

# User's Manual

The attachment is the user's manual of the specific Lenovo host PC devices in this application, which indicates the regulatory notice concerning the FCC Part 2, 15B, 15C, 15E, 27, and IC RSS-102e & RSS-210.

In addition, some electronic information referred to in the user's manual is installed in each host PC devices and is displayed on the LCD screen.

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## ThinkPad® X200 Tablet Regulatory Notice

### Read first — regulatory information

Please read this document before you use the ThinkPad computer. ThinkPad 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.

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

**Note:** You cannot use the Wireless WAN adapter and the Wireless LAN adapter (Models: AR5BHB63-L, 533ANXMMW, 512AN\_MMW, or 533AN\_MMW) 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 the “Power-status indicators” section in Access Help.

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.

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

**Remarque:** Vous ne pouvez pas utiliser simultanément la carte de réseau étendu sans fil et la carte de réseau local sans fil (Modèles: AR5BHB63-L, 533ANXMMW, 512AN\_MMW, ou 533AN\_MMW). 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 l'aide Access.

## USA — Federal Communications Commission (FCC)

### I. User installable Wireless LAN/WiMAX module

WLAN Mini PCI Express Cards:

- FCC ID: PPD-AR5BHB63-L (Model: AR5BHB63-L)
- FCC ID: PD9LEN512ANMU (Model: 512AN\_MMW)
- FCC ID: PD9533ANMU (Model: 533AN\_MMW)

WLAN & WiMAX Mini PCI Express combo Card:

- FCC ID: PD9533ANXMMU (Model: 533ANXMMW)

Wireless LAN Mini PCI Express 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 total radiated energy from the Main, Auxiliary, and Third antennas connected to one of the wireless LAN Mini PCI Express Cards and from the *Bluetooth* card (with its built-in antenna on the 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 either conventional notebook or tablet computer orientations.

The transmission antennas used for the wireless LAN Mini PCI Express Card are located at the upper left and right side of the LCD screen, and the antenna used for Bluetooth card (Model: BCM92046MD\_GEN) is located under the palm rest at center. See the "UltraConnect wireless antennas" and "Bluetooth antenna" sections in *Access Help*.

**Note:** The transmission diversity function is implemented for this product. For WLAN card (Model: AR5BHB63-L) using Main and Auxiliary antennas for transmission in the 802.11 b/g transmission mode, radio frequency energy is not emitted simultaneously from both Main and Auxiliary antennas. One of the antennas is selected automatically or manually (by users) to have good quality of radiocommunication (transmission diversity function). For the WLAN cards (Models: 533AN\_MMW and 533ANXMMW) in the MIMO (Multiple In Multiple Out) transmission mode, multiple antennas (Main, Auxiliary, and Third) can transmit radio frequency energy simultaneously. For WLAN card (Model: 512AN\_MMW) in the IEEE 802.11 a/b/g or MIMO (Multiple In Multiple Out) transmission mode, the radio frequency energy is emitted from Main antenna. When the Model: 533ANXMMW switches to WiMAX operation mode, only the Main antenna is used for RF transmission.

**ii) FCC ID of wireless module:** There is no FCC ID for Mini PCI Express Card shown on the enclosure of your ThinkPad computer. Instead you will find an indicator pointing to the location of the FCC ID on the bottom side of your ThinkPad computer. For the location of the FCC ID indicator, see the "Location of the FCC ID and IC Certification number label" section in Access Help. The FCC ID is affixed on the approved module installed in the Mini PCI Express Card slot. For the location of the slot, see the "PCI Express Mini Card slot for wireless LAN/WiMAX" section in Access Help.

**iii) Installation of approved wireless module:** If no integrated wireless LAN/WiMAX Mini PCI Express Card has been preinstalled in your ThinkPad computer, you can install one, provided by Lenovo as an option. Plug the wireless card option into the Mini PCI Express Card slot. For the installation procedure, see the "Installing and replacing the PCI Express Mini Card for wireless LAN/WiMAX connection" section in Access Help.

**Attention:** The ThinkPad computers contain an authentication mechanism. If you install an unauthorized wireless LAN Mini PCI Express 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 model AR5BHB63-L was subject to DoC. Refer to "Electronic emission notices" on page 10. The models 512AN\_MMW, 533AN\_MMW, and 533ANXMMW underwent the certification process with each respective FCC ID number listed in "I. User installable Wireless LAN/WiMAX module" on page 2.
- Each device is restricted to indoor use due to its operation in the 5.15 to 5.25 GHz frequency range. FCC requires these products to be used indoors for the frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.
- High power radar are allocated as primary users of the 5.25 to 5.35 GHz and 5.65 to 5.85 GHz bands. These radar stations can cause interference with and/or damage this device.

**II. Preinstalled integrated *Bluetooth* module**

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

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

**ii) The FCC RF safety requirement:** The radiated output power of the *Bluetooth* module 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.

For the location of the *Bluetooth* module “BCM92046MD\_GEN” and its built-in antenna, see the “About your computer” section 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 module**

- FCC ID: V4EUWB3480MPE (Model: 3480MPE-US)

**i) FCC ID and installation of the module:** If you find the FCC ID “V4EUWB3480MPE” on the label at the bottom side of your computer, your computer integrates the Wireless USB card (Model: 3480MPE-US). The Wireless USB card is preinstalled by Lenovo. If the card 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 standard FCC rule for RF exposure compliance requires a separation distance of at least 20 cm (8 inches) between the integrated Wireless USB antenna and all persons. However the radiated output power of the Wireless USB card authorized to use for your ThinkPad computer is far below the FCC radio frequency exposure limits. Therefore, a 20 cm of separation between the Wireless USB antenna built into the screen section of your computer and human body is not required.

For the location of the Wireless USB antenna, see the “Location of the UltraConnect wireless antennas” section in Access Help. For the location of the slot for the Wireless USB card, see the “About your computer” section in Access Help.

