

# 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, 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.

The contents are similar for all the Lenovo host PC devices, so the manual for ThinkPad T400/R400/T500/R500/W500 represents in this exhibit.

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## ThinkPad® 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: PD9533ANXMU (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 radiated output power of the Wireless LAN Mini PCI Express Card authorized to use for the your ThinkPad 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 Mini PCI Express 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.**

For the location of the antenna, see the “Location of the UltraConnect wireless antennas” section 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 IEEE 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 9. 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: HJY-LBUA0ZZKB1 (Model: LBUA0ZZKB1-214)

**i) FCC ID and installation of the module:** If you find the FCC ID "HJY-LBUA0ZZKB1" on the label at the bottom side of your computer, your computer integrates the Wireless USB card (Model: LBUA0ZZKB1-214). 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 9. Also it has been certified as an intentional radiator regarding FCC Part 15 Subpart F under the FCC ID: HJY-LBUA0ZZKB1.

#### **IV. 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: HJY-LBUA0ZZKB1)

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

1. 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.
2. 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: LBUA0ZZKB1-214) is not permitted in Canada. Please do not use this module, as it will be a violation of Industry Canada regulations.

**IV) 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 AR5BHB63-L, 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.

**V) 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 4.2.

## Numéro d'homologation IC

**I) 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 connaître l'emplacement de ce logement, consultez la section correspondante dans l'aide Access.

**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: TBD (French translation)

**IV) Remarque relative aux appareils de communication radio de faible puissance sans licence (CNR-210):** Le fonctionnement de ce type d'appareil est soumis aux deux conditions suivantes:

1. Cet appareil ne doit pas perturber les communications radio, et



2. cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Les périphériques d'émission sont conçus pour fonctionner avec des antennes intégrées 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 , AR5BHB63-L, 512AN\_MMW, 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.

#### **V) 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)".

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. (Will be translated to French)

## Electronic emission notices

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

- Model: AR5BHB63-L

**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 or RD02-D330 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'empêche 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.

***Avvertissement:*** 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 ou RD02-D330 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.

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

## ThinkPad tour

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

[Front](#)

[Right side](#)

[Left side](#)

[Bottom](#)

[Rear](#)

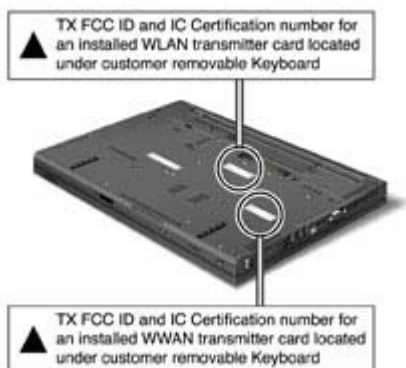
ThinkPad

## 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.

### ThinkPad T500 and W500



### ThinkPad T400 and R400



### ThinkPad R500



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 connection](#) or [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.

### ThinkPad T500 and W500



#### 1. 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 top left portion 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 right corner 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.

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

The main antenna connected to the wireless LAN or WiMAX feature is located at the upper left side of the computer display.

#### 5. Wireless WAN antenna

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

### ThinkPad T400 and R400



#### 1. 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 top left portion 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 (Auxiliary)

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

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

The main antenna connected to the wireless LAN or WiMAX feature is located at the upper left side of the computer display.

#### 5. Wireless WAN antenna

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

### ThinkPad R500



#### 1. Wireless LAN antenna (Auxiliary)

The auxiliary antenna for the wireless LAN feature is located at the top left portion of the computer display.

#### 2. 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 top right portion of the computer display.

#### 3. Wireless LAN antenna (Main)

The main antenna for the wireless LAN feature is located at the upper left side of the computer display.

Location: Bluetooth antenna

[ThinkPad T500 and W500](#)

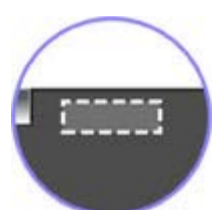
[ThinkPad T400 and R400](#)

[ThinkPad R500](#)

### ThinkPad® T500 and W500



#### 2. [Bluetooth antenna](#)



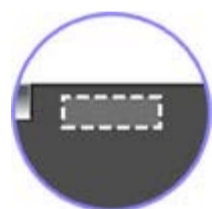
Some models have the [Integrated Bluetooth features](#).



### ThinkPad® T400 and R400



#### 3. [Bluetooth antenna](#)



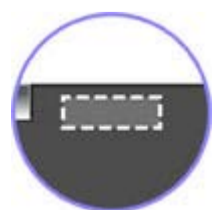
Some models have the [Integrated Bluetooth features](#).



### ThinkPad® R500



#### 3. [Bluetooth antenna](#)



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



Location: PCI Express Mini Card slot for Wireless WAN

ThinkPad® T500 and W500



7. [PCI Express Mini Card slot for Wireless WAN](#)



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

## ThinkPad® T400 and R400



### 8. [PCI Express Mini Card slot for wireless WAN](#)



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

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

▼ [ThinkPad T500 and W500](#)

▼ [ThinkPad T400 and R400](#)

▼ [ThinkPad R500](#)

### ThinkPad® T500 and W500



### 9. [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.

## ThinkPad T400 and R400



### 4. [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.

**\* Note:** ThinkPad R400 does not support WiMAX feature.

## ThinkPad R500



**Front**



**Right**



**Left**



**Bottom**



**Rear**



### 7. PCI Express Mini Card slot for wireless LAN




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


## 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 slot for connection to a wireless LAN/WiMAX. To replace the PCI Express Mini Card with a new one, read the following prerequisites and then select your model from the list below.

