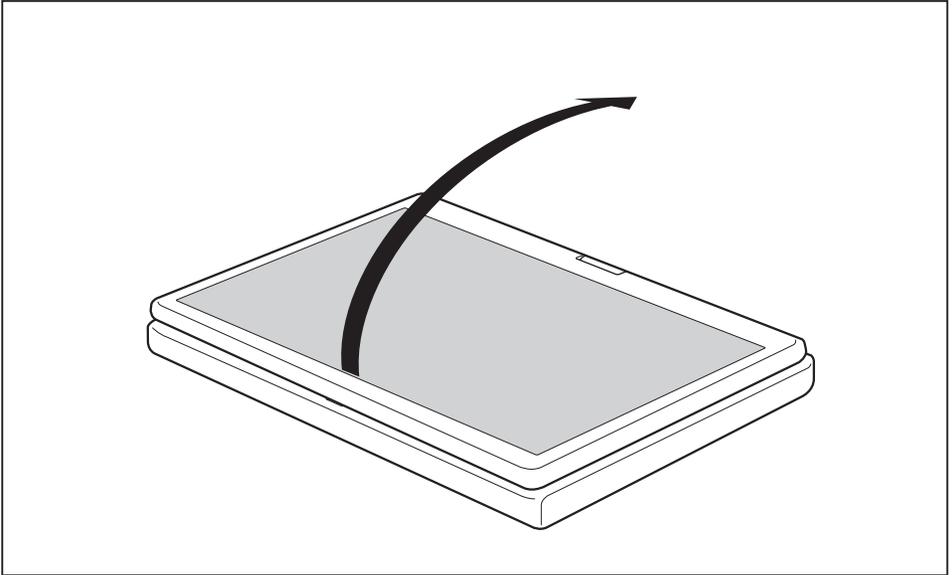
You can change these settings under *Windows 8.1 Desktop - Control Panel - Hardware and Sound - Windows Mobility Center / Rotate screen*.



In the *Fujitsu Tablet Controls* settings, profiles are saved for operation with different screen orientations. These profiles have preset standard configurations that can be modified as desired.

These settings do not just affect the screen settings on the Tablet PC, but also those on externally connected monitors.

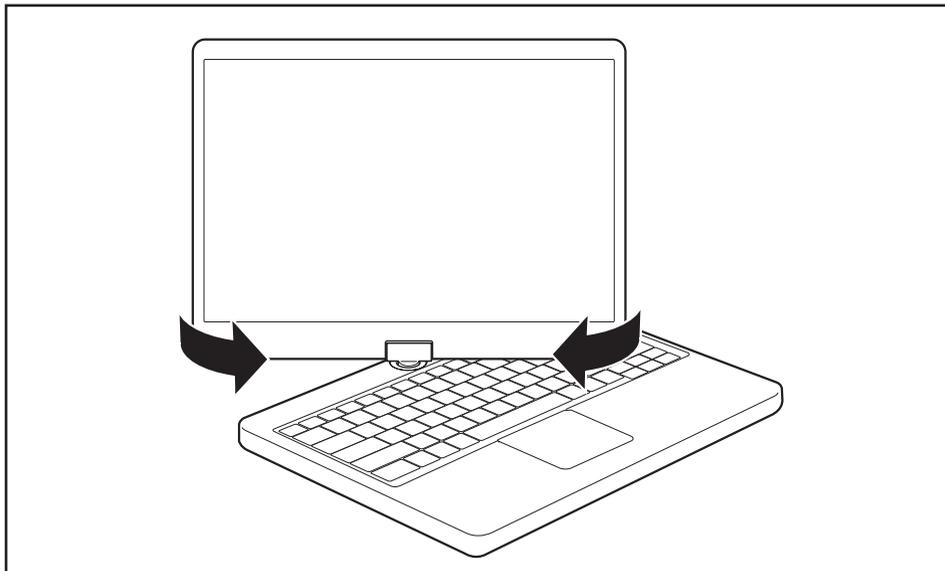
From Tablet PC to notebook



- ▶ Raise the LCD screen into a 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.

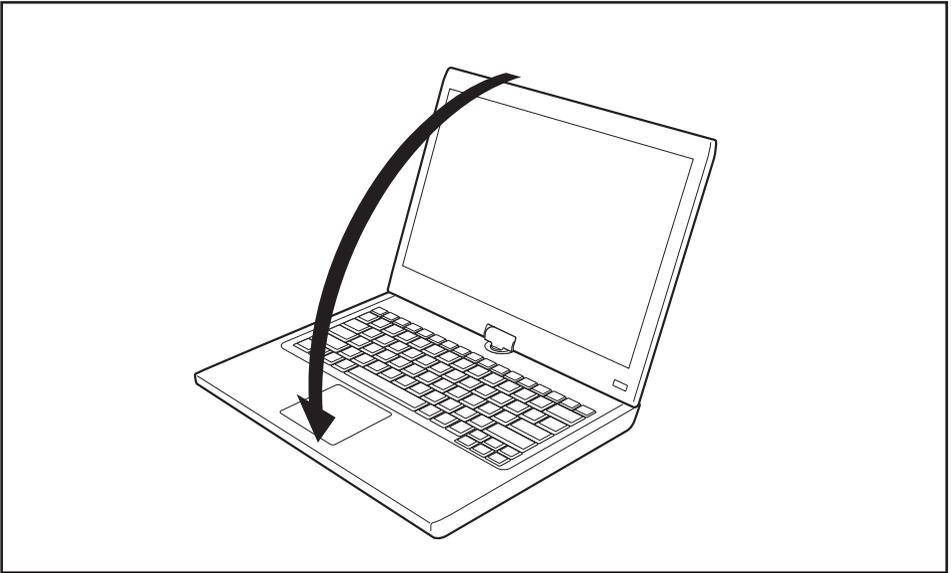


- ▶ hold the screen as near to the bottom as possible on both sides and turn the screen in the direction indicated by the rotational direction indicator. It will turn easily and without resistance.
- ▶ Turn or move the display further until it has turned 180° and the hinge latches in.

Switching off the notebook

- ▶ Close all applications and then shut down the operating system (please see the "Operating System Manual").
- ▶ Slide the ON/OFF switch towards the right.
- ↳ The ON/OFF switch returns automatically to its original position.

Closing the notebook



- ▶ Fold the LCD screen down onto the lower part of the notebook until you feel it lock into place.

Handwriting recognition

For detailed information on handwriting recognition, see the documentation on your operating system.

At present, handwriting recognition under Windows 7 or Windows 8.1 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.

Under Windows 8.1 you can set the required language under *Control Panel – Time, Language and Region – Language*.

LCD screen

Fujitsu notebooks have high-quality LCD monitors (TFT). For technical reasons, these monitors are manufactured for a specific resolution. An optimal, clear picture can only be ensured with the resolution intended for the relevant monitor. A resolution which differs from the specification can result in an unclear picture.

The resolution of your notebook's monitor is optimally set at the factory.

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 faulty pixels is stipulated in the international standard ISO 9241-307 (Class 2).

Example:

A screen with a resolution of 1280 x 800 has $1280 \times 800 = 1024000$ pixels. Each pixel consists of three subpixels (red, green and blue), so there are almost 3 million subpixels in total. According to ISO 9241-307 (class 2), 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.

At a resolution of $1600 \times 900 = 1440000$ pixels, a maximum of 3 light and 3 dark pixels and in addition 7 light or 14 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 | A cluster contains two or more defective pixels or subpixels in a 5 x 5 pixel block. |

Background lighting

LCD 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.

Synchronising the display on the LCD screen and an external monitor

For more information, please refer to the chapter "[Key combinations](#)", [Page 46](#) under "Display output, switch between".

Ambient Light Sensor

In the case of delivery with a *Windows* operating system, the screen brightness is regulated by means of the ambient light sensor and depending on the particular light conditions. This results in optimum readability and longer battery life at the same time.

Using the device as a Tablet PC

You can execute commands as follows:

- using the pen (supplied with your device).
- using your fingers

Using fingers

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



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

Calibrate the Dual Digitizer for finger-based operation of the device.

Windows 7

Use the following steps to calibrate your touchscreen in Windows 7:

- ▶ Click on *Start - Control Panel - Hardware and Sound*.
- ▶ Under *Tablet PC Settings*, click on *Calibrate the screen for pen or touch input*.
- ▶ On the *Display* tab page under *Display options*, tap on **Calibrate** and then on *Yes* so that the program can make changes.
- ▶ Follow the instructions on the screen to calibrate the touchscreen.

Windows 8.1

To adapt the sensitivity of the monitor when using a pen or your finger:

- ▶ Swipe from the right-hand edge of the screen inwards, and then tap on *Search*.

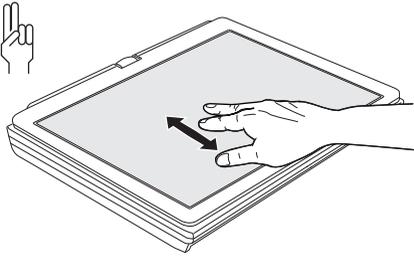
or

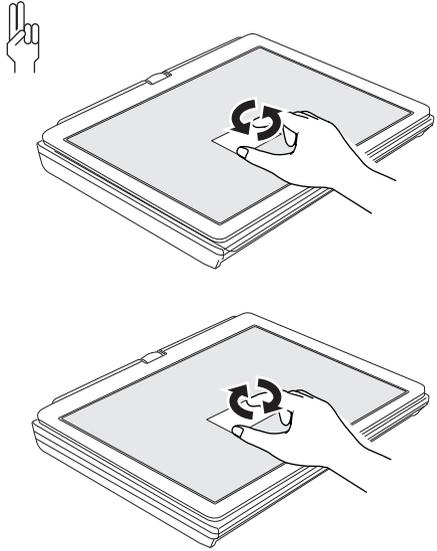
- ▶ If using a mouse, point at the top right corner of the screen, move the mouse pointer downwards, and then click on *Search*.
- ▶ Enter *Calibrate* in the search field and tap or click on *Calibrate the screen for pen or touch input* to open the Tablet PC Settings.
- ▶ Ensure that the monitor displayed in the *Display* field is the same as the monitor that you wish to calibrate.
- ▶ Tap or click on *Calibrate* and follow the instructions on the screen.

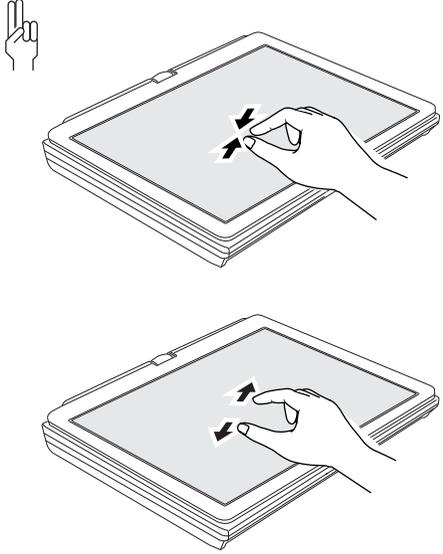
Actions with one finger

| Action | Description |
|---|---|
| Selecting objects (click with the left mouse button) | <ul style="list-style-type: none"> ▶ With your finger, tap once briefly on the object. |
| Starting programs (double-click with the left mouse button) | <ul style="list-style-type: none"> ▶ With your finger, tap twice briefly in quick succession on the program icon. |
| Moving objects/windows (drag with left mouse button pressed, Drag & Drop) | <div data-bbox="576 359 1013 614" data-label="Image"> <p>The diagram shows a hand with the index finger touching a tablet screen. A four-way arrow cursor is positioned over the touch point. The tablet is shown in a perspective view, and the hand is positioned as if moving the object across the screen.</p> </div> <ul style="list-style-type: none"> ▶ Place a finger directly on the object/window, hold the finger pressed against the touchscreen and move the desired object/window. |
| Opening a context menu (click with the right mouse button) | <ul style="list-style-type: none"> ▶ Touch the desired item once with your finger tip. Keep the finger tip pressed against the touchscreen. <p>The context menu appears.</p> |
| Moving the cursor | <ul style="list-style-type: none"> ▶ Position one finger on the touchscreen and move the finger in the desired direction. |

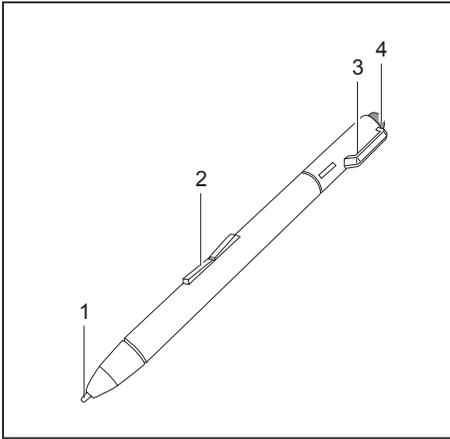
Actions with two fingers

| Action | Description |
|---------------|--|
| Scrolling |  <ul style="list-style-type: none">▶ Position two fingers on the touchscreen.▶ Move your fingers upwards to scroll up. or <ul style="list-style-type: none">▶ Move your fingers downwards to scroll down. |

| Action | Description |
|----------|--|
| Rotating |  <p>► Position the thumb on the touchscreen, then turn the picture clockwise or counter-clockwise using your index finger.</p> |

| Action | Description |
|-----------------------------------|--|
| Increasing or decreasing the view |  <ul style="list-style-type: none">▶ Position two fingers on the touchscreen and move them apart to increase the view.or▶ Position two fingers on the touchscreen and move them together to decrease the view. |
| Blocking context-sensitive menus | <ul style="list-style-type: none">▶ With two fingers, tap twice briefly in quick succession on the touchscreen. |

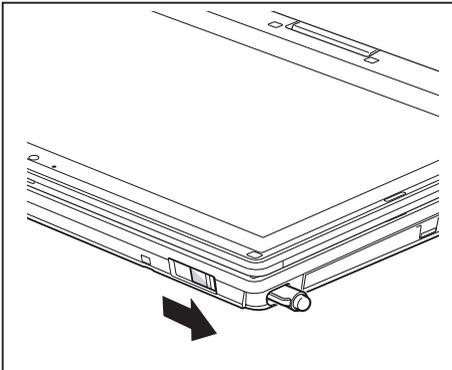
Using the pen



- 1 = pen tip
- 2 = rocker button
- 3 = eyelet for optional pen tether
- 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.

The notebook pen is retained securely in its 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 carry it while travelling. Always replace the pen in the slot when you are not using it. To eject the pen from the slot, slide the pen ejection button on the front of the device towards the right.



A pen tether is available as an optional extra and you can use this to tie the eyelet on the pen to the eyelet 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 pen tip if it is worn. The warranty does not cover a scratched screen.

While writing, you should take care not to scratch the surface of the display (e.g. with a wristwatch or bracelet).



The pen of your notebook is an electronic instrument which can be damaged if used incorrectly. 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 grip is used to place the pen in its slot or to remove it from its slot.
- Never store the pen with the tip bearing the weight of the pen (e.g. with the tip down in a pen holder). If the pen is stored with the tip pointing down, this may have an adverse effect on the pen mechanism (particularly at 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 slot 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 responds to entries made with the tip of the finger or the pen when the tip of the finger or the pen is in direct contact with the screen.

You can use the pen to perform all the functions for which you would otherwise use a mouse. In addition, you can conveniently delete hand-written pen entries using the pen.

| Handling | Mouse | Pen |
|------------------------|--|---|
| Selecting menu entries | Click with the left-hand mouse button. | Touch the menu entry with the pen tip. |
| Starting programs | Double click with the left-hand mouse button. | Briefly touch the program icon twice with the pen tip. |
| Moving objects/windows | Drag with the left-hand mouse button held pressed. | Place the pen tip directly on the object/window. Hold the pen tip pressed against the screen. Move the desired object/window. |
| Opening a context menu | Click with the right-hand mouse button. | Touch the desired element with the pen and leave the pen on the element for a moment. |
| Moving the cursor | - | Place the pen tip directly on the screen. |

Setting the pen

| Operating system | Menu |
|------------------|--|
| Windows 7 | Under <i>Hardware and Sound - Pen and Input Devices</i> in the Control Panel you can make various settings for the pen (assignment and function of the pen button). |
| Windows 8.1 | Under <i>Windows 8.1 Desktop - Control Panel - Hardware and Sound - Pen and Touch</i> you can make various settings for the pen (assignment and function of the pen button). |

Calibrating the pen

You must calibrate your Tablet PC with the pen before first usage, so that it recognises the pen as accurately as possible.

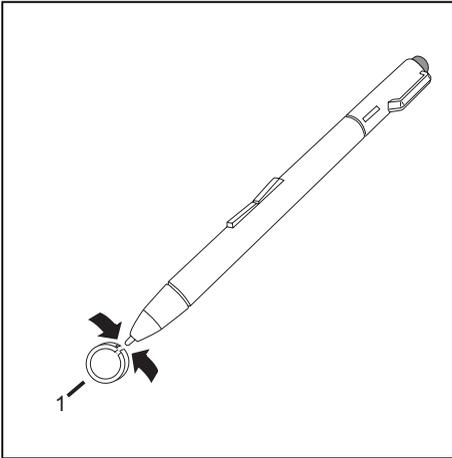
You should also always repeat the calibration if the co-ordination between the pen and cursor movement deteriorates.

| Operating system | Menu |
|------------------------------------|--|
| Windows 7 / Windows 8.1 Desktop | To calibrate, call up the <i>Hardware and Sound / Tablet PC Settings</i> 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 this, use the supplied tool (1).



