

User's Manual

The attachment is the user's manual for the specific Lenovo host PC device, ThinkPad X100e/Mini 10 Series.

It consists of the following three sections.

1. The regulatory notice concerning the FCC Part 2 /15B /22H /24E and IC RSS-102/132 /133, ICES-003 for the applying WWAN transmitter device (FCC ID: **J9CGOBI2000-L**, IC: **2723A-GOBI2000**).
2. Reference only:
The regulatory notice concerning the FCC Part 2 /15B /15C and IC RSS-102/210, ICES-003 for WLAN and Bluetooth transmitter devices incorporated in the host PC.
3. Screen copies of electronic user's guidance referred to in the above regulatory notices, which are displayed on the LCD screen of the host PC device.

§1. Regulatory notice for the applying WWAN transmitter device

ThinkPad Regulatory Notice for the Wireless WAN Adapter

Read first — regulatory information

Read this document before using your computer. Be sure to also read *ThinkPad® Regulatory Notice*. This computer complies with the radio frequency and safety standards of any country or region in which it has been approved for wireless use. Install and use your computer according to the following instructions.

The latest Regulatory Notice has been uploaded on the Web site. To refer to it, go to <http://www.lenovo.com/think/support>, click **Troubleshooting**, and then click **User's guides and manuals**.

Note: You cannot use the wireless WAN adapter and a wireless LAN/WiMAX adapter simultaneously. If one of the adapters has established the connection to the network, the other will be disconnected automatically. To confirm the status of the network connection, check the power status indicators of your computer. For more information about the power status indicators, see "Power-status indicators" in *Access Help*.

Veillez lire le présent document avant d'utiliser votre ordinateur. Veillez à lire également la consigne réglementaire *ThinkPad Regulatory Notice*. Cet ordinateur est conforme aux normes de fréquence radio et de sécurité de tous les pays ou régions dans lesquels son utilisation sans fil a été homologuée. Installez et utilisez l'ordinateur en respectant les instructions qui suivent.

La version la plus récente de la Notice relative à la réglementation a été chargée sur le site Web. Pour la consulter, accédez à <http://www.lenovo.com/think/support>, cliquez sur **Troubleshooting**, puis sur **User's guides and manuals**.

Remarque: Vous ne pouvez pas utiliser simultanément la carte de réseau étendu sans fil et la carte de réseau local sans fil. Si l'une de ces cartes a établi la connexion avec le réseau, l'autre carte sera automatiquement déconnectée. Pour confirmer l'état de la connexion réseau, contrôlez les voyants d'état d'alimentation. Pour plus d'informations, reportez-vous à la section "Voyants d'état de l'alimentation" dans *Access Help*.

USA — Federal Communications Commission (FCC)

If your computer integrates the wireless WAN adapter (Model: Gobi2000), you may connect it to the radiocommunication Public Network in the USA.

I. FCC ID of the wireless adapter

PCI Express Mini Card:

- FCC ID: J9CGOBI2000-L (Model: Gobi2000)

There is no FCC ID for the adapter shown on the enclosure of your computer. Instead you will find an indicator pointing to the location of the FCC ID on the bottom of your computer. For the location of the FCC ID indicator, see “Location of the FCC ID and IC Certification number label” in *Access Help*. The FCC ID is affixed on the approved adapter installed in the PCI Express Mini Card slot, and the FCC ID is visible prior to installation. For the location of the slot, see “PCI Express Mini Card slot for wireless WAN” in *Access Help*.

II. Installation of the approved wireless adapter

If no integrated PCI Express Mini Card has been preinstalled in your computer, you can install one, provided by Lenovo® as an option. Plug the wireless option adapter into the PCI Express Mini Card slot. For the installation procedure, see “Installing and replacing the PCI Express Mini Card for wireless WAN connection” in *Access Help*.

Attention: The computers contain an authentication mechanism. If you install an unauthorized PCI Express Mini Card that is not approved for use in your computer, the computer will not start, but only displays an error message and emits audible beeps.

III. RF safety compliance

The radiated energy from the antenna connected to the wireless WAN adapter conforms to the FCC limit of the SAR (Specific Absorption Rate) requirement regarding 47 CFR Part 2 section 1093, when the computer was tested in either conventional notebook or tablet computer orientations.

The transmission antenna is located in the LCD cover. See “Location of the UltraConnect™ wireless antennas” in *Access Help*.

IV. Emergency Calls

The wireless WAN adapter embedded in the computer does not support voice calls, hence their use for essential communication is not possible, including emergency calls regarding the E911 rule.

V. Simultaneous use of RF transmitters

The wireless WAN adapter is approved for simultaneous use with one of the *Bluetooth* devices. For a list of those transmitters, refer to the latest *ThinkPad Regulatory Notice*, which has been uploaded on the Web site at: <http://www.lenovo.com/think/support>

Make sure of the following conditions when you use any other external RF option device:

1. When you use any other RF option device, you are requested to confirm that the device conforms to the RF Safety requirement and is approved to use for your computer.
2. You must follow the RF Safety instructions of the RF option device that are included in the user manual of the RF option device.
3. If the RF option device is prohibited to use in conjunction with another transmitters, you must turn off all other wireless features in your computer.

Electronic emission notices

Federal Communications Commission (FCC) Declaration of Conformity

- Model: Gobi2000

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 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 on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. 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 undesired operation.

Responsible Party:

Lenovo (United States) Incorporated
1009 Think Place-Building One
Morrisville, NC 27560
Telephone: 1-919-294-5900



Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

Canada — Industry Canada (IC)

IC Certification number

User installable wireless WAN adapter:

- IC: 2723A-GOBI2000 (Model: Gobi2000)

There is no certification number of Industry Canada for the PCI Express Mini Card shown on the enclosure of your computer. Instead you will find an indicator pointing to the location of the certification number on the bottom of your computer. For the location of the certification number indicator, see "Location of the FCC ID and IC certification number label" in *Access Help*. The IC certification number is affixed on the approved adapter installed in the PCI Express Mini Card slot, and the IC Certification number is visible prior to installation. For the location of the slot, see "PCI Express Mini Card slot for wireless WAN" in *Access Help*.

Attention: The computer contains an authentication mechanism. You can install or remove each wireless adapter by yourself. If you install an unauthorized wireless adapter that is not approved for use in the computer, the computer will not start, but only displays an error message and emits audible beeps.

Exposure of humans to RF fields (RSS-102)

The computers employ low gain integral antennas that do not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's Web site at <http://www.hc-sc.gc.ca/>

The radiated energy from the antenna connected to the wireless WAN adapter conforms to the IC limit of the SAR (Specific Absorption Rate) requirement regarding IC RSS-102, Issue 2 clause 4.1.

Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

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 the device.

Numéro d'homologation IC

Module sans fil installable par l'utilisateur:

- IC: 2723A-GOBI2000 (Model: Gobi2000)

Le boîtier de votre ordinateur ne comporte pas de numéro d'homologation IC (Industry Canada) pour la carte mini-PCI Express ; mais sous votre ordinateur, vous trouverez un indicateur pointant vers l'emplacement du numéro d'homologation IC. Pour connaître l'emplacement du numéro d'homologation, consultez la section "Emplacement de l'étiquette d'identification FCC et du label du numéro de certification" dans *Access Help*. Le numéro d'homologation IC figure sur la carte homologuée installée dans le logement pour carte mini-PCI Express et est visible avant l'installation. Pour savoir où se trouve cet emplacement, consultez la section "Logement de cartes mini-PCI Express pour réseau étendu sans fil" dans *Access Help*.