### Prerequisites for the procedure

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

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

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

### Replacement instructions

- ▶ [For ThinkPad® T500 and W500](#)
- ▶ [For ThinkPad T400 and R400](#)
- ▶ [For ThinkPad R500](#)



## Installing and replacing a PCI Express Mini Card for wireless LAN/WiMAX connection (T500 and W500)

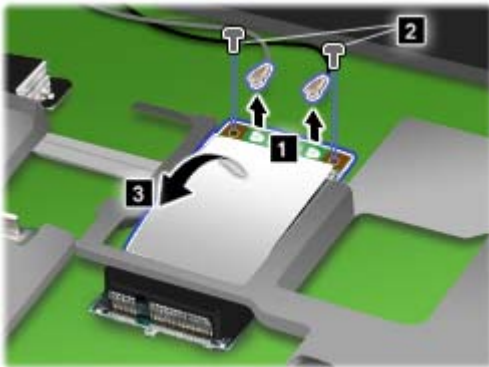
Before you start, print these instructions.

Your ThinkPad® 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.

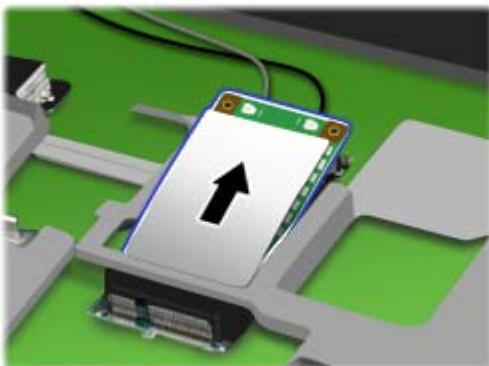
- ▼ [Replacing a PCI Express Mini Card with two connectors.](#)
- ▼ [Replacing a PCI Express Mini Card with three connectors.](#)
- ▼ [Replacing a half size PCI Express Mini Card.](#)

### 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. [Remove the keyboard.](#)
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 (1). If no such tool is included, disconnect the cables (1) by picking up the connectors with your fingers and gently unplugging them. Remove the screws (2). The card pops up (3).

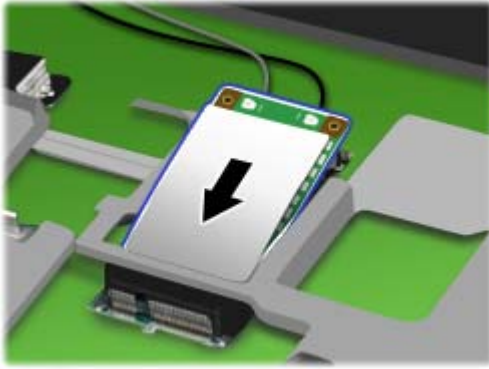


6. Remove the card.



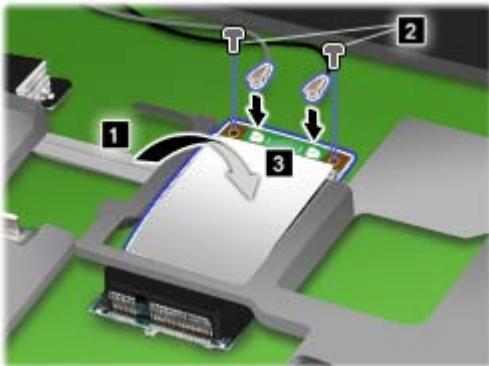
7. Align the contact edge of the new PCI Express Mini Card with the corresponding socket contact of the

computer.

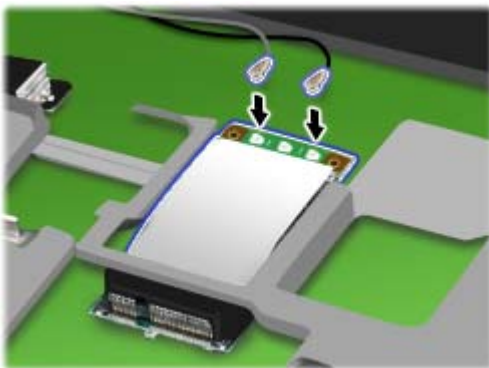


8. Pivot the card until you can snap it into place by pressing the upper side of the connectors **(1)**, and secure the card with the two screws **(2)**. Connect the cables to the new PCI Express Mini Card **(3)**.

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, and the black cable to the connector marked "2".



**\* 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 "1" on the card, and the black cable to the connector marked "2". If you attach either cable to the center connector, the connection speed will be lower.

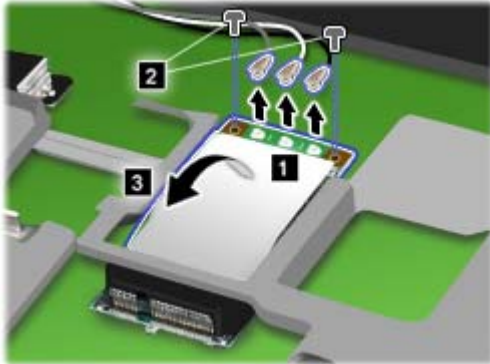


9. [Reinstall the keyboard.](#)
10. [Reinstall the battery.](#)
11. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

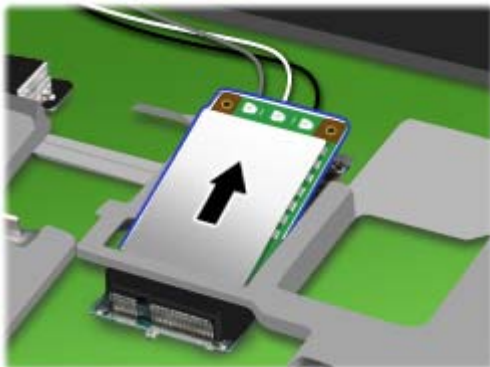
## Replacing a PCI Express Mini Card with three connectors