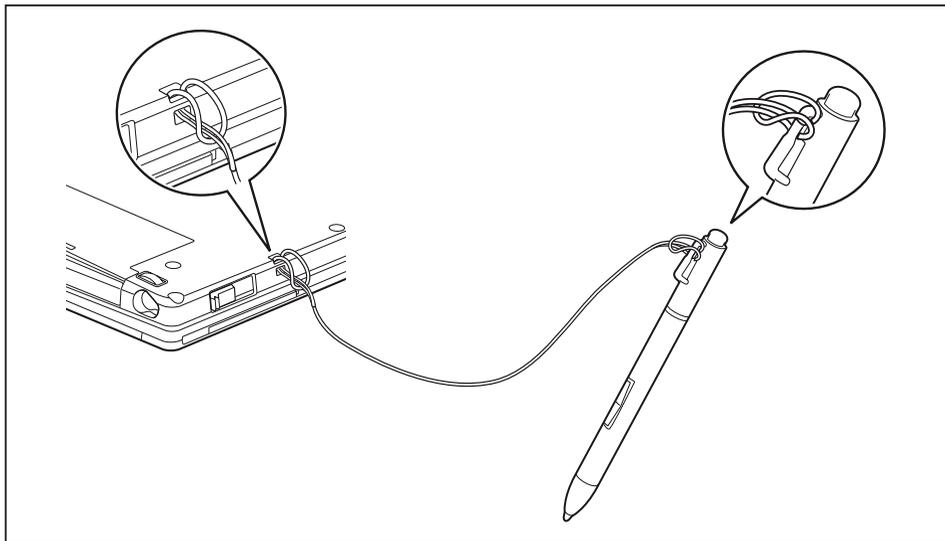
- ▶ To remove the tip, position the tip in the gap between the two ends of the tool supplied.
- ▶ Pinch the two ends of the supplied tool together so that the tip is firmly clasped, then pull it from the barrel.
- ▶ To replace the tip, retrieve one of the new tips that were supplied your pen. Insert the flat end of the tip into the barrel and exerting gentle pressure, push it in until it is firmly in place.

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If the tip is worn or damaged, discard it.

Attach the pen tether (optional)

You can attach the pen with a pen tether (available as an option) to prevent it being dropped or becoming lost.



- ▶ Secure one end of the pen tether to the pen and the other end of the pen tether to the notebook.

Using the device as a notebook

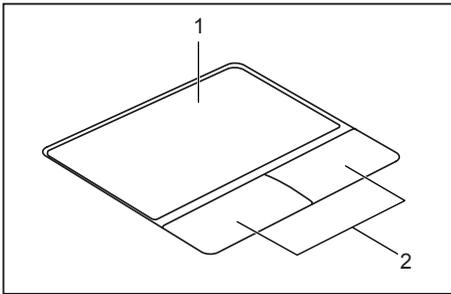
Touchpad and touchpad buttons



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

Never use the touchpad if your fingers are dirty.

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



1 = Touchpad

2 = Touchpad buttons

You can move the cursor using the touchpad.

The touchpad buttons allow you to select and execute commands. They correspond to the buttons on a conventional mouse.



You can also deactivate the touchpad using a keyboard shortcut, so that you cannot move the cursor unintentionally (see chapter "[Key combinations](#)", [Page 46](#)).

Moving the pointer

- ▶ Move your finger on the touchpad.
- ↳ The pointer will move.

Selecting an item

- ▶ Move the pointer to the item you wish to select.
- ▶ Tap the touchpad once or press the left button once.
- ↳ The item is selected.

Executing commands

- ▶ Move the pointer to the field you wish to select.
- ▶ Tap the touchpad twice or press the left button twice.
- ↳ The command is executed.

Dragging items

- ▶ Select the desired item.
- ▶ Press and hold the left button and, with your finger on the touchpad, drag the item to the desired position.
- ↳ The item will be moved.

Switching the Touchpad on and off



You can switch the Touchpad on and off using a key combination, see "[Key combinations](#)", [Page 46](#).

Keyboard

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The keyboard of your notebook is subject to continuous wear through normal use. The key markings are especially prone to wear. The key markings are liable to wear away over the life of the notebook.

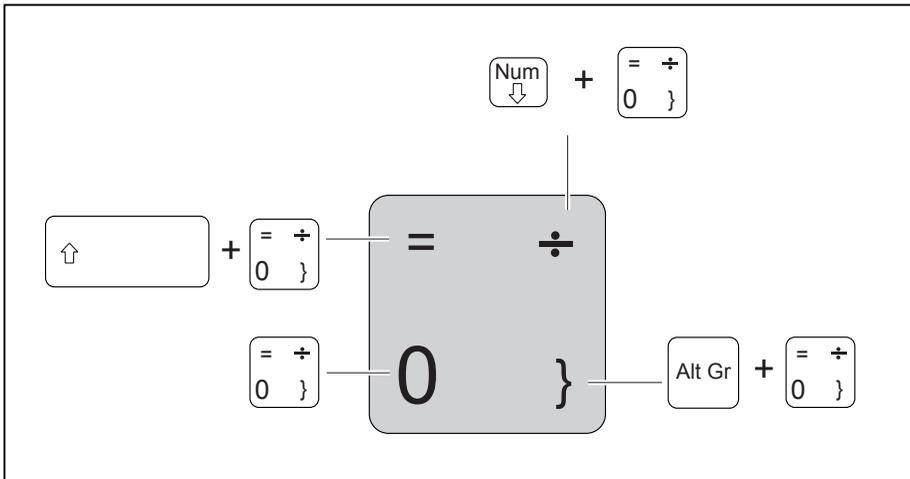
The keyboard has been designed to provide all the functions of an enhanced keyboard. Some enhanced keyboard functions are mapped with key combinations.

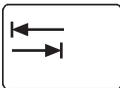
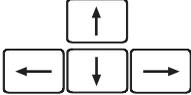
The following description of keys refers to Windows. Additional functions supported by the keys are described in the relevant manuals supplied with your application programs.

The figure below shows how to access the different characters on keys with overlaid functions. The example applies when the Caps Lock key has not been activated.

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The illustrations shown below may differ from your actual device.



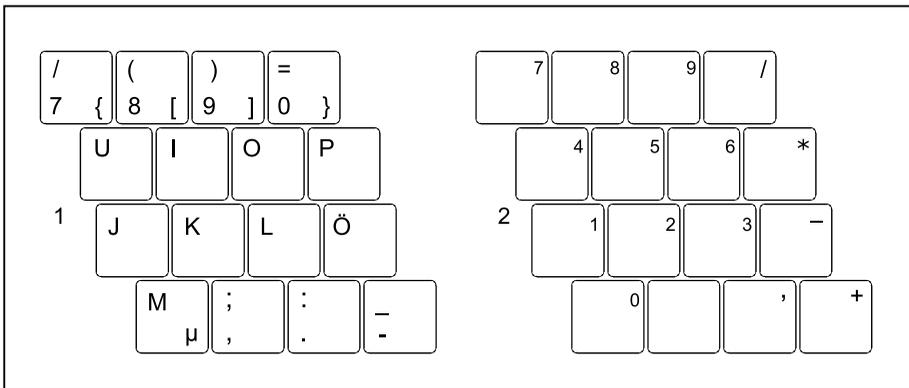
| Key | Description |
|--|---|
|  | <p>Backspace key The Backspace key deletes the character to the left of the cursor.</p> |
|  | <p>Tab key The Tab key moves the cursor to the next tab stop.</p> |
|  | <p>Enter key (return) The Enter key terminates a command line. The command you have entered is executed when you press this key.</p> |
|  | <p>Caps Lock key The Caps Lock key activates uppercase mode. In Caps Lock mode, all of the characters you type appear in upper case. In the case of overlay keys, the character printed on the upper left of the key will appear when that key is pressed. To cancel the Caps Lock function, simply press the Caps Lock key again.</p> |
|  | <p>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.</p> |
|  | <p>Fn button The [Fn] key enables the special functions indicated on overlay keys (see "Key combinations", Page 46).</p> |
|  | <p>Cursor keys The cursor keys move the cursor in the direction of the arrow, i.e. up, down, left, or right.</p> |
|  | <p>Windows key The Windows key switches between the start screen and the last used application.</p> |
|  | <p>Menu key The Menu key opens the menu for the active application.</p> |

Virtual numeric keypad

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.



The keyboard layout shown below may differ from your actual device.



1 = Valid characters when the Num key is not activated

2 = Valid characters when the Num key is activated

Further information about the status indicators can be found in chapter ["Status indicators", Page 20](#).

Country and keyboard settings

- Change the country and keyboard settings as described in the documentation for your operating system.

Key combinations

The key combinations described below apply when using Microsoft Windows operating systems. Some of the following key combinations may not function in other operating systems or with certain device drivers.

Key combinations are entered as follows:

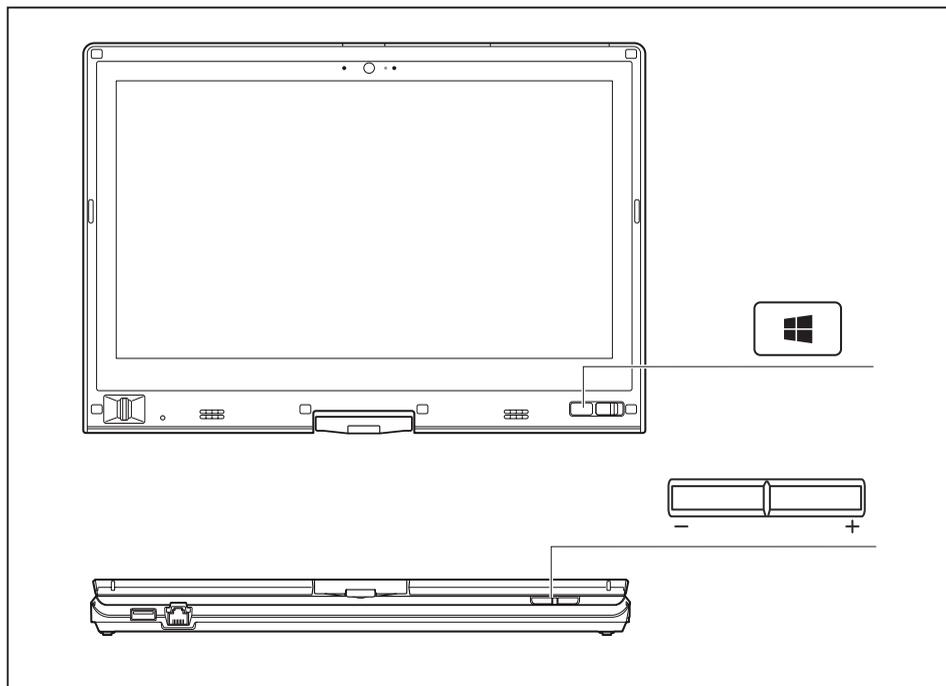
- ▶ Press the first key in the combination and keep it pressed.
- ▶ While holding the first key down, press the other key or keys in the combination.

| Combination | Description |
|--|---|
|  +  | <p>Activate/deactivate keyboard backlight On backlit keyboards, this key combination activates or deactivates the backlight.</p> |
|  +  | <p>Switching the loudspeakers on/off This key combination switches the integrated loudspeakers on and off.</p> |
|  +  | <p>Enable/disable touchpad This key combination enables and disables the touchpad.</p> |
|  +  | <p>Switching the radio components on / off This key combination enables or disables the radio components.</p> |
|  +  | <p>Decrease screen brightness This key combination decreases the brightness of the screen.</p> |
|  +  | <p>Increase screen brightness This key combination increases the brightness of the screen.</p> |
|  +  | <p>Decrease volume This key combination reduces the volume of the internal loudspeakers.</p> |
|  +  | <p>Increase volume This key combination increases the volume of the internal loudspeakers.</p> |

| Combination | Description |
|--|---|
|  +  | <p>Toggle output screen</p> <p>Use this key combination to select which screen(s) is/are used for display if an external monitor is connected.</p> <p>Screen output is possible:</p> <ul style="list-style-type: none"> • only on the notebook's LCD screen • only on the external monitor • on the notebook's LCD screen and the external monitor at the same time. <p>Press the key combination several times to switch through all possible settings.</p> <p>It is possible to display video on two screens simultaneously, regardless of the type and number of external screens connected.</p> <p>If you have connected two external monitors to the port replicator, the following display outputs are possible:</p> <ul style="list-style-type: none"> • only on the notebook's LCD screen • only on the external monitor (analogue) • at the same time on the notebook's LCD screen and on the external monitor (analogue) <p>You cannot use the key combination to switch output at the same time to both external monitors on the Port Replicator.</p> |
|  +  | <p>Halt current operation</p> <p>This key combination can be used to halt an operation instantly without clearing the keyboard buffer.</p> |
|  +  | <p>Back tab</p> <p>This key combination moves the cursor back to the previous tab stop.</p> |

Tablet buttons

Your Tablet PC is equipped with three tablet buttons.



| Symbol | Description | Functions |
|--|-----------------|---|
|  | Windows key | This key corresponds to the function of the Windows Start key on the keyboard. If the key is pressed in combination with the ON/OFF switch, the function equates to the key combination  +  +  . |
| + | Volume + button | Increase the volume |
| - | Volume - button | Decrease the volume |

Webcam

Depending on the software used, you can use your Webcam to take pictures, record video clips or take part in web chats.

- The picture quality depends on the lighting conditions and the software being used.
- You can only operate the webcam with a particular application (e.g. an Internet telephony program or a video conferencing program which supports a webcam).
- When using the webcam the notebook support must not wobble.
- The webcam automatically adjusts itself to the current light level. For this reason the LCD screen may flicker while the light level is adjusted.



Further information on using the webcam and on the additional settings which are possible for your webcam can be found in the help function of the program which uses the webcam.

Rechargeable battery

When not plugged into a mains socket, the notebook runs on its built-in battery. You can increase the life of the battery by caring for the battery properly. The average battery life is around 500 charge/discharge cycles.

You can extend the battery life by taking advantage of the available energy saving functions.

Charging, caring for and maintaining the battery

The notebook battery can only be charged when the ambient temperature is between 5°C / 41°F and max. 35°C / 95°F.

You can charge the battery by connecting the notebook to the mains adapter (see ["Mains adapter connecting", Page 17](#)).

If 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.

monitoring the battery charging level

Windows also has a "Battery status meter" in the taskbar for monitoring the battery capacity. When you place the mouse pointer on the battery symbol, the system displays the battery status.

Battery storage

Keep the battery pack in a dry environment at between 0°C / 32°F and 30°C / 86°F. The lower the temperature at which the batteries are stored, the lower the rate of self-discharge.



If you will be storing batteries for a longer period (longer than two months), the battery charge level should be approx. 30 %. To prevent exhaustive discharge which would permanently damage the battery, check the level of charge of the battery at regular intervals.

To be able to make use of the optimal charging capacity of the batteries, the battery should be completely discharged and then fully recharged.



If you do not use the batteries for long periods, remove them from the notebook. Never store the batteries in the device.

Removing and installing the battery



Only use batteries approved by Fujitsu for your notebook.

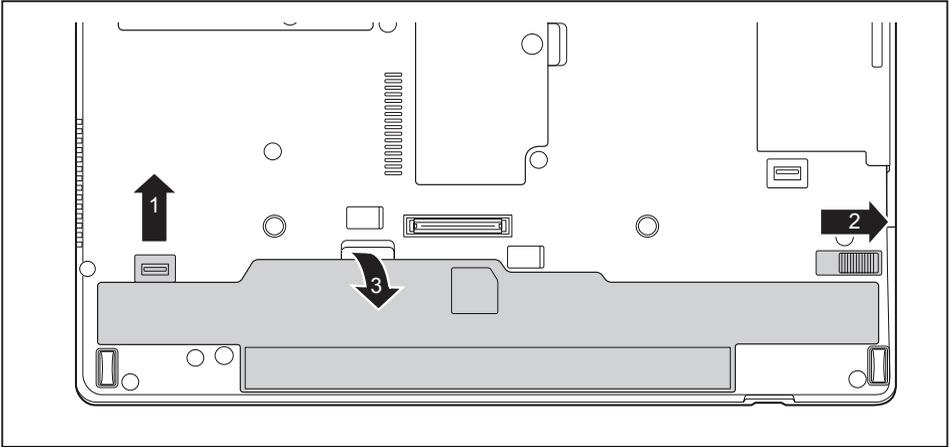
Never use force when fitting or removing a battery.

Make sure that no foreign bodies get into the battery connections.

Never store a battery for long periods in the discharged state. This can make it impossible to recharge.

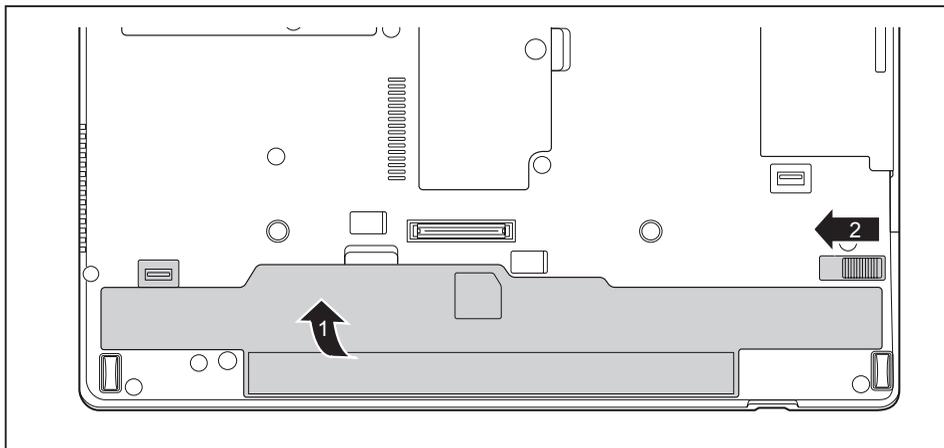
Removing the battery

- ▶ Prepare for removal, see chapter ["Preparing to remove components", Page 98.](#)



- ▶ Slide the release button (1) in the direction of the arrow and hold it there.
- ▶ Slide the release button (2) in direction of the arrow.
- ▶ Lift the battery out of the battery compartment (3).

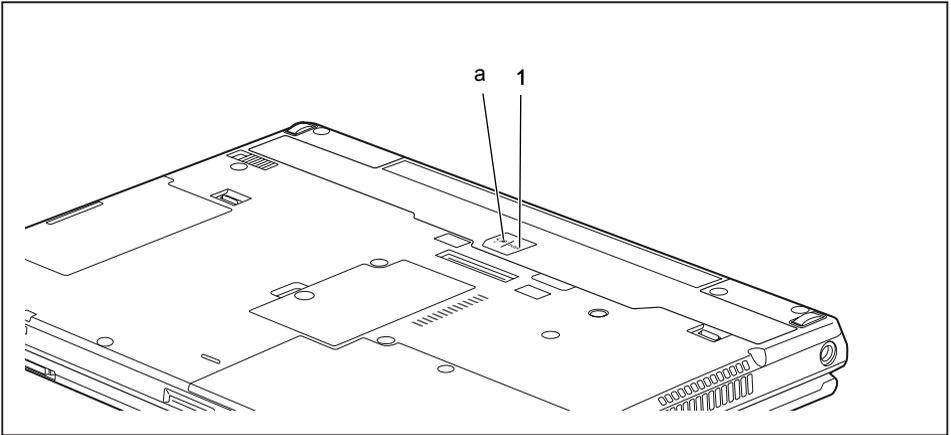
Inserting battery



- ▶ Place the battery at the lower edge of the battery compartment.
- ▶ Push the battery into the battery compartment until you feel it engage (1).
- ▶ Slide the release button into its latch point (2).
- ▶ Complete the removal, see chapter ["Finishing component removal", Page 104](#).

Battery charge status indicator

You can check the charge status directly on the battery itself.



► Press the key (1).

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

| LED indicator | State of charge |
|---------------|--|
| Green | The battery is between 50 % and 100 % charged. |
| Orange | The battery is between 11 % and 49 % charged. |
| Red | The battery is between 1 % and 10 % charged. |
| LED not lit | The battery is fully discharged. |

Module

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
- Optical drive
- Empty plug-in unit (save weight)



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.

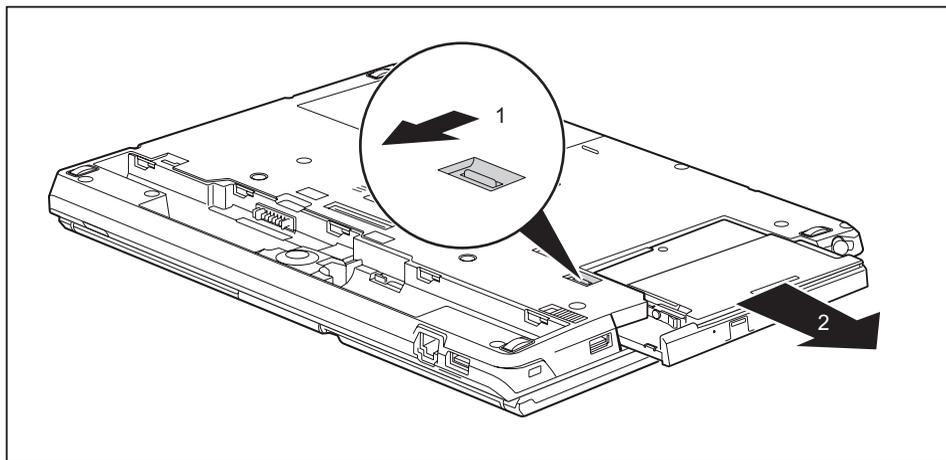


You can swap modules during operation. This means you do not need to switch off the notebook.

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

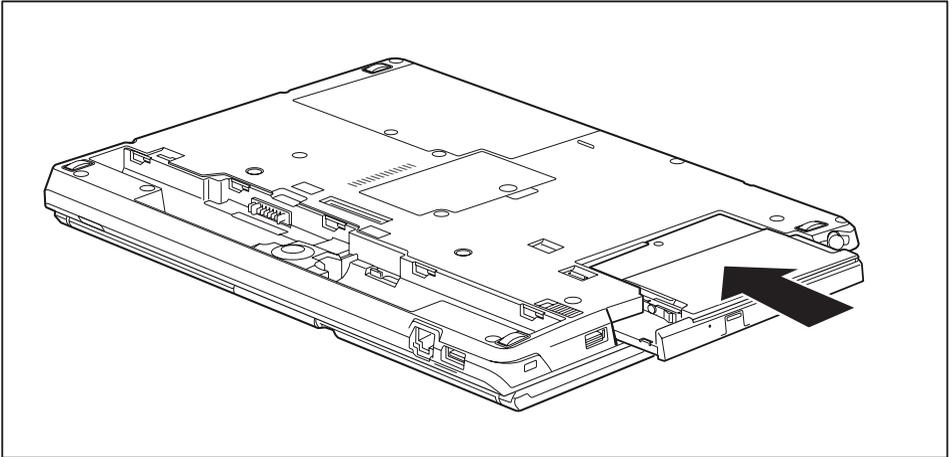
The module can now be removed without any further actions being necessary.

Removing a module



- ▶ Slide the release mechanism (1) in the direction of the arrow and hold.
- ▶ Pull the module (2) out of the module bay.

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



This product contains a light emitting diode, classification according to IEC 60825 1:2007: LASER CLASS 1, and must therefore not be opened.

Handling data carriers

Observe the following guidelines when handling data carriers:

- Avoid touching the surface of a data carrier. Only handle data carriers by their edges.
- Always store data carriers in their cases. This will protect the data carrier against being covered in dust, scratched or damaged in any other way.
- Protect your data carriers against dust, mechanical vibrations and direct sunlight.
- Avoid storing a data carrier in areas subject to high temperatures or humidity.

You can use data carriers with a diameter of 8 cm / 3.15" or 12 cm / 4.7" in the drive.

When using a data carrier of lesser quality, vibrations and reading errors may occur.

CD/DVD indicator

The CD/DVD indicator flashes when a data carrier is inserted. The indicator goes out when the drive is ready for reading. The indicator lights up when the drive is being accessed. You may only remove the data carrier when the indicator is unlit.

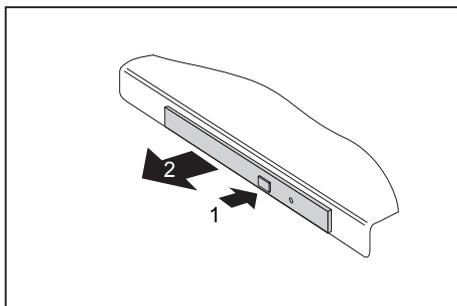


If the CD/DVD indicator does not go out after a data carrier has been inserted, but instead continues to flash, this means that the drive cannot access the data carrier.

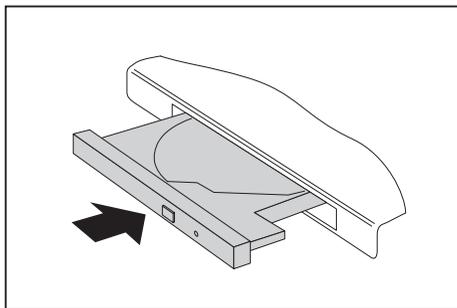
Either the data carrier is damaged or dirty or you are using a data carrier that the drive cannot read.

Inserting or removing a data carrier

The notebook must be switched on.



- ▶ Push the insert/eject button (1).
- ↳ The drive tray will open.
- ▶ Gently pull the drive tray (2) completely out.



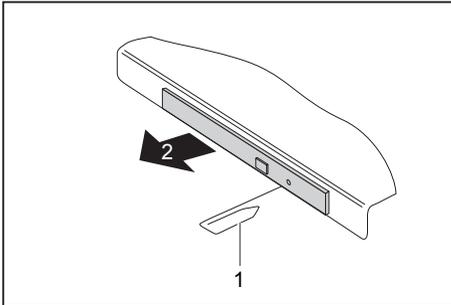
- ▶ Place the data carrier in the drive tray with the printed side facing upwards.

or

- ▶ Remove a data carrier that has been inserted.
- ▶ 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, you can remove the data carrier manually.



- ▶ Switch your notebook off.
- ▶ Push a pen or a piece of wire (such as a paperclip) firmly into the opening (1).
- ↳ The drive tray is ejected. You can now pull the drive tray (2) out of the drive.

Using the power-management features

The notebook uses less power when the available power-management features are used. You will then be able to work longer when using the battery before having to recharge it.



Power efficiency is increased and environmental pollution reduced. By choosing the best power options, you can make significant savings and at the same time help protect the environment.

When you close the LCD screen, depending on the setting in Windows, the notebook automatically enters a power saving mode.

We recommend the following settings:

| Function | On external power | On battery power |
|-----------------------|-------------------|------------------|
| Turn off monitor | After 10 minutes | After 5 minutes |
| Turn off hard disk(s) | After 15 minutes | After 10 minutes |
| Energy saving (S3) | After 20 minutes | After 15 minutes |
| Hibernate mode (S4) | After 1 hour | After 30 minutes |

- ▶ Select the power management functions in your Control Panel.
- ▶ Select the Screen Saver in your Control Panel.

or

- ▶ Right-click on the desktop. Activate the screen saver by clicking on *Personalize – Change Screen Saver*.



If you need further information about an option, you can get help with most settings by pressing **F1** to open the Microsoft Help.

When the notebook is in power-saving mode, the following must be remembered:



During power saving mode, open files are held in the main memory or in a swap file on the hard disk.

Never turn off your notebook while it is in a power saving mode. If the built-in battery is nearly empty, close the open files and do not go into power saving mode.

If you do not intend to use your notebook for a long period of time:

- ▶ Exit power saving mode if necessary via the mouse or keyboard or by switching on the notebook.
- ▶ Close all opened programs and completely shut down the notebook.

Memory cards

Your notebook is equipped with an integrated memory card reader.



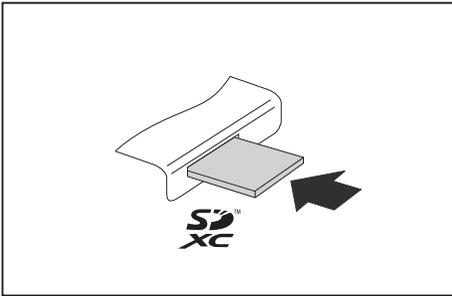
Observe the manufacturer's instructions when handling the memory cards.

Supported formats

The memory card reader supports the following format:

- Secure Digital (SD™ card)
- SDHC
- SDXC

Inserting the memory card

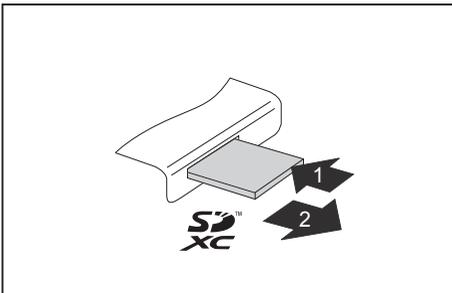


- ▶ Carefully slide the memory card into the slot. The label should be facing upward. Do not apply excessive force, as otherwise the delicate contact surfaces could be damaged.
- ↳ Depending on the particular type used, the memory card may protrude slightly from the slot.

Removing the memory card



In order to protect your data, always follow the correct procedure for removing the card (see the documentation for your operating system).



- ▶ Press on the memory card (1).
- ↳ The memory card is released and can now be removed.
- ▶ Pull the memory card out of the slot (2).

Loudspeakers and microphones

You will find information about the exact position of speakers and microphones in chapter ["Ports and controls", Page 9](#).

Please refer to chapter ["Key combinations", Page 46](#) for information on setting the volume and also enabling/disabling the loudspeakers using key combinations.



If you attach an external microphone, the built-in microphone is disabled.

When you connect headphones or external speakers, the built-in speakers are disabled.

Information on connecting headphones and a microphone can be found in ["Connecting external devices", Page 91](#).

SIM card

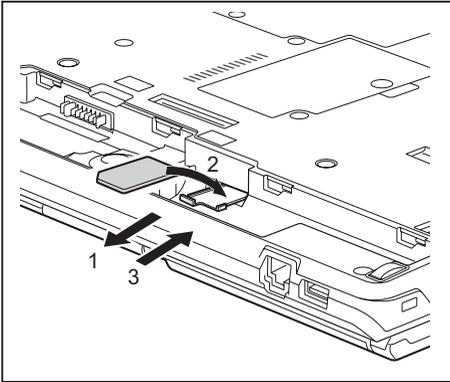
A SIM card (Subscriber Identity Module) is a chip card which is inserted in a mobile phone or notebook and, together with an integrated UMTS/LTE module, enables access to a mobile network.



When handling SIM cards, follow the instructions supplied by the provider.

Inserting the SIM card

- ▶ Remove the battery, see ["Removing the battery", Page 51.](#)

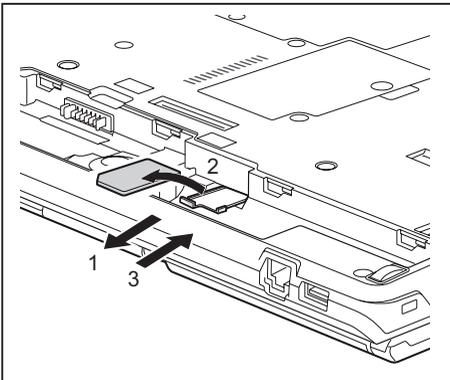


- ▶ Pull the SIM card holder out of the slot (1).
- ▶ Insert the SIM card (2) into the SIM card holder as shown in the diagram on the SIM card holder.
- ▶ Push the SIM card holder back into the slot (3).

- ▶ Install the battery again, see ["Inserting battery", Page 52.](#)

Removing the SIM card

- ▶ Remove the battery, see ["Removing the battery", Page 51.](#)



- ▶ Pull the SIM card holder out of the slot (1).
- ▶ Remove the SIM card from the SIM card holder (2).
- ▶ Push the SIM card holder back into the slot (3).

- ▶ Install the battery again, see ["Inserting battery", Page 52.](#)

Optional Wireless LAN / Bluetooth / UMTS / LTE wireless components



The installation of radio components not approved by Fujitsu will invalidate the certifications issued for this device.



Depending on the device configuration you ordered, your device will be equipped with Wireless LAN, Bluetooth, UMTS or LTE.

Switching the wireless components on and off

- ▶ Press the key combination **Fn** + **F5** to start the *WirelessSelector*.
- ↳ The wireless component indicator will illuminate when one or more wireless components are switched on.



The Bluetooth and UMTS modules and the wireless LAN transmission unit (antenna) will also be switched off when you switch off the wireless components.

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

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

You can obtain more information on UMTS from your service provider.

Setting up WLAN access

- Requirement: A WLAN must be available and you must have the corresponding access information.



Information on configuring the WLAN access can be found in the documentation for your operating system.

Access via UMTS / LTE

If you ordered an integrated UMTS / LTE module with your system, you can enjoy optimum reception and maximum energy efficiency without awkward cables or antennas. The optional UMTS / LTE module is ready for use straight away.

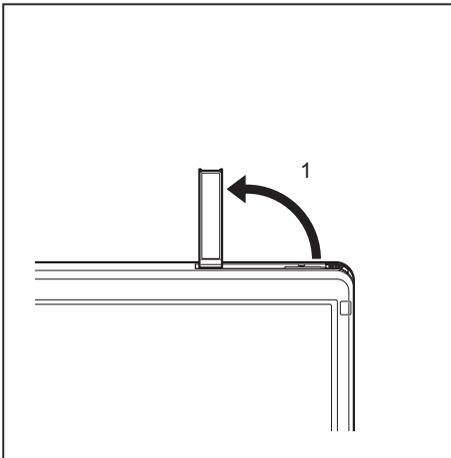
If you did not order a UMTS / LTE module, you can purchase the accessories for UMTS / LTE reception from your retailer or your Fujitsu Technology Solutions dealer.

