Atheros AR5001X Mini PCI Wireless Network Adapter Client Utility Help

Introduction

The Atheros AR5001X Mini PCI Wireless Network Adapter are reference designs based on the Atheros AR5001 chipsets. These reference designs support all IEEE 802.11a data rates (6 to 54 Mbps) and 802.11b data rates (1 to 11 Mbps). In the Atheros Turbo ModeTM, they support data rates up to 108 Mbps.

The Atheros Client Utility (ACU) is a user-mode utility designed to display information and statistics pertaining to a selected Atheros NIC, as well as to allow users to edit and add configuration profiles.

Station Configuration

Configure the Atheros AR5001X Mini PCI Wireless Network Adapter through the Atheros Client Utility. The wireless network adapter (also called wireless card) works in either access point mode (infrastructure mode - leverages an AP) or ad hoc mode (a group of stations participating in the WLAN).

To switch to another configuration profile, click on the profile name in the Select Profile list, then click the Apply button.

- To add a configuration profile
- To edit a configuration profile
- Access Point (infrastructure) mode profile configuration
- Ad Hoc mode profile configuration

Add or Edit a Configuration Profile

1. To add a configuration profile, click New on the Station Configuration tab. To edit a configuration profile, select the configuration from the list of profiles and click the Modify button.

2. The Network Configuration Settings dialog box displays the General tab.

Edit the Network Configuration Settings:

- Edit the General tab.
- Edit the Security tab.
- Edit the Advanced tab.

To configure a profile for ad hoc or access point (infrastructure) mode, edit the Network Type field on the General tab.

General Tab

In the Atheros Client Utility, access the General tab by clicking New or Modify on the Station Configuration tab.

Edit the fields in the General tab to configure the configuration profile.

Make sure to also edit the Security and Advanced tabs.

Field Name	Description
Configuration Name	Identifies the configuration. This name must be unique. Configuration names are not case sensitive.
Network Name	The IEEE 802.11a wireless network name, for example, Atheros 802.11a Wireless Network. This field has a maximum limit of 32 characters.
Network Type	Defines whether the station is configured for an ad hoc or access point network.
Power Save Mode	The power management options. Power management is disabled in ad hoc mode. *Off* The adapter receives full power from the PC. *Normal* The driver turns off power to the adapter for short periods over briefly spaced time intervals. *Maximum* The driver turns off power to the adapter for longer periods over more widely spaced time intervals.

Security Tab

In the Atheros Client Utility, access the Security tab by clicking New or Modify on the Station Configuration tab.   Click the Security tab.

Edit the fields in the Security   tab of the Network Configuration Settings to configure the profile.

Make sure to also edit the General and Advanced tabs.

Field Name	Description
Encryption Type	Specifies the encryption type: *Use Dynamic Security* Use dynamic encryption keys, such as those defined by Cisco LEAP or 802.1X. To use Cisco LEAP, make sure the checkbox "Enable Cisco LEAP" is checked, and fill in the LEAP User Name and Password. *Use Static Keys* Use static encryption keys. Enter the keys in the Encryption Keys fields. *Disabled* Use no encryption.
Enable Cisco LEAP	Enables the use of Cisco LEAP for dynamic security keys. Click the Use Dynamic Security radio button under Encryption Type to use Cisco LEAP.
User Name	The user name used to log in to the network.
Password	The password used to log in to the

	network. This password is encrypted using the same encryption type as the encryption keys.

To define static encryption keys, click the Define Static Encryption Keys button with either Dynamic Security or Static Keys selected.   Fill in the security dialog box.

Advanced Tab

In the Atheros Client Utility, access the Advanced tab by clicking New or Modify on the Station Configuration tab, then clicking the Advanced tab.

Edit the fields in the Advanced tab of the Network Configuration Settings to configure the configuration profile.

Make sure to also edit the General and Security tabs.