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:

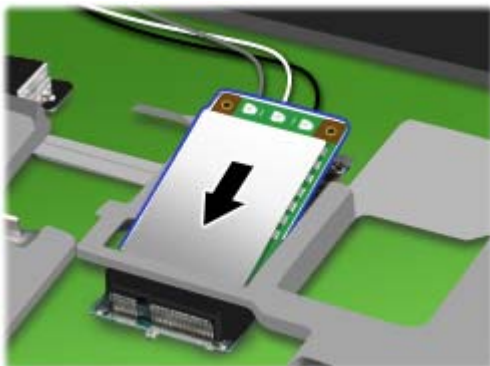
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
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 **(1)**. If no such tool is included, disconnect the cables **(1)** by picking up the connectors with your fingers and gently unplugging them. Remove the screws **(2)**. The card pops up **(3)**.



6. Remove the card.

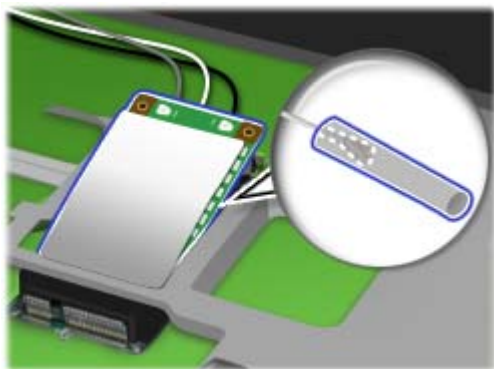


7. Align the contact edge of the new card with the corresponding socket contact of the computer.



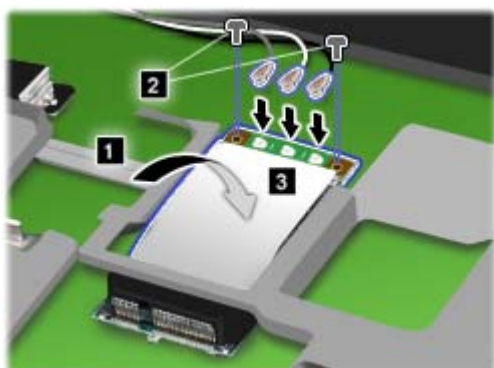
**\* Note:** If the new PCI Express Mini Card has two connectors, as in the next drawing, be sure to attach the gray cable to the connector marked "1" on the card, and the black cable to the connector marked "2".

Put the white cable in the cable protection tube.



8. 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 **(3)**.

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, the white cable to the connector marked "3", and the black cable to the connector marked "2".

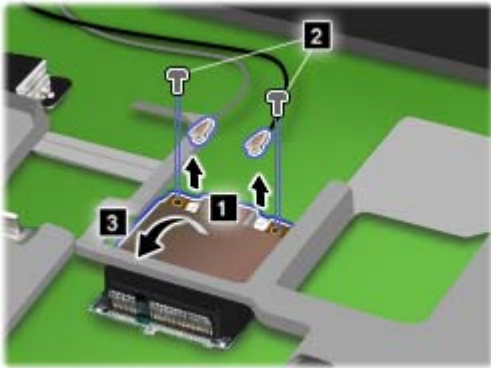


9. [Reinstall the keyboard.](#)
10. [Reinstall the battery.](#)
11. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

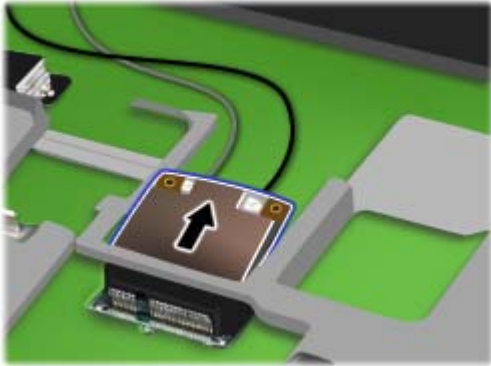
## Replacing a half size PCI Express Mini Card

Your computer may have a half size PCI Express Mini Card. To replace the card, do as follows:

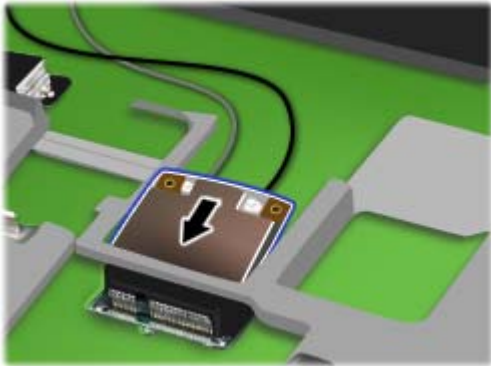
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card **(1)**. If no such tool is included, disconnect the cables **(1)** by picking up the connectors with your fingers and gently unplugging them. Remove the screws **(2)**. The card pops up **(3)**.



6. Remove the card.

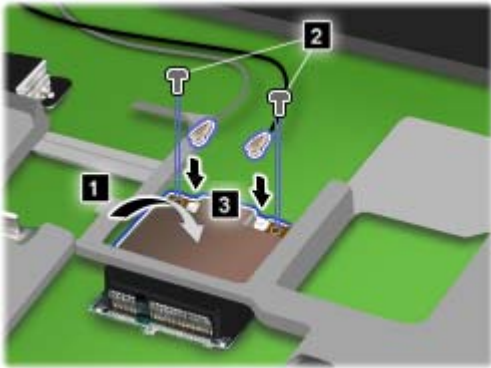


7. Align the contact edge of the new card with the corresponding socket contact of the computer.



8. 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 (3).