You will find information on establishing the connection with the UMTS / LTE network in the documentation for the hardware used.

Your device can connect to the Internet via UMTS / LTE. To do this, use one of the following types of connection:

- Integrated UMTS / LTE module (availability dependent on your model variant)
- a USB dongle (a USB stick with your mobile phone provider's SIM card)
- a mobile end-device (e.g. mobile phone with Bluetooth or cable connection)
- UMTS ExpressCard (fits into the ExpressCard slot on your device)

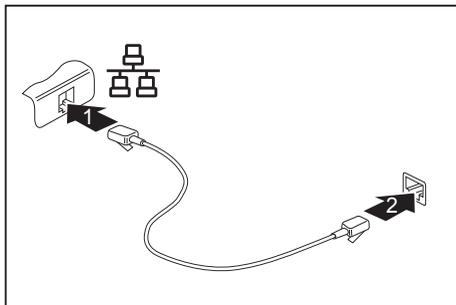
UMTS/LTE antenna



- To improve the signal strength of the UMTS/LTE, fold out the UMTS/LTE antenna in the direction of the arrow (1).

Ethernet and LAN

The internal network module of your notebook supports Ethernet LAN. You can use it to establish a connection to a local network (LAN = Local Area Network).



- ▶ Connect the network cable to the LAN port of the notebook (1).
- ▶ Connect the network cable to your network connection (2).



Your network administrator can help you to configure and use the LAN connections.

The network cable is not included in the delivery scope. This type of cable can be obtained from a specialist dealer.

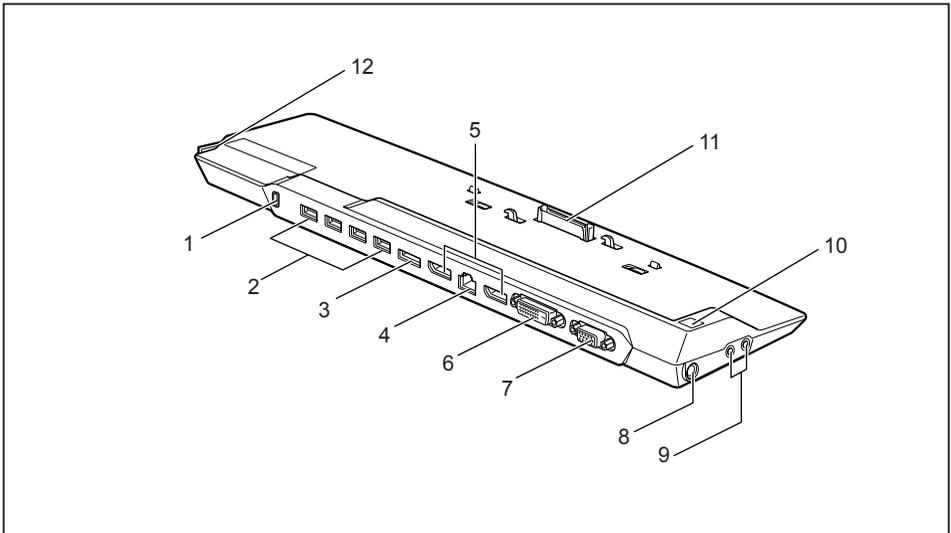
Your Port Replicator (optional)

Your Port Replicator is a device that enables you to quickly connect your notebook to your peripherals, such as a monitor, printer etc.

The features offered by the Port Replicator include standard ports for monitor, audio, mouse and keyboard.

You need only dock the notebook in order to use your peripheral devices.

Ports on the Port Replicator



- 1 = Security Lock device
- 2 = USB ports (USB 3.0)
- 3 = eSATA port
- 4 = LAN port
- 5 = Display ports
- 6 = DVI-D monitor port
- 7 = VGA monitor port

- 8 = DC jack socket (DC IN)
- 9 = Headphone and microphone port
- 10 = ON/OFF button
- 11 = Connector on the port replicator for the docking port on the bottom of the notebook
- 12 = Release



The DVI port and the neighbouring DisplayPort cannot be used at the same time.

The DVI port and the neighbouring DisplayPort cannot be used if an HDMI device is connected to the notebook.

Setting up the port replicator



Select a suitable location for the Port Replicator before setting it up. Follow the instructions below when doing so:

- 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 non-slip surface. Please note that the port replicator's rubber feet may mark certain types of surface.
- 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.

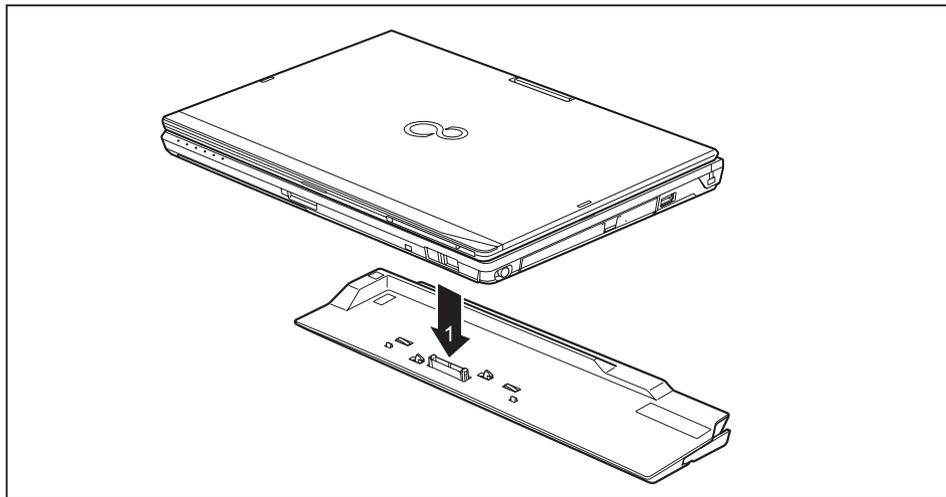
Connecting the notebook to the Port Replicator



The mains adapter must be connected to the Port Replicator when the notebook is connected to the Port Replicator.

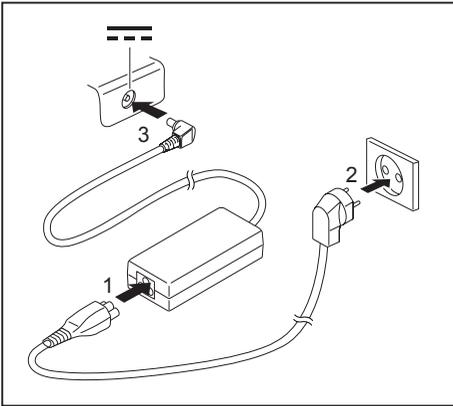
We recommend that the notebook is not operated with the LCD screen closed when the notebook is connected to the Port Replicator. The resulting overheating can cause reduced performance and increased activity of the integrated fan.

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



- ▶ Position the notebook so that it is in line with the back edge of the Port Replicator.
- ▶ Place the notebook onto the Port Replicator (1) and ensure that it locks into place correctly.

Connecting the mains adapter to the Port Replicator

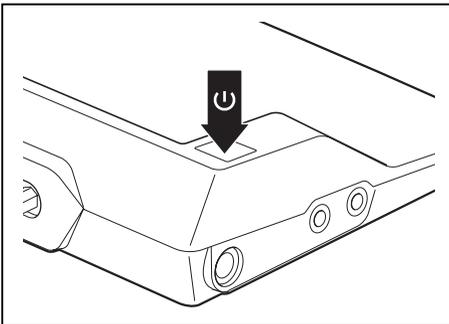


- ▶ Connect the power cable to the mains adapter (1).
- ▶ Plug the power cable into the mains socket (2).
- ▶ Connect the mains adapter cable to the DC jack (DC IN) of the Port Replicator (3).



When the notebook is connected to a Port Replicator, the operating system creates a hardware profile for the "Docked" mode. In this profile, for example, the setting is saved as to which monitor was last used for output. This profile will be loaded, as soon as the notebook is connected to a Port Replicator of the same type.

Switching on the notebook via the port replicator



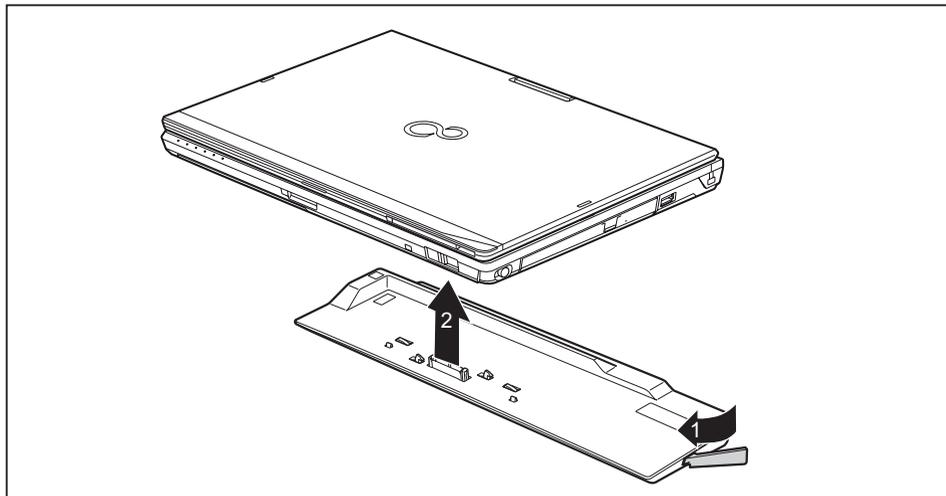
- ▶ Press the ON/OFF switch on the port replicator to switch the notebook on.
- ↳ The power-on indicator of the Port Replicator lights up.

Disconnecting the notebook from the Port Replicator



Windows 7:

Problems may occur if the notebook is removed from the Port Replicator during operation. We recommend that the notebook is switched off or that the appropriate undocking function provided by the operating system is executed.



- ▶ Pull the unlocking lever in the direction of the arrow (1), until you hear the notebook unlatch.
- ▶ Lift off the notebook (2).

Security functions

Your notebook has several security features that you can use to secure your system from unauthorised access.

This chapter explains how to use each function, and what the benefits are.



Please remember that in some cases, for example, forgetting your password, you may be locked out and unable to access your data. Therefore, please note the following information:

- Make regular backups to external data carriers such as external hard drives, CDs, DVDs or Blu-ray Discs.
- Some security functions need you to choose passwords. Make a note of the passwords and keep them in a safe place.

If you forget your passwords you will need to contact the our Service Desk. Deletion or resetting of passwords is not covered by your warranty and a charge will be made for assistance.

Brief overview of security functions



Detailed information about the security equipment of your device can be found in the "Professional Notebook" manual, on the "Drivers & Utilities" CD/DVD or on the Internet at ["http://www.fujitsu.com/fts/support/index.html"](http://www.fujitsu.com/fts/support/index.html).

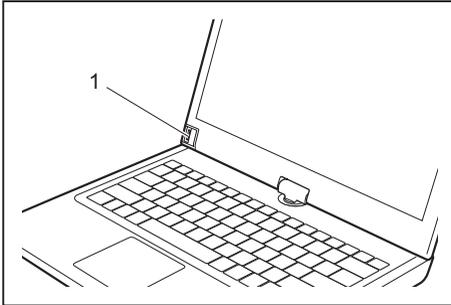
| Security functions | Type of protection | Preparation |
|--|--|---|
| Security Lock | Mechanical | Fit and lock the Kensington Lock Cable (accessory). |
| Fingerprint sensor (depending on the device) | Biometric | Install the supplied fingerprint software. |
| BIOS password protection | Password protection for <i>BIOS Setup</i> , 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 <i>BIOS Setup</i> and activate the password protection for the operating system and hard disk as desired. |
| Boot from removable media | Prevents unauthorised booting of an operating system from external media (e.g. USB stick, USB CD-ROM drive etc.). | In the BIOS Setup, go to the <i>Security</i> menu and edit the option <i>Boot from Removable Media</i> . |
| Owner Information | Overlay service desk or owner information during the boot process. | In the BIOS Setup, go to the <i>Security</i> menu and edit the option <i>Owner Information</i> . |
| System Lock (device dependent) | 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 | To use the SmartCard reader functions, install the supplied (or other suitable) software. |
| Trusted Platform Module (device dependent) | Identification and authentication of the notebook | Define a supervisor password in the <i>BIOS Setup</i> and enable the TPM (<i>Security Chip</i>). |

Configuring the fingerprint sensor

i

Whether or not your device has a fingerprint sensor depends on the device configuration you have ordered.

The fingerprint sensor can record an image of a fingerprint. With additional fingerprint software, this image can be processed and used instead of a password.



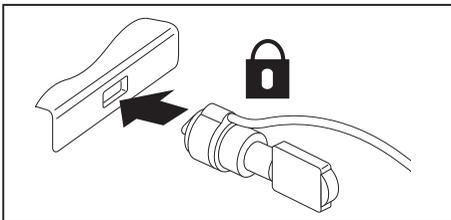
- ▶ You must install the fingerprint software in order to be able to use the fingerprint sensor (1).

Using the Security Lock

Your device comes with a Security Lock device for the Kensington Lock Cable. You can use the Kensington Lock Cable, a sturdy steel cable, to help protect your notebook from theft. The Kensington Lock Cable is available as an accessory.

i

Fujitsu recommends the use of a combination lock.



- ▶ Fit the Kensington Lock Cable on the device on your notebook.

i

Attach another Kensington Lock Cable to your Port Replicator to protect your Port Replicator from theft as well.

Configuring password protection in BIOS Setup Utility



Before using the various options for password protection in the *BIOS Setup utility* to increase data security, please observe the following:

Make a note of the passwords and keep them in a safe place. If you forget your supervisor password you will not be able to access your notebook. Deletion of the password is not covered by your warranty and a charge will be made for assistance.



Your password can be up to eight characters long and contain letters and numbers. No distinction is made between uppercase and lowercase.

Protecting BIOS Setup Utility (supervisor and user password)



If you have opened these operating instructions on the screen, we recommend that you print them out. You cannot call the instructions onto the screen while you are setting up the password.

The supervisor password and the user password both prevent unauthorised use of the *BIOS Setup Utility*. With the aid of the supervisor password you can access all of the functions of the *BIOS Setup Utility*, while the user password will only give you access to some of the functions. You can only set up a user password if a supervisor password has already been assigned.



Please refer to section ["Settings in BIOS Setup Utility", Page 105](#) for a description of how to call up and operate the *BIOS-Setup-Utility*.

Assigning the supervisor and user passwords

- ▶ Start the *BIOS Setup Utility* and go to the *Security* menu.
- ▶ Select 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.
- ↳ *Confirm new Password* requires you to confirm the password.
- ▶ Enter the password again and press the Enter key.
- ↳ *Changes have been saved* is a confirmation that the new password has been saved.
- ▶ To set the user password, select *Set User Password* and proceed exactly as when configuring the supervisor password.
- ↳ If you do not want to change any other settings, you can exit *BIOS Setup Utility*.
- ▶ In the *Exit* menu, select the option *Save Changes & Exit*.
- ▶ Select *Yes* and press the Enter key.
- ↳ The notebook is then rebooted and the new password comes into effect. It will now be necessary to first enter your supervisor or user password in order to open the *BIOS Setup Utility*. Please note that the user password only provides access to a few of the BIOS settings.

Changing the supervisor or user password

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

- ▶ Call the *BIOS Setup Utility* and go to the *Security* menu.
- ▶ When changing the password, proceed exactly as for password assignment.

Removing passwords

To remove a password (without setting a new password) perform the following steps:

- ▶ Start the *BIOS Setup Utility* and go to the *Security* menu.
- ▶ Highlight the *Set Supervisor Password* or *Set User Password* field and press the Enter key.
 - ↳ You will be requested to enter the current password by the *Enter Current Password* prompt. You will be requested to enter a new password by the *Enter New Password* prompt.
- ▶ Press the Enter key twice.
- ▶ In the *Exit* menu, select the option *Save Changes & Exit*.
- ▶ Select *Yes* and press the Enter key.
- ↳ The notebook will now reboot with the password removed.
 - Removing the supervisor password simultaneously deactivates the user password.

Password protection for booting of the operating system



With the supervisor password you have set in the *BIOS Setup Utility* (see section ["Assigning the supervisor and user passwords", Page 72](#)), you can also prevent starting of the operating system.

Activating system protection

- ▶ Start the *BIOS Setup Utility* and go to the *Security* menu.
- ▶ Select the *Password on Boot* option and press the Enter key.
- ▶ Select the desired option (*Disabled*, *First Boot* or *Every Boot*) and press the Enter key.
- ▶ Select the *Save Changes & Exit* option under *Exit*.
- ↳ The notebook reboots. You will be prompted to enter your password (the supervisor password).

Deactivating system protection

- ▶ Start the *BIOS Setup Utility* and go to the *Security* menu.
- ▶ Select the *Password on Boot* option and press the Enter key.
- ▶ Select the *Disabled* option and press the Enter key.
- ↳ If you do not want to change any other settings, you can exit *BIOS Setup Utility*.
- ▶ Select the *Save Changes & Exit* option under *Exit*.
- ↳ The notebook will reboot. The system is no longer password-protected.