**iii) Radio Frequency interference requirements:** The device has been tested and found to comply with the limits for a Class B digital device regarding FCC Part 15 Subpart B and was subject to DoC. Refer to “Electronic emission notices” on page 10. Also it has been certified as an intentional radiator regarding FCC Part 15 Subpart F under the FCC ID: V4EUWB3480MPE.

#### **IV. Digitizer function in LCD screen**

The ThinkPad X200 Tablet computer employs a digitizer function in LCD screen which is able to sense the Tablet Digitizer Pen shipped associated with your computer. The digitizer emits extra low power radio frequency and complies with the FCC Part 15, Subpart C. The FCC ID: XXXX is indicated on the label at the bottom side of your ThinkPad computer.

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

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

- Wireless LAN adapter (FCC ID: PPD-AR5BHB63-L, PD9LEN512ANMU, PD9533ANMU, or PD9533ANXMU)
- *Bluetooth* module (FCC ID: QDS-BRCM1033)
- Wireless USB adapter (FCC ID: V4EUWB3480MPE)

Please make sure of the following conditions on use of these wireless features:

1. When you use any other RF option device, you are requested to confirm that the device conforms to the SAR requirement and is approved to use for ThinkPad X200 Tablet computer.
2. When you use any other RF option device, all other wireless features including the above integrated devices in your ThinkPad computer are required to be turned off.
3. Users must follow the RF Safety instructions on wireless option devices that are included in the RF option device's user's manual.

### **Canada — Industry Canada (IC)**

#### **IC Certification number**

##### **I) User installable Wireless LAN modules:**

- IC: 4104A-ARBHB63L (Model: AR5BHB63-L)
- IC: 1000M-L512ANMU (Model: 512AN\_MMW)
- IC: 1000M-533ANMU (Model: 533AN\_MMW)

Wireless LAN Mini PCI Express 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 Mini PCI Express Card shown on the enclosure of your ThinkPad computer. Instead you will find an indicator pointing to the location of the IC Certification number on the bottom side of your ThinkPad computer. For the location of the IC Certification number indicator, see the "Location of the FCC ID and IC Certification number label" section in Access Help. The IC certification number is affixed on the approved module installed in the Mini PCI Express Card slot. For the location of the slot, see the "PCI Express Mini Card slot for wireless LAN/WiMAX" section in Access Help.

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

**II) Preinstalled integrated *Bluetooth* module:**

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

If you find an indication “Contains Transmitter Module: Canada IC: 4324A-BRCM1033” on the label at the bottom side of your computer, your computer integrates the *Bluetooth* transmitter module. The *Bluetooth* module is preinstalled by Lenovo, and is not removable by users. 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) Wireless USB module:** Operation of the Wireless USB Card (Model: 3480MPe-US) is not permitted in Canada. Please do not use this module, as it will be a violation of Industry Canada regulations.

**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 ThinkPad 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 model 512AN\_MMW or 533AN\_MMW:

- 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):** ThinkPad 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/rpb](http://www.hc-sc.gc.ca/rpb)

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.

**V) Digitizer function in LCD screen:** The ThinkPad X200 Tablet computers employ a digitizer function in LCD screen which is able to sense the Tablet Digitizer Pen shipped associated with your computer. The digitizer emits extra low power radio frequency and complies with the standard (RSS-210). The IC certification number IC: XXXX is indicated on the label at the bottom side of your ThinkPad computer.

### **Numéro d'homologation IC**

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

- IC: 4104A-ARBHB63L (Model: AR5BHB63-L)
- IC: 1000M-L512ANMU (Model: 512AN\_MMW)
- IC: 1000M-533ANMU (Model: 533AN\_MMW)

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; mais sous votre ThinkPad, 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 l'aide Access. 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: Canada 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) Wireless USB module:** L’utilisation de la carte USB sans fil (modèle 3480MPe-US) n’est pas autorisée au Canada. Veuillez ne pas utiliser ce module dans ce pays car ce serait une infraction aux lois d’Industrie Canada.

**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\_MMW ou 533AN\_MMW:

- 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/rpb](http://www.hc-sc.gc.ca/rpb)”.

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.

**V) Fonction de numérisation sur écran LCD:** Les ordinateurs ThinkPad X200 Tablet utilisent une fonction de numérisation sur écran LCD capable de détecter le stylo numériseur de la tablette graphique qui est associé à votre ordinateur. Le numériseur émet une fréquence radio extrêmement basse et il est conforme à la norme CNR-210. Le numéro de certification IC: XXXX figure sur l'étiquette apposée au bas de votre ordinateur ThinkPad.

## Electronic emission notices

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

- Model: AR5BHB63-L
- ThinkPad X200 Tablet (Machine Type: 4184, 7448, 7449, 7450, 7453, 2263, and 2266)

**Note:** The models 512AN\_MMW, 533AN\_MMW, 533ANXMMW, and 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.

## Telecommunication notices

### *Federal Communications Commission (FCC) and Telephone Company Requirements (Part 68 of the FCC Rules)*

1. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual.

In order to program this information into your computer, you should be sure to follow the installation instructions for your fax software package.

2. This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.
3. The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3).
4. If the built-in modem causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But, if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

5. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.
6. No customer repairs are possible to the modem. If you experience trouble with this built-in modem, contact your Lenovo Authorized Seller, or the Customer Support Center. For the most current phone numbers, go to <http://www.lenovo.com/think/support> and click Support phone list. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected, or until you are sure the equipment is not malfunctioning.
7. The modem may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.
8. When ordering network interface (NI) service from the Local Exchange Carrier, specify service arrangement USOC RJ11C.
9. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.
10. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this Data/Fax Modem does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

### **Industry Canada requirements**

*Notice:* This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of communication. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

**Caution:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Ringer Equivalence Number (REN) for the terminal equipment RD02-D450 is 0.1. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

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

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. Dans certains cas, les fils intérieurs de l'entreprise utilisés pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dispositif homologué de raccordement (cordon prolongateur téléphonique interne). L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations. Actuellement, les entreprises de télécommunication ne permettent pas que l'on raccorde leur matériel à des jacks d'abonné, sauf dans les cas précis prévus par les tarifs particuliers de ces entreprises.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de

télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

***Avertissement:*** L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

L'indice d'équivalence de la sonnerie (IES) du présent matériel RD02-D450 est de 0.1. L'IES assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

## **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

Click a view to see the location of ThinkPad® features and hardware.

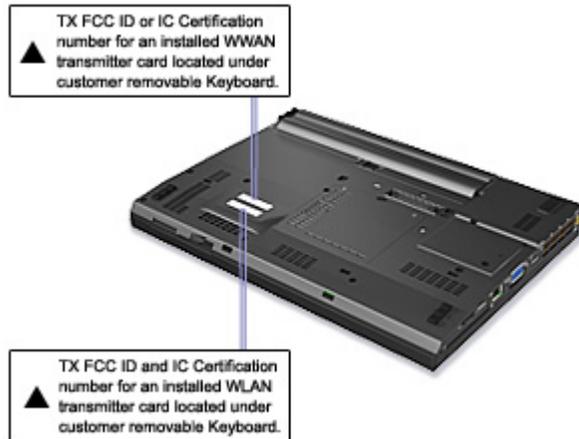
- ▶ [Front](#)
- ▶ [Right side](#)
- ▶ [Left side](#)
- ▶ [Bottom](#)

ThinkPad

## Location of the 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 ThinkPad® computer. Instead you will find an indicator pointing to the location of the FCC ID and the IC Certification number for the installed transmitter card on the bottom side of your ThinkPad as shown below. 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.

**\* Note:** The wording of the label may vary depending on the model.



If no integrated wireless PCI Express Mini Card has been preinstalled in your ThinkPad 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](#).

## Location of the UltraConnect wireless antennas

ThinkPad® models feature an integrated diversity antenna system built into the display for optimal reception, enabling wireless communication wherever you are.

The following shows the location of each built-in wireless antenna.



### 1. Wireless WAN antenna (Auxiliary)

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

### 2. Wireless LAN and WiMAX combo antenna (Auxiliary)

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

### 3. Wireless USB antenna

If your computer comes with a wireless USB feature, the 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, its main transmitter antenna is located at the top right side of the computer display.

### 5. Wireless LAN and WiMAX combo antenna (Main)

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

### 6. Wireless LAN antenna (Third)

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

Location: *Bluetooth* antenna



Front



**Right**



Left



Bottom



**8. Bluetooth antenna**

Some ThinkPad® models have Integrated Bluetooth features.

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



**Front**



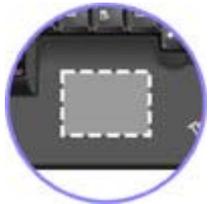
**Right**



**Left**



**Bottom**



### 15. 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 for Wireless LAN/WiMAX which enable wireless LAN communications.

## Location: PCI Express Mini Card slot for Wireless WAN



**Front**



**Right**



**Left**



**Bottom**



### 14. PCI Express Mini Card slot for Wireless WAN

Some computers have a PCI Express Mini Card in the PCI Express Mini Card slot for Wireless WAN which enable wireless WAN communications.

## Location: PCI Express Half Mini Card slot for Wireless USB



**Front**



Right



Left



Bottom



### 4. PCI Express Half Mini Card slot for Wireless USB

Some models have the Wireless USB features.

This slot also accepts an [Intel® Turbo Memory Card](#).

## Installing and replacing the PCI Express Mini Card for wireless LAN/WiMAX connection

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

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



**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 module, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. The static electricity could damage the PCI Express Mini Card.



**Note:** Use the PCI Express Mini Card provided by Lenovo.

▼ [Replacing a PCI Express Mini Card with two connectors](#)

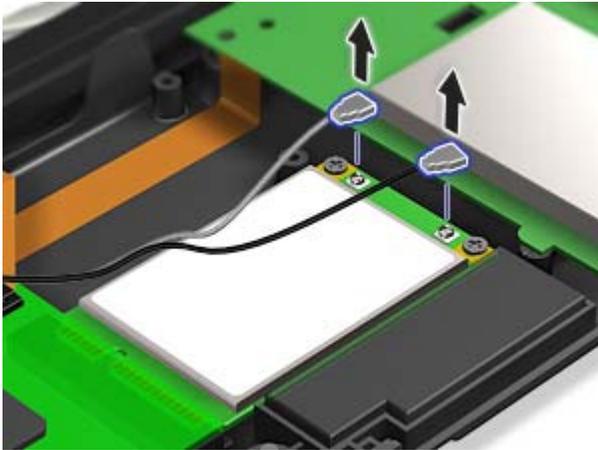
▼ [Replacing a PCI Express Mini Card with three connectors](#)

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

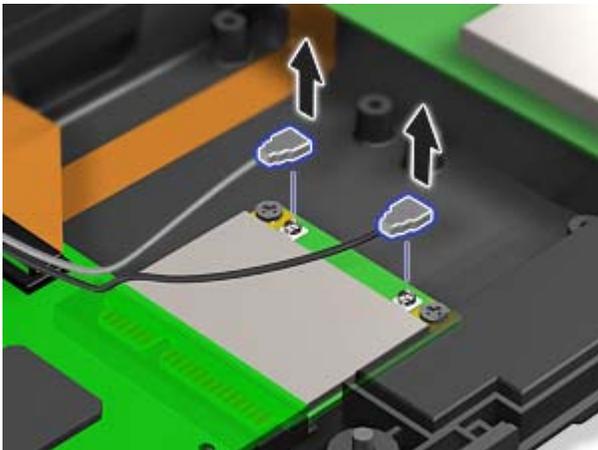
To replace the PCI Express Mini Card with two connectors, do as follows:

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. [Remove the keyboard.](#)
5. [Remove the palm rest.](#)
6. 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 from the card by picking up the connectors with your fingers and gently unplugging them.

**PCI Express Mini Card**

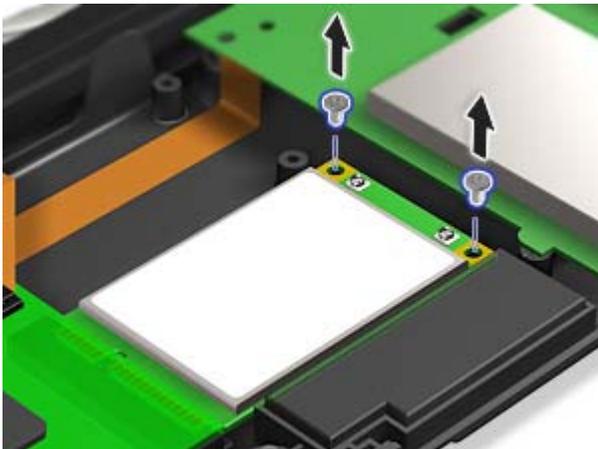


**PCI Express Half Mini Card**

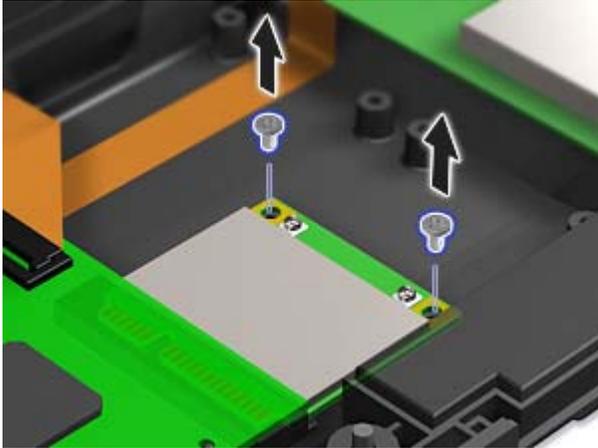


7. Remove the screws.

**PCI Express Mini Card**

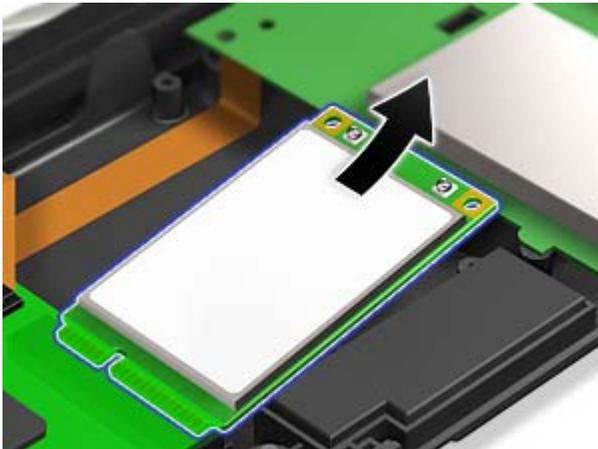


**PCI Express Half Mini Card**

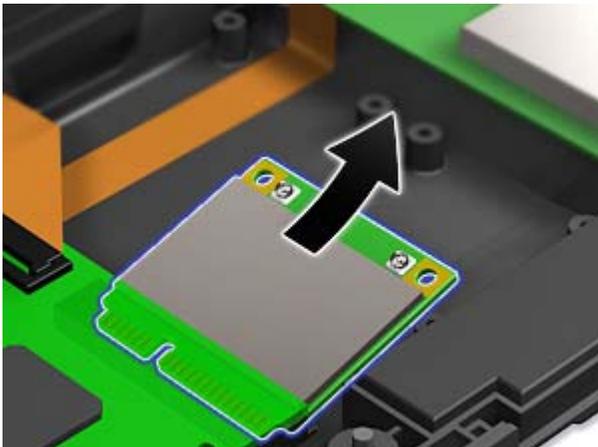


8. Remove the card.

#### PCI Express Mini Card



#### PCI Express Half Mini Card



9. Align the contact edge of the PCI Express Mini Card with the corresponding socket contact of the computer.
10. Pivot the card until you can snap it into place by pressing the upper side of the connectors; then secure the card with the two screws.
11. Connect the cables to the new PCI Express Mini Card.

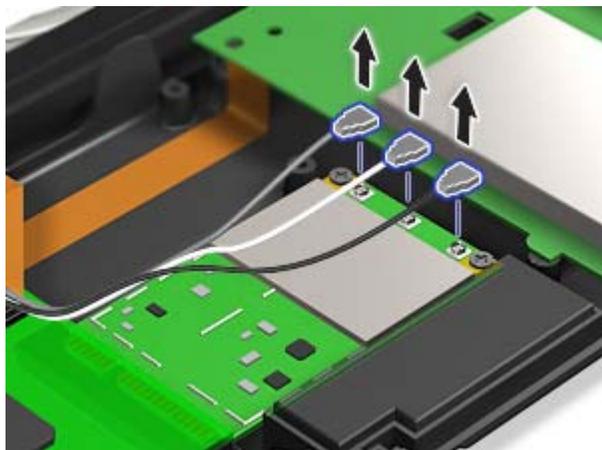
**\* Note:** If the new PCI Express Mini Card has three connectors, you must attach the cables to the right and left connectors. If you attach either cable to the center connector, the connection speed will be lower.

12. [Reinstall the palm rest.](#)
13. [Reinstall the keyboard.](#)
14. [Reinstall the battery.](#)
15. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

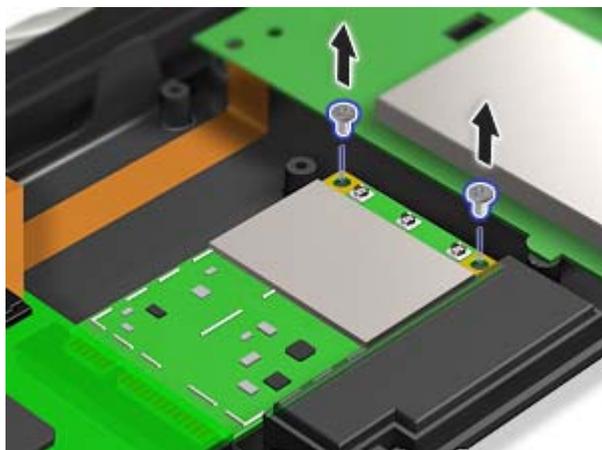
## Replacing a PCI Express Mini Card with three connectors

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

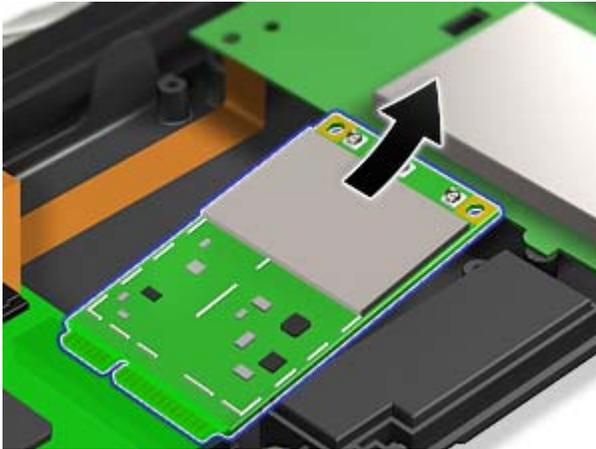
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
5. [Remove the palm rest.](#)
6. 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 from the card by picking up the connectors with your fingers and gently unplugging them.



7. Remove the screws.



8. Remove the card.



9. Align the contact edge of the new card with the corresponding socket contact of the computer.
10. Pivot the card until you can snap it into place by pressing the upper side of the connectors; then secure the card with the two screws.
11. Connect the black cable (AUX) to the right connector, the white cable (MIMO third) to the center connector and the gray cable to the left connector on the new card.  
**\* Note:** If the new PCI Express Mini Card has two connectors, you must attach the gray cable to the left connector and the black cable to the right connector.
12. [Reinstall the palm rest.](#)
13. [Reinstall the keyboard.](#)
14. [Reinstall the battery.](#)
15. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

## Installing and replacing the PCI Express Mini Card for wireless WAN connection

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

Some ThinkPad® models have a PCI Express Mini Card slot for wireless WAN connection. To replace the PCI Express Mini Card with a new one, follow the procedure below.

 **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.

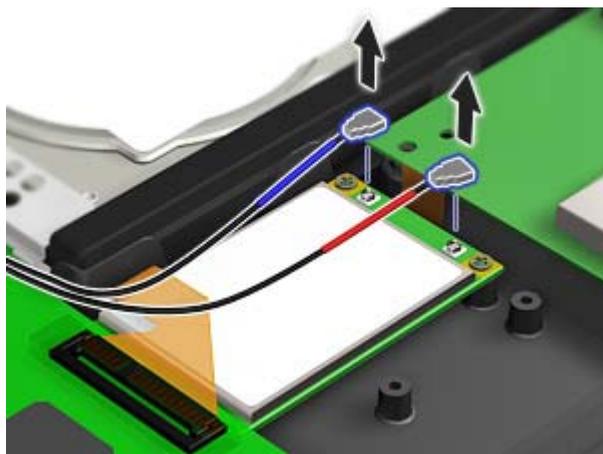
 **Attention:** Before you start installing a PCI Express Mini Card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. The static electricity could damage the card.

### Replacing the PCI Express Mini Card

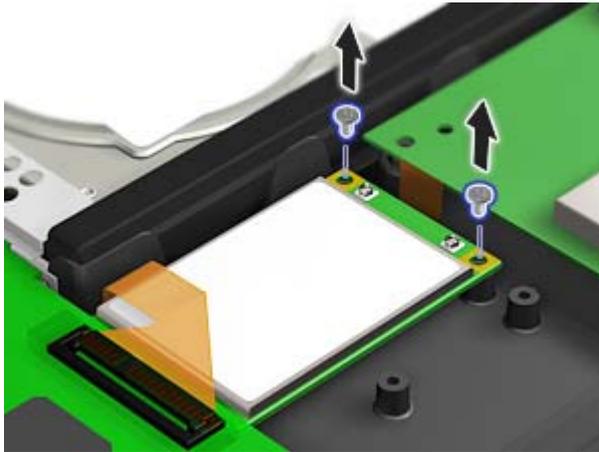
To replace the PCI Express Mini Card, do as follows:

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. [Remove the keyboard.](#)
5. [Remove the palm rest.](#)
6. 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 from the card by picking up the connectors with your fingers and gently unplugging them.

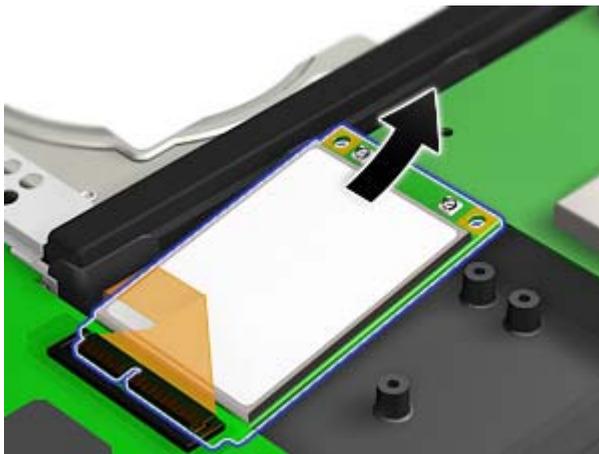
 **Note:** Depending on the system configuration of your computer, the card may have only one connector.



7. Remove the screws that secure the card.



8. Remove the card.



9. Align the contact edge of the new Wireless WAN Card with the corresponding socket contact of the computer.
10. Pivot the card until you can snap it into place by pressing the upper side of the connectors; then secure the card with the two screws. Connect the cables to the new card.

**\* Note:** Depending on the system configuration of your computer, the card may have only one connector.

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

## Power-status indicators

The computer has status indicators that show the mode (sleep/standby, hibernation, or normal), AC power status, and the status of the battery. The following shows the location and the meaning of the indicators:

### For models with *Bluetooth*



### For models with *Wireless USB*



#### 1. Sleep (standby in Windows® XP) status

- **Green:** The computer is in sleep (standby) mode.
- **Blinking green:** The computer is entering sleep (standby) or hibernation mode, or is resuming normal operation.

#### 2. AC power status

- **Green:** The AC adapter is connected and the computer is operating on AC power. If a battery is installed in the computer, it is charged when this indicator is green.
- **Off:** The computer is operating on battery power.

#### 3. Battery status

- **Green:** The battery has more than 20% charge.
- **Orange:** The battery has between 5% and 20% charge.
- **Fast blinking orange:** The battery has less than 5% charge.

**\* Note:** The battery may be charging.

- **Slow blinking orange:** The battery is being charged. When it reaches 20%, the blinking color changes to green.
- **Slow blinking green:** The battery has between 20% and 80% charge, and charging is continuing. When the battery reaches 80% charge, blinking stops, but the charging may continue until the battery is 100% charged.

**\* Note:** If the computer is operating on battery power, the Battery status indicator does not work while the computer is turned off or it is in sleep (standby) mode or hibernation mode.

If your computer is shipped with a wireless WAN feature, a *Bluetooth* feature, a *Wireless USB* feature, a wireless LAN feature, and a *WiMAX* feature, you can use the following indicators:

#### 4. Wireless WAN/*WiMAX* status

- **Green:** The wireless WAN feature or *WiMAX* feature is on, and the radio link is ready for use.
- **Blinking green:** Data is being transmitted.

#### 5. *Bluetooth* or *Wireless USB* status

- **Green:** The *Bluetooth* feature or *Wireless USB* feature is on, and the radio link is ready for use.
- **Blinking green:** Data is being transmitted.

#### 6. Wireless LAN status

- **Green:** The wireless feature (the IEEE 802.11 standard) is on, and the radio link is ready for use.
- **Blinking green:** Data is being transmitted.

## Location: wireless radio switch



[Front](#)



[Right](#)



**Left**



[Bottom](#)



### 2. [Wireless radio switch](#)

You can quickly turn the wireless features of your ThinkPad computer on and off using this switch.

## 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 IEEE 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 IEEE 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](#)
- ▶ [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® computer with the wireless LAN feature into an airplane, 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](#).

 **Note:** If you use the computer in tablet mode, do not cover the UltraConnect™ wireless antennas built into the display.

## 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 IEEE 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 security features](#)

▶ [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 IEEE 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 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 a city or an entire country, by use of multiple antenna sites or satellite systems maintained by wireless service providers.

Some ThinkPad® computers come with a built-in wireless WAN card integrating some wireless WAN technologies, such as 1xEV-DO or HSPA. 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.

**\* Note:** When the wireless WAN connection is enabled, you cannot set the screen orientation of your computer to Secondary Landscape.

For maximum performance from your wireless WAN connection, please keep the following best usage guidelines in mind:

- Keep your notebook away from your body.
- Place your notebook on a flat surface and keep the lid open at a 105 degree angle.
- If your notebook has a retractable antenna, ensure that the antenna is fully extended.
- Place your notebook away from concrete or brick walls that may dampen cellular signals.
- Best reception will be available near windows and other locations where cellular phone reception is the strongest.

To use a wireless WAN connection with built-in wireless WAN features, 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 Connection 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 Connection Manager and the balloon message "Wireless USB device associated" appears.
4. Remove the USB cable.
5. Wait until the status of the Wireless USB device in the Wireless USB Connection Manager changes to "Connected."

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 connect to a *Bluetooth* device, start [Access Connections™](#). Access Connections enables you to easily pair your computer with the available devices, take advantage of their functions, or transfer files.

To use a *Bluetooth* device, do the following:

Click **Start** --> **All Programs** --> **ThinkVantage** --> **Access Connections**, and then select the Connect to Devices tab.

Click the **Find** button to find the *Bluetooth* devices in your vicinity. Double-click the device or drag and drop it within the circle surrounding your computer to pair them, and then click the device again to select the task from the task list.

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 IEEE 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

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.

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 IEEE 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 IEEE 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.

## Wireless security features

Advances in wireless technology require that we manage your security more reliably than ever. Therefore, Lenovo has extended its Embedded Security Subsystem to encompass virtually all of our ThinkPad® and desktop computer lines. This security subsystem helps protect data, hardware, network access and communications - both wired and wireless - on select ThinkPad and desktop PCs.

The Embedded Security Subsystem provides hardware-based protection of critical security information, including passwords, encryption keys, and electronic credentials. It also helps identify computer users involved in transactions, and helps establish that data transmissions are authentic, confidential and intact.

Security and Privacy Services for wireless risk assessment and wireless solution design can help you assess the risks based on your business needs, identify your information risk position, and integrate security strategies, policies, and architectures to help you achieve your wireless e-business objectives. To effectively manage risk on an ongoing basis, organizations must have a sound security strategy. By understanding threats and vulnerabilities at an early stage, we can help define the necessary scope and features of your wireless e-business security infrastructure.

For more information on wireless security offerings, click the following link:

<http://www.pc.ibm.com/us/think/thinkvantagetech/security.html>

## 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

 No link or a very poor one

 Usable but weak link

 Strong link

 Wireless radio is disabled

 **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

## 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 Wireless Icon in the system tray.
2. Click **Power On Wireless Radio**.

To disable the wireless feature, do as follows:

1. Click the Wireless Icon in the system tray.
2. Click **Power Off Wireless Radio**.

**\* Note:** To enable the wireless radio, do as follows:

1. Select **On** for the Wireless LAN Radio Frequency in the [BIOS Setup Utility](#).
2. Select the On position of the wireless radio switch on the computer.
3. Click the Wireless Icon in the system tray and select **Power On Wireless Radio**. Or press Fn+F5, and then turn the feature on.

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

**\* Note:** You can also use the [Tablet Shortcut Menu](#) to enable or disable the wireless feature if you are using your computer in tablet mode.

## Wireless upgradeable ThinkPad models

Depending on the model, your ThinkPad® computer might 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 IEEE 802.11a/b/g 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* Daughter Card is designed to be interoperable with any *Bluetooth* product that is compliant to *Bluetooth* Specification 2.0 + EDR as defined by the *Bluetooth* SIG. Following profiles are supported by *Bluetooth* Daughter Card:

- 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

- Basic Image
- Handsfree
- AV

## **Usage environment and your health**

Wireless LAN PCI Express Mini Card and *Bluetooth* Daughter Card 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.

Because Wireless LAN PCI Express Mini Card and *Bluetooth* Daughter Card 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 or *Bluetooth* Daughter Card may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may for example include:

- Using the integrated wireless cards on board of airplanes, or in hospitals
- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

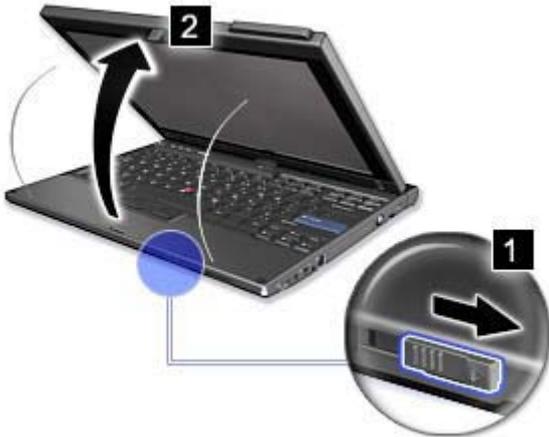
If you are uncertain of the policy that applies on the use of wireless devices in a specific organization (e.g. airport or hospital), you are encouraged to ask for authorization to use Wireless LAN PCI Express Mini Card or *Bluetooth* Daughter Card prior to turning on the computer.

## Using the tablet mode

In the tablet mode, you can use your ThinkPad® computer in a creative and intuitive way by jotting down notes and illustrations with the Tablet Digitizer Pen and then storing them digitally.

To use your ThinkPad computer in the tablet mode, do as follows:

1. Unlock the display latch **(1)** and open the computer display **(2)** slowly, holding the upper left and right sides of the display with both hands. Your computer is now in the **notebook mode**.



2. Open the display by at least 45 degrees, preferably by 90 degrees. Grasp the center of one side of the computer display with one hand while holding the keyboard bezel with the other hand; then rotate the display slowly clockwise or counter-clockwise (the figure below shows clockwise rotation as an example) until the back of the display is facing the keyboard. Your computer is now in the **picture frame mode**.

**\* Note:** While rotating the display, do not press the upper edge of either side of the display.



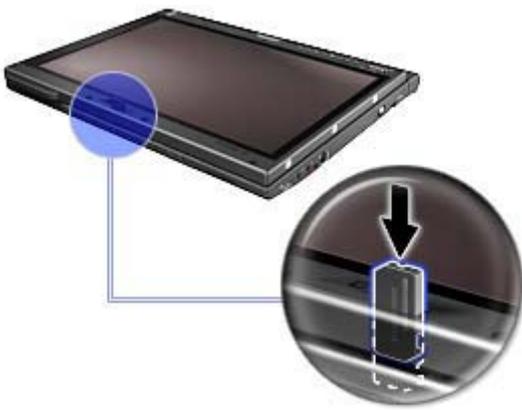
3. Close the computer display slowly, holding the upper left and right sides with both hands.

**\* Note:** Make sure that the display is rotated at 180 degrees, so that the back of the display faces the keyboard.



4. Press the center latch down to lock the display.

**\* Note:** Do not rotate, twist, or bend the center latch of the display.

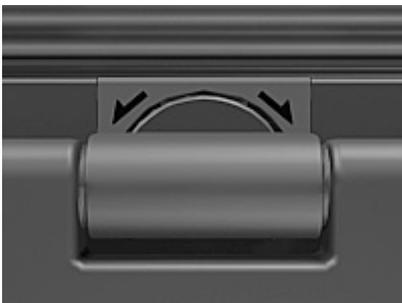


Your computer is now in the **tablet mode**.

To return your ThinkPad computer to the notebook mode, do as follows:

1. Take note of the display swivel indicator located on the hinge. The arrow lights green to show which direction you need to rotate the display to return it to notebook mode.

**\* Note:** Do not force the display to rotate in the wrong direction.



2. Unlatch the display latch and open the display by at least 45 degrees, preferably by 90 degrees.
3. Follow the direction shown by the dual-swivel indicator and rotate the display slowly (figure below shows counter-clockwise rotation as an example) until the front of the display is facing the keyboard.



Your computer is now in the **notebook mode**.

### Tips on using your computer in the tablet mode

- To close the computer display, first make sure that the display either faces the keyboard or is positioned at 180 degrees to the keyboard, so that the back of the display faces the keyboard.
- Do not pick up or hold the computer by the display only.
- Do not hit, vibrate, or bump the computer display.
- To allow free ventilation, do not place any obstacle, such as a thick-piled carpet or a soft cushion, in front of the fan.
- When you use the computer in the picture frame mode, hold the display with one hand and use the Tablet Digitizer Pen.
- If you hold the computer with one hand while using it in the tablet mode, do not expose it to excessive vibration, shock, or rotation.
- Do not use the computer outdoors. Do not expose it to rain.
- If you put your computer in a carrying case, put it into notebook mode and close the display.

## Using the Tablet Digitizer Pen

The Tablet Digitizer Pen and its accessories are shipped in a separate box within the ThinkPad® shipping box. You can use the pen to control your computer just as you would with a mouse or keyboard.

**\* Note:** This pen is not waterproof. Take care not to soak it or dip it in water.

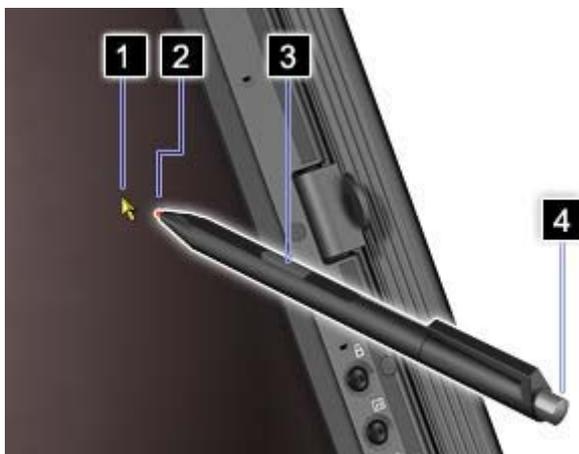
You can store the pen in the slot on the right side of the ThinkPad computer. Press it gently into the slot until you hear a click.

To remove the pen from its slot, press it gently into the slot **(1)** to release it; then pull it out **(2)**.



**\* Note:** The pen contains pressure sensors. Do not push the tip of the pen for an extended period of time. Do not subject the pen to shock or vibration.

The Tablet Digitizer Pen consists of a tip **(2)**, a click button **(3)**, and an eraser tip **(4)**. Hold the pen and point the tip at the display to move the cursor **(1)**.



To make a selection (single click), tap the display once with the pen. To double-click, tap twice without pausing. To do a right-click, tap the display once and then hold the tip of the pen on the display; the right-click icon appears.

Pressing the click button **(3)** is the same as a right-click. The eraser tip **(4)** functions like an eraser in applications that support this function.

**\* Note:** You can enable or disable the pen buttons in the Tablet and Pen Settings panel of the [Tablet Shortcut Menu](#).

**\* Note:** The Digitizer Pen shipped with the ThinkPad X200 Tablet computer is for use with that computer only. Do not insert it into the pen slot of the ThinkPad X41 Tablet computer.

only. Do not insert it into the pen slot of the ThinkPad X200 Tablet computer.

## Using the Tablet PC Input Panel

Besides functioning as a basic selection tool, the Tablet Digitizer Pen also enables you to write text or draw on the screen, as you would with a pen on paper. Different methods of input can be chosen from the Tablet PC Input Panel on the Windows® taskbar.

To configure the Tablet Digitizer Pen settings, use the Tablet and Pen Settings panel of the [Tablet Shortcut Menu](#).

## Replacing the Tablet Digitizer Pen tip

The tip of the Tablet Digitizer Pen may wear out. Replacement tips and a tip removal tool are included in the pen box shipped with your computer.

**\* Note:** Your computer is shipped with five replacement tips for the Digitizer Pen. Be sure to store the pen tips in a secure place for future use. The pen tips will not be covered under the warranty for the digitizer pen or the computer.

To replace a pen tip, do as follows:

1. Grip the pen tip with the tip removal tool, and pull it out.



2. Insert a replacement pen tip fully into the Tablet Digitizer Pen.



## Using the touch panel

Some models have the touch panel feature. The touch panel feature makes the interaction with your ThinkPad computer even more natural, because you can use your finger instead of a pen for navigation on the go.

To make a selection (single click), tap the display once with your finger. To double-click, tap twice without pausing. To do a right-click, tap the display once and then hold your finger on the display until the right-click icon appears.

### Tips on using the touch panel

- The touch panel is a glass panel covered with a plastic film. For input you can use either your finger or the Tablet Digitizer Pen shipped with your computer. Do not use any pen other than the specified one, or any metallic object, because to do so might damage the touch panel or cause it to malfunction.
- If you put your computer in a carrying case, put it into notebook mode and close the display. Do not carry your computer in tablet mode.
- If you use both your finger and the Tablet Digitizer Pen simultaneously for input to the screen, only data entered by use of the Digitizer Pen will be processed.
- If you use your finger to input to the touch panel, touch only one point at a time. If you touch several points simultaneously, the input will not be processed correctly.
- With the touch panel, gradually a discrepancy may start to appear between the point you touched with your finger during the finger point, and its actual position on the screen. To avoid this, regularly correct the accuracy of the finger input by use of the touch panel Settings Utility.

### Cleaning the touch panel display

1. To remove fingerprints, etc., from the touch panel display, use a dry, soft, lint-free cloth. (A piece of absorbent cotton will also serve the purpose.) Do not apply solvents to the cloth.
2. Gently wipe foreign particles and dust from the touch panel with one side of the cloth.
3. Wipe smudges or fingerprints with the other side of the cloth, or with a clean cloth.
4. After using the cloth, wash it with a neutral detergent.