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, the white cable to the connector marked "3", and the black cable to the connector marked "2".



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



## Installing and replacing a PCI Express Mini Card for wireless LAN/WiMAX connection (T400 and R400)

Before you start, print these instructions.

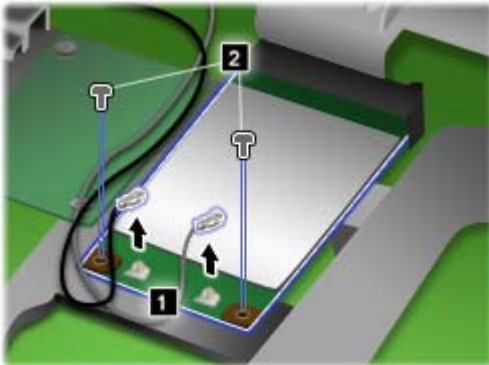
Your ThinkPad® has a PCI Express Mini Card slot for connection to a wireless LAN/WiMAX.

\* **Note:** ThinkPad R400 does not support WiMAX.

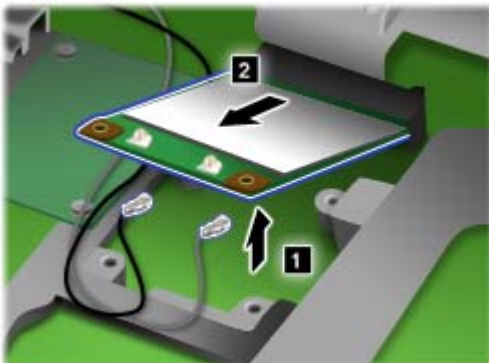
- ▼ [Replacing a PCI Express Mini Card with two connectors.](#)
- ▼ [Replacing a PCI Express Mini Card with three connectors.](#)
- ▼ [Replacing a half size PCI Express Mini Card.](#)

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

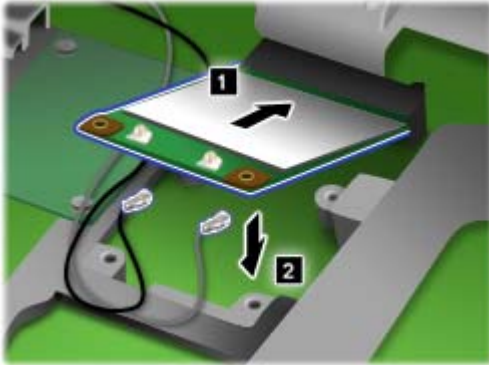
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
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 (1). If no such tool is included, disconnect the cables (1) by picking up the connectors with your fingers and gently unplugging them. Remove the screws (2).



6. The card pops up (1). Then remove the card (2).

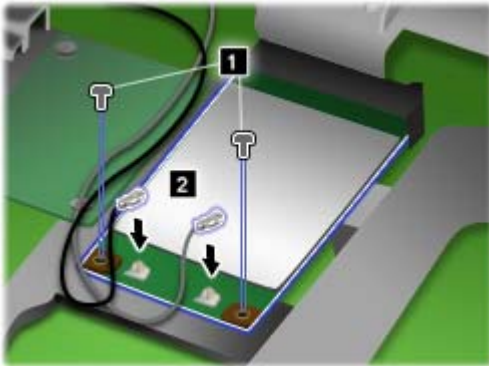


- Align the contact edge of the new PCI Express Mini Card with the corresponding socket contact of the computer (1). Pivot the card until you can snap it into place by pressing the upper side of the connectors (2).

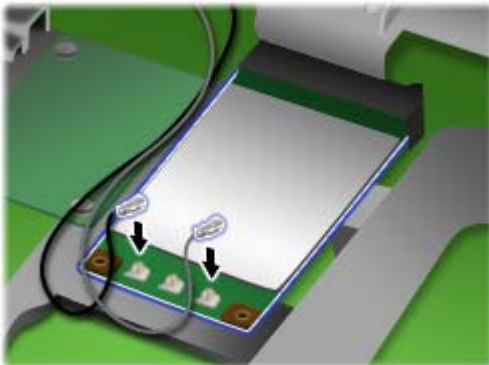


- Secure the card with the two screws (1). Connect the cables to the new PCI Express Mini Card (2).

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, and the black cable to the connector marked "2".



**\* 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 "1" on the card, and the black cable to the connector marked "2". If you attach either cable to the center connector, the connection speed will be lower.



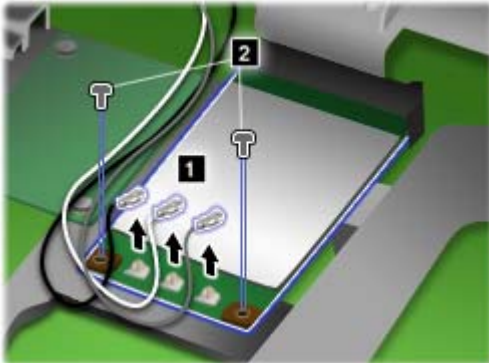
- [Reinstall the keyboard.](#)
- [Reinstall the battery.](#)
- Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.