Password protection for the hard disk

If a supervisor password has been assigned, a password for the hard disk can also be set in the *Hard Disk Security* menu.

The hard disk is protected by this password. Data on this hard disk can only be read into another system if the correct password has been entered.

SmartCard reader

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

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 home banking.

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

In order to be able to take advantage of all the security features of your notebook, you will need a CardOS SmartCard from Fujitsu.



The SmartCard can only be used with a PIN, offering maximum protection even if you lose the SmartCard. In order to maximise your security, the CardOS SmartCard is disabled if three incorrect attempts are made to enter the PIN.

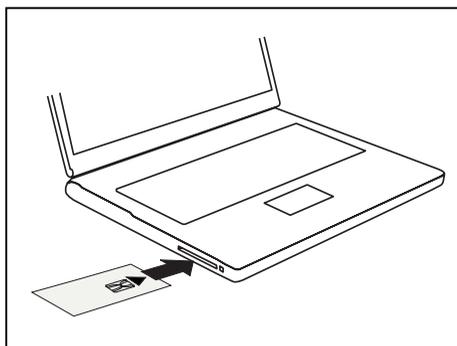
When you use the CardOS SmartCard for the first time, you will either need to enter the preset PIN "12345678" or the PIN given to you by your systems administrator.

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 upwards (on some variants it faces down) and to the front.

SmartCard SystemLock (optional)

With *SystemLock* enabled, the device can only be started using an initialised SmartCard (SICRYPT, CardOS or Fujitsu) and a personal identification number (PIN). The SmartCard and PIN are checked during system booting in the BIOS, i.e. before the operating system is started.

| 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. |
| Install Group PC: | [Enter] | |
| | | SmartCard data will be overwritten. |
| | | A correct SmartCard is required for a permanent installation |



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

On SICRYPT and CardOS SmartCards, the value *12345678* is preset for the PIN and the PUK.

On Fujitsu cards, the value *0000* is preset for the PIN and the value *administrator* is preset for the PUK. For security reasons, we recommend that you change both PIN and PUK without fail.

Additional software (e.g. Smarty) is required so that the system can also check that the correct SmartCard is inserted while the system is running.



For information on how to uninstall *SystemLock*, please refer to "Uninstall SystemLock". A system which was protected using *SystemLock* can no longer be released.

Always create a backup copy of the SmartCard which was 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: starting the system, changing the PIN
- SuperUser SmartCard: starting the system, changes in *BIOS Setup*, changing the PIN
- Service SmartCard: changes in *BIOS-Setup*, operating system boot-up not possible
- Admin SmartCard: starting the system, changes in *BIOS Setup*, changing the PIN, uninstalling *SystemLock*, initialising SmartCards, blocking SmartCards

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

| | User SmartCard | | SuperUser SmartCard | | Service SmartCard | | Admin SmartCard | |
|-----------------------------------|----------------|-----|---------------------|-----|-------------------|-----|-----------------|-----|
| | PIN | PUK | PIN | PUK | PIN | PUK | PIN | PUK |
| Start-up system | x | | x | | | | x | |
| Run BIOS Setup | | | x | | x | | x | |
| Change own PIN | x | | x | | x | | x | x |
| Unblocking own blocked SmartCard | | x* | | x* | | x* | | x |
| Unblocking all blocked SmartCards | | | | | | | | x |
| Generating user cards | | | | | | | | x |
| Uninstall SystemLock | | | | | | | | x |

* *BIOS Setup* setting (*Unblock own SmartCard*)

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

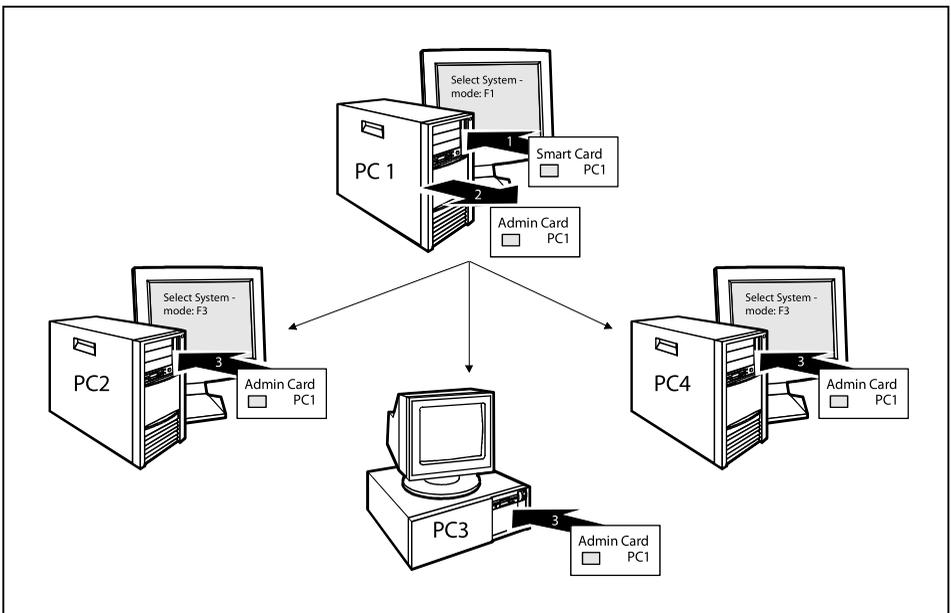
SmartCard user groups

User groups can be set up using *SystemLock*. This enables several systems to be started with one SmartCard. A user group consists of at least two systems. Each user that is allowed to start the systems is provided with one SmartCard. The user can start any of the systems using this SmartCard.

Basic information on setting up user groups

When installing *SystemLock*, the first PC in the user group is set up as a "Single PC". The Admin SmartCard generated during this process is used to set up the user group. *SystemLock* sets up each additional device as a "Group PC" during installation. The existing Admin SmartCard is inserted, information is read in and the device is added to the user group. The Admin SmartCard determines which user group the device belongs to.

If you use FSC-CardOS SmartCards, *SystemLock* can be administered via the Windows program "SystemLock Admin". "SystemLock Admin" allows you to conveniently manage *SystemLock* at the operating system level, create SystemLock Organisation Units and Groups, generate SmartCards for these Organisation Units or Groups, assign access rights for user cards at various levels and restore access rights using remote access. You can also change the SmartCard's PIN or PUK for yourself and other users and reactivate blocked cards. For a detailed description, see the "SystemLock Admin" Help manual.



User SmartCards or SuperUser SmartCards must still be generated using *SystemLock* so that users can access the systems within the user group. Using a User SmartCard or SuperUser SmartCard a user can log on to each system within the user group.

Installing SystemLock

During initial installation, the first SmartCard becomes the Admin SmartCard. Together with the PUK, it has all access rights, and should therefore be kept in a safe place. It can only be used by the authorised user (administrator), e.g. to initialise user cards.

You need an Admin SmartCard if you want to set up a user group. You use the Admin SmartCard 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:

| | | |
|--|---------------|---|
| Security | | |
| SmartCard SystemLock | | Item Specific Help |
| SmartCard SystemLock | Not Installed | Installs the security from a SystemLock Admin SmartCard into this PC without modifying any data on the SmartCard. |
| Install Single PC | [Enter] | |
| Install Group PC | [Enter] | |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Enter PIN: []</div> | | rect SmartCard is red for a permanent installation. |

- ▶ Insert a new SmartCard in the reader and press Enter.



New SmartCards have a preset PUK (see above).

if you want to re-initialise a previously initialised SmartCard, you will need to know the PUK which was assigned to it.

▶ Enter the PUK.

↳ When the following appears:

- *ACCESS DENIED* = You have entered an invalid 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:



A number with 4 to 8 digits is acceptable for the new PUK. For security reasons, we recommend that you change the PUK for every SmartCard, and use an 8-digit number each time.

▶ Re-enter the new PIN to confirm.

↳ When the following appears:

- *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* is being 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 | | Item Specific Help |
|--------------------------|-------------------|--|
| SmartCard SystemLock | | |
| SmartCard SystemLock | Installed | <p>Allows to deactivate the smartcard security.</p> <p>ATTENTION: Always check the BIOS password settings after uninstalling SystemLock.</p> <p>NOTICE: Reinstalling a SinglePC implies re-initializing all of your smartcards</p> |
| Uninstall: | [Enter] | |
| BIOS Recovery: | [Allowed] | |
| SmartCard and Pin | [Always required] | |
| SmartCard Initialization | | |
| Admin SmartCard | [Enter] | |
| SuperUser SmartCard: | [Enter] | |
| User SmartCard: | [Enter] | |
| Service SmartCard: | [Enter] | |
| SmartCard Configuration | | |
| Change PIN: | [Enter] | |
| 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 input the 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.

↳ When the following appears:

- *ACCESS DENIED* = You have entered an invalid 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:



A number with 4 to 8 digits is acceptable for the new PUK. For security reasons, we recommend that you change the PUK for every SmartCard, and use an 8-digit number each time.

► Re-enter the new PUK to confirm.

↳ When 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", Page 84.](#)

- ▶ 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!



Keep the SmartCard and PIN/PUK in a safe 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:

| | | |
|---|---------------|---|
| Security | | |
| SmartCard SystemLock | | Item Specific Help |
| SmartCard SystemLock | Not Installed | Installs the security from a SystemLock Admin SmartCard into this PC without modifying any data on the SmartCard. |
| Install Single PC | [Enter] | |
| Install Group PC | [Enter] | |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;"> Enter PIN: [] </div> | | rect SmartCard is red for a permanent installation. |

- ▶ Insert the Admin SmartCard for the user group.
 - ↳ *Enter PIN:*
 - ▶ Enter the PIN.
 - ↳ When the following appears:
 - *ACCESS DENIED* = You have confirmed the PIN incorrectly. You are then requested to enter and confirm the new PIN again. After three failed attempts, the SmartCard will be blocked and can then only be activated again by entering the PUK.
- Enter the PUK:*

► Enter the PUK.

↳ When the following appears:

- *ACCESS DENIED* = You have entered an invalid 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* is being 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 The smartcard security. |
| Uninstall: | [Enter] | |
| BIOS Recovery: | [Allowed] | |
| SmartCard and Pin | [Always required] | ATTENTION: Always check the BIOS password settings after uninstalling SystemLock. |
| SmartCard Initialization | | NOTICE: Reinstalling a SinglePC implies re-initializing all of your smartcards |
| Admin SmartCard | [Enter] | |
| SuperUser SmartCard: | [Enter] | |
| User SmartCard: | [Enter] | |
| Service SmartCard: | [Enter] | |
| SmartCard Configuration | | |
| Change PIN: | [Enter] | |
| Change PUK: | [Enter] | |
| Unblock SmartCard: | [Enter] | |

Generate a user card for the device as described in Section "[Carrying out administrator functions](#)", Page 84.

► 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 switch on the device by inserting the SmartCard. If you switch on the device with the On/Off switch then the following message appears:

SystemLock

Insert a SmartCard.

▶ Insert the Admin SmartCard. The following message will be displayed:

↳ *Enter your PIN:*

You can now select:

F2=Setup, F3=Change PIN, F4=Administration

▶ Press the **F4** function key. The following message will be displayed:

↳ *Enter the PUK:*

▶ If you have entered the PUK correctly, you receive the following message:

↳ *PUK OK.*

Initialize another SmartCard or press ESC to abort?

F5=User, F6=SuperUser, F7=Admin, F8=Service, F9=Unblock SmartCard, F10=Uninstall

F5: Normal User SmartCard ("System" access rights):

Only allows system start-up, does not allow changes in BIOS Setup.

F6: Extended User SmartCard ("System and Setup" access rights):

Allows system start-up and changes in BIOS Setup.

F7: Admin SmartCard ("Admin" access rights):

Allows generation of further Admin SmartCards.

F8: Service SmartCard ("Service" access rights):

Only allows changes in BIOS Setup.

F9: Re-activate a blocked User SmartCard.

Enables a new user PIN entry.

F10: Uninstalls SystemLock.

Additional SmartCards should be produced either as Normal User SmartCards ("System") or as Extended User SmartCards ("System and Setup"). These then have restricted access to the device.

▶ Press the desired function key. The following message will be displayed:

↳ *Remove the SmartCard.*

▶ Remove the Admin SmartCard.

↳ *Insert a SmartCard.*



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

- ▶ Insert the next SmartCard. It will be initialised as required.
- ↳ The following message will be displayed:

Remove the SmartCard.



Always change the PIN and PUK for all further SmartCards. The PUK is used to re-activate a blocked SmartCard.

- ▶ 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 Access Enabling – 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 "[SmartCard user groups](#)", Page 77).

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 prompt to *Insert a SmartCard* will appear.
- ▶ Press the F4 key.

| | |
|----------------------|----------------------|
| SmartCard SystemLock | |
| Org Unit: | Company Department 1 |
| PC Group: | Group 1 |
| I-CODE 1: | 0123456789ABCDEF |
| I-CODE 2: | 0123456789ABCDEF |

The following dialogue box will appear:

- ↳ The user must then contact the administrator or the administration hotline and inform them of the data and codes displayed .

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

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

An activation code will be generated that depends on the access rights granted; this will be given to the user by the Hotline.

The user must now press the Enter key on the PC to be activated, enter the first half (Code 1) of the activation code and confirm the entry by pressing Enter. The dialogue box for entering the second half (Code 2) of the activation code will appear. If an incorrect entry is made, there is no limit to the number of times the process can be repeated.

When all 32 characters of the activation code have been correctly entered, the device will boot with the rights assigned by the administrator, in the same way as if a corresponding SmartCard were inserted.



The activation code can only be used once to start the device; it immediately becomes invalid when the device boots. If you wish to switch off the device and start it again without your SmartCard, the procedure described above must be repeated each time.

Switch on the device using SystemLock

If you have an internal SmartCard reader, you can switch on the device by inserting the SmartCard. If you switch on the device with the On/Off switch then the following message appears:

Insert a SmartCard.

- ▶ Insert your SmartCard.

↳ *Enter PIN:*

- ▶ Enter your PIN.

↳ When 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 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).

Changing PIN

It is possible to change the PIN for any initialised SmartCard.

- ▶ Press the function key F3.
- ▶ Enter the old PIN.
- ▶ Enter the new PIN.

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A number with 4 to 8-digits is acceptable for the new PIN. For security reasons, we recommend that you change the PIN for every SmartCard, and use an 8-digit number each time.

- ▶ Confirm the new PIN.

Uninstall SystemLock

- ▶ Start the device.
- ▶ Follow the instructions given in section ["Carrying out administrator functions", Page 84](#). Select "Uninstall" to uninstall *SystemLock*. You can now use the device again without the need for a SmartCard.

Error messages

In this chapter you will find the error messages which are generated by the mainboard and the SmartCard reader.

| Error | Cause |
|---|--|
| <i>Boot access denied</i> | The SmartCard has no access rights to the system. |
| <i>Check your SmartCard</i> | The SmartCard is either inserted incorrectly or it is not a suitable SystemLock SmartCard. |
| <i>SmartCard reader FAILURE</i> | An error has occurred on the serial port to the SmartCard 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. |
| <i>Non-authorized SmartCard</i> | The SmartCard cannot be used on this device. The SmartCard has been configured for a different device. |
| <i>SystemLock installation FAILED:</i> | An error occurred while installing <i>SystemLock</i> . Do not switch off the device, insert the "BIOS Flash diskette" instead. Perform a BIOS update and try the installation process again. |
| <i>The SmartCard is blocked. Enter the PUK:</i> | 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. |

Trusted Platform Module (TPM) (device-dependent)

To use the TPM, you **must** activate the TPM in the *BIOS Setup* before the software is installed. The condition for this is that you have assigned at least the supervisor password (see ["Security functions", Page 69](#)).

Enabling TPM

- Requirement: You have set a supervisor password, see ["Security functions", Page 69](#).
- ▶ Call up the BIOS Setup and select the *Security* menu.
- ▶ Mark the *TPM Security Chip Setting* field and press the Enter key.
- ▶ Select *Enabled* to activate the TPM.
- ↳ Once you have activated the TPM the *Clear Security Chip* option appears.
Select *Clear Security Chip* to delete the holder in the TPM. By clicking on *Enabled*, all secret keys (e.g. SRK - Storage Root Keys, AIK - Attestation Identity Keys etc.) generated by applications are deleted.

Please note that you will then no longer be able to access the data you have encrypted with the keys based on that holder.
- ▶ In the *Exit* menu, choose the option *Exit Saving Changes*.
- ▶ Press the enter key and select *Yes*.
- ↳ The notebook will restart, and TPM will be enabled after the reboot.