Field Name	Description
Wireless Address	Wireless Address Specify the wireless card address in hexadecimal (0-9, A-F).
Scan Mode	Specify passive or auto scans. The scan mode is set by the country code, with most regions using an active scan mode. Passive mode sets the wireless card to listen-only mode. To override an active setting, click passive.
802.11b Preamble	Specifies the preamble setting in 802.11b. The default setting is Short & Long, which allows both short and long headers in the 802.11b frames. Set to Long Only to override allowing short frames.
Wireless Mode	Specifies 5GHz 54 Mbps, 5 GHz 108 Mbps, or 2.4 GHz 11 Mbps operation in an access point network.
Wireless Mode when Starting Ad Hoc Network	Specifies 5GHz 54 Mbps, 5 GHz 108 Mbps, 2.4 GHz 11 Mbps to start an ad hoc network if no matching network name is found after scanning all available modes.
QoS	Disables or enables the station to cooperate in a network using Quality of Service.
Transmit Power Level	Selects full, half, quarter, eighth, or lowest transmit power.

Ad Hoc Mode Profile Configuration

To configure a profile in ad hoc mode, change the Network Type in the General tab. This table provides the General tab field descriptions to configure a profile for ad hoc mode:

Field Name	Description
Configuration Name	Identifies the configuration. This name must be unique. Configuration names are not case sensitive.
Network Name	A network name is mandatory for ad hoc mode. The SSID for all stations in a single ad hoc network must be the same.
Network Type	Ad hoc.
Power Save Mode	Power saving mode is currently not supported in ad hoc mode.

Make sure to also edit the Security and Advanced tabs.

Ad Hoc Mode

In ad hoc mode, a Wireless Network Adapter works within an independent basic service set (IBSS), as illustrated here. All stations communicate directly with other stations without an AP.

Ad Hoc Mode

To connect to an ad hoc network, configure the profile for Ad Hoc mode.

Access Point Mode Profile Configuration

To configure a profile in Access Point (infrastructure) mode, change the Network Type in the General tab.

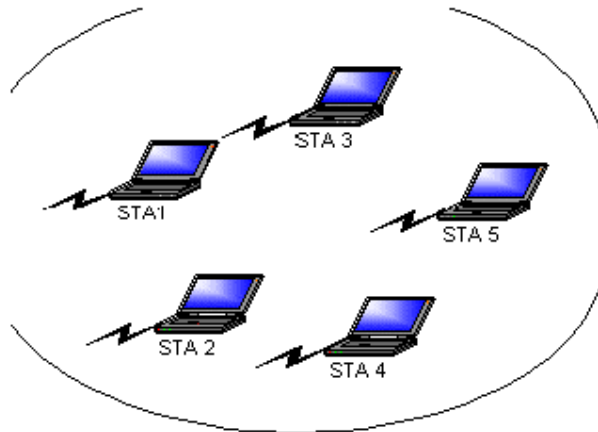This table provides the General tab field descriptions to configure a profile for access point mode:

Field Name	Description
Configuration Name	Identifies the configuration. This name must be unique. Configuration names are not case sensitive.
Network Name	The IEEE 802.11a wireless network name, for example, Atheros 802.11a Wireless Network. This field has a maximum limit of 32 characters.
Network Type	Access Point.
Power Save Mode	The power management options. ***Off*** he adapter receives full power from the PC. ***Normal*** The driver turns off power to the adapter for short periods over briefly spaced time intervals. ***Maximum*** The driver turns off power to the adapter for longer periods over more widely spaced time intervals.

Make sure to also edit the Security and Advanced tabs.

Access Point Mode

In Access Point (infrastructure) mode, the Wireless Network Adapter participates in a basic service set (BSS) as a station, and communicates with the other stations through an AP, as illustrated here.
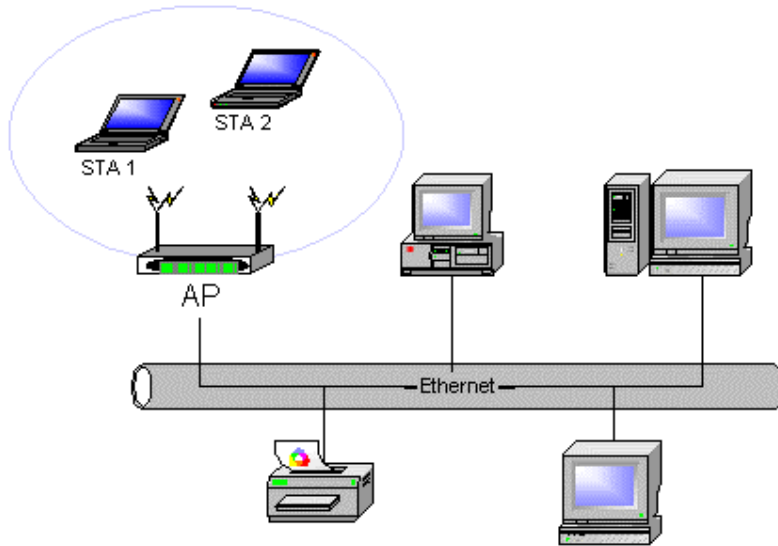
Access Point (Infrastructure) Mode

To connect to an Access Point network, configure the profile for Access Point mode.

Remove a Configuration Profile

1. To remove a configuration profile, select the profile to remove from the list of configuration profiles on the Station Configuration tab.
2. Click the Remove button.
3. Click Apply to complete the configuration profile deletion.

TCP/IP Configuration

Configure the TCP/IP Address for the network device after configuring the Atheros AR5001X Mini PCI Wireless Network Adapter properties.

1. Open the Control Panel and click Network and Dial-up Connections.
2. Find the Local Area Connection associated with the Atheros AR5001X Mini PCI Wireless Network Adapter. Right-click that connection, and click Properties.
3. Select Internet Protocol (TCP/IP) and click Properties.
4. Click the radio button Use the following IP address, then enter an IP address and Subnet mask. Assigning an IP address and Subnet mask allows stations to operate in Access Point mode (infrastructure mode) and to have Internet access. Default gateway and DNS server information is also required.
5. IP configuration information (DHCP or assigned IP address, gateway and DNS server IP addresses) is usually obtained from the corporate IT staff.
6. Click OK to finish.

Station Configuration

Configure the Atheros AR5001X Mini PCI Wireless Network Adapter through the Atheros Client Utility.

The wireless network adapter   (also called wireless card) works in either access point mode (infrastructure mode - leverages an AP) or ad hoc mode (a group of stations participating in the WLAN).

To switch to another configuration profile, click on the profile name in the Select Profile list, then click the Apply button.

Security Tab

In the Atheros Client Utility, access the Security tab by clicking New or Modify on the Station Configuration tab.　Click the Security tab.

Edit the fields in the Security　tab of the Network Configuration Settings to configure the profile.

Make sure to also edit the General and Advanced tabs.

Field Name	Description
Encryption Type	Specifies the encryption type: ***Use Dynamic Security*** Use dynamic encryption keys, such as those defined by Cisco LEAP or 802.1X. To use Cisco LEAP, make sure the checkbox "Enable Cisco LEAP" is checked, and fill in the LEAP User Name and Password. ***Use Static Keys*** Use static encryption keys. Enter the keys in the Encryption Keys fields. ***Disabled*** Use no encryption.
Enable Cisco LEAP	Enables the use of Cisco LEAP for dynamic security keys.　Click the Use Dynamic Security radio button under Encryption Type to use Cisco LEAP.
User Name	The user name used to log in to the network.
Password	The password used to log in to the network.　This password is encrypted using the same encryption type as the encryption keys.

To define static encryption keys, click the Define Static Encryption Keys button with either Dynamic Security or Static Keys selected.　Fill in the security dialog box.

Define Static Encryption Keys

To define static encryption keys, click the Define Static Encryption Keys button on the security tab.

Fill in the fields in the Security dialog box.

Field Name	Description
Key Entry Method	Determines the entry method for an encryption key: hexadecimal (0-9, A-F), or ASCII text (all keyboard characters).
Encryption Keys	Selects the default encryption keys used (either Unique or Shared). Only allows the selection for a Unique key, or a shared First, Second, Third, or Fourth key whose corresponding field has been completed.
Unique Key	Defines the unique encryption key for network configuration security. This field must be populated to enable security using a unique key. Click on the radio button to set the unique key as the default encryption key. Not used in ad hoc mode.
Shared Keys (First, Second, Third Fourth)	Defines a set of shared encryption keys for network configuration security. At least one Shared Key field must be populated to enable security using a shared key. Click on the radio button to set the key as

	the default encryption key.

Key Length	Defines the length for each encryption key. The options include:
	   64 bit (enter 10 digits)
	   128 bit (enter 26 digits)
	   152 bit (enter 32 digits)
	
	 As the Key Length is changed, the number of available characters in the field automatically changes. If an already-entered key is too long, the key is automatically truncated to fit. If the key length is increased again, the field does not update to its previous value.

Click OK for the changes to take effect.

Check the Status Information or Statistics

The Atheros client utility includes a number of tools to display current statistics and status information.

- Check link status
- Check WLAN status
- Check driver information
- Check receive and transmit statistics
- Check signal strength

Link Status

The Link Status tab of the Atheros Client Utility contains general information about the program and its operations. The Link Status tab does not require any configuration.

The following table describes the items found on the Link Status screen.

Screen Item	Description

Wireless Mode	Displays the wireless mode. The options include:
	  5 GHz 54 Mbps
	  5 GHz 108 Mbps
	  2.4 GHz 11 Mbps
	Configure the wireless mode on the Advanced tab.

Configuration Name	The name of the current selected configuration profile. Set up the configuration name on the General tab.
Link Status	Shows whether the station is connected to the wireless network.
Transmit Rate	The transmit rate (Mbps) for the current connection for the wireless driver.
Receive Rate	The receive rate (Mbps) for the current connection for the driver.

Network Type	The type of network the station is connected to. The options include:
	  Access Point (Infrastructure)
	  Ad Hoc
	Configure the network type on the General tab.

Security Mode	Displays the security mode the driver is using:
	  Off
	  WEP
	  AES-CCM
	  AES-OCB
	
	Configure the security mode on the Security tab. For more information, see Encryption Types.

IP Address	The IP address of the station.

Click the Advanced button to see the advanced link status statistics.

Advanced Link Status Statistics

Click the Advanced button on the Link Status tab of the Atheros Client Utility to see advanced information about the program and its operations. The Link Status tab does not require any configuration.

The following table describes the items found on the Advanced Link Status screen.

Screen Item	Description

Country	The regulatory domain of the network. The options include:
	  FCC
	  MKK
	  ETSI
	
	Configure the country in the country code selector, accessible from the Tools tab.

Transmit Power Level	The transmit power level:
	  Full (100%)
	  Half (50%)
	  Quarter (25%)
	  Eighth (12.5%)
	  Lowest
	Configure the transmit power level on the Advanced tab.

Network Name (SSID)	The wireless network name. Configure the network name on the General tab.
QoS	Shows whether the station is enabled to cooperate in a network using Quality of Service. Configure QoS on the Advanced tab.
Noise Level	The amount of noise (dBm) in the current connection.
Power Save Mode	The power management options. Power management is disabled in ad hoc mode. *Off* The adapter receives full power from the PC. *Normal* The driver turns off power to the adapter for brief periods over briefly-spaced time intervals. *Maximum* The driver turns off power to the adapter for longer periods over more widely spaced time intervals. Configure the power save mode on the General tab.
Channel/Frequency	The channel and frequency the station is using.

WLAN Status Tab

The WLAN status tab of the Atheros Client Utility contains information about the basic service set (BSS).

The WLAN Status tab does not require any configuration.

The following table describes the items found on the WLAN Status screen.

Screen Item	Description
Network Name (SSID)	The network name of the selected wireless LAN. Configure the network name on the General tab.
AP Address (BSSID)	The MAC address of the connected Access

	Point (basic service set identification).
Station Status	The operational status of the wireless card: **_Associated_** The station is associated to the network. **_Authenticated_** The station has been authenticated by the access point. **_Disassociated_** The station is not associated to the network.
Channel/Frequency	The channel and frequency the station is using.

The WLAN Status screen also includes the Available APs and Ad Hoc Networks list, which describes the available APs and ad hoc networks.

Double-click on a network name to connect an available network. If no configuration profile exists for that network, double-click on the network name to create a configuration profile for that network.

Driver Information

The Driver Information   tab of the Atheros Client Utility contains general information about the network interface card (the wireless card) and the network driver interface specification (NDIS) driver.   The Driver Information   tab does not require any configuration.

The following table describes the items found on the Driver Information screen.

Screen Item	Description
Card Name	The name of the wireless card.
MAC Address	The MAC address of the wireless card.
Driver	The driver name and path of the wireless card driver.
Driver Version	The version of the wireless card driver.
Driver Date	The creation date of the wireless card driver.

Statistics

The Statistics tab of the Atheros Client Utility contains receive and transmit statistics. The Link Status tab does not require any configuration.

The Statistics tab lists uptime as well as the following receive and transmit statistics for frames received by or transmitted by the wireless card:

  Multicast frames transmitted and received
  Broadcast frames transmitted and received
  Unicast frames transmitted and received
 Total bytes transmitted and received

Click the Advanced button to also show receive and transmit statistical information for the following receive and transmit statistics for frames received by or transmitted to the wireless card:

Beacons transmitted and received

Frames transmitted and received OK

Transmitted frame retried

Frames dropped

RTS frames sent

Frames received with errors

Encryption errors

Duplicate frames received

CTS frames received

Authentication rejects

Association rejects

Click the Reset button to reset the statistics.

Site Survey

The Site Survey tool displays the quality and strength of the signal. On the left, the tool graphs signal strength and quality. On the right side, signal strength and signal quality are indicated separately in a bar graph and histogram. All graphs also use color to indicate signal quality.
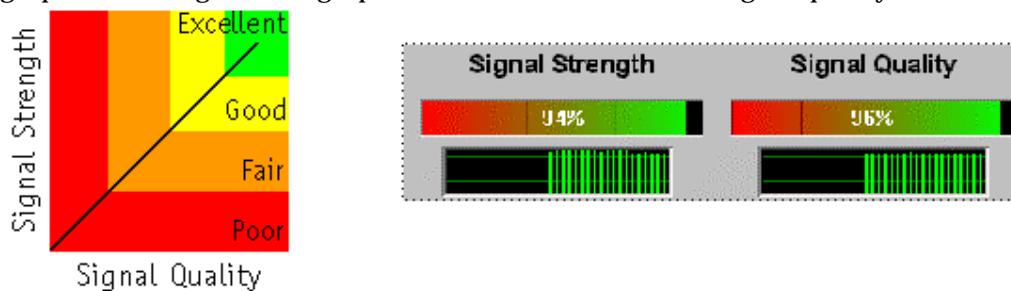
Site Survey Tool

Identify the need of additional access points in the network using these measurements while changing the location of the wireless card.

WLAN Status: Available APs and Ad Hoc Networks List

The WLAN status tab of the Atheros Client Utility contains information about the available access point and ad hoc networks.   The Available Access Points (APs) and Ad Hoc Networks list describes the available APs and ad hoc networks.

Double-click on a network name to connect an available network. If no configuration profile exists for that network, double-click on the network name to create a configuration profile for that network.

The following table describes the columns found in the Available APs and Ad Hoc Networks list.

Column Item	Description
Network Name (SSID)	The IEEE 802.11a wireless network name (service set identification). Configure the network name on the General tab.
Signal Strength	The received signal strength indicator. Displays the signal strength in either dBm or %, as well as displaying the signal strength indicator.
Mode	Displays the wireless mode. The options include: A 5.4 GHz 54 Mbps T 5.4 GHz 108 Mbps B 2.4 GHz 11 Mbps Configure the wireless mode on the Advanced tab.
Channel	The channel the station is using.
Frequency	The frequency the station is using.
AP Address (BSSID)	The network AP address (basic service set identification).

To connect to another network:

Double-click on the network name in the list of   Available APs and Ad Hoc Networks.

Tools

The Tools tab contains the following tools:

Radio Enable/Disable	Enable or disable the RF Signal on all Atheros Station Reference Designs.
Site Survey	Open the Site Survey tool to view the signal quality and strength.
Tray Icon	Enable/Disable Enable or disable the tray icon.

Tray Icon

The tray icon appears at the bottom of the screen, and shows the signal strength using colors and the received signal strength indication (RSSI).
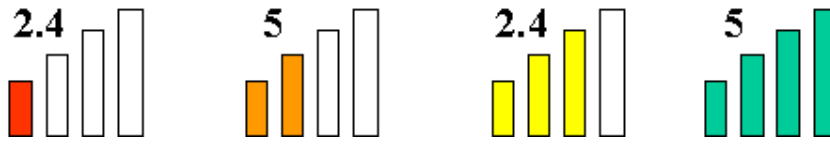
Tray Icons

Hold the mouse cursor over the tray icon to display transmit and receive speed and the current configuration profile name.

Right-click on the tray icon to:

Launch Station Utility	Launch the Atheros Client Utility. Use the Atheros Client Utility to configure the profile or view status and statistics information.
Display available configuration profiles	Display a list of available configurations.
Switch to another configuration profile	Click a configuration profile name to switch to it. If no configuration profile exists for a connection, add a profile first.
Enable/disable radio	Enable or disable the RF Signal.

Open the Country Code Selector   Open the Country Code Selector to set the regulatory domain of the configuration profile.

Open the Site Survey tool   Open the Site Survey tool to view the signal quality and strength.

The colors are defined as follows:

Color	Quality	RSSI*
Green	Excellent	20 dBm +
Yellow	Good	10-20 dBm
Orange	Poor	<10 dBm
Red	No Link	No connection

*Received signal strength indication RSSI.

Displayed in decibels relative to one milliwatt (dBm) or percentage.

Enable or disable the tray icon in the Action menu.

Display Settings

To change the display settings, choose Options > Settings from the menu.

The display settings dialog box contains tools to set the:

Signal Strength Display Units   Sets the units used when displaying signal strength: percentage or decibels relative to one milliwatt (dBm).

Data Display   Sets the display to cumulative or relative.
Cumulative displays statistical data collected from the beginning of driver load.
Relative displays the change (delta) in statistical data since the last update.

Refresh Interval   Sets the display refresh interval in milliseconds (ms).

Wireless Interoperability

The Atheros AR5001X Mini PCI Wireless Network Adapter　products are designed to be interoperable with any wireless LAN product that is based on Direct Sequence Spread Spectrum (DSSS) radio technology, and is compliant to:

　　The IEEE 802.11 Standard on Wireless LANs(Revision A/B), as defined and approved by the Institute of Electrical and Electronics Engineers.

　　The Wireless Fidelity(WiFi) certification as defined by the WECA Wireless

　　Ethernet Compatibility Alliance.

CAUTION

Bluetooth™ and WirelessLAN devices operate within the same radio frequency range and may interfere with one another.　If you use Bluetooth™ and WirelessLAN devices simultaneously, you may occasionally experience a less than optimal network performance or even lose your network connection.

If you should experience any such problem, immediately turn off either one of your Bluetooth™ or WirelessLAN.

Please contact Toshiba PC product support on web site

http://www.toshiba-europe.com/computers/tnt/bluetooth.htm　in Europe or

http://www.pc.support.global.toshiba.com　in the United States for more information.

CAUTION

This device is restricted to indoor use due to its operation in the 5.15 to 5.85 GHz frequency range.

Wireless LAN and your Health

Wireless LAN products, like other radio devices, emit radio frequency electromagnetic energy. The level of energy emitted by Wireless LAN devices however is far much less than the electromagnetic energy emitted by wireless devices like for example mobile phones.

Because Wireless LAN products operate within the guidelines found in radio frequency safety standards and recommendations, TOSHIBA believes Wireless LAN is 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 situations or environments, the use of Wireless LAN may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may for example include:

　　Using the Wireless LAN equipment on board of airplanes, or

　　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 or environment (e.g. airports), you are encouraged to ask for authorization to use the Wireless LAN device

prior to turning on the equipment.

Regulatory Information

The Atheros AR5001X Mini PCI Wireless Network Adapter must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. This device complies with the following radio frequency and safety standards.

Canada – Industry Canada (IC)

This device complies with RSS 210 of Industry Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device."

L ' utilisation de ce dispositif est autorisée seulement aux conditions suivantes : (1) il ne doit pas produire de brouillage et (2) l' utilisateur du dispositif doit étre prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.

IC : 248H-DPA3233W

This device has been designed to operate with an antenna having a maximum gain of 4.8dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Pour empecher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit etre utilize a l'interieur et devrait etre place loin des fenetres afin de Fournier un ecram de blindage maximal. Si le matriel (ou son antenne d'emission) est installe a l'exterieur, il doit faire l'objet d'une licence.

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC with essential test suites as per standards:

EN 60950 Safety of Information Technology equipment

ETS 300 328 Technical requirements for radio equipment

ETS 300 826 General EMC requirements for radio equipment.

België/ Belgique:	For outdoor usage only channel 10 (2457 MHz) and 11 (2462 MHz) is allowed. For private usage outside buildings across public grounds over less than 300m no special registration with IBPT/BIPT is required. Registration to IBPT/BIPT is required for private usage outside buildings across public grounds over more than 300m. An IBPT/BIPT license is required for public usage outside building. For registration and license please contact IBPT/BIPT.
	Gebruik buiten gebouw alleen op kanalen 10 (2457 MHz) en 11 (2462 MHz). Voor privé-gebruik buiten gebouw over publieke groud over afstand kleiner dan 300m geen registratie bij BIPT/IBPT nodig; voor gebruik over afstand groter dan 300m is wel registratie bij BIPT/IBPT nodig. Voor publiek gebruik buiten gebouwen is licentie van BIPT/IBPT verplicht. Voor registratie of licentie kunt u contact opnemen met BIPT.
	L'utilisation en extérieur est autorisé sur le canal 10 (2457 MHz) et 11 (2462 MHz). Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de I'IBPT est requise. Pour une utilisation publique à l'extérieur de bâtiments, une licence de I'IBPT est requise. Pour les enregistrements et licences, veuillez contacter I'IBPT.
Deutschland:	License required for outdoor installations. Check with reseller for procedure to follow
	Anmeldung im Outdoor-Bereich notwendig, aber nicht genehmigungspflichtig.Bitte mit Händler die Vorgehensweise abstimmen.
France:	Restricted frequency band: only channels 10 and 11 (2457 MHz and 2462 MHz respectively) may be used in France. License required for every installation, indoor and outdoor installations. Please contact ART for procedure to follow.
	Bande de fréquence restreinte : seuls les canaux 10 à 11 (2457 et 2462 MHz respectivement) doivent être utilisés en France. Toute utilisation, qu'elle soit intérieure ou extérieure, est soumise à autorisation. Vous pouvez contacter I'Autorité de Régulation des Télécommuniations (http://www.art-telecom.fr) pour la procédure à suivre.
Italia:	License required for indoor use. Use with outdoor installations not allowed
	E'necessaria la concessione ministeriale anche per l'uso interno. Verificare con i rivenditori la procedura da seguire. L'uso per installazione in esterni non e' permessa.
Nederland	License required for outdoor installations. Check with reseller for procedure to follow
	Licentie verplicht voor gebruik met buitenantennes. Neem contact op met verkoper voor juiste procedure

USA-Federal Communications Commission (FCC)

This device complies with Part 15 of FCC Rules. Operation of the devices in a Wireless LAN System is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference that may cause undesired operation.

TOSHIBA is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this Atheros AR5001X Mini PCI Wireless Network Adapter , or the substitution or attachment of connecting cables and equipment other than specified by TOSHIBA.

The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Caution: Exposure to Radio Frequency Radiation.

The Atheros AR5001X Mini PCI Wireless Network Adapter will be installed with one of two types of antennas. The both of antenna types, when installed are located at the upper edge of the LCD screen. For both antennas, the radiated output power of the Atheros AR5001X Mini PCI Wireless Network Adapter is far below the FCC radio frequency exposure limits. Nevertheless, the Atheros AR5001X Mini PCI Wireless Network Adapter shall be used in such a manner that the potential for human contact during normal operation is minimized. The antenna(s) used in this notebook computer are located at the upper edge of the LCD screen, and this device has been tested as portable device as defined in section 2.1093 of FCC rules when the LCD screen is rotated 180 degree and covered the keyboard area.. In addition, Wireless LAN has been tested with Bluetooth Transceiver for co-location requirements. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Caution: Radio Frequency Interference Requirements.

This device is restricted to indoor use due to its operation in the 5.15 to 5.25 GHz frequency range. FCC requires this product to be used indoors for frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.
High power radars 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.

Taiwan

Article 14 Unless approved, for any model accredited low power radio frequency electric machinery, any company, trader or user shall not change the frequency, increase the power or change the features and functions of the original design.
Any use of low power radio frequency electric machinery shall not affect the aviation safety and interfere with legal communications. In event that any interference is found, the use of such electric machinery shall be stopped immediately, and reusing of such products can be resumed until no interference occurs after improvement.
The legal communications mentioned in the above item refer to radio communications operated in accordance with telecommunication laws and regulations.
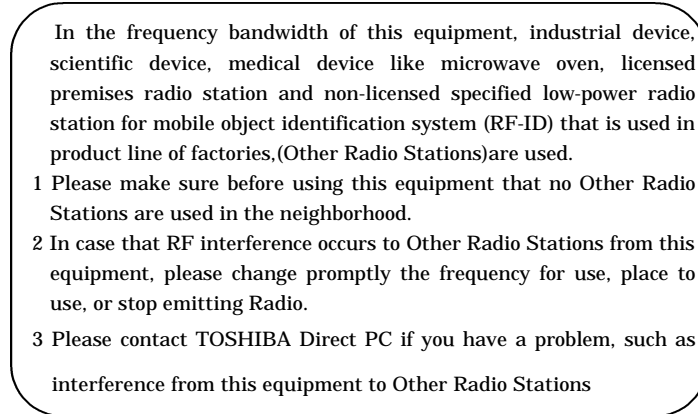Low power radio frequency electric machinery shall resist against interference from legal communications or from industrial, scientific and medical radio emission electric machinery.

Using this equipment in Japan

In Japan, the frequency bandwidth of 2,400 2,483.5MHz for second generation low-power data communication systems such as this equipment overlaps that of mobile object identification systems (premises radio station and specified low-power radio station).

1. Sticker

   Please put the following sticker on devices incorporating this product.

> In the frequency bandwidth of this equipment, industrial device, scientific device, medical device like microwave oven, licensed premises radio station and non-licensed specified low-power radio station for mobile object identification system (RF-ID) that is used in product line of factories,(Other Radio Stations)are used.
> 1 Please make sure before using this equipment that no Other Radio Stations are used in the neighborhood.
> 2 In case that RF interference occurs to Other Radio Stations from this equipment, please change promptly the frequency for use, place to use, or stop emitting Radio.
> 3 Please contact TOSHIBA Direct PC if you have a problem, such as interference from this equipment to Other Radio Stations

2. Indication

The indication shown below appears on this equipment.

```
        (1)    (2)  (3)
      ┌──────────────────┐
      │  2. 4DS4         │
      │  ■■  ■■  ■■       │
      └──────────────────┘
            (4)
```
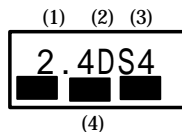
(1) 2.4 this equipment uses a frequency of 2.4GHz.

(2) DS This equipment uses DS-SS modulation.

(3)   4 The interference range of this equipment is less than 40m.

(4) ■■ ■■ ■■   This equipment uses a frequency bandwidth from 2,400MHz to 2,483.5MHz.
     It is possible to avoid the band of mobile object identification systems.

3. TOSHIBA Direct PC

    Monday – Friday : 10:00 – 17:00
    Toll Free Tel   : 0120-13-1100
    Direct Dial   : 03-3457-5916
    Fax   : 03-5444-9450

Device Authorization

This device obtains the Technical Regulation Conformity Certification and the Technical Conditions Compliance Approval, and it belongs to the device class of radio equipment of low-power data communication system radio station stipulated in the Radio Law and the Telecommunications Business Law of Japan.

The Name of the radio equipment: PA3232U-1MPC

TELECOM ENGINEERING CENTER   Approval Number: 03NY   A0018, 03GZDA0017

The following restrictions apply:

    Do not disassemble or modify the device.

    Do not install the embedded wireless module into other device.

Trademark

Bluetooth is a trademark owned by its proprietor and used by TOSHIBA under license.