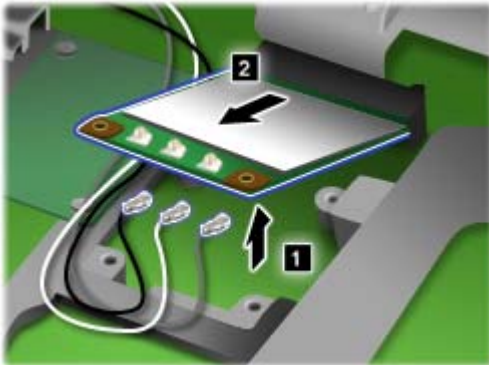
## Replacing a PCI Express Mini Card with three connectors

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:

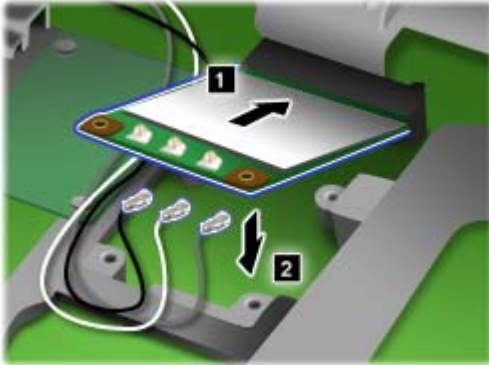
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
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 **(1)**. If no such tool is included, disconnect the cables **(1)** by picking up the connectors with your fingers and gently unplugging them. Remove the screws **(2)**.



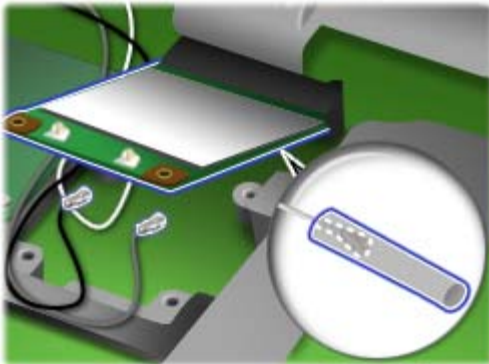
6. The card pops up **(1)**. Then remove the card **(2)**.



7. Align the contact edge of the new card with the corresponding socket contact of the computer **(1)**. Pivot the card until you can snap it into place by pressing the upper side of the connectors **(2)**.

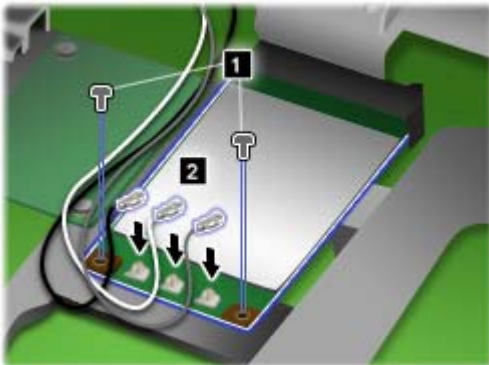


**\* Note:** If the new PCI Express Mini Card has two connectors, as in the next drawing, be sure to attach the gray cable to the connector marked "1", and the black cable to the connector marked "2". Put the white cable in the cable protection tube.



8. Secure the card with the two screws (1). Connect the cables to the new PCI Express Mini Card (2).

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, the white cable to the connector marked "3", and the black cable to the connector marked "2".



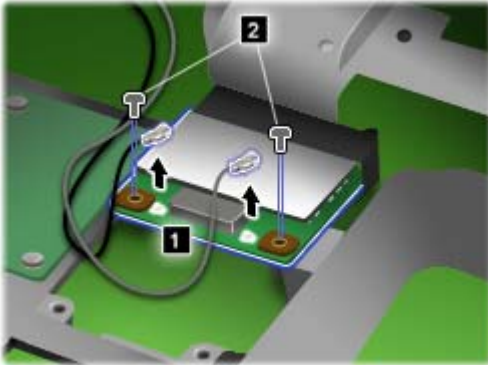
9. [Reinstall the keyboard.](#)

10. [Reinstall the battery.](#)

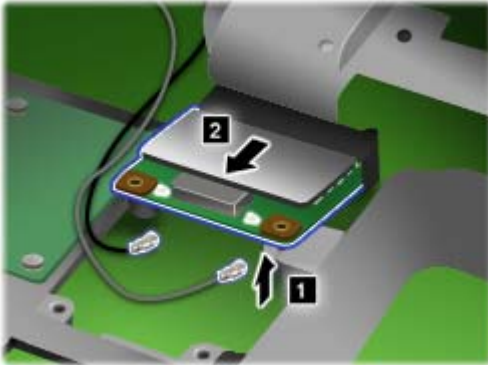
11. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

## Replacing a half size PCI Express Mini Card

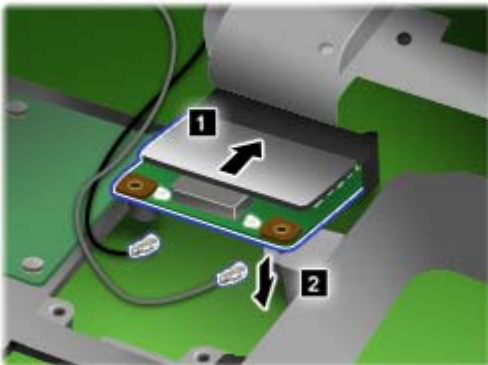
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
5. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card (1). If no such tool is included, disconnect the cables (1) by picking up the connectors with your fingers and gently unplugging them. Remove the screws (2) .