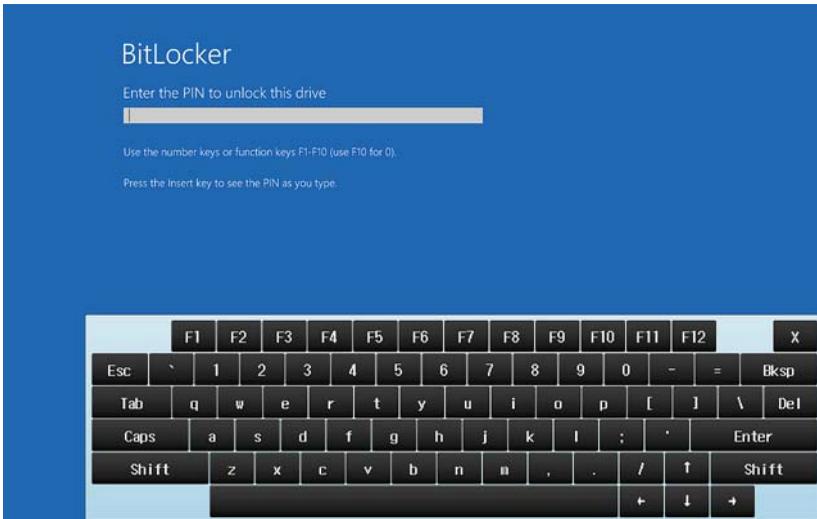
Disabling TPM

- Requirement: You have set a supervisor password, see ["Security functions", Page 69](#).
- ▶ Call up the BIOS Setup and select the *Security* menu.
- ▶ Mark the *TPM Security Chip Setting* field and press the Enter key.
- ▶ Select *Disabled* to deactivate the TPM.
- ▶ In the *Exit* menu, choose the option *Exit Saving Changes*.
- ▶ Press the enter key and select *Yes*.
- ↳ Your notebook will now restart and TPM will be disabled.

Enable password entry using the on-screen keyboard (on-screen keyboard for BitLocker password)

If TPM is enabled, in the BIOS Setup you can enable an on-screen keyboard for the internal touchscreen.

- ▶ Call BIOS Setup and select the *Advanced* menu.
- ▶ Mark *Boot Configurations* and press the enter key.
- ▶ From the *UEFI Boot On-Screen Keyboard Location* selection, choose the option *Lower Right* or *Upper Right*.
- ▶ From the *Exit* menu, choose the option *Exit Saving Changes*.
- ▶ Press the Enter key and select *Yes*.
- ↳ The notebook restarts and the password dialogue is displayed.
Tap on the password field to enable the on-screen keyboard.



Connecting external devices



Always refer to the safety information provided in ["Important notes", Page 12](#) before connecting or disconnecting any devices to or from your notebook.

Always read the documentation supplied with the device you wish to connect.

Never connect or disconnect cables during a thunderstorm.

Never pull at a cable when disconnecting it. Always grasp the plug.

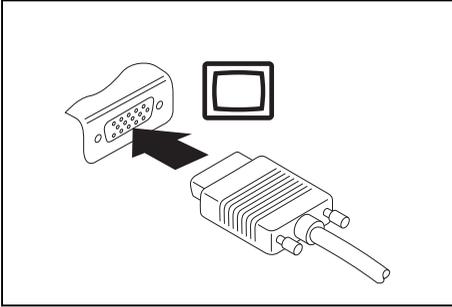


With some devices such as USB devices, it is not necessary to switch off the notebook and the device before connecting/disconnecting. For more information about whether or not devices need to be switched off, please refer to the documentation supplied with the external device.

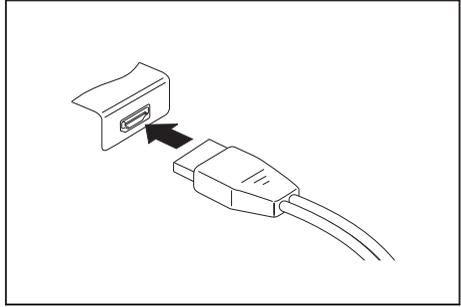
Some of the external devices require special drivers (see the operating system and external device documentation).

Connecting an external monitor

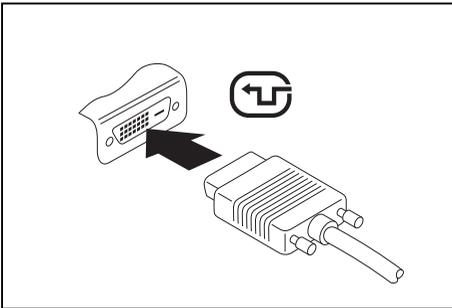
An analogue monitor is connected to the analogue VGA monitor port, a digital monitor to the DisplayPort or to the DVI-D monitor port on the optional Port Replicator. Monitor output is limited to a maximum of two monitors at any one time (see "[Key combinations](#)", [Page 46](#), section "Toggle output monitor").



Analogue VGA monitor port (on notebook or on optional port replicator)



Digital DisplayPort (on optional port replicator)



Digital DVI-D monitor port (on the optional Port Replicator)

- ▶ Switch off the notebook and the external monitor.
- ▶ Plug the data cable of the external monitor into the monitor port.
- ▶ First switch on the external monitor and then the notebook.

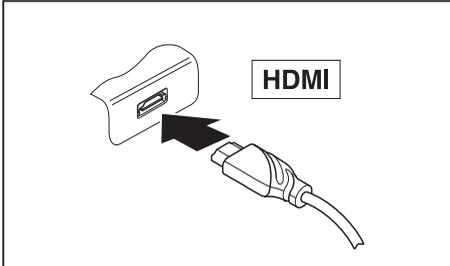


You can also switch between the external monitor and the LCD monitor of the notebook, see chapter "[Key combinations](#)", [Page 46](#).

You can display the same picture on the external monitor and the notebook LCD monitor simultaneously.

HDMI port

The HDMI port on your notebook can be used to connect an external amplifier, LCD TV or a plasma TV with an HDMI connection.



- ▶ Connect the data cable to the external device.
- ▶ Connect the data cable to the HDMI port of the notebook.

Connecting USB devices

On the USB ports, you can connect external devices that also have a USB port (e.g. a DVD drive, a printer, a scanner or a modem).

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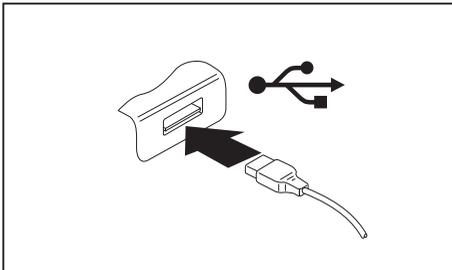
USB devices are hot-pluggable. This means you can connect and disconnect devices while your operating system is running.

USB 1.x has a maximum data transfer rate of 12 Mbit/s.

USB 2.0 has a data transfer rate of up to 480 Mbit/s.

USB 3.0 has a data transfer rate of up to 5 Gbit/s.

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 a USB port of the notebook.

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Device drivers

USB devices will be automatically recognised and installed by your operating system.

USB port with charging function (Anytime USB charge)

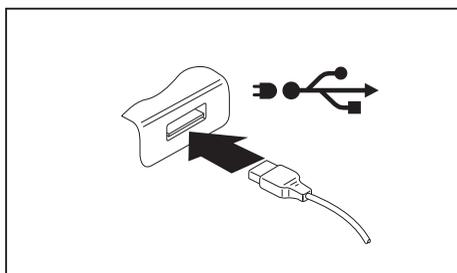


It is recommended that the notebook be operated with the power supply connected whenever the USB port with charging function is in use, as this function will drain the battery more quickly if an external USB device is being charged.

The power supply unit must already be connected when the notebook is switched off, as otherwise the USB charging function will be disabled and the connected USB devices will not be charged.



Some USB devices (e.g. mobile telephones) require a driver in order to utilise the USB charging function. In this case the USB charging function will not work when the notebook is switched off, as no drivers are active when the notebook is switched off.



You can use this USB port to charge or supply power to a USB device (e.g. to charge a PDA or a mobile phone or to connect a USB lamp), even if the notebook is switched off.

Connecting an external SATA hard disk (eSATA) (port replicator only)

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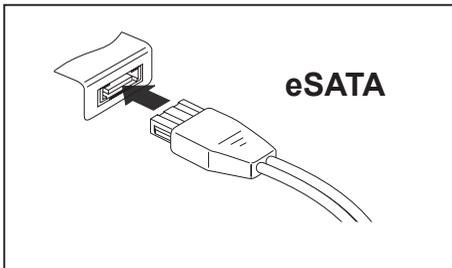
The notebook itself does not have an eSATA port. The optional Port Replicator available for your notebook provides this port.

An external SATA hard disk can be connected at the eSATA port. This allows you to expand the internal hard disk capacity as you wish.

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The length of the eSATA cable must not exceed 2 metres. Consult a specialist dealer for advice on which eSATA data cable is suitable for your external eSATA hard disk. Make sure that the hard disk has its own external power supply.

The data transfer rate is up to 2,400 Mbit/s.



- ▶ Connect the data cable to the external device.
- ▶ Connect the data cable to the eSATA port.

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Device drivers

The eSATA hard disk is automatically recognised by your operating system and installed.

You will find more information in the documentation for the external SATA hard disk and the operating system.

Safe removal of eSATA and USB devices



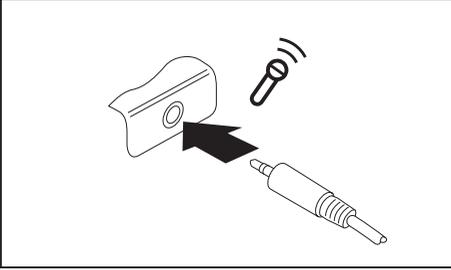
Always correctly remove the device according to the rules described below, to ensure that none of your data is lost.

- ▶ Left-click on the symbol to remove hardware safely.
- ▶ Select the device you wish to shut down and remove.
- ▶ Press the "Enter" key.
- ↳ Wait for the dialogue box which tells you that it is now safe to remove the device.

Connecting external audio devices

Microphone port/Line In

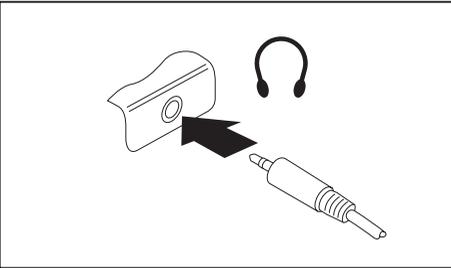
The microphone port/Line In allows you to connect an external microphone, a MiniDisc player, MP3 player, CD player or a tape deck to your notebook.



- ▶ Connect the audio cable to the external device.
- ▶ Connect the audio cable to the microphone port/Line In of the notebook.

Headphone port

You can connect headphones or external loudspeakers to your notebook via the headphone port.



- ▶ Connect the audio cable to the external device.
- ▶ Connect the audio cable to the headphone port of the notebook.
- ↳ The internal loudspeakers are disabled.



If you purchase a cable from a retailer, please note the following information:

The headphone port on your notebook is a "3.5 mm jack socket".

If you want to connect headphones or a speaker you will need a "3.5 mm jack plug".

Removing and installing components during servicing



Only qualified technicians should repair your notebook. Unauthorised opening or incorrect repair may greatly endanger the user (electric shock, fire risk) and will invalidate your warranty.

After consulting the Hotline/Service Desk, you may remove and install the components described in this chapter yourself.



If you remove and install components without consulting the Hotline/Service Desk, then the warranty of your notebook will be voided.

Notes on installing and removing boards and components

- Switch the notebook off and pull the power plug out of the mains socket.
- Always remove the battery.
- Take care when you use the locking mechanisms on the battery and any other component.
- Never use sharp objects such as screwdrivers, scissors or knives as leverage to remove covers.



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

When handling boards fitted with ESDs, you must always observe the following points:

- You must always discharge static build up (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Remove the power plug from the mains supply before inserting or removing boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.

Preparing to remove components

If you are going to remove or change system components, prepare for the removal as follows:



Please observe the safety information in chapter ["Important notes", Page 12](#).

Remove the power plug from the mains outlet !

- ▶ Switch the device off.



The device must not be in energy-saving mode !

- ▶ Close the LCD screen.
- ▶ Remove all the cables from the device.
- ▶ Turn the device over and place it on a stable, flat and clean surface. If necessary, lay an anti-slip cloth on this surface to prevent the device from being scratched.
- ▶ Remove the battery (see ["Removing the battery", Page 51](#)).

Installing and removing memory expansion

If you are asked by the Hotline/Service Desk to remove and install the memory expansion yourself, proceed as follows:



Please observe the safety information in chapter ["Important notes", Page 12](#).

When installing/removing memory modules, the battery must be removed from the notebook and the notebook must not be connected to the power supply, see ["Preparing to remove components", Page 98](#).

Only use memory expansion modules that have been approved for your notebook (see ["Technical data", Page 117](#)).

Never use force when installing or removing a memory extension.

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

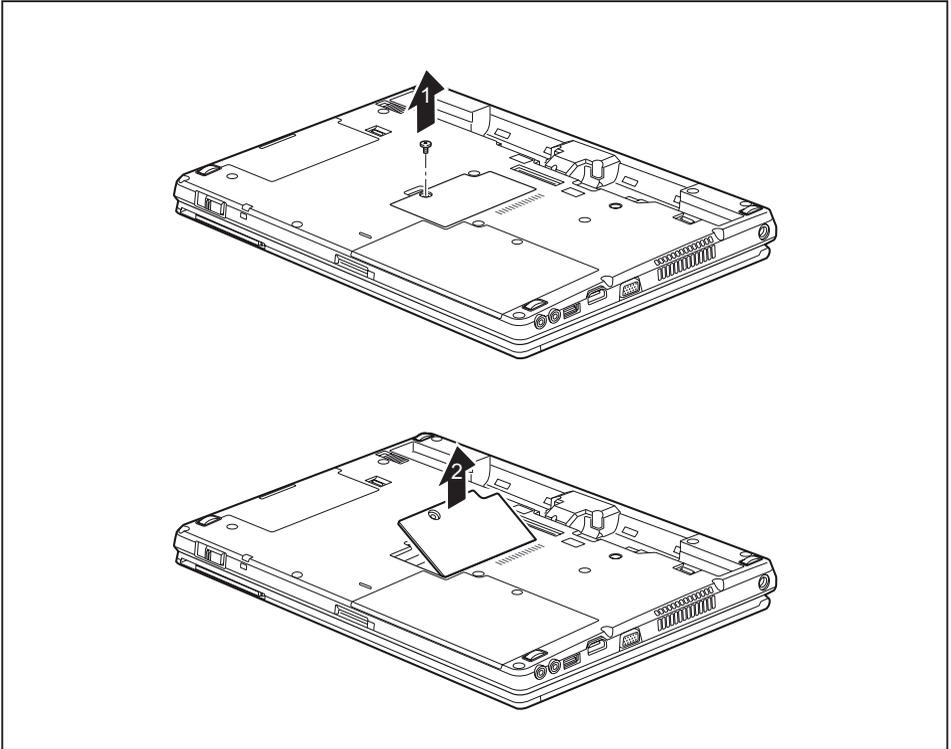
You must open the service compartment to remove or install a memory module. On some devices, opening the compartment may expose other components. These components should be removed and replaced only by authorised specialists. Therefore, be sure to observe the following:



Individual components can become very hot during operation. Therefore, we recommend that you wait one hour after switching off the notebook before removing or installing memory modules. Otherwise, there is a risk of suffering burns!

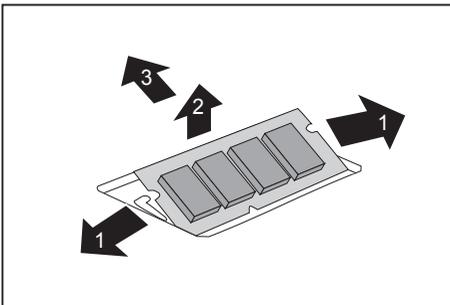
As some components are exposed that are sensitive to static electricity, please take note of chapter ["Notes on installing and removing boards and components", Page 97](#).

Removing a cover



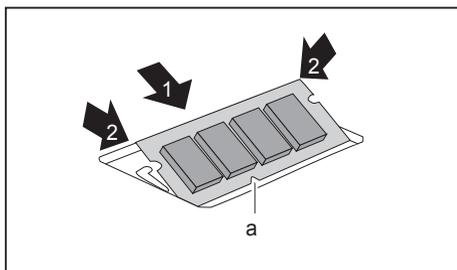
- ▶ Remove the screw (1).
- ▶ Lift the cover off the notebook in the direction of the arrow (2).