Attention: L'ordinateur renferme un mécanisme d'authentification. Vous pouvez installer ou retirer chaque carte sans fil vous-même. Si vous installez une carte sans fil qui n'est pas homologuée dans votre ordinateur, l'ordinateur ne démarrera pas mais affichera un message d'erreur et générera des bips sonores.

Exposition des êtres humains aux champs radioélectriques (RF) (CNR-102)

L'ordinateur utilise des antennes intégrales à faible gain qui n'émettent pas un champ électromagnétique supérieur aux normes imposées par le Ministère de la santé canadien pour la population. Consultez le Safety Code 6 sur le site Web du Ministère de la santé canadien à l'adresse <http://www.hc-sc.gc.ca/>

L'énergie émise par l'antenne reliée au adaptateur sans fil respecte la limite concernant le débit d'absorption spécifique (DAS) telle que définie par Industrie Canada dans la clause 4.1 du document CNR-102.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Le fonctionnement de ce type d'appareil est soumis aux deux conditions suivantes: (1) Cet appareil ne doit pas perturber les communications radio, et (2) cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®
ThinkPad®
UltraConnect

Other company, product, and service names may be trademarks or service marks of others.

Part Number: XXXXXXXX

Printed in China

For Barcode Position Only

§2. Reference only

Regulatory notice of WLAN and Bluetooth transmitter devices incorporated in the host PC device

ThinkPad Regulatory Notice

About this manual

This manual contains regulatory information for the following ThinkPad® product.

- ThinkPad X100e
- ThinkPad Mini 10

Read first — regulatory information

Read this document before using your computer. This computer complies with the radio frequency and safety standards of any country or region in which it has been approved for wireless use. Install and use your computer according to the following instructions.

If your computer contains a wireless WAN adapter, be sure to also read *ThinkPad Regulatory Notice for the Wireless WAN Adapter*, included with your computer.

The latest Regulatory Notice has been uploaded on the Web site. To refer to it, go to <http://www.lenovo.com/think/support>, click **Troubleshooting**, and then click **User's guides and manuals**.

Note: You cannot use the wireless WAN adapter and the wireless LAN adapter simultaneously. If one of the adapters has established the connection to the network, the other will be disconnected automatically. To confirm the status of the network connection, check the status indicators of your computer. For more information about the status indicators, see "Status indicators" in *Access Help*.

Veillez lire le présent document avant d'utiliser votre ordinateur. Cet ordinateur est conforme aux normes de fréquence radio et de sécurité de tous les pays ou régions dans lesquels son utilisation sans fil a été homologuée. Installez et utilisez l'ordinateur en respectant les instructions qui suivent.

Si votre ordinateur contient une carte de réseau étendu (WAN) sans fil, veuillez à lire également la consigne réglementaire *ThinkPad Regulatory Notice for the Wireless WAN Adapter*, fournie avec votre ordinateur.

La version la plus récente de la Notice relative à la réglementation a été chargée sur le site Web. Pour la consulter, accédez à <http://www.lenovo.com/think/support>, cliquez sur **Troubleshooting**, puis sur **User's guides and manuals**.

Remarque: Vous ne pouvez pas utiliser simultanément la carte de réseau étendu sans fil et la carte de réseau local sans fil. Si l'une de ces cartes a établi la connexion avec le réseau, l'autre carte sera automatiquement déconnectée. Pour confirmer l'état de la connexion réseau, contrôlez les voyants d'état. Pour plus d'informations, reportez-vous à la section "Voyants d'état" dans *Access Help*.

USA — Federal Communications Commission (FCC)

I. Approved wireless devices

This section presents the FCC ID and model number of each wireless device.

i) User installable wireless LAN adapter

- FCC ID: TX2-RTL8191SE-L (Model: RTL8191SE)

Note: PCI Express Mini Cards for a wireless LAN marketed in the USA and Canada do not support or function in the extended channels (12ch, 13ch).

ii) Preinstalled integrated *Bluetooth* device

- FCC ID: QDS-BRCM1046 (Model: BCM92070MD_LEN0)

II. User installable wireless LAN adapter

i) Use of the wireless LAN adapter

If no integrated PCI Express Mini Card has been preinstalled in your computer, you can install one, provided by Lenovo® as an option. Plug the wireless option adapter into the PCI Express Mini Card slot. For the installation procedure, see “Installing and replacing the PCI Express Mini Card for wireless LAN/WiMAX connection” in *Access Help*.

Attention: The computer contains an authentication mechanism. If you install an unauthorized PCI Express Mini Card that is not approved for use in your computer, the computer will not start, but only displays an error message and emits audible beeps.

ii) FCC ID location

There is no FCC ID for the PCI Express Mini Card shown on the enclosure of your computer. Instead you will find an indicator pointing to the location of the FCC ID on the bottom of your computer. For the location of the FCC ID indicator, see “Location of the FCC ID and IC Certification number label” in *Access Help*. The FCC ID is affixed on the approved adapter installed in the PCI Express Mini Card slot, and the FCC ID is visible prior to installation. For the location of the slot, see “PCI Express Mini Card slot for wireless LAN/WiMAX” in *Access Help*.

iii) FCC RF Exposure compliance

The radiated energy from the antenna(s) connected to the PCI Express Mini Card conforms to the FCC limit of the SAR (Specific Absorption Rate) requirement regarding 47 CFR Part 2 section 1093, when the computer was tested in the conventional orientation.

The transmission antenna for the PCI Express Mini Card are located in the LCD cover. See “Location of the UltraConnect™ wireless antennas” in *Access Help*.

iv) Radio Frequency interference requirements

The wireless LAN transmitter device has been tested and found to comply with the limits for a Class B digital device pursuant to FCC Part 15 Subpart B. Refer to “Electronic emission notices” on page 9.

III. Preinstalled integrated *Bluetooth* device

i) Use of the *Bluetooth* device

The *Bluetooth* device is preinstalled by Lenovo, and any other device is not approved for use in your computer. If the device requires replacement via the proper steps shown in “Getting help and service” of the *Service and Troubleshooting Guide*, shipped with your computer, Lenovo will send you a Customer Replaceable Unit (CRU).

ii) FCC ID location

If your computer uses a *Bluetooth* device, the FCC ID for the *Bluetooth* device is affixed on the label at the bottom of your computer.

iii) FCC RF safety requirement

The radiated output power of the *Bluetooth* device is far below the FCC radio frequency exposure limits. Therefore, a 20 cm of separation between the *Bluetooth* antenna and human body is not required.

The *Bluetooth* device is located under the palm rest. See “About your computer” in *Access Help*.

iv) Radio Frequency interference requirements

The *Bluetooth* device has been tested and found to comply with the limits for both a Class B digital device regarding FCC Part 15 Subpart B and an intentional radiator regarding FCC Part 15 Subpart C; then it underwent the certification processes for both rules. Thus the FCC ID of the *Bluetooth* device includes both certifications of Part 15 Subpart B and C.

IV. Simultaneous use of RF transmitters

Your computer is approved for simultaneous use of the approved wireless LAN adapter and the approved *Bluetooth* device. For a list of those transmitters, refer to “I. Approved wireless devices” on page 3.

Make sure of the following conditions when you use any other external RF option device:

1. When you use any other RF option device, you are requested to confirm that the device conforms to the RF Safety requirement and is approved to use for your computer.
2. You must follow the RF Safety instructions of the RF option device that are included in the user manual of the RF option device.
3. If the RF option device is prohibited to use in conjunction with another transmitters, you must turn off all other wireless features in your computer.

IC Certification number

I. Approved wireless devices

This section presents the IC Certification and model number of each wireless device.

i) User installable wireless LAN adapter

- IC: 6317A-RTL8191SE (Model: RTL8191SE)

Note: PCI Express Mini Cards for a wireless LAN marketed in the USA and Canada do not support or function in the extended channels (12ch, 13ch).

ii) Preinstalled integrated *Bluetooth* device

- IC: 4324A-BRCM1046 (Model: BCM92070MD_LEN0)

II. User installable wireless LAN adapter

There is no certification number of Industry Canada for the PCI Express Mini Card shown on the enclosure of your computer. Instead you will find an indicator pointing to the location of the IC Certification number on the bottom of your computer. For the location of the IC Certification number indicator, see “Location of the FCC ID and IC Certification number label” in *Access Help*. The IC certification number is affixed on the approved adapter installed in the PCI Express Mini Card slot, and the IC Certification number is visible prior to installation. For the location of the slot, see “PCI Express Mini Card slot for wireless LAN/WiMAX” in *Access Help*.

Attention: The computer contains an authentication mechanism. You can install or remove each wireless adapter by yourself. If you install an unauthorized wireless adapter that is not approved for use in the computer, the computer will not start, but only displays an error message and emits audible beeps.

III. Preinstalled integrated *Bluetooth* device

If your computer uses a *Bluetooth* device, the IC Certification number for the *Bluetooth* device is affixed on the label at the bottom of your computer. The *Bluetooth* device is preinstalled by Lenovo, and any other device is not approved for use in your computer. If the device requires replacement via the proper steps shown in “Getting help and service” of the *Service and Troubleshooting Guide*, shipped with your computer, Lenovo will send you a Customer Replaceable Unit (CRU).

VI. Low power license-exempt radiocommunication devices (RSS-210)

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 the device.

The transmitter devices have been designed to operate with the antennas integrated in the computer, and having a maximum gain of within 3 dBi.

V. Exposure of humans to RF fields (RSS-102)

The computers employ low gain integral antennas that do not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's Web site at <http://www.hc-sc.gc.ca/>

The radiated energy from the antennas connected to the wireless adapters conforms to the IC limit of the RF exposure requirement regarding IC RSS-102, Issue 2 clause 4.1.

Numéro d'homologation IC

I. Périphériques sans fil homologués

Cette section présente le numéro d'homologation IC et le numéro de modèle de chaque périphérique sans fil.

i) Module sans fil installable par l'utilisateur

- IC: 6317A-RTL8191SE (Model: RTL8191SE)

Remarque: Les cartes de réseau local sans fil Express mini-PCI commercialisées aux Etats-Unis et au Canada ne prennent pas en charge les canaux étendus (12ch, 13ch) et ne fonctionnent donc pas sur de tels canaux.

ii) Émetteur *Bluetooth* intégré préinstallé

- IC: 4324A-BRCM1046 (Model: BCM92070MD_LEN0)

II. Module sans fil installable par l'utilisateur

Le boîtier de votre ordinateur ne comporte pas de numéro d'homologation IC (Industry Canada) pour la carte mini-PCI Express; mais sous votre ordinateur, vous trouverez un indicateur pointant vers l'emplacement du numéro d'homologation IC. Pour connaître l'emplacement du numéro d'homologation IC, consultez la section correspondante dans *Access Help*. Le numéro d'homologation IC figure sur la carte homologuée installée dans le logement pour carte mini-PCI Express et est visible avant l'installation. Pour savoir où se trouve cet emplacement, consultez la section "Logement pour cartes mini-PCI Express pour réseau local/WiMAX" dans *Access Help*.

Attention: L'ordinateur contient un mécanisme d'authentification. Vous pouvez installer ou désinstaller tout dispositif sans fil. Si vous installez une carte sans fil qui n'est pas homologuée dans votre ordinateur, l'ordinateur ne démarrera pas mais affichera un message d'erreur et générera des bips sonores.

III. Émetteur *Bluetooth* intégré préinstallé

Si votre ordinateur utilise un émetteur *Bluetooth*, le numéro d'homologation IC de cet émetteur *Bluetooth* figure sur une étiquette collée sous l'ordinateur. L'émetteur *Bluetooth* est préinstallé par Lenovo et ne peut pas être retiré par l'utilisateur. S'il doit être remplacé pendant la période de garantie, l'opération doit être effectuée par un prestataire de services agréé par Lenovo.

IV. Remarque relative aux appareils de communication radio de faible puissance sans licence (CNR-210)

Le fonctionnement de ce type d'appareil est soumis aux deux conditions suivantes:

1. Cet appareil ne doit pas perturber les communications radio, et
2. cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Les périphériques d'émission sont conçus pour fonctionner avec des antennes intégrées à l'ordinateur et ayant un gain maximal de moins de 3 dBi.

V. Exposition des êtres humains aux champs radioélectriques (RF) (CNR-102)

L'ordinateur utilise des antennes intégrales à faible gain qui n'émettent pas un champ électromagnétique supérieur aux normes imposées par le Ministère de la santé canadien pour la population. Consultez le Safety Code 6 sur le site Web du Ministère de la santé canadien à l'adresse <http://www.hc-sc.gc.ca/>

L'énergie émise par les antennes reliées aux adaptateurs sans fil respecte la limite d'exposition aux radiofréquences telle que définie par Industrie Canada dans la clause 4.1 du document CNR-102.

Electronic emission notices

Federal Communications Commission (FCC) Declaration of Conformity

- Model: RTL8191SE

Note: The *Bluetooth* device (Model: BCM92070MD_LEN0) underwent certification process for the FCC Part 15 Subpart B compliance under the FCC ID number.

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 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 on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. 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 undesired operation.

Responsible Party:

Lenovo (United States) Incorporated
1009 Think Place-Building One
Morrisville, NC 27560
Telephone: 1-919-294-5900



Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®
ThinkPad®
UltraConnect

Other company, product, and service names may be trademarks or service marks of others.

Part Number: 63Y0635

§3. The screen copies of electronic user's guidance

About your computer



This section introduces you to the hardware features of your computer, and then gives you the basic information you'll need to start taking advantage of its functions.

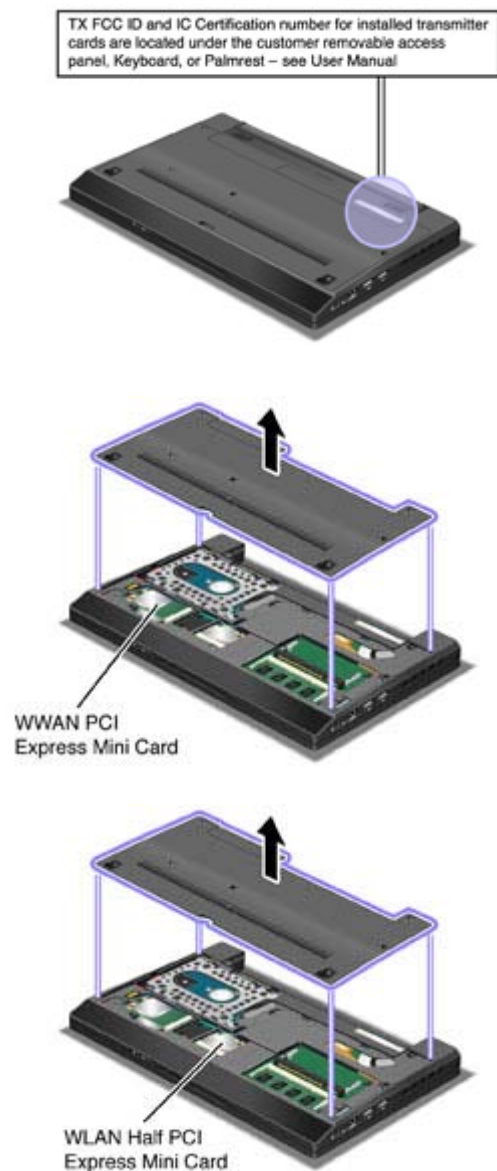
- ▶ [Front view](#)
- ▶ [Right-side view](#)
- ▶ [Left-side view](#)
- ▶ [Bottom view](#)
- ▶ [Rear view](#)
- ▶ [Features and specifications](#)





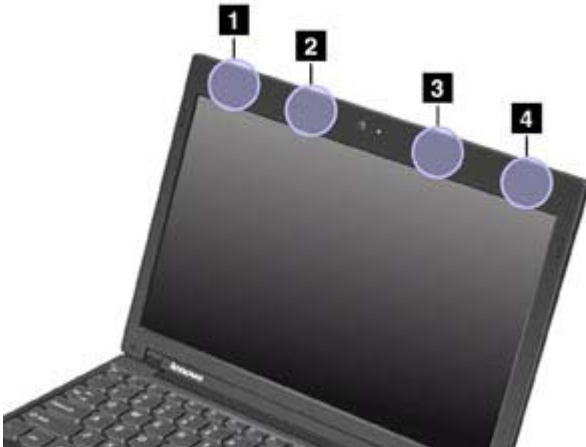
Location: FCC ID and IC Certification number label

There is no FCC ID or IC Certification number for the PCI Express Mini Card shown on the enclosure of your computer. The FCC ID and IC Certification number label is affixed on the card installed in the PCI Express Mini Card slot of your computer.



If no integrated wireless PCI Express Mini Card has been preinstalled in your computer, you can install one. To do this, follow the procedure in [Installing and replacing the PCI Express Mini Card for wireless LAN connection](#) or [Installing and replacing the PCI Express Mini Card for wireless WAN connection](#).

Location of the UltraConnect wireless antennas



1. Wireless LAN antenna (Auxiliary)

The auxiliary antenna connected to the wireless LAN is located at the top left corner of the computer display.

2. Wireless WAN antenna (Auxiliary)

If your computer comes with a wireless WAN feature, its transmitter antenna is located at the top left side of the computer display, near the center.

3. Wireless WAN antenna (Main)

The main antenna connected to the wireless WAN feature is located at the top right side of the computer display, near the center.

4. Wireless LAN antenna (Main)

The main antenna connected to the wireless LAN feature is located at the top right corner of the computer display.

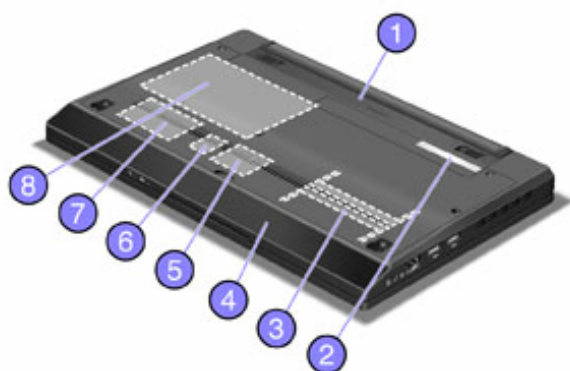


7 Bluetooth antenna

Some models have the [Integrated Bluetooth features](#).

See Also

[Back to top](#)



5 PCI Express Mini Card slot for wireless LAN

Your computer might include a PCI Express Mini Card in the PCI Express Mini Card slot which enables wireless LAN communications.

[See Also](#)

6 SIM card slot

If your computer has a wireless WAN feature, it may require a SIM (Subscriber Identification Module) card to establish a wireless WAN (Wide Area Network) connections. Depending on the country of delivery, the SIM card may be already installed in the SIM card slot.

[See Also](#)

7 PCI Express Mini Card slot for wireless WAN

Your computer might include a PCI Express Mini Card in the PCI Express Mini Card slot which enables wireless WAN communications.

[See Also](#)





Before you start, print these instructions.

Some models have a [PCI Express Mini Card slot](#) for connection to a wireless WAN. To replace the PCI Express Mini Card with a new one, read the following prerequisites, and then the instructions.

Prerequisites for the procedure

When installing or replacing the card, be sure to follow the precautions.

 **Danger:** During electrical storms, do not connect the cable to or disconnect it from the the telephone outlet on the wall.

 **Danger:** Electric current from power, telephone, and communication cables is hazardous. To avoid shock hazard, disconnect the cables before opening the cover of this slot.

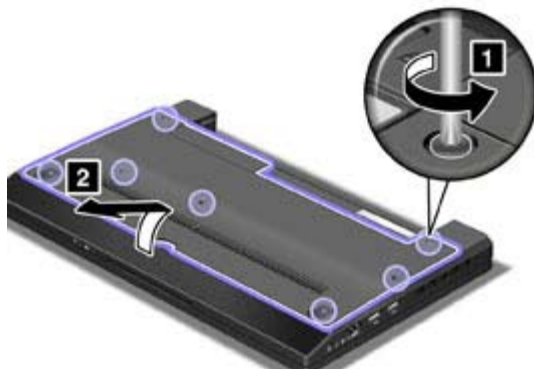
 **Attention:** Before you start installing a PCI Express Mini Card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. The static electricity could damage the card.

Replacing the card

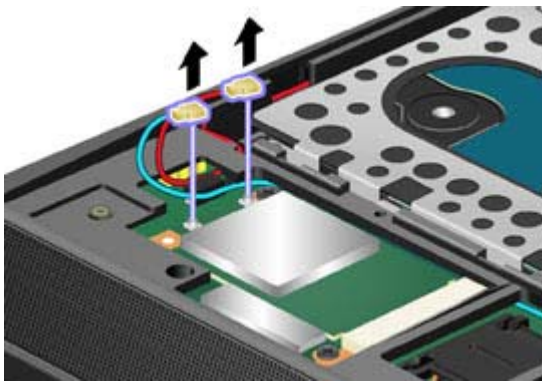
To replace the PCI Express Mini Card, do as follows:

 **Note:** Your computer may look slightly different from what these illustrations show.

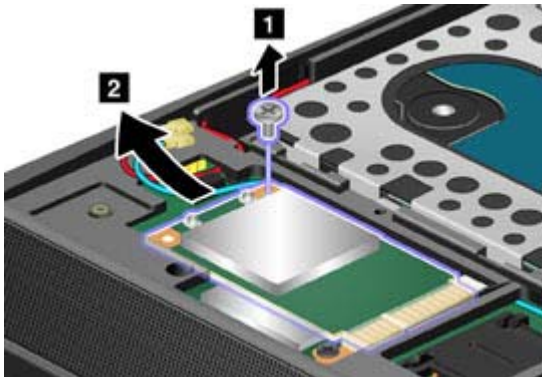
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedure.
2. Close the computer display, and turn the computer over.
3. [Remove the battery](#).
4. Loosen the screws on the slot cover **(1)**, then remove the cover **(2)**.



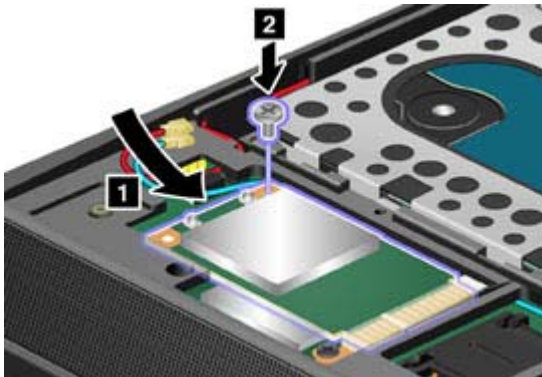
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the antenna cables from the card. If no such tool is included, pick up the antenna cables with your fingers and gently unplug them.



6. Remove the screws (1). The card pops up (2). Remove the card.

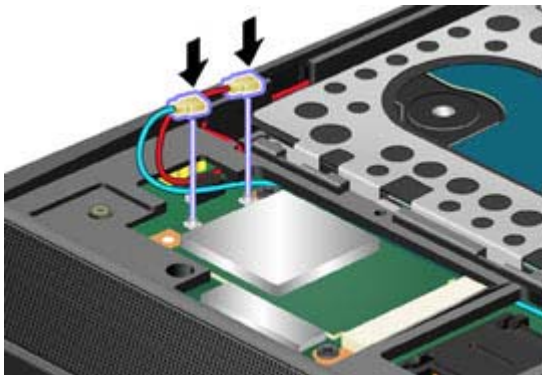


7. Align the contact edge of the new PCI Express Mini Card with the corresponding socket (1). Pivot the card until you can snap it into place. Secure the card with the two screws (2).

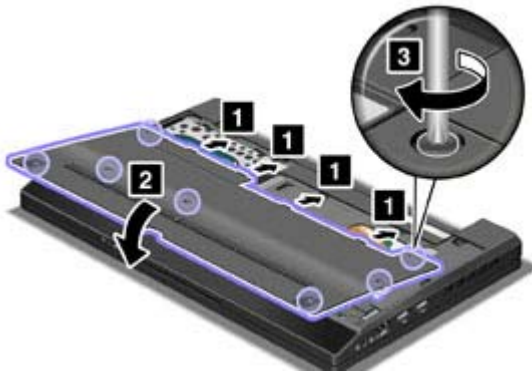


8. Connect the antenna cables to the new PCI Express Mini Card as shown in the drawing.

*** Note:** Be sure to attach the red cable to the connector marked MAIN, and the blue cable to the connector marked AUX.



9. Put the slot cover back in place (1), close the cover (2), and then tighten the screws (3).



10. [Reinstall the battery.](#)
11. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

Installing and replacing a PCI Express Mini Card for wireless LAN connection



Before you start, print these instructions.

Your computer has a [PCI Express Mini Card slot](#) for connection to a wireless LAN. To replace the PCI Express Mini Card with a new one, read the following prerequisites, and then the instructions.

Prerequisites for the procedure

Danger: During electrical storms, do not connect the cable to or disconnect it from the telephone outlet on the wall.

Danger: Electric current from power, telephone, and communication cables is hazardous. To avoid shock hazard, disconnect the cables before opening the cover of this slot.

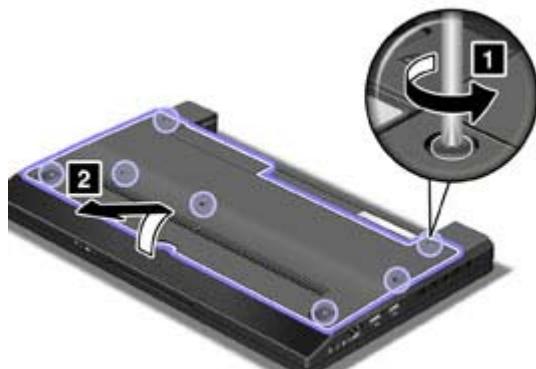
Attention: Before you start installing a PCI Express Mini Card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. The static electricity could damage the card.

Replacing the card

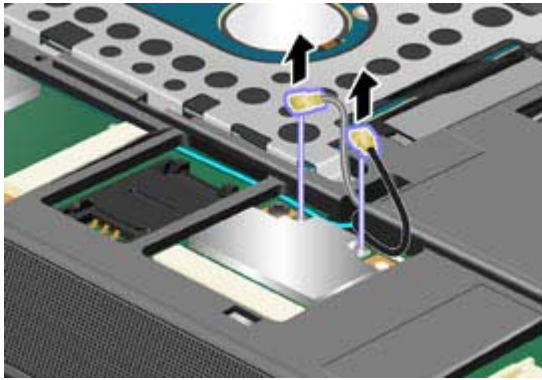
To replace the card, do as follows:

Note: Your computer may look slightly different from what these illustrations show.

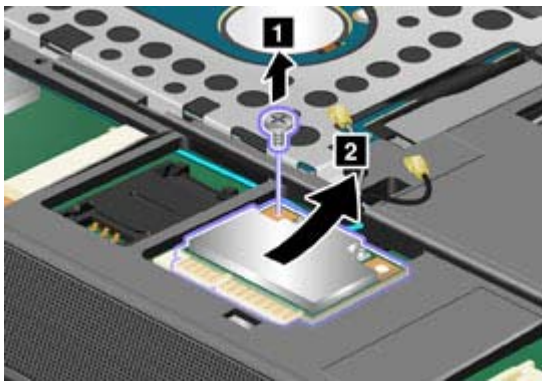
1. Turn off the computer; then disconnect the ac adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedure.
2. Close the computer display, and turn the computer over.
3. [Remove the battery](#).
4. Loosen the screws on the slot cover **(1)**, then remove the cover **(2)**.



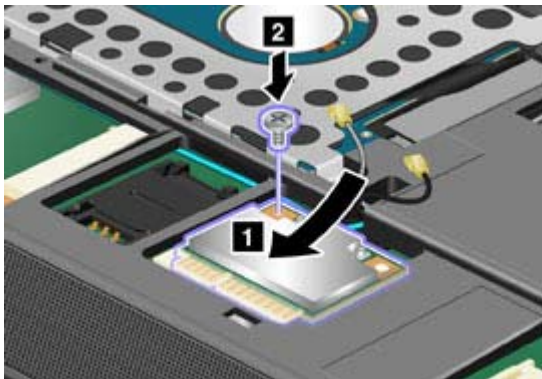
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card. If no such tool is included, disconnect the cables by picking up the connectors with your fingers and gently unplugging them.



6. Remove the screw (1). The card pops up (2). Remove the card.

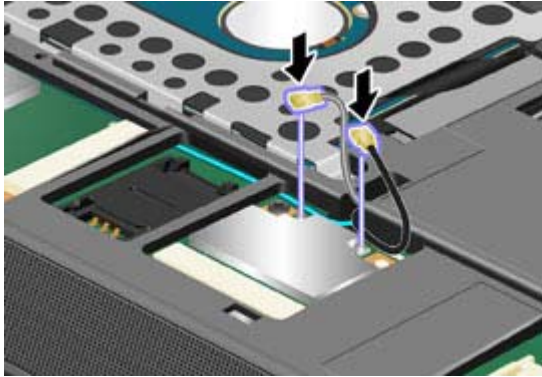


7. Align the contact edge of the new card with the corresponding socket contact of the computer. Pivot the card until you can snap it into place (1), and secure the card with the screw (2).

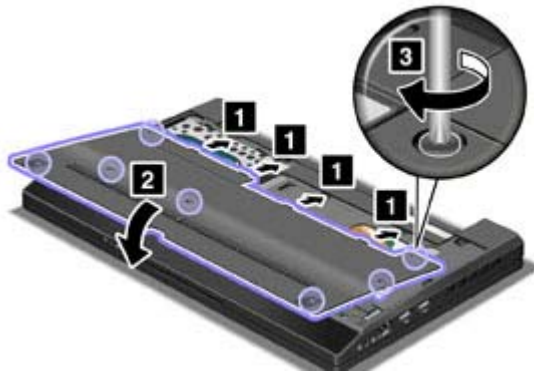


8. Connect the cables to the new PCI Express Mini Card.

*** Note:** Be sure to attach the gray cable to the connector marked MAIN on the card and the black cable to the connector marked AUX.



- Put the slot cover back in place (1), close the cover (2), and then tighten the screws (3).



- [Reinstall the battery.](#)
- Turn the computer over again. Connect the ac adapter and cables to the computer; then turn it on.



Wireless connections

Wireless connection is the transfer of data without the use of cables by means of radio waves only.

Depending on the frequency used for data transmission, the area covered, or the type of the device used for data transfer, the following categories of wireless networks may be available to you:

Wireless LAN

A wireless local area network covers a relatively small geographic area, such as an office building or a house. Devices based on the 802.11 standards can connect to this network.

Wireless WAN

A wireless wide area network covers a broader geographic area. Cellular networks are used for data transmission, and access is provided by a wireless service carrier.

Bluetooth

One of a number of technologies used to create a wireless personal area network. *Bluetooth* can connect devices a short distance from one another, and is commonly used for connecting peripheral devices to a computer, transferring data between hand-held devices and PC, or remotely controlling and communicating with devices such as mobile phones.

- ▶ [Using wireless LAN connections](#)
- ▶ [Using wireless WAN connections](#)
- ▶ [Using *Bluetooth* feature](#)
- ▶ [Checking wireless connection status](#)
- ▶ [Enabling or disabling the wireless feature](#)



Using wireless LAN connections

Your computer comes with a built-in wireless networking card and a configuration utility to help you make wireless connections and monitor the status of your connection, so that you can stay connected to your network while you are in the office, in a meeting room, or at home, with no need for a wired connection.

Attention:

- If you carry your ThinkPad® Notebook with the wireless LAN feature into an airplane, check the services with the airline before boarding the airplane.
- If there are restrictions on the use of computers on an airplane with the wireless feature, you need to disable it before boarding. To disable it, refer to the instructions in [Enabling or disabling the wireless feature](#).

 **Note:** You can purchase a wireless networking card as an option. For more information, refer to [Finding ThinkPad options](#).

Tips for using the wireless LAN feature

- Place your computer so that there are as few obstacles as possible between the wireless LAN access point and the computer.
- For the best connection of the wireless LAN feature, open your computer display to an angle of slightly more than 90 degrees.
- If you use the wireless feature (the 802.11 standard) of your computer simultaneously with a *Bluetooth* option, data transmission speed can be delayed and the performance of the wireless feature can be degraded.

▶ [Wireless networking setup](#)

Wireless networking setup



To use the built-in wireless networking card (the 802.11 standard) to communicate, start [Access Connections™](#).

For Windows® 7: To start the Access Connections wizard, see [Getting started with Windows 7](#), and follow the instructions on the screen.

For Windows XP: To start the Access Connections wizard, click **Start --> All Programs --> ThinkVantage --> Access Connections**, and follow the instructions on the screen.

*** Note:** Before you start setting up wireless networking connections by using Access Connections, obtain a Network Name (SSID) and your encryption information from your network administrator.


Access Connections, a connectivity assistant program, can easily enable one network adapter and disable the other adapters on demand. After setting up your wireless networking connection, you can use the program to quickly switch the network settings.



Using wireless WAN connections

Wireless Wide Area Network (wireless WAN) enables you to establish wireless connections over remote public or private networks. These connections can be maintained over a large geographical area, such as a city or an entire country, by use of multiple antenna sites or satellite systems maintained by wireless service providers.

Some ThinkPad® Notebooks come with a built-in wireless WAN card integrating some wireless WAN technologies, such as 1xEV-DO, HSPA, 3G or GPRS. You can connect to the Internet or your company network with the built-in wireless WAN card and the configuration utility to make a wireless WAN connection and monitor its status.

 **Note:** Wireless WAN service is provided by authorized service providers in some countries.

To use the wireless WAN feature, start [Access Connections™](#).

For Windows® 7: To start the Access Connections wizard, see [Getting started with Windows 7](#), and follow the instructions on the screen.

For Windows XP: To start the Access Connections wizard, click **Start --> All Programs --> ThinkVantage --> Access Connections**, and follow the instructions on the screen.



Using *Bluetooth* feature

▼ [For Windows® 7](#)

▼ [For Windows XP](#)

For Windows 7:

If your computer is equipped with the Integrated *Bluetooth* features, you can enable or disable the features by pressing Fn+F5. If you press Fn+F5, a list of wireless features is displayed. You can enable or disable the *Bluetooth* features with a single click.


To configure a *Bluetooth* device or manage connection settings, you can use **Bluetooth Devices** in Control Panel.

1. Click **Start** --> **Control Panel**.
2. Click **Hardware and Sound**.
3. Click **Devices and Printers**.

To send data to a *Bluetooth*-enabled device, do as follows:

1. Right-click data that you want to send.
2. Select **Send To** --> **Bluetooth Devices**.

For details, refer to the Windows online help.

 **Note:** If you use the wireless feature (the 802.11 standard) of your computer simultaneously with a *Bluetooth* option, data transmission speed can be delayed and the performance of the wireless feature can be degraded.

For Windows XP:

If your computer is equipped with the Integrated *Bluetooth* features, you can enable or disable the features by pressing Fn+F5.

If you press Fn+F5, a list of wireless features is displayed. You can enable or disable the *Bluetooth* features with a single click.

In Windows XP, you can use either ThinkPad® *Bluetooth* with Enhanced Data Rate Software, or the Microsoft® *Bluetooth* software.

By default, ThinkPad *Bluetooth* with Enhanced Data Rate Software is installed on your computer.

▼ [Using *Bluetooth* for the first time on your computer](#)

▼ [Using the Microsoft *Bluetooth* software](#)

▼ [Using ThinkPad *Bluetooth* with Enhanced Data Rate Software](#)

▼ [Installing the Microsoft *Bluetooth* software in Windows XP](#)

▼ [Installing ThinkPad *Bluetooth* with Enhanced Data Rate Software in Windows XP](#)

Using *Bluetooth* for the first time on your computer

If this is the first time *Bluetooth* has been used on your computer, use either of the following procedures:

1. Double-click the **My *Bluetooth* Places** icon on the desktop, or the ***Bluetooth*** icon in the task bar. The Start Using *Bluetooth* window opens, and some virtual device drivers are installed automatically.
2. Wait until the installation of the drivers is complete.

OR

1. Right-click the **My *Bluetooth* Places** icon on the desktop, or the ***Bluetooth*** icon in the task bar.
2. Select **Start Using *Bluetooth***. The Start Using *Bluetooth* window opens, and some virtual device drivers are installed automatically.
3. Wait until the installation of the drivers is complete.

Some other virtual device drivers will be installed on demand when you use certain *Bluetooth* profiles for the first time.

Using the Microsoft *Bluetooth* software

If you are using Windows XP and want to use the Microsoft standard *Bluetooth* features, install the software by following the instructions in [Installing the Microsoft *Bluetooth* software in Windows XP](#).

For information about how to use the *Bluetooth* function, do as follows:

1. Press Fn+F5 to turn on *Bluetooth*.
2. Click **Start --> Control Panel**.
3. Click **Printers and Other Hardware**.
4. Click ***Bluetooth* Devices**.
5. Click the **Options** tab.
6. Click **Learn more about *Bluetooth* Settings**.

Using ThinkPad *Bluetooth* with Enhanced Data Rate Software

If ThinkPad *Bluetooth* with Enhanced Data Rate Software is installed on your computer, two icons are displayed on the screen:

- ▼ [My *Bluetooth* Places](#) on the desktop
- ▼ [Bluetooth Configuration](#) in the system tray of the taskbar

My *Bluetooth* Places

To use the *Bluetooth* features, do the following:

1. Double-click the **My *Bluetooth* Places** icon on the desktop.
2. Go to *Bluetooth* Tasks and double-click **View devices in range**. A list of the devices on which *Bluetooth* has been enabled appears.
3. Click the device to which you want access. A list of the services available on that device appears, as follows:
 - ***Bluetooth* keyboard and mouse (Human interface devices)**
 - **Printer (HCRP)**
 - **Audio gateway**
 - **Headset**
 - **PIM synchronization**
 - **Fax**
 - **File transfer**
 - **PIM item transfer**
 - **Dial-up networking**
 - **Network access**

- **Bluetooth Imaging**
- **Hands Free**
- **AV profile**

4. Click the service you want.

For more information, press the F1 key to open the online help for *Bluetooth*.

Bluetooth Configuration

To use the configuration features of *Bluetooth*, right-click the icon. A pop-up menu appears. Select **Bluetooth Setup Wizard** or **Advanced Configuration**.

The *Bluetooth* Setup Wizard has the following capabilities:

- Finding all *Bluetooth*-enabled devices that can provide services
- Finding a specific *Bluetooth*-enabled device that you want to use, and configuring the services on that device
- Configuring the *Bluetooth*-enabled services on your computer that are provided for remote devices
- Configuring the name and device type of your computer

The Advanced Configuration has the following functions:

- Configuring the name and device type of your computer
- Configuring your computer settings so that remote *Bluetooth*-enabled devices can find your computer
- Configuring your computer settings so that your computer can find remote *Bluetooth*-enabled devices
- Configuring, on your computer, the *Bluetooth*-enabled services provided for remote devices
- Configuring the services on remote *Bluetooth*-enabled devices
- Displaying information about *Bluetooth* hardware

For details, refer to the help for *Bluetooth*.

To see the help, double-click **My Bluetooth Places**, and click **Help** and then **Bluetooth help**.

Another way to start the help is to right-click **Bluetooth Configuration** in the system tray of the taskbar, and click **Advanced Configuration** and then **Help**.

Installing the Microsoft *Bluetooth* software in Windows XP

If you want to use the Microsoft *Bluetooth* software, do as follows:

First uninstall the ThinkPad *Bluetooth* with Enhanced Data Rate Software.

1. Turn *Bluetooth* power off.
2. Click **Start** --> **Control Panel**.
3. Click **Add/Remove Programs**.
4. Select **ThinkPad *Bluetooth* with Enhanced Data Rate Software**; then click **Change/Remove** to uninstall the software.
5. Follow the instructions on the screen.

Next install the Microsoft *Bluetooth* software, as follows:

1. Turn *Bluetooth* power on. Microsoft *Bluetooth* software is loaded automatically.
2. If the Found New Hardware Wizard window pops up, do the following:
 1. Select **No, not this time**, and then click **Next**.
 2. Select **Install from a list or specific location (Advanced)**; then click **Next**.
 3. Select **Search for the best driver in those locations**.
 4. Select **Include this location in the search**:, and type "C:\SWTOOLS\Drivers\MSBTooth," or specify the location in which you placed the extracted INF file. Then click **Next**.
3. Click **Finish**.

Installing ThinkPad *Bluetooth* with Enhanced Data Rate Software in Windows XP

If you are using the Microsoft *Bluetooth* software and want to use ThinkPad *Bluetooth* with Enhanced Data Rate Software instead, replace the Microsoft *Bluetooth* software with ThinkPad *Bluetooth* with Enhanced Data Rate Software as follows:

1. Press Fn+F5 to turn the *Bluetooth* power on.
2. Click **Start** --> **Run**.
3. Type "C:\SWTOOLS\Drivers\TPBTooth\Setup.exe" (or specify the full path to the setup.exe file you have downloaded from

<http://www.lenovo.com/think/support>) then click **OK**.


4. Click **Next**.
5. Select **I accept the terms in the license agreement**; then click **Next**.
6. Click **Next** to select the default destination folder.

If you need to change the destination folder, click **Change**, select or enter the name of the destination folder in the Change current destination folder window, and click **OK**.

7. Click **Install** to begin installation.
8. Click **OK** to accept the driver signature.
9. Click **Finish**.
10. Restart the computer if necessary.

If you did not turn the *Bluetooth* power on before installing ThinkPad *Bluetooth* with Enhanced Data Rate Software -- that is, if you skipped step 1 -- replace the *Bluetooth* driver, as follows:

1. Click **Start** --> **Control Panel**.
2. Click **Performance and Maintenance**; then click **System**.
3. Click the **Hardware** tab; then click **Device Manager**.
4. Double-click **Bluetooth Radios** to extract the *Bluetooth* Radios device tree.
5. Double-click the **ThinkPad Bluetooth with Enhanced Data Rate** icon to open the Properties window.
6. Click the **Driver** tab; then click **Update Driver**.
7. Click **No, not this time**, and then click **Next**.
8. Select **Install from a list or specific location (Advanced)**, and then click **Next**.
9. Select **Don't search. I will choose the driver to install**; then click **Next**.
10. Select the driver that has no "Digital Signed" icon; then click **Next**.
11. Click **Finish**.

 **Note:** If you use the wireless feature (the 802.11 standard) of your computer simultaneously with a *Bluetooth* option, data transmission speed can be delayed and the performance of the wireless feature can be degraded.



Checking wireless connection status

- ▼ [Access Connections™ Gauge \(Windows® 7\)](#)
- ▼ [Access Connection icon and wireless status icon](#)







Access Connections Gauge (Windows 7)

If your computer is running Windows 7, the Access Connections Gauge in the task bar displays the signal strength and status of your wireless connection.

 **Note:** To display Access Connections Gauge in the task bar, see the Help in Access Connections.



You can find more detailed information about the signal strength and status of your wireless connection by opening Access Connections or by right-clicking the Access Connections Gauge in the task bar and selecting **View Status of Wireless Connection**.

Access Connections Gauge states: wireless LAN

-  Power to the wireless radio is off or no signal.
-  Power to the wireless radio is on. The signal strength of the wireless connection is poor. To improve signal strength, move your system closer to the wireless access point.
-   Power to the wireless radio is on. The signal strength of the wireless connection is marginal.
-   Power to the wireless radio is on. The signal strength of the wireless connection is excellent.

 **Note:** For more information about Access Connections Gauge, see the Help in Access Connections.

Access Connections Gauge states: wireless WAN

-  No signal
-  Signal level 1

-  Signal level 3

Access Connections icon and wireless status icon




The Access Connections icon displays general connection status.

The wireless status icon displays the signal strength and status of your wireless connection.







You can find more detailed information about the signal strength and status of your wireless connection either by opening Access Connections or by double-clicking the Access Connections wireless status icon in the task bar.

*** Note:** If your computer is running Windows 7, to display the Access Connections icon and wireless status icon, click **Show hidden icons** in the task bar. To add it to the task bar permanently, click **Customize** and proceed to customize the settings. For more information about the icon, see the Help in Access Connections.

Access Connections icon states







-  No location profile is active or none exists.
-  Current location profile is disconnected.
-  Current location profile is connected.

Wireless status icon states: wireless LAN

-  Power to the wireless radio is off.
-  Power to the wireless radio is on. No association.
-  Power to the wireless radio is on. No signal.
-  Power to the wireless radio is on. The signal strength of the wireless connection is excellent.
-  Power to the wireless radio is on. The signal strength of the wireless connection is marginal.
-  Power to the wireless radio is on. The signal strength of the wireless connection is poor. To improve signal strength, move your system closer to the wireless access point.

 **Note:** If you have trouble in making a connection, try moving your computer closer to your wireless access point.

Wireless status icon states: wireless WAN

-  Power to the WAN radio is off.
-  No association
-  No signal
-  Signal level 1
-  Signal level 2
-  Signal level 3



Enabling or disabling the wireless feature

To enable or disable the wireless feature, press Fn+F5. A list of wireless features is displayed. You can turn the feature on and off with a single click.

You can also enable or disable the feature by the following procedures.

To enable the wireless feature, do as follows:

1. Click the Access Connections™ wireless icon in the system tray.
2. Click **Power On Wireless Radio**.

To disable the wireless feature, do as follows:

1. Click the Access Connections wireless icon in the system tray.
2. Click **Power Off Wireless Radio**.

*** Note:** You can use the wireless radio switch to disable the wireless radio of all the wireless devices on your computer.

*** Note:** If your computer is a Windows® 7 model, click **Show hidden icons** in the task bar. The Access Connections wireless icon is displayed. To add it to the task bar permanently, click **Customize** and proceed to customize the settings.



Wireless interoperability

Wireless LAN PCI Express Mini Card is designed to be interoperable with any wireless LAN product that is based on Direct Sequence Spread Spectrum (DSSS), Complementary Code Keying (CCK), and/or Orthogonal Frequency Division Multiplexing (OFDM) radio technology, and is compliant to:

- The 802.11b/g or 802.11n draft 2.0 standard on Wireless LANs, as defined and approved by the Institute of Electrical and Electronics Engineers.
- The Wireless Fidelity (WiFi) certification as defined by the Wi-Fi Alliance.

Bluetooth device is designed to be interoperable with any *Bluetooth* product that is compliant to *Bluetooth* Specification 2.1 + EDR as defined by the *Bluetooth* SIG. Following profiles are supported by *Bluetooth* device:

- Generic Access
- Service Discovery
- Serial Port
- Dial-up Networking
- FAX
- LAN Access using PPP
- Personal Area Network
- Generic Object Exchange
- Generic Object Push
- File Transfer
- Synchronization
- Audio Gateway
- Headset
- Printer
- Human Interface Devices (Keyboard/Mouse)
- Basic Image
- Handsfree
- AV
- Phone Book Access Profile (PBAP) (Windows® 7)
- VDP-Sync Profile (Windows 7)

Usage environment and your health

Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card, and *Bluetooth* device emit radio frequency electromagnetic energy like other radio devices. However, the level of energy emitted is far much less than the electromagnetic energy emitted by wireless devices like for example mobile phones.

Due to the fact that Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card, and *Bluetooth* device operate within the guidelines found in radio frequency safety standards and recommendations, Lenovo believes the integrated wireless cards are safe for use by consumers. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature.

In some situation or environment, the use of Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card or *Bluetooth* device may be restricted by the proprietor of the building or responsible representatives of the organization. These situations and areas may for example include:

- Using the integrated wireless cards on board of airplanes, in hospitals or near petrol stations, blasting areas (with electro-explosive devices), medical implants or body-worn electronic medical devices, e.g. pace makers.
- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies on the use of wireless devices in a specific organization (e.g., airport or hospital), you are encouraged to ask for authorization to use Wireless LAN PCI Express Mini Card, Wireless WAN PCI Express Mini Card or *Bluetooth* device prior to turning on the computer.



Verifying the connection of replaceable or upgradable devices

You can replace or upgrade the following devices for your ThinkPad® Notebook. If you experience a problem, click each of the following in turn, and verify that each device is correctly and securely installed on and connected to the computer.

- [Battery](#)
- [PCI Express Mini Card for wireless LAN connection](#)
- [PCI Express Mini Card for wireless WAN connection](#)
- [Hard disk drive](#)
- [Memory](#)
- [SIM card](#)
- [AC adapter and power cord](#) (refer also to the Setup Instructions.)
- [TrackPoint® cap](#)