6. The card pops up (1). Then remove the card (2).

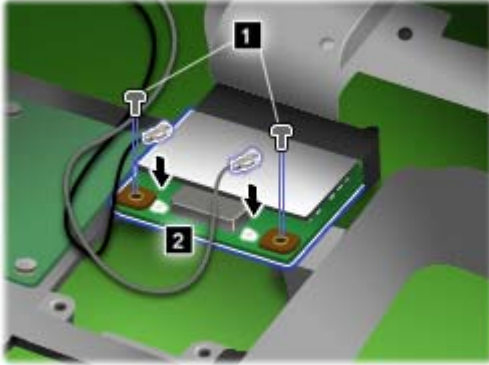


7. Align the contact edge of the new card with the corresponding socket contact of the computer (1). Pivot the card until you can snap it into place by pressing the upper side of the connectors (2).



8. Secure the card with the two screws (1). Connect the cables to the new PCI Express Mini Card (2).

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, and the black cable to the connector marked "2".



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

## Installing and replacing a PCI Express Mini Card for wireless LAN connection (R500)

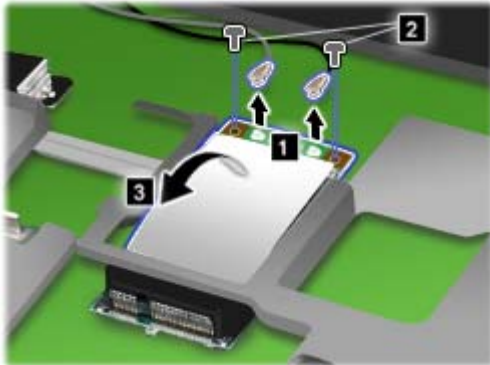
**Before you start, print these instructions.**

Your ThinkPad® has a PCI Express Mini Card slot for connection to a wireless LAN.

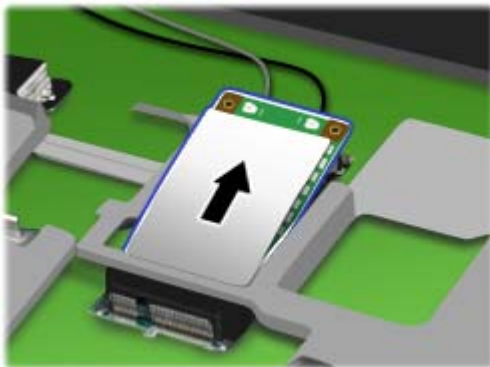
- ▼ [Replacing a PCI Express Mini Card with two connectors.](#)
- ▼ [Replacing a PCI Express Mini Card with three connectors.](#)
- ▼ [Replacing a half size PCI Express Mini Card.](#)

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

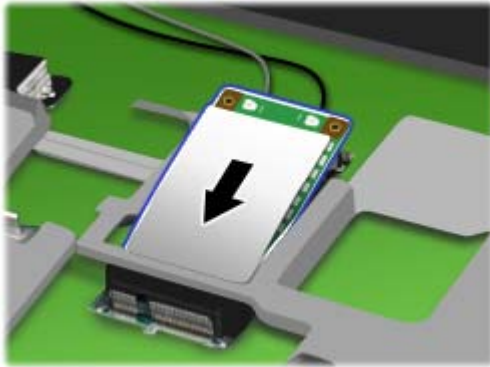
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
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 **(1)**. If no such tool is included, disconnect the cables **(1)** by picking up the connectors with your fingers and gently unplugging them. Remove the screws **(2)**. The card pops up **(3)**.



6. Remove the card.

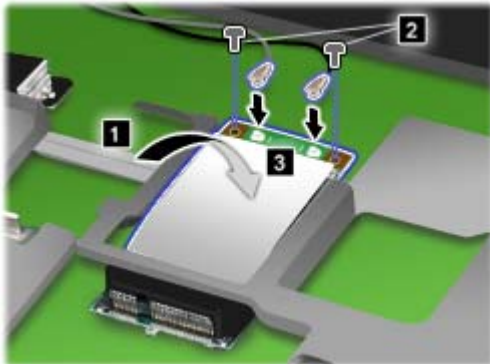


7. Align the contact edge of the new PCI Express Mini Card with the corresponding socket contact of the computer.

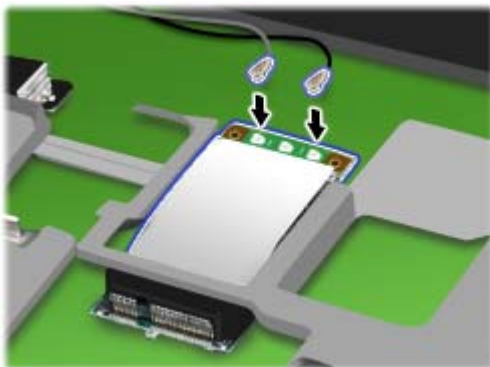


8. Pivot the card until you can snap it into place by pressing the upper side of the connectors (1), and secure the card with the two screws (2). Connect the cables to the new PCI Express Mini Card (3).

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, and the black cable to the connector marked "2".



**\* 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 "1" on the card, and the black cable to the connector marked "2". If you attach either cable to the center connector, the connection speed will be lower.



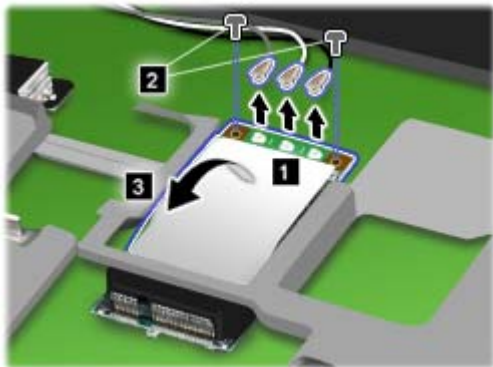
9. [Reinstall the keyboard.](#)
10. [Reinstall the battery.](#)
11. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

## Replacing a PCI Express Mini Card with three connectors

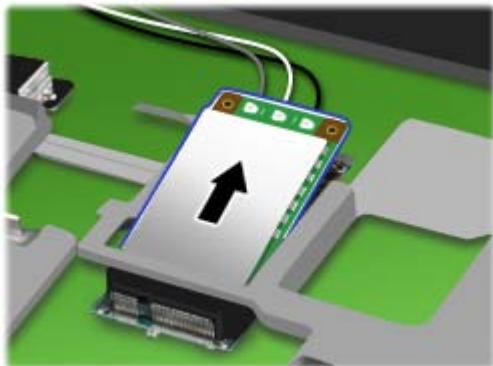


connectors comes with the computer. To replace the card for the MIMO feature, do as follows:

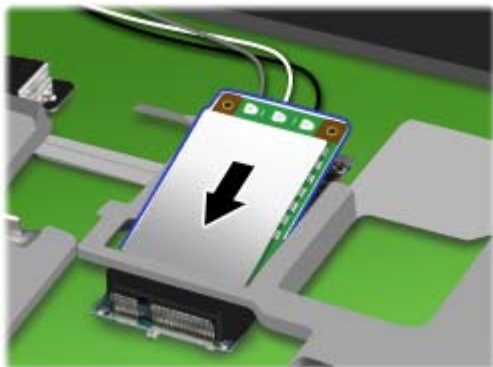
1. Turn off the computer; then disconnect the AC adapter and all cables from the computer. Wait for a few minutes, till the inside of the computer cools, before you start the following procedures.
2. Close the computer display, and turn the computer over.
3. [Remove the battery.](#)
4. [Remove the keyboard.](#)
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 **(1)**. If no such tool is included, disconnect the cables **(1)** by picking up the connectors with your fingers and gently unplugging them. Remove the screws **(2)**. The card pops up **(3)**.



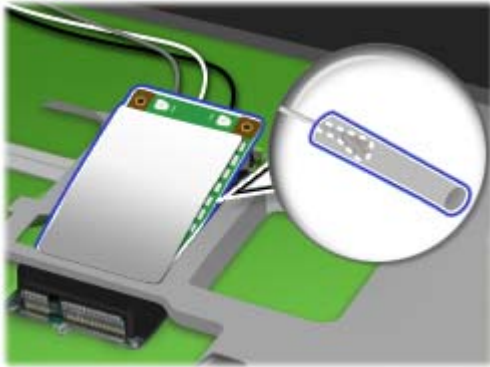
6. Remove the card.



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

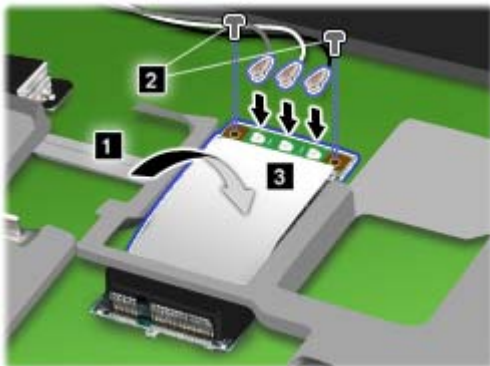


**\* Note:** If the new PCI Express Mini Card has two connectors, as in the next drawing, be sure to attach the gray cable to the connector marked "1" on the card, and the black cable to the connector marked "2". Put the white cable in the cable protection tube.



8. 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 **(3)**.

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, the white cable to the connector marked "3", and the black cable to the connector marked "2".



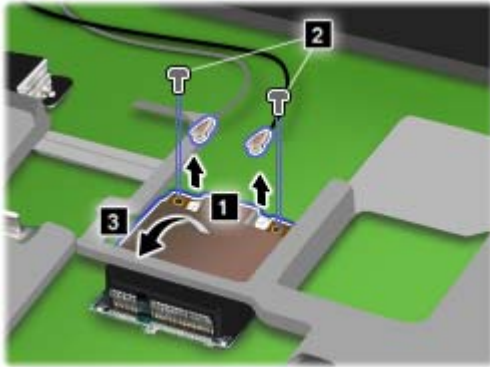
9. [Reinstall the keyboard.](#)
10. [Reinstall the battery.](#)
11. Turn the computer over again. Connect the AC adapter and cables to the computer; then turn it on.

## Replacing a half size PCI Express Mini Card

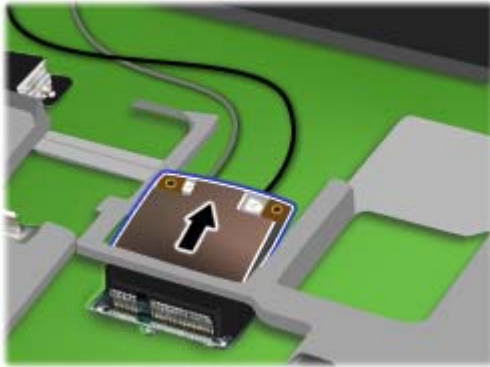
Your computer may have a half size PCI Express Mini Card. To replace the card, do as follows:

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. If a tool for removing connectors is included in the package with the new card, use it to disconnect the cables from the card **(1)**. If no such tool is included, disconnect the cables **(1)** by picking up the connectors with your fingers and gently unplugging them. Remove the screws **(2)**. The card pops up **(3)**.

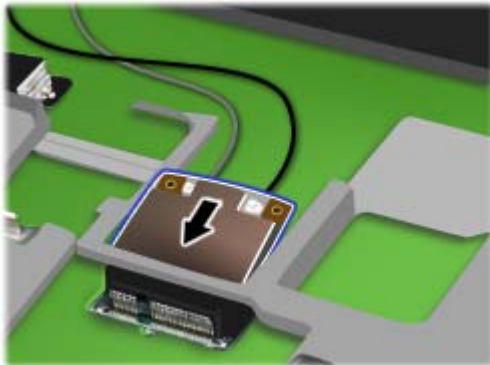




6. Remove the card.

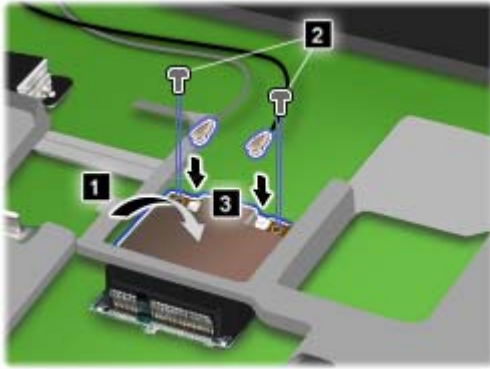


7. Align the contact edge of the new card with the corresponding socket contact of the computer.



8. 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 (3).

**\* Note:** Be sure to attach the gray cable to the connector marked "1" on the card, the white cable to the connector marked "3", and the black cable to the connector marked "2".



9. [Reinstall the keyboard.](#)
10. [Reinstall the battery.](#)
11. 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:



### 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. Status of AC power

- **Green:** The AC adapter is connected and the computer is operating on AC power. If a battery is installed on 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 is in sleep (standby) mode or hibernation mode.

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

### 4. Wireless WAN status

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

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

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

### 6. Wireless LAN status

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

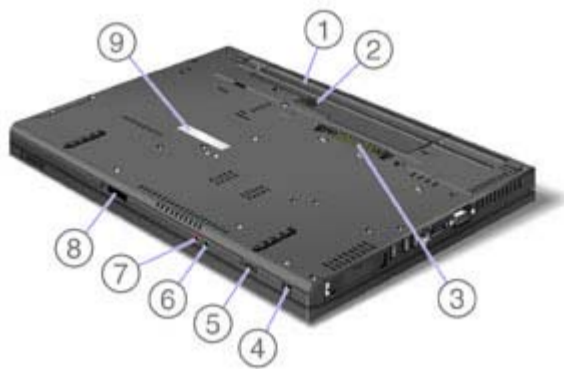
**Location: Wireless radio switch**

[ThinkPad T500 and W500](#)

[ThinkPad T400 and R400](#)

[ThinkPad R500](#)

**ThinkPad® T500 and W500**



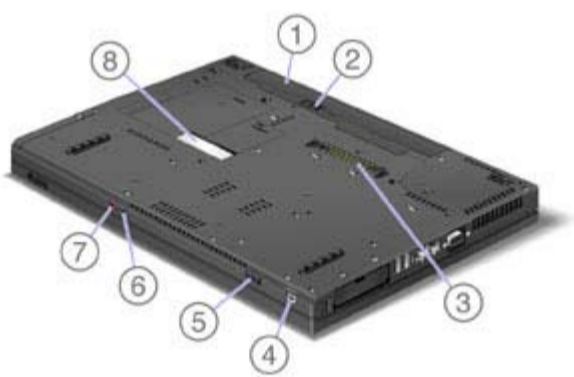
4. [Wireless radio switch](#)



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



**ThinkPad® T400 and R400**



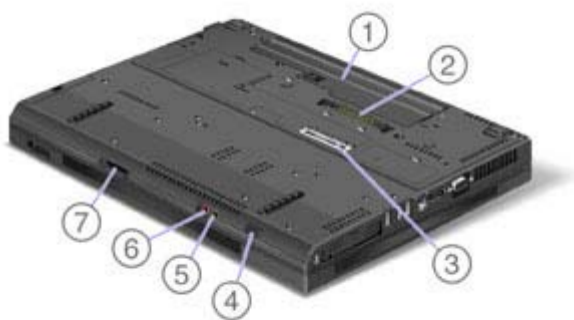
4. [Wireless radio switch](#)



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



**ThinkPad® R500**



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 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.

[Using wireless LAN connections](#)

[Using wireless WAN connections](#)

[Using \*Bluetooth\*](#)


[Using Wireless USB](#)


[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](#).

### 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](#)

[Checking wireless connection status](#)


[Enabling or disabling the wireless feature](#)

[Wireless upgradeable ThinkPad models](#)

## Using wireless WAN connections

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

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

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

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

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



## Using Wireless USB

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.



## 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 called the Trusted Platform Module (TPM) 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.

Client Security Solution provides enhanced security for both wired and wireless networks. For both types of network, the Client Security Solution and TPM ensure data confidentiality and availability by providing a hardware- and software-based architecture for better protection of the sensitive keys, identity information, and confidential data. Also, for wireless networks the TPM hardware provides enhanced authentication and session confidentiality by concealing authentication credentials for industry-standard 802.1x protocols and Cisco LEAP.

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



Power to the wireless radio is on. The signal strength of the wireless connection is poor. To improve signal strength, move your system closer to the wireless access point.



Power to the wireless radio is on. The signal strength of the wireless connection is marginal.



Power to the wireless radio is on. The signal strength of the wireless connection is excellent.



Power to the wireless radio is off.



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

1. Select **Enabled** for the Internal Wireless Device in the [BIOS Setup Utility](#).
2. Select the On position of the wireless radio switch on the computer.
3. Click the Access Connections wireless icon in the system tray and select **Turn Wireless Radio On**. 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.

## **8 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](#).