Removing memory modules



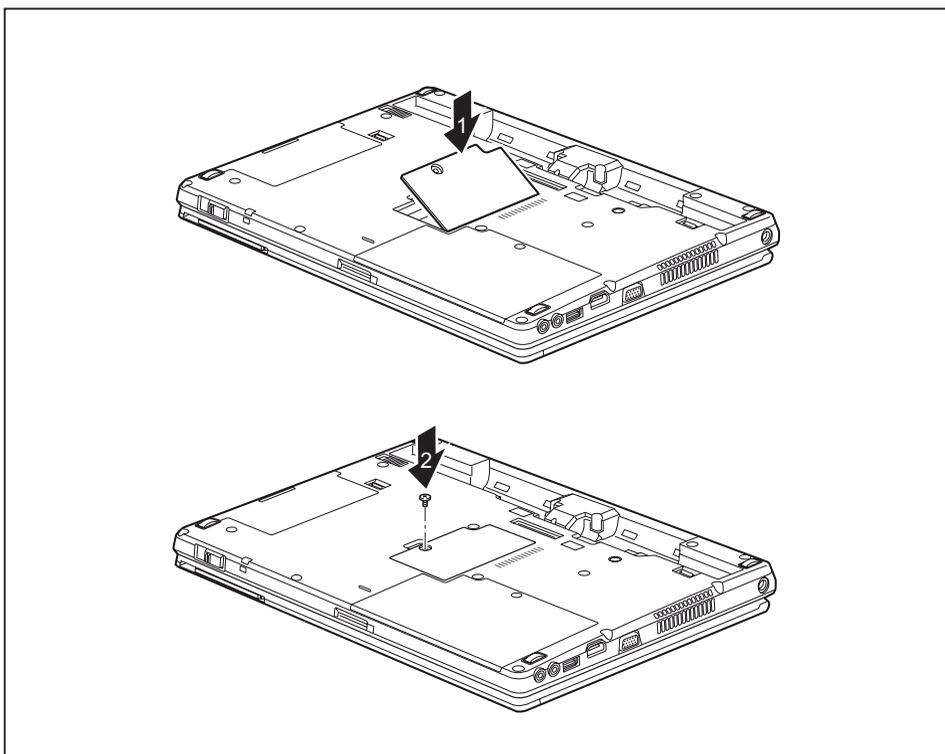
- ▶ Carefully push the two mounting clips outwards (1).
- ↳ The memory module snaps upwards (2).
- ▶ Pull the memory module out of its slot in the direction of the arrow (3).

Installing a memory module



- ▶ Insert the memory module with the contacts and the recess (a) facing the slot (1).
- ▶ Carefully push the memory module downwards until you feel it click into place (2).

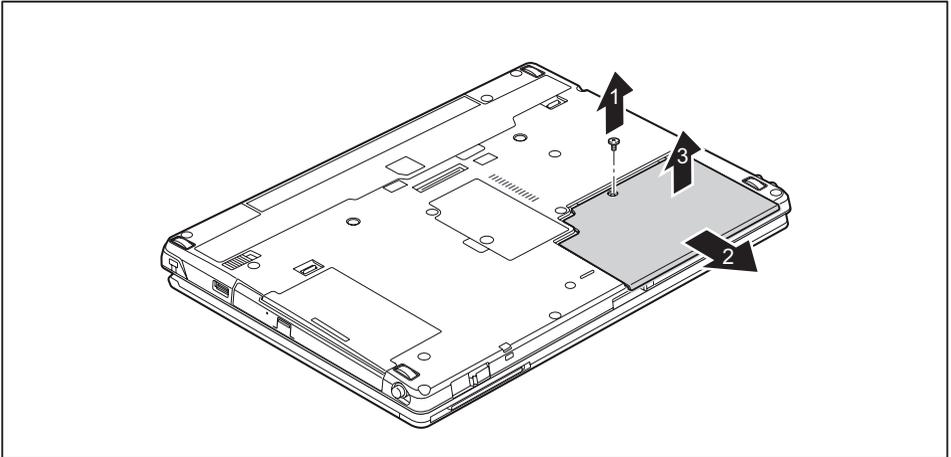
Attaching the cover



- ▶ Place the cover into position, following the direction of the arrow (1).
- ▶ Fasten the cover with the screw (2).

Removing and installing the hard disk

Removing a cover



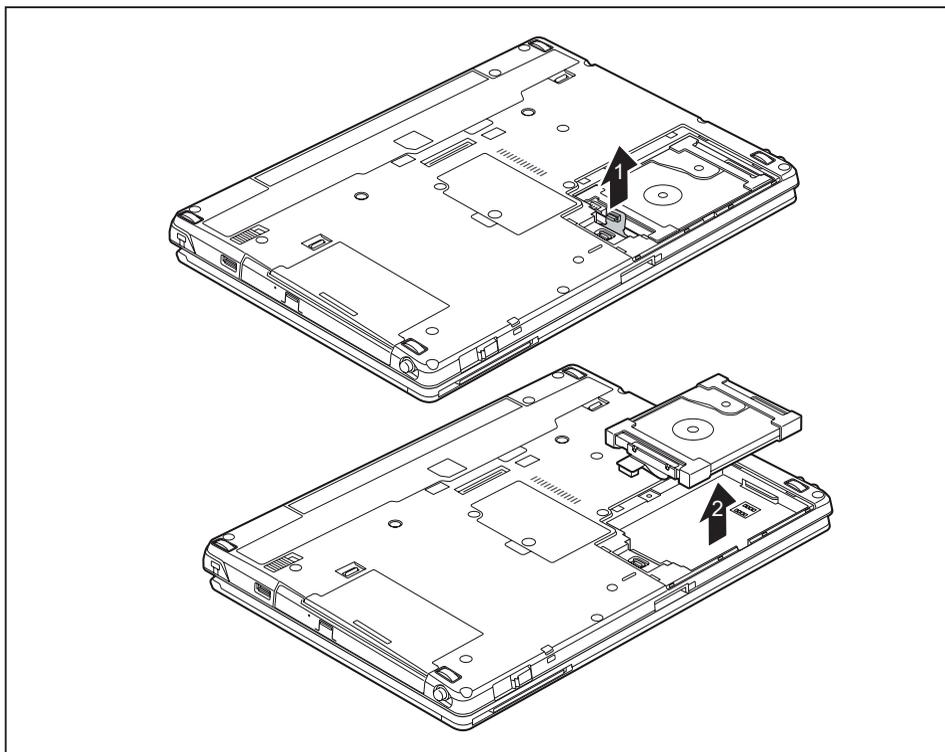
- ▶ Remove the screw (1).



Keep the screw in a safe place. If you are removing more than one component at the same time, store the screws for the individual components separate from each other. If you install the wrong screws, components may be damaged.

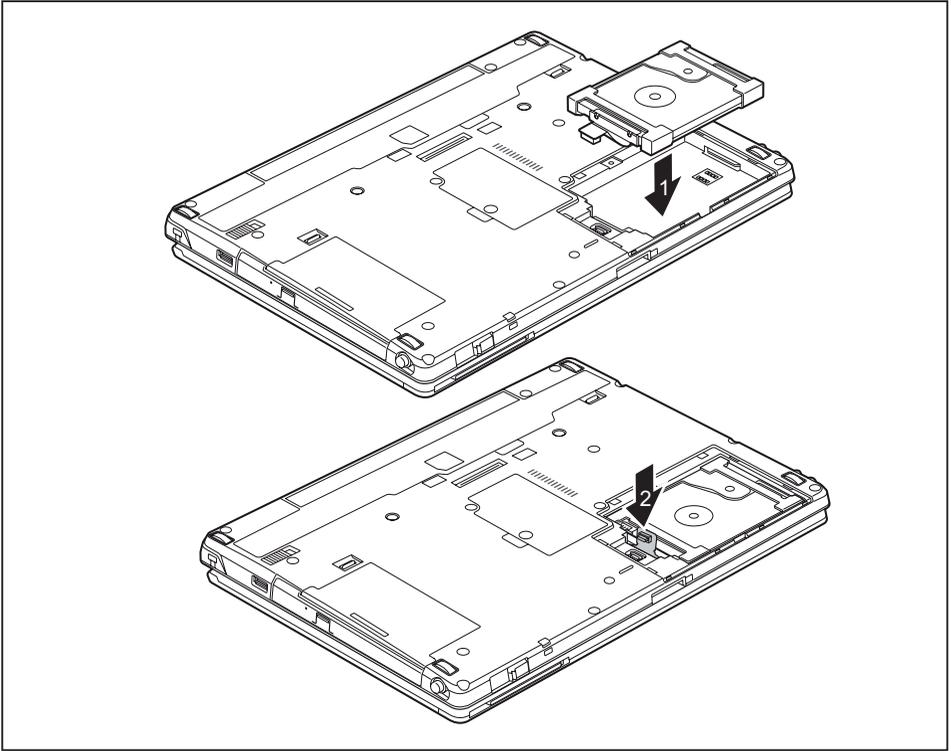
- ▶ Slide the cover in direction of the arrow (2).
- ▶ Lift the cover off the notebook (3).

Removing a hard disk



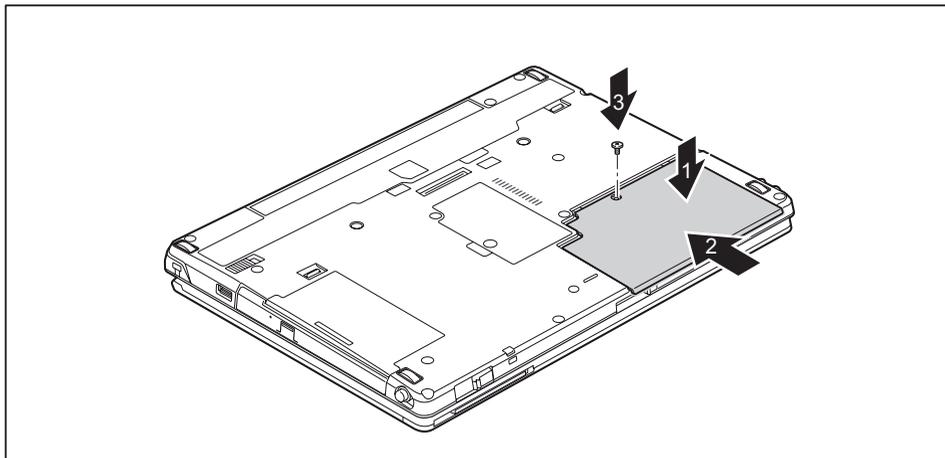
- ▶ Carefully disengage the connector for the hard disk (1).
- ▶ Remove the hard disk from the hard disk compartment (2) by lifting it upwards using the two rubber lugs.

Installing a hard disk



- ▶ Place the hard disk into the hard disk compartment (1).
- ▶ Attach the connector for the hard disk (2).

Attaching the cover



- ▶ Place the cover in the correct mounting position (1).
- ▶ Slide the cover in the direction of the arrow (2).
- ▶ Tighten the screw (3).

Finishing component removal

After you have removed or changed the system components as you required, please prepare your device for operation again as follows:

- ▶ Install the battery again (see ["Inserting battery", Page 52](#)).
- ▶ Turn the notebook the right way up again and place it on a flat surface.
- ▶ Reconnect the cables that you disconnected before.

Settings in BIOS Setup Utility

The *BIOS Setup Utility* allows you to set the system functions and the hardware configuration for the notebook.

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

The *BIOS Setup Utility* program contains the following menus:

| | |
|-----------------|--|
| <i>About</i> | Displays information relating to the BIOS, processor and notebook |
| <i>System</i> | Advanced system settings |
| <i>Advanced</i> | Configuration of various hardware components, such as mouse, keyboard, processor |
| <i>Security</i> | Password settings and security functions |
| <i>Boot</i> | Configuration of the start-up sequence |
| <i>Exit</i> | Exits the <i>BIOS Setup Utility</i> |

Starting the BIOS Setup Utility

- ▶ Reboot the device (switch off/on or reboot the operating system).
- ↳ Depending on the *Fast Boot* setting in the *BIOS Setup utility*, the following information may appear on the screen during start:
 - <F2> BIOS Setup <F12> Boot Menu
- ▶ 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 customer service centre.

The *BIOS Setup Utility* starts.

Operating BIOS Setup Utility



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

With the **F9** key you can load the default settings of the *BIOS Setup Utility*.

- ▶ Use the cursor keys **←** or **→** to select the menu you wish to access to make changes.
↳ The menu is displayed on the screen.
- ▶ Select the option you want to change with the cursor keys **↑** or **↓**.
- ▶ Press the Enter key.
- ▶ Press the **ESC** key to exit the selected menu.
- ▶ For future reference, make a note of the changes you have made (for example, in this manual).

Exiting BIOS Setup Utility

You need to select the desired option in the *Exit* menu and activate it by pressing the Enter key:

Exit Saving Changes - save changes and exit BIOS Setup Utility

- ▶ To save the current menu settings and exit the *BIOS Setup Utility*, select *Exit Saving Changes* and *Yes*.
- ↳ The notebook is rebooted and the new settings come into effect.

Exit Discarding Changes – Discard changes and exit BIOS Setup Utility

- ▶ To discard the changes, select *Exit Discarding Changes* and *Yes*.
- ↳ The settings in place when *BIOS Setup Utility* was called remain effective. *BIOS Setup Utility* is terminated and the notebook is rebooted.

Load Setup Defaults – Copy Standard Entries

- ▶ To copy the standard entries for all menus of the *BIOS Setup Utility*, choose *Load Setup Defaults* and *Yes*.

Discard Changes – Discard changes without exiting the BIOS Setup Utility

- ▶ To discard the changes you have made, select *Discard Changes* and *Yes*.
- ↳ The settings in place when *BIOS Setup Utility* was called remain effective. You can now make additional settings in the *BIOS Setup Utility*.
- ▶ If you want to exit *BIOS Setup Utility* with these settings, select *Exit Saving Changes* and *Yes*.

Save Changes - save changes without exiting the BIOS Setup Utility

- ▶ To save the changes, select *Save Changes* and *Yes*.
- ↳ The changes are saved. You can now make additional settings in the BIOS Setup Utility.
- ▶ If you want to exit BIOS Setup Utility with these settings, choose *Exit Saving Changes* and *Yes*.

Save Changes and Power Off

- ▶ To save the changes and switch off your device, select *Save Changes and Power Off* and *Yes*.
- ↳ The changes are saved. Your device is shut down.

Troubleshooting and tips



Follow the safety notes in the "Safety/Regulations" manual when connecting or disconnecting cables.

If a fault occurs, try to correct it as described. If you fail to correct the problem, proceed as follows:

- ▶ Make a note of the steps and the circumstances that led to the fault. Also make a note of any error messages displayed.
- ▶ Switch the notebook off.
- ▶ Please contact the Hotline/Service Desk.



You can find the telephone numbers in the service desk list. Please have the following information ready when you call:

- The model name and serial number of the notebook. The serial number is located on a sticker on the underside of the notebook.
- Notes of any messages that appear on the screen and information on acoustic signals.
- Any changes you have made to the hardware or software since receiving the notebook.
- Any changes you have made to the *BIOS Setup* settings since receiving the notebook.
- Your system configuration and all peripheral devices connected to your system.
- Your sales contract.



Our notebooks have been designed primarily with mobile applications in mind. This means that considerable effort has been made to optimise components and equipment in terms of weight, space and energy requirements. Depending on the particular configuration you have purchased, it is possible that functionality may be slightly reduced compared to a desktop PC if you are running processor-intensive gaming software, e.g. games with intensive 3D graphics. Updating your hardware with drivers which have not been approved by Fujitsu Technology Solutions may result in performance losses, data losses or malfunction of the equipment. A list of approved drivers and current BIOS versions can be downloaded from: ["http://support.ts.fujitsu.com/Download/Index.asp"](http://support.ts.fujitsu.com/Download/Index.asp)

Help if problems occur

Should you encounter a problem with your computer that you cannot resolve yourself:

- ▶ Note the ID number of your device. The ID number is found on the type rating plate on the back or underside of the casing.
- ▶ For further clarification of the problem, contact the Service Desk for your country (see the Service Desk list or visit the Internet at ["http://support.ts.fujitsu.com/contact/servicedesk/ServiceDeskNumber_Int.asp"](http://support.ts.fujitsu.com/contact/servicedesk/ServiceDeskNumber_Int.asp)). When you do this, please have ready the ID number and serial number of your system.

The notebook's date or time is incorrect

| Cause | Troubleshooting |
|---|---|
| Time and date are incorrect. | ▶ With the <i>BIOS-Setup-Utility</i> , you can set the date and time in the <i>main</i> menu. |
| If the time and date are still set incorrectly after switching on the notebook. | ▶ Please contact your sales outlet or our Hotline/Service Desk. |

Battery indicator does not illuminate

| Cause | Fault elimination |
|---|--|
| The battery is not installed correctly. | <ul style="list-style-type: none"> ▶ Switch the notebook off. ▶ Check whether the battery is installed correctly in its compartment. ▶ Switch the notebook on. |
| The battery is fully discharged. | <ul style="list-style-type: none"> ▶ Charge the battery. <p>or</p> <ul style="list-style-type: none"> ▶ Install a charged battery. <p>or</p> <ul style="list-style-type: none"> ▶ Connect the notebook to a mains outlet using the mains adapter. |

When certain characters are entered on the keyboard, only numerals are written

| Cause | Troubleshooting |
|---|-------------------------------------|
| The virtual numeric keypad of your device is activated, see "Virtual numeric keypad", Page 45 | ▶ Press the <code>[Num]</code> key. |

The notebook's LCD screen remains blank

| Cause | Troubleshooting |
|---|--|
| Monitor is switched off. | ▶ Press a key or touch the touchpad. |
| External monitor or television set connected. | ▶ Press the key combination to switch the screen output, see "Key combinations", Page 46 . |

The LCD screen is difficult to read

| Cause | Troubleshooting |
|-----------------|--|
| Reflected glare | <ul style="list-style-type: none"> ▶ Turn the notebook or alter the tilt of the LCD screen. ▶ Increase the brightness of the 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 is set to dark. | ▶ Adjust the brightness of the monitor. |
| Screen output is set to the notebook's LCD screen | ▶ Press the key combination to switch the screen output, see " Key combinations ", Page 46 . |
| The external monitor's power cable or data cable is not connected properly. | <ul style="list-style-type: none"> ▶ 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 | Troubleshooting |
|---|---|
| The wrong external monitor has been selected or the wrong screen resolution has been set for the application program. | <ul style="list-style-type: none"> ▶ Terminate the application program in Windows by pressing [Alt] + [F4]. If the fault persists after closing the program, use the key combination for switching the screen output (see "Key combinations", Page 46) to switch over to the notebook's LCD screen. Change the following setting: ▶ Set the screen resolution: Set the screen resolution as described in the documentation for your operating system. ▶ Select monitor: Select monitor 1 or 2 as described in the documentation for your operating system. |

The cursor does not correctly follow the pen movements

| Cause | Fault elimination |
|----------------------------|--|
| Pen incorrectly calibrated | <ul style="list-style-type: none"> ▶ Calibrate the pen as shown under <i>Hardware and Sound / Tablet PC Settings</i> in the Control Panel, see "Setting the pen", Page 38 and "Calibrating the pen", Page 38. |

Pen input not working

| Cause | Troubleshooting |
|-----------------------------|--|
| Incorrect driver installed. | <ul style="list-style-type: none"> ▶ If your device is one which can only be operated using the pen, install the driver for the standard model. <p>or</p> <ul style="list-style-type: none"> ▶ If your device is one which can be operated using the pen and by finger, install the driver for the "Dual Digitizer" model. |

The notebook cannot be started

| Cause | Troubleshooting |
|---|--|
| The battery is not installed correctly. | <ul style="list-style-type: none"> ▶ Check whether the battery is installed correctly in its compartment. ▶ Switch the notebook on. |
| The battery is dead. | <ul style="list-style-type: none"> ▶ Charge the battery. <p>or</p> <ul style="list-style-type: none"> ▶ Insert a charged battery. <p>or</p> <ul style="list-style-type: none"> ▶ Connect the mains adapter to the notebook. |
| The power adapter is not connected correctly. | <ul style="list-style-type: none"> ▶ Check whether the mains adapter is connected correctly to the notebook. ▶ Switch the notebook on. |

The notebook stops working

| Cause | Troubleshooting |
|--|---|
| Notebook is in energy saving mode. | ▶ Leave energy saving mode. |
| An application programme has caused the malfunction. | ▶ Close the application program or restart the notebook (by restarting the operating system or switching the device off and back on again). |
| The battery is dead. | ▶ Charge the battery. or ▶ Insert a charged battery. or ▶ Connect the mains adapter to the notebook. |

The printer does not print

| Cause | Troubleshooting |
|---|---|
| The printer is not switched on. | ▶ Make sure that the printer is switched on and ready for operation (refer to the documentation supplied with the printer). |
| The printer is not connected correctly. | ▶ Check that the data cable connecting the notebook to the printer is properly connected. |
| The printer driver is faulty or not correctly installed, or it is the wrong printer driver. | ▶ Check that the data cable connecting the notebook to the printer is properly connected. ▶ Check whether the correct printer driver is loaded (refer to the printer documentation). |

The radio connection to a network does not work

| Cause | Troubleshooting |
|--|---|
| The wireless component is disabled. | ▶ Switch the radio component on (see "Switching the wireless components on and off", Page 62). |
| The wireless component is enabled. Despite this, the wireless connection to a network does not work. | ▶ Check whether the radio connection is switched on via the software. ▶ Further information on using the radio component can be found in the help files. |

The battery discharges too quickly

| Cause | Troubleshooting |
|--|---|
| The battery is either too hot or too cold. In this case the battery indicator flashes. | <ul style="list-style-type: none"> ▶ Bring the notebook up/down to a normal temperature again. ▶ 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. | <ul style="list-style-type: none"> ▶ Use the mains adapter as frequently as possible. |
| The maximum brightness may have been set for the screen. | <ul style="list-style-type: none"> ▶ Set the screen slightly darker with the key combination for <i>Decreasing the screen brightness</i> in order to reduce the amount of power being drawn. |

SmartCard reader is not recognised.

| Cause | Troubleshooting |
|---------------------------------|--|
| Chip card inserted incorrectly. | <ul style="list-style-type: none"> ▶ Make sure you have inserted your SmartCard into the SmartCard reader with the chip facing upwards/downwards (device-dependent). ▶ 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 | <ul style="list-style-type: none"> ▶ If you are working in a network, contact your system administrator, who can unlock your notebook with a Supervisor PIN. |

SmartCard lost

| Cause | Troubleshooting |
|----------------|--|
| SmartCard lost | <ul style="list-style-type: none"> ▶ If you are working in a network, contact your system administrator, who can boot up your notebook with a Supervisor SmartCard. |

User and/or supervisor SmartCard lost

| Cause | Troubleshooting |
|---------------------------------------|---|
| User and/or supervisor SmartCard lost | <ul style="list-style-type: none"> <li data-bbox="568 236 1019 357">▶ If you have lost your User SmartCard, you can continue working with the Supervisor SmartCard and initialise a new User SmartCard or deactivate the SystemLock function. <li data-bbox="568 363 1019 459">▶ If you have lost the Supervisor SmartCard, you can continue working, but you no longer have all your rights and can no longer initialise a Supervisor SmartCard. <li data-bbox="568 466 1019 603">▶ If you have lost both SmartCards, you can no longer 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 warnings

| Cause | Troubleshooting |
|--|--|
| <p data-bbox="82 754 555 780">A beep sounds every few seconds.</p> <p data-bbox="82 786 555 812">The battery is almost flat.</p> | <ul style="list-style-type: none"> <li data-bbox="568 754 1019 780">▶ 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.



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

| Error message/cause | Resolution |
|---|---|
| <p><i>CMOS battery bad</i></p> <p>If the error message occurs repeatedly, the buffer battery in the notebook is flat.</p> | <ul style="list-style-type: none"> ▶ Contact your sales outlet or our customer service centre. |
| <p><i>System CMOS checksum bad - default configuration used</i></p> <p>The system configuration information is incorrect.</p> | <ul style="list-style-type: none"> ▶ Switch the notebook off. ▶ Switch the notebook on. ▶ Press the function key [F2] to access the <i>BIOS Setup</i>. ▶ In the <i>BIOS Setup</i>, select the <i>Exit</i> menu. ▶ Select the entry <i>Load Setup Defaults</i>. ▶ Select <i>OK</i> and press the Enter key. |
| <p><i>Extended memory failed at offset: xxxx Failing Bits: zzzz zzzz</i></p> <p>When testing the extended memory an error has resulted at the address xxxx.</p> | <ul style="list-style-type: none"> ▶ Check whether the additional memory module has been inserted correctly. |
| <p><i>Failure Fixed Disk n</i></p> <p>The settings of the hard disk drive are incorrect.</p> | <ul style="list-style-type: none"> ▶ Start the <i>BIOS Setup (Primary Master submenu)</i> and select the correct settings. |
| <p><i>Keyboard controller error</i></p> | <ul style="list-style-type: none"> ▶ Switch the notebook off with the ON/OFF switch. ▶ Wait 3 - 5 seconds and switch on the notebook again. |
| <p><i>Keyboard error</i></p> | <p>If you are using an external keyboard:</p> <ul style="list-style-type: none"> ▶ Check the connection and reboot the notebook. |
| <p><i>nn Stuck key</i></p> | <ul style="list-style-type: none"> ▶ Make sure that no key is pressed. |
| <p><i>Operating system not found</i></p> | <ul style="list-style-type: none"> ▶ Check in the <i>BIOS Setup</i> whether your hard disk has been set correctly. ▶ Make sure that the operating system is installed on the corresponding drive. |
| <p><i>Press <F1> to resume, <F2> to SETUP</i></p> <p>This error message appears if an error occurs during the self-test before starting the operating system.</p> | <ul style="list-style-type: none"> ▶ Press the [F1] function key to start the operating system. ▶ Press the function key [F2] to access the <i>BIOS Setup</i>. |

| Error message/cause | Resolution |
|--|--|
| <i>Previous boot incomplete - Default configuration used</i> 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. |
| <i>Real time clock error</i> | ▶ Contact your sales outlet or our customer service centre. |
| <i>nnnnK Shadow RAM failed at offset: xxxx Failing Bits: zzzz</i> | ▶ Contact your sales outlet or our customer service centre. |
| <i>System battery is dead - Replace and run SETUP</i> | ▶ Contact your sales outlet or our customer service centre. |
| <i>System cache error - Cache disabled</i> | ▶ Contact your sales outlet or our customer service centre. |
| <i>System timer error</i> | ▶ Contact your sales outlet or our customer service centre. |

Restoring the contents of the hard disk under Windows

Restoring the system under Windows 8/8.1

If necessary, you can reset your system to the original state of the hard disk.

- ▶ Starting from the right side of the Windows start screen or the desktop, wipe over the screen with a finger to open the charm with the system commands, or press the Windows key + the **[C]** key on an external keyboard.
- ▶ Select *Change PC Settings*.
- ▶ Select *Update/Recovery*.
- ▶ Select *Recovery*.
- ▶ Choose between the following options according to your requirements: *Refresh your PC without affecting your files* or *Remove everything and reinstall Windows*.

Restore factory settings and reinstall the operating system with the Hard Disk Based Recovery (HDBR) under Windows 7

- ▶ Switch the device on.
- ▶ While the Fujitsu start screen is being shown, hold the **[F8]** button pressed until the *Advanced Boot Options* menu is displayed.
- ▶ Select *Repair your computer*.
- ▶ Select the desired keyboard input method via *Keyboard input method*, e.g. English.
- ▶ Select the correct user, enter the current user password and confirm with *OK*.
- ▶ Select *Fujitsu Recovery*.
- ▶ Follow the instructions to reset the system to the factory settings.

Technical data

Notebook

| General | |
|---|---|
| Processor | 5th generation Intel® Core™ with vPro™ technology (vPro optional, dependent on configuration) |
| Main memory (SO DIMM) | Maximum 12 Gbyte DDR3 4 GBytes permanently installed main memory (soldered) 1 slot for 2, 4 or 8 Gbyte modules |
| Electrical data | |
| Safety regulations complied with | CE |
| Protection class | III |
| Maximum power draw (when the notebook is switched on and the battery is being charged): | <ul style="list-style-type: none"> 65 W without port replicator 80 W with port replicator |
| LCD screen | |
| Size | 31.75 cm / 12.5" TFT HD |
| Resolution | 1366 x 768 (HD), 16 mio. colors |
| Pixel class | II |
| Brightness control | 11 levels |
| Technology | Wide-View High-Bright HD Display with LED Background Lighting |
| Digitizer and glass panel | <ul style="list-style-type: none"> Dual Digitizer Matt touchscreen Toughened glass |
| WebCam | Full-HD camera (1080 p), with status indicator |
| Graphics card | |
| Chip | Intel® HD Graphics 5500 |
| Maximum resolution on external display: | VGA: 1920 x 1200 subpixels, 16 million colors HDMI: 4096 x 2160@24Hz, 3840 x 2160@30Hz on port replicator: <ul style="list-style-type: none"> VGA: 1920 x 1200 subpixels DVI: 1920 x 1200 subpixels DisplayPort: 2560 x 1600 subpixels |
| Dimensions | |
| Width x depth x height | 316 mm x 233 mm x 25.4 - 31.3mm / 12.43 inches x 14.76 inches x 1 - 1.23 inches with rubber feet |
| Weight depending on configuration | from 1.81 kg / 3.99 lbs |

Technical data

| Input devices | |
|-------------------------------------|---|
| Keyboard | 85 buttons, splash-protected |
| Touchpad | 2 keys |
| Tablet buttons | 1 Windows button, volume + button, volume – button |
| Pen | 1 freely programmable rocker button / eraser |
| Slots | |
| Memory card slot | 1 x SD Card |
| SIM card slot | 1 x |
| SmartCard reader (device-dependent) | 1 x |
| Ports | |
| VGA monitor port | 15-pin socket |
| HDMI port | 1 x |
| LAN port | Socket, RJ45 |
| Microphone port/Line In | 3.5 mm stereo mini jack |
| Headphones port/Line Out | 3.5 mm stereo mini jack |
| Docking port | 100-pin socket |
| USB (Universal Serial Bus) | Total: 3 x USB (1 x USB 3.0 with charging function (Anytime USB charge), 2 x USB 3.0) |
| Security Lock | 1 x |
| Ambient conditions | |
| Environment class DIN IEC 721 | 7K1 |
| Mechanism class DIN IEC 721 | 7M2 |
| Operating temperature | 5°C 35°C / 41°F 95°F |
| Transport temperature (2K2) | –15°C 60°C / 5°F 140°F |

Port Replicator (optional)

| Electrical data | |
|----------------------------------|----------------------------------|
| Safety regulations complied with | CE |
| Protection class | III |
| Ports | |
| VGA monitor port | 15-pin socket |
| DVI-D monitor port | 25-pin socket |
| DisplayPort | 2 x |
| LAN port | RJ45 |
| USB (Universal Serial Bus) | 4 x USB 3.0 |
| eSATA port | 1 x |
| Audio | Headphone and microphone port |
| Docking port | 100-pin |
| Security Lock | 1 x |
| Ambient conditions | |
| Environment class DIN IEC 721 | 7K1 |
| Mechanism class DIN IEC 721 | 7M2 |
| Operating temperature | 5°C 35°C / 41°F 95°F |
| Transport temperature | -15°C 60°C / 5°F 140°F |

Rechargeable battery



You will find information on the batteries used in your device on the Internet at ["http://www.fujitsu.com/fts/support/"](http://www.fujitsu.com/fts/support/).

In addition to the main battery, you can order an optional battery which is inserted in the module slot. All rechargeable batteries are 6-cell batteries.

| | Main battery | Optional battery (to be inserted in the module bay) |
|----------------|---------------------|--|
| Rated voltage | 11.25 V | 10.8 V |
| Rated capacity | 72 Wh | 28 Wh |
| Nominal power | 6400 mAh | 2600 mAh |



The operating time depends on the device configuration, the active applications and the energy-saving settings.

Mains adapter for use with the notebook and port replicator



The following technical data applies to the mains adapter supplied with the notebook and to the port replicator which you can order optionally.

| Primary | |
|--------------------|----------------------------|
| Rated voltage | 100 V to 240 V (automatic) |
| Rated frequency | 50 Hz to 60 Hz (automatic) |
| Max. rated current | 0.7 A to 1.2 A |
| Secondary | |
| Nominal power | 80 W |
| Rated voltage | 19 V |
| Max. rated current | 4.22 A |



An additional mains adapter or power cable can be ordered at any time.

Manufacturer's notes

Disposal and recycling

You can find information on this subject on your notebook or on our website (["http://www.fujitsu.com/fts/about/fts/environment-care/"](http://www.fujitsu.com/fts/about/fts/environment-care/)).

Declarations of Conformity

The "Declarations of Conformity" for the device can be found on the Internet at: ["http://globasp.ts.fujitsu.com/sites/certificates/default.aspx"](http://globasp.ts.fujitsu.com/sites/certificates/default.aspx).

Fujitsu Technology Solutions hereby declares that your device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

CE marking

CE marking for devices with radio component

The shipped version of this device complies with the requirements of Directive 2009/125/EC "Ecodesign directive", Directive 2011/65/EU "RoHS Directive" and R&TTE directive 199/5/EC of the European Parliament and Commission of 9th March 1999 governing Radio and Telecommunications Equipment and mutual recognition of conformity.

CE nnnn (!) ; nnnn: For digits and exclamation mark (!), see label on the product.

You can find more information and declarations of conformity on the Internet at: ["http://globasp.ts.fujitsu.com/sites/certificates"](http://globasp.ts.fujitsu.com/sites/certificates).

This equipment can be used in the following countries:

| | | | |
|----------------|-----------------|-----------|------------|
| Belgium | Bulgaria | Denmark | Germany |
| Estonia | Finland | France | Greece |
| UK | Ireland | Iceland | Italy |
| Latvia | Liechtenstein | Lithuania | Luxembourg |
| Malta | The Netherlands | Norway | Austria |
| Poland | Portugal | Romania | Sweden |
| Switzerland | Slovakia | Slovenia | Spain |
| Czech Republic | Hungary | Cyprus | Croatia |
| Turkey | | | |

Contact the corresponding government office in 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.

Other certification markings

Any other certification markings are listed in the "Manual Appendix - Additional Certifications" supplement.

If such markings are available, you can find the supplement on the Internet at ["http://support.ts.fujitsu.com/Manuals/"](http://support.ts.fujitsu.com/Manuals/) with the Operating Manual for your device.

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 in the US trading area carrying this device, 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.

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 tether 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 dialing 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 semi-public 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 Règlement sur le matériel 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 authorised 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.

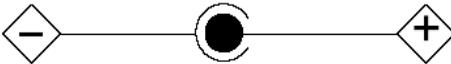


AVERTISSEMENT:

Pour assurer la sécurité, les utilisateurs doivent vérifier que la prise de terre du service d'électricité, les lignes téléphoniques 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 tether.

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 authorised by Fujitsu Technology Solutions may invalidate the user's right to operate this equipment.

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