QCNFA364A

Product name：802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card

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Document Conventions

Text Conventions

bold	Bold type within paragraph text indicates commands, file names, directory names, paths, output, or returned values. Example: The DK_Client package will not function unless you use the **wdreg_install** batch file.
italic	Within commands, italics indicate a variable that the user must specify. Example: **mem_alloc** *size_in_bytes* Titles of manuals or other published documents are also set in italics.
`Courier`	The Courier font indicates output or display. Example: `Error:Unable to allocate memory for transfer!`
Menu	The Menu character tag is used for menu items. Example: Choose Edit > Copy.
[ ]	Within commands, items enclosed in square brackets are optional parameters or values that the user can choose to specify or omit.
{ }	Within commands, items enclosed in braces are options from which the user must choose.
|	Within commands, the vertical bar separates options.
…	An ellipsis indicates a repetition of the preceding parameter.
>	The right angle bracket separates successive menu selections. Example: Start > Programs > DK > wdreg_install.

Notices

NOTE: This message denotes neutral or positive information that calls out important points to the text. A note provides information that may apply only in special cases.

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Revision History

Revision	Description of Changes
March 2009	Initial Release

Introduction

The Atheros 802.11n + Bluetooth Adapter supports 802.11n and Bluetooth EDR2.0 operation. The card uses the Atheros Client Utility (ACU) which is a user-mode utility designed to edit and add profiles for selected Atheros network interface adapters.

System Requirements

- Laptop/ PC containing:
  - 32-bit PCI Express Bus
  - 32 MB memory or greater
  - 300 MHz processor or higher
- Microsoft Windows 2000, Windows Millennium Edition, Windows 98 Second Edition, Windows XP, or Windows NT 4.0 (with Service Pack 6)

Profile Management

Configure the wireless network adapter (wireless card) from the Profile Management tab of the Atheros Client Utility.

- Add a profile
- Edit a profile
- Import a Profile
- Export a Profile
- Order profiles
- Switch to a different profile
- Remove a profile
- Connect to a Different Network

The wireless network adapter works in either infrastructure mode (which uses an access point) or ad hoc mode (a group of stations participating in the wireless LAN).

Create or Modify a Configuration Profile

To add a new configuration profile, click New on the Profile Management tab. To modify a configuration profile, select the configuration from the Profile list and click the Modify button.

The Profile Management dialog box displays the General tab. In profile management:

- 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 Advanced tab.

Note that the ACU only allows the creation of 16 configuration profiles. After the creation of 16 profiles, clicking the New button displays an error message. Remove an old profile or modify an existing profile for a new use.

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Remove a Configuration Profile

1. Go to the Profile Management tab.
2. Select the profile to remove from the list of configuration profiles.
3. Click the Remove button.

Auto Profile Selection Management

Including a profile in the auto selection feature allows the wireless adapter to automatically select that profile from the list of profiles and use it to connect to the network.

Including a profile in auto profile selection:

1. On the Profile Management tab, click the Order Profiles button.
2. The Auto Profile Selection Management window appears, with a list of all created profiles in the Available Profiles box.
3. Highlight the profiles to add to auto profile selection, then click Add. The profiles appear in the Auto Selected Profiles box.

Ordering the auto selected profiles:

1. Highlight a profile in the Auto Selected Profiles box.
2. Click Move Up, Move Down, or Remove as appropriate. The first profile in the Auto Selected Profiles box has highest priority, and the last profile has lowest priority.
3. Click OK.
4. Check the Auto Select Profiles box.
5. Save the modified configuration file.

When auto profile selection is enabled by checking Auto Select Profiles on the Profile Management tab, the adapter scans for an available network. The profile with the highest priority and the same SSID as one of the found networks is the one that is used to connect to the network. If the connection fails, the adapter tries the next highest priority profile that matches the SSID, and so on.

With auto profile selection enabled, the wireless adapter scans for available networks. The highest priority profile with the same SSID as a found network is used to connect to the network. On a failed connection, the adapter tries with the next highest priority profile.

Switching to a Different Configuration Profile

1. To switch to a different profile, go to the Profile Management tab.
2. Click on the profile name in the Profile List.
3. Click the Activate button.

The Profile List provides icons that specify the operational state for that profile. The list also provides icons that specify the signal strength for that profile.

Import and Export Profiles

Importing a Profile

1. From the Profile Management tab, click the Import button. The Import Profile window appears.
2. Browse to the directory where the profile is located.
3. Highlight the profile name.
4. Click Open. The imported profile appears in the profiles list.

Exporting a Profile

1. From the Profile Management tab, highlight the profile to export.
2. Click the Export button. The Export Profile window appears.
3. Browse to the directory to export the profile to.
4. Click Save. The profile is exported to the specified location.

TCP/IP Configuration

Configuring the TCP/IP Address for the network device:

1. After configuring the wireless network adapter properties, open the Control Panel and open Network and Dial-up Connections.
2. Find the Local Area Connection associated with the 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) or in ad hoc mode and to have Internet access. Default gateway and DNