

# User's Manual

The attachment is the user's manual (Regulatory Notice) of the specific Lenovo host PC devices.  
Only the related section is picked up for this application concerning the FCC Part 2, 15B, 15C and IC RSS-102e & RSS-210.

In addition, some electronic user's guidance referred to in the Regulatory Notice is installed in each host PC device, and it is displayed on the LCD screen. This exhibit also includes the screen copies of electronic user's guidance for ThinkPad T400s Series representatively among the specific Lenovo host PC devices.

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## ThinkPad Regulatory Notice

### Read first — regulatory information

Read this document before you use the computer. The computer complies with the radio frequency and safety standards of any country or region in which it has been approved for wireless use. You must install and use your computer in strict accordance with the instructions as described hereafter.

Veillez lire ce document avant d'utiliser l'ordinateur ThinkPad. L'ordinateur ThinkPad est conforme aux normes de sécurité et de radiofréquence du pays ou de la région où son utilisation sans fil est agréée. Vous devez installer et utiliser votre ordinateur en respectant scrupuleusement les instructions décrites ci-après.

### USA — Federal Communications Commission (FCC)

#### I. User installable wireless LAN/WiMAX adapter

Wireless LAN PCI Express Mini Cards:

- FCC ID: PD9512ANHU (Model: 512AN\_HMW)
- FCC ID: PD9533ANHU (Model: 533AN\_HMW)
- FCC ID: PPD-AR5BHB63-L (Model: AR5BHB63-L)
- FCC ID: TX2-RTL8191SE-L (Model: RTL8191SE)

Wireless LAN & WiMAX PCI Express Mini combo Card:

- FCC ID: PD9512ANXHU (Model: 512ANXHMW)

Wireless LAN PCI Express Mini Cards marketed in the USA and Canada do not support nor function in the extended channels (12ch, 13ch).

For information concerning the wireless cards announced after the publication of this notice, visit the Web site at <http://www.lenovo.com/support/site.wss/document.do?sitestyle=lenovo&Indocid=tpad-matrix>

**i) The FCC RF Exposure compliance:** The radiated output power of the wireless LAN/WiMAX PCI Express Mini Card authorized to use for your computer is far below the FCC radio frequency exposure limits. Nevertheless, it shall be used in such a manner that the potential for human contact during normal operation is minimized as follows:

**Caution:** To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm (8 inches) must be maintained between the antennas for the integrated wireless LAN/WiMAX PCI Express Mini Cards built into the screen section and all persons. You are not allowed to disable “sleep (standby) mode” for the power management function, if you cannot maintain the sufficient antenna separation (at least 20 cm) in any case the LCD is left opened or closed.

The transmission antennas for the wireless LAN/WiMAX adapter are built in the screen section. See “Location of the UltraConnect™ wireless antennas” in *Access Help*.

**Note:** The wireless LAN & WiMAX PCI Express combo Card (Model: 512ANXHMW) incorporates two functions: LAN and WiMAX. These functions operate exclusively, and do not transmit radio frequency simultaneously.

**ii) FCC ID of the wireless adapter:** There is no FCC ID for the PCI Express Mini Card shown on the enclosure of your computer. The FCC ID is affixed on the approved adapter installed in the PCI Express Mini Card slot. For the location of the slot, see “PCI Express Mini Card slot for wireless LAN/WiMAX” in *Access Help*.

**iii) Installation of the approved wireless adapter:** If no integrated wireless LAN/WiMAX 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 wireless LAN/WiMAX 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.

**iv) Radio Frequency interference requirements:**

- The devices have been tested and found to comply with the limits for a Class B digital device pursuant to FCC Part 15 Subpart B. The wireless LAN adapters (Models: AR5BHB63-L and RTL8191SE) were subject to DoC. Refer to “Electronic emission notices” on page 9. The wireless LAN/WiMAX adapters (Models: 512ANXHMW, 512AN\_HMW, and 533AN\_HMW) underwent the certification process with each respective FCC ID number listed in “I. User installable wireless LAN/WiMAX adapter” on page 1.
- Each device is restricted to indoor use due to its operation in the 5150 to 5250 MHz frequency range. FCC requires these products to be used indoors

for the frequency range 5150 to 5250 MHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.

- High power radar are allocated as primary users of the 5250 to 5350 MHz and 5650 to 5850 MHz bands. These radar stations can cause interference with and/or damage this device.

## **II. Preinstalled integrated *Bluetooth* device**

- FCC ID: QDS-BRCM1033 (Model: BCM92046MD\_GEN)

**i) FCC ID and installation of the device:** If you find the FCC ID QDS-BRCM1033 on the label at the bottom side of your computer, your computer integrates the *Bluetooth* transmitter device (Model: BCM92046MD\_GEN). The *Bluetooth* device is preinstalled by Lenovo, and is not removable by yourself. If your 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 request you to send your computer with the device to Lenovo so that Lenovo will repair it.

**ii) The 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 (Model: BCM92046MD\_GEN) is integrated under the palm rest. See “About your computer” in *Access Help*.

**iii) Radio Frequency interference requirements:** The 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 QDS-BRCM1033 of this device includes both certifications of Part 15 Subpart B and C.

## **III. Preinstalled integrated Wireless USB adapter**

- FCC ID: TX2RTU7305BG13HMC (Model: RTU7305 BG1/3 HMC V2C)

**i) FCC ID and installation of the adapter:** If you find the FCC ID TX2RTU7305BG13HMC on the label at the bottom side of your computer, your computer integrates the Wireless USB adapter (Model: RTU7305 BG1/3 HMC V2C). The Wireless USB adapter is preinstalled by Lenovo. If the adapter 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 spare part so that you will replace the original adapter with it.

**ii) The FCC RF safety requirement:** The transmission antenna for the Wireless USB adapter is built in the screen section. See “Location of the

UltraConnect wireless antennas" in *Access Help*. Any Wireless USB adapter is not subject to the RF Safety requirement regarding 47 CFR Part 2 section 1091 nor 1093. Therefore there is no restriction on operation of the Wireless USB adapter.

**iii) Radio Frequency interference requirements:** The device has been tested and certified as an intentional radiator regarding FCC Part 15 Subpart F under the FCC ID TX2RTU7305BG13HMC.

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

#### **IV. Simultaneous use of RF transmitters**

Your computer is approved for simultaneous use of the transmitters listed below:

- Wireless LAN & WiMAX PCI Express combo Card (FCC ID: PD9512ANXHU)
- Wireless LAN adapter (FCC ID: PD9512ANHU, PD9533ANHU, PPD-AR5BHB63-L, or TX2-RTL8191SE-L)
- *Bluetooth* device (FCC ID: QDS-BRCM1033)
- Wireless USB adapter (FCC ID: TX2RTU7305BG13HMC)

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

1. When you use any other RF option device, all other wireless features including the above integrated devices in your computer are required to be turned off.
2. You must follow the RF Safety instructions on wireless option devices that are included in the user manual of the RF option device.

## Canada — Industry Canada (IC)

### IC Certification number

#### I) User installable wireless LAN adapters:

- IC: 1000M-512ANHU (Model: 512AN\_HMW)
- IC: 1000M-533ANHU (Model: 533AN\_HMW)
- IC: 6317A-RTL8191SE (Model: RTL8191SE)
- IC: 4104A-ARBHB63L (Model: AR5BHB63-L)

Wireless LAN PCI Express Mini Cards marketed in the USA and Canada do not support nor function in the extended channels (12ch, 13ch).

There is no certification number of Industry Canada for PCI Express Mini Card shown on the enclosure of your computer. The IC certification number is affixed on the approved adapter installed in the PCI Express Mini Card slot. 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.

#### II) Preinstalled integrated *Bluetooth* device:

- IC: 4324A-BRCM1033 (Model: BCM92046MD\_GEN)

If you find an indication “Contains Transmitter Module: IC: 4324A-BRCM1033” on the label at the bottom side of your computer, your computer integrates the *Bluetooth* transmitter device. The *Bluetooth* device is preinstalled by Lenovo, and is not removable by yourself. If your card requires replacement via the proper steps shown in “Getting help and service” of the *Service and Troubleshooting Guide*, Lenovo will request you to send your computer with the card to Lenovo so that Lenovo will repair it.

#### III) 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.

The maximum antenna gain permitted for devices in the 5250-5350 MHz, 5470-5725 MHz, and 5725-5825 MHz bands complies with the e.i.r.p. limit in section A9.2 of RSS-210.

When you use the wireless LAN adapter (Model: 512AN\_HMW or 533AN\_HMW):

- The devices for the band 5150–5250 MHz are only for indoor usage to reduce potential for harmful interference to co-channel Mobile Satellite systems.
- High power radars are allocated as primary users (meaning they have priority) of 5250–5350 MHz and 5650–5850 MHz and these radars could cause interference and/or damage to LELAN (Licence-Exempt Local Area Network) devices.

**IV) 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 [www.hc-sc.gc.ca/](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 4.2.

### **Numéro d'homologation IC**

**I) Module sans fil installable par l'utilisateur:** Les cartes Express mini-PCI de réseau local sans fil :

- IC : 1000M-512ANHU (Model : 512AN\_HMW)
- IC : 1000M-533ANHU (Model : 533AN\_HMW)
- IC : 6317A-RTL8191SE (Model : RTL8191SE)
- IC : 4104A-ARBHB63L (Model : AR5BHB63-L)

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.

Le boîtier de votre ordinateur ThinkPad ne comporte pas de numéro d'homologation IC (Industry Canada) pour la carte mini-PCI Express. Le numéro d'homologation IC est apposé sur le module installé dans le logement pour carte mini-PCI Express. 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 ThinkPad 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 ThinkPad, l'ordinateur ne démarrera pas mais affichera un message d'erreur et générera des bips sonores.

## **II) Module *Bluetooth* intégré préinstallé:**

- IC : 4324A-BRCM1033 (Model : BCM92046MD\_GEN)

Si la mention "Contains Transmitter Module: IC: 4324A-BRCM1033" figure sur l'étiquette située au bas de votre ordinateur, cela signifie que ce dernier intègre le module de transmission *Bluetooth*. Le module *Bluetooth* est préinstallé par Lenovo et ne peut pas être retiré par les utilisateurs. Si votre carte doit être remplacée conformément aux étapes du Chapitre relatif à l'aide et la maintenance dans le manuel *Guide de maintenance et d'identification des incidents*, Lenovo vous demandera de lui envoyer votre ordinateur accompagné de la carte pour réparation.

**III) 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 aux ThinkPad et ayant un gain maximal de moins de 3 dBi.

Le gain d'antenne maximal pour les périphériques dans les bandes de fréquence 5250-5350 MHz, 5470-5725 MHz, et 5725-5825 MHz est conforme à la limite p.i.r.e énoncée dans la section A9.2 de la CNR-210.

Lorsque vous utilisez le modèle, 512AN\_HMW ou 533AN\_HMW :

- Tout appareil destiné à la bande 5150-5250 MHz devra être exclusivement utilisé en intérieur afin de réduire les risques de perturbations électromagnétiques gênantes sur les systèmes de satellite mobile dans un même canal.
- Les radars à forte puissance sont désignés comme les utilisateurs principaux (c'est-à-dire qu'ils sont prioritaires) des bandes 5250-5350 MHz et 5650-5850 MHz. Ils peuvent provoquer des perturbations électromagnétiques sur les appareils de type LELAN (réseau de communication local sans licence) ou les endommager.

## **IV) Exposition des êtres humains aux champs radioélectriques (RF)**

**(CNR-102):** L'ordinateur ThinkPad 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 [www.hc-sc.gc.ca/](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 4.2 du document CNR-102.

## Electronic emission notices

### *Federal Communications Commission (FCC) Statement*

- Model: AR5BHB63-L
- Model: RTL8191SE

**Note:** The wireless LAN adapters (Models: 512ANXHMW, 512AN\_HMW, and 533AN\_HMW) and the *Bluetooth* device (Model: BCM92046MD\_GEN) underwent certification process for the FCC Part 15 Subpart B compliance under each respective 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®


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































Printed in China

For Barcode Position Only

## The screen copies of electronic user's guidance are extracted hereafter.

### ThinkPad tour

To see the location of a feature of the computer, or of any piece of hardware, click the mark  for it in the table.

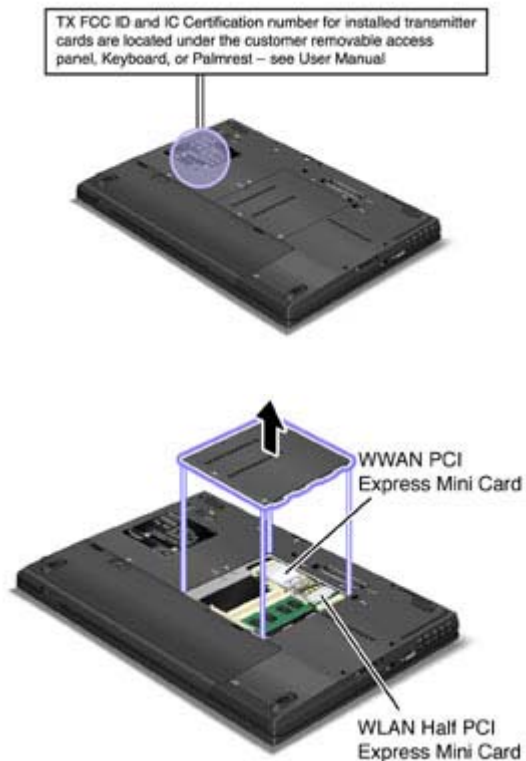
	T400s	T400	R400	T500	W500	R500
Front view						
Right-side view						
Left-side view						
Bottom view						
Rear view						

ThinkPad

## Location of the FCC ID and IC Certification number label (T400s)



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 Mini PCI Express Card slot of your ThinkPad 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/WiMAX connection](#) or [Installing and replacing the PCI Express Mini Card for wireless WAN connection](#).



There are two types of antenna locations. Your computer corresponds to any of the following.

### **Type 1: Antenna location**

#### **1. Wireless LAN and WiMAX combo antenna and Wireless WAN antenna (Auxiliary)**

The auxiliary antenna connected to the wireless LAN, WiMAX, or wireless WAN feature is located at the top left corner of the computer display.

#### **2. Wireless USB antenna**

If your computer comes with a wireless USB feature, the antenna is located at the top left portion of the computer display, near the center.

#### **3. Wireless LAN antenna (Third)**

If your computer has the Multiple Input Output (MIMO) wireless LAN feature, the third antenna is located at the top right portion of the computer display, near the center.

#### **4. Wireless LAN and WiMAX combo antenna and Wireless WAN antenna (Main)**

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

### **Type 2: Antenna location**

#### **1. Wireless LAN and WiMAX combo antenna and Wireless WAN antenna (Auxiliary)**

The auxiliary antenna connected to the wireless LAN, WiMAX, or wireless WAN feature is located at the top left corner of the computer display.

#### **2. Wireless USB antenna**

If your computer comes with a wireless USB feature, the antenna is located at the top left portion of the computer display, near the center.

#### **3. Wireless LAN and WiMAX combo antenna (Main) and Wireless LAN antenna (Third)**

The main antenna connected to the wireless LAN or WiMAX feature is located at the top right portion of the computer display, near the center. If your computer has the Multiple Input Output (MIMO) wireless LAN feature, the third antenna is located at the top right portion of the computer display, near the center.

#### **4. Wireless WAN antenna (Main)**

If your computer comes with a wireless WAN feature, the main antenna is located at the top right corner of the computer display.



# Location: *Bluetooth* antenna

ThinkPad® T400s



**Front**



**Right**



**Left**



**Bottom**



**Rear**



**18** *Bluetooth* antenna



Some models have the *Integrated Bluetooth* features.

# Location: PCI Express Mini Card slot for Wireless LAN/WiMAX

ThinkPad® T400s



Front



Right



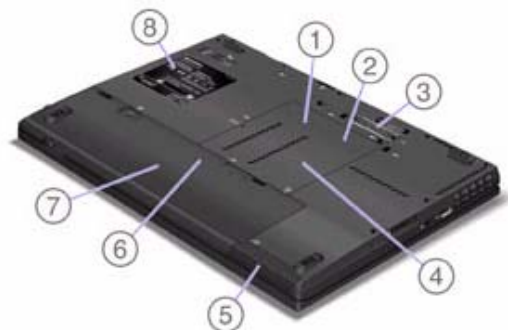
Left



Bottom



Rear



② PCI Express Mini Card slot for Wireless LAN/WiMAX



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

# Location: Wireless USB card slot

ThinkPad® T400s



Front



Right



Left



Bottom



Rear



3 Wireless USB card slot



Some models have the Wireless USB features.

## Installing and replacing a PCI Express Mini Card for wireless LAN/WiMAX connection (T400s)



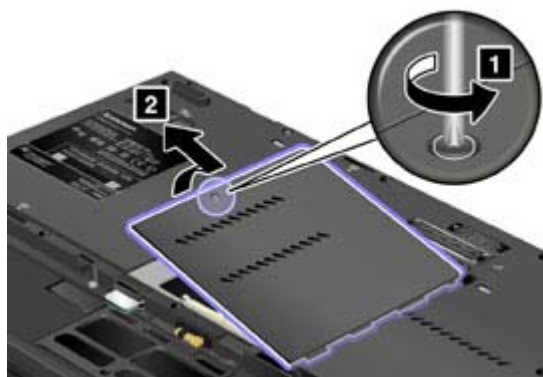
**Before you start, print these instructions.**

Your computer has a PCI Express Mini Card slot for connection to a wireless LAN/WiMAX. To replace the PCI Express Mini Card with a new one, follow the procedure below.

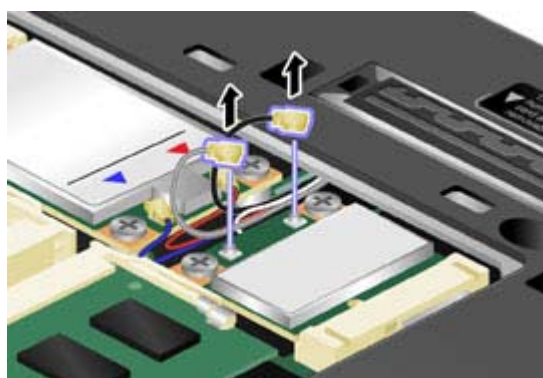
- [Replacing a PCI Express Mini Card with two connectors.](#)
- [Replacing a PCI Express Mini Card with three connectors.](#)

### Replacing a PCI Express Mini Card with two connectors

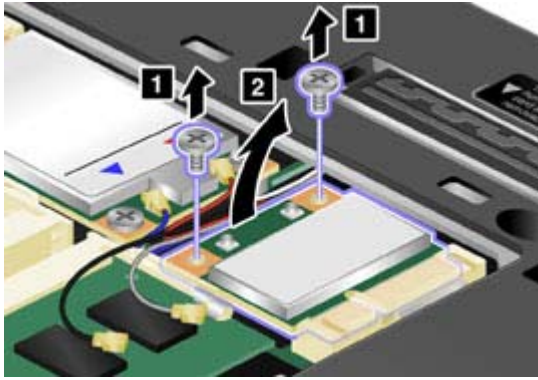
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. Loosen the screw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



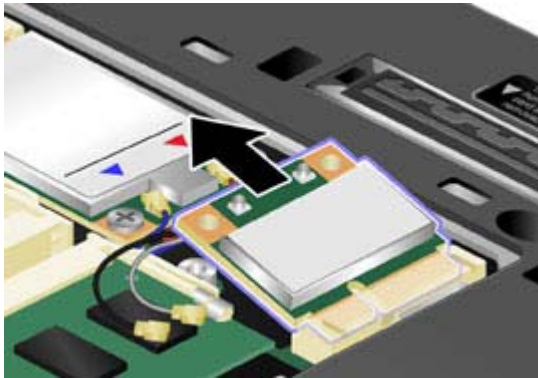
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card. If no such tool is included, disconnect the cables by picking up the connectors with your fingers and gently unplugging them.



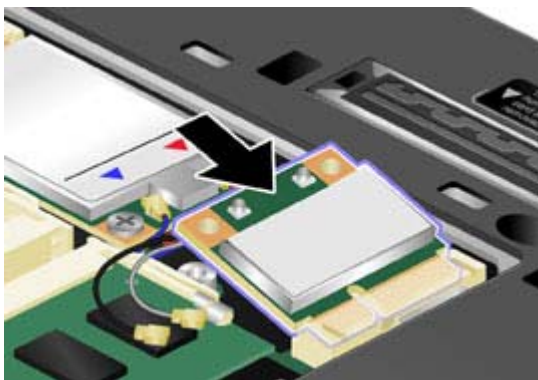
6. Remove the screws **(1)**. The card pops up **(2)**.



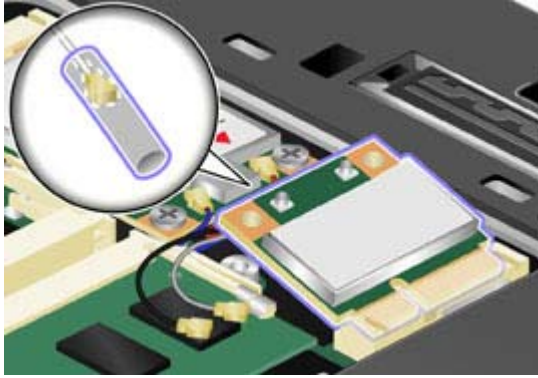
7. Remove the card.



8. Align the contact edge of the new PCI Express Mini Card with the corresponding socket contact of the computer.

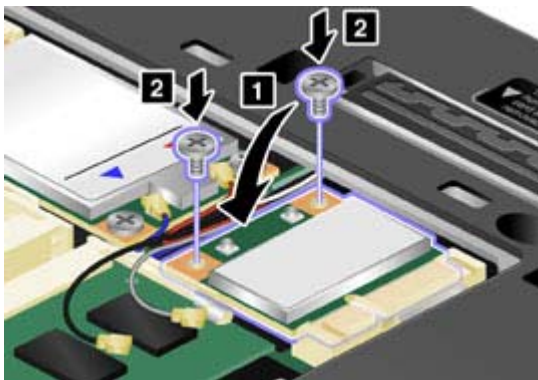


**\* Note:** If the new PCI Express Mini Card has two connectors, as in the next drawing, be sure to attach the gray cable to the connector marked "MAIN" on the card, and the black cable to the connector marked "AUX". Put the white cable in the cable protection tube.

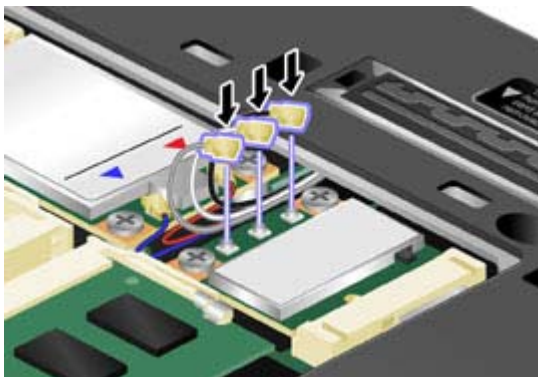


9. Pivot the card until you can snap it into place by pressing the upper side of the connectors **(1)**, and secure the card with the two screws **(2)**. Connect the cables to the new PCI Express Mini Card.

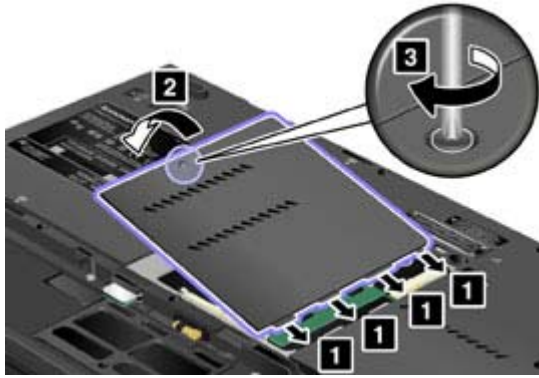
**\* Note:** Be sure to attach the gray cable to the connector marked "MAIN" on the card, and the black cable to the connector marked "AUX".



**\* Note:** If the new PCI Express Mini Card has three connectors, as in the next drawing, be sure to attach the gray cable to the connector marked "MAIN" on the card, and the black cable to the connector marked "AUX". If you attach either cable to the center connector, the connection speed will be lower.



10. Put the memory slot cover back in place **(1)**, close the cover **(2)**, and then tighten the screw **(3)**.

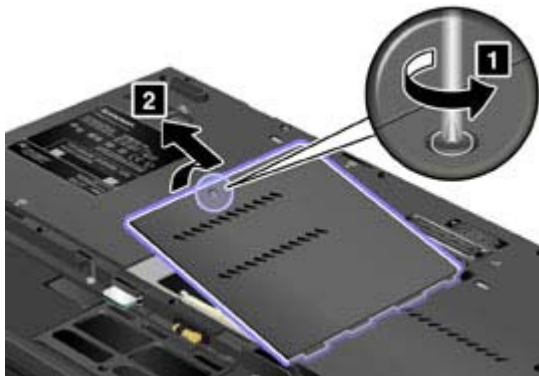


11. [Reinstall the battery.](#)
12. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

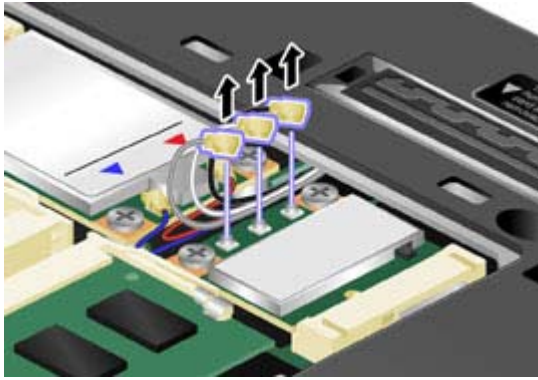
### Replacing a PCI Express Mini Card with three connectors

If your computer has a Multiple Input Multiple Output (MIMO) feature, a PCI Express Mini Card that has three connectors comes with the computer. To replace the card for the MIMO feature, do as follows:

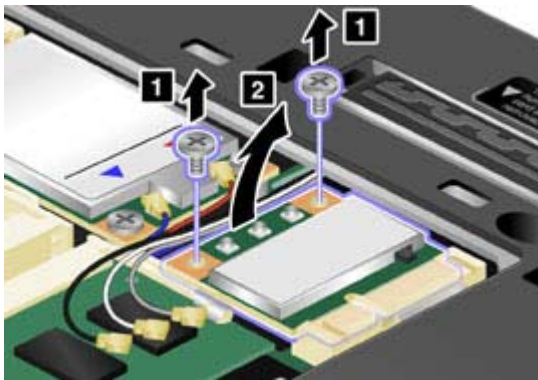
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. Loosen the screw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



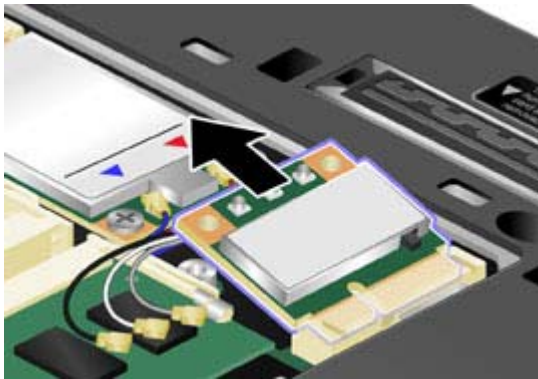
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card. If no such tool is included, disconnect the cables by picking up the connectors with your fingers and gently unplugging them.



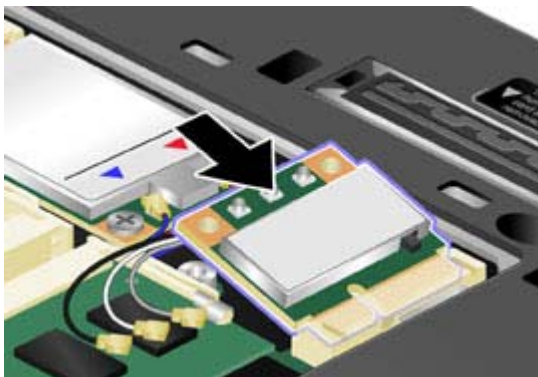
6. Remove the screws (1). The card pops up (2).



7. Remove the card.

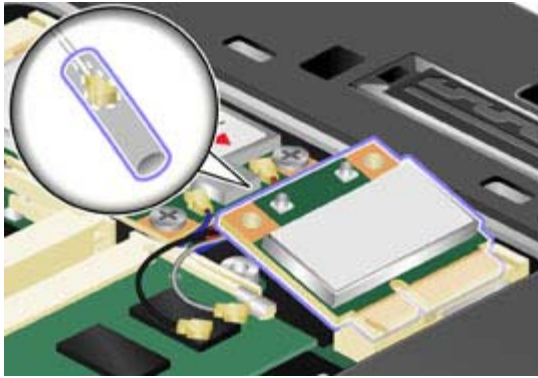


8. Align the contact edge of the new card with the corresponding socket contact of the computer.

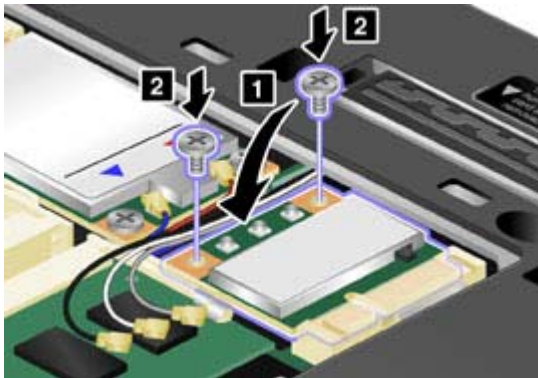




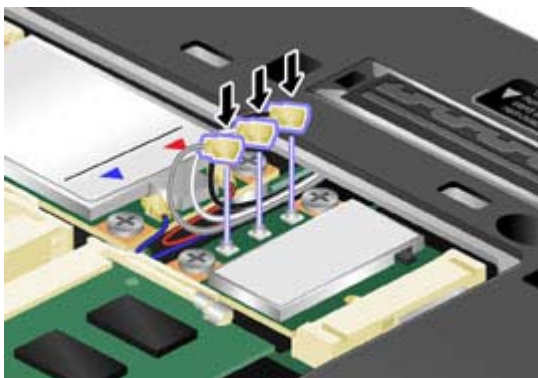
**\* Note:** If the new PCI Express Mini Card has two connectors, as in the next drawing, be sure to attach the gray cable to the connector marked "MAIN" on the card, and the black cable to the connector marked "AUX". Put the white cable in the cable protection tube.



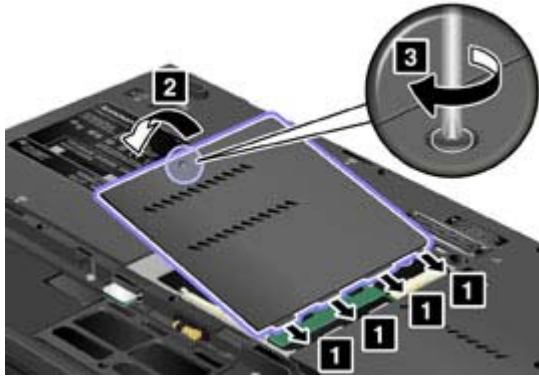
9. Pivot the card until you can snap it into place by pressing the upper side of the connectors **(1)**, and secure the card with the two screws **(2)**. Connect the cables to the new PCI Express Mini Card.



**\* Note:** Be sure to attach the gray cable to the connector marked "MAIN" on the card, the white cable to the connector marked "MIMO", and the black cable to the connector marked "AUX".



10. Put the memory slot cover back in place **(1)**, close the cover **(2)**, and then tighten the screw **(3)**.



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

# Location: system and power-status indicators

- [T400s](#)
- [T400/R400](#)
- [T500/W500](#)
- [R500](#)

ThinkPad® T400s



**Front**



**Right**



**Left**



**Bottom**



**Rear**



8 System and power-status indicators

22 CapsLock indicator



Your computer has two system-status indicators: CapsLock and Device Access.

If your computer is shipped with a wireless LAN feature, a wireless WAN feature, a WiMAX feature, a *Bluetooth* feature, and a Wireless USB feature, it has the following indicators: Wireless LAN/WAN/WiMAX status and *Bluetooth*/Wireless USB status.

# Location: wireless radio switch

- [T400s](#)
- [T400/R400](#)
- [T500/W500](#)
- [R500](#)

ThinkPad® T400s



### 3 Wireless radio switch



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

## 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.

### **Wireless USB**

This wireless analog of the USB standard can create a wireless personal area network by implementing short-range large-bandwidth radio transmissions. It is used primarily for connecting a PC to peripherals that are no more than a short distance from the host.

### **WiMAX (Worldwide Interoperability for Microwave Access)**

This long-range wireless data transmission technology based on the 802.16 standard, is expected to provide the user a "last mile" broadband connectivity similar to that provided by cable or ADSL, but without the need to physically connect a cable to the PC.

- [Using wireless LAN connections](#)
- [Using wireless WAN connections](#)
- [Using Bluetooth](#)
- [Using Wireless USB](#)
- [Using WiMAX](#)
- [Checking wireless connection status](#)



# 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 computer 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 upgradeable ThinkPad models](#)

## 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 computer 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 upgradeable ThinkPad models](#)

## Using WiMAX

Some ThinkPad® computers come with a built-in wireless LAN card integrating WiMAX technology.

WiMAX -- a long-range wireless data transmission technology based on the 802.16 standard -- provides you with a "last mile" broadband connectivity similar to that offered by cable or ADSL, but without the need to physically connect a cable to the PC.

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

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

## Using Wireless USB



**\* Note:** For Japanese models, when you use the Wireless USB feature, use AC power to run your computer. If you do not use AC adapter, the Wireless USB feature will not work.

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

**\* Note:** Only a Certified Wireless USB device can be connected to your ThinkPad® computer.

### Using a Wireless USB device with your computer for the first time

When a Wireless USB device is used for the first time, you must associate it with your computer, by doing the following:

1. Open the Wireless USB Manager by double-clicking its icon in the task tray.
2. Connect the Wireless USB device to your computer, using a USB cable.
3. Wait until the Wireless USB device is listed in the Wireless USB Manager and the balloon message "Wireless USB device associated done" appears.
4. Remove the USB cable.
5. Wait until the Wireless USB device icon in the Wireless USB Manager brightens up.

Once the device is associated, it will automatically connect without a USB cable as long as it is within a range of availability. For more details, refer to the manual provided with the device.

**\* Note:** The Wireless USB device may reconnect automatically even after you click the "Disconnect" button in the USB Connection Manager. To completely disconnect the Wireless USB device, press Fn + F5 keys.

## Using *Bluetooth*

- [For Windows Vista®](#)
- [For Windows® XP](#)

### For Windows Vista:

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 also use **Bluetooth Devices** in Control Panel.

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

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 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

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. For Windows XP, 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* serial port
  - *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.

## Wireless networking setup

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

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.


## Checking wireless connection status


You can check 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 system tray.


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

### Wireless status icon states: wireless LAN

 Power to the wireless radio is off.


 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.

## Wireless upgradeable ThinkPad models

Your ThinkPad® computer can be wireless upgradeable. This means that your computer has an antenna that can support wireless LAN access when wireless LAN access points are available. Wireless devices are available from Lenovo: [Finding ThinkPad options](#).

## Wireless related information

### 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 The 802.11b/g Standard, 802.11a/b/g or 802.11n draft 2.0 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 Vista® only)
- VDP-Sync Profile (Windows Vista only)



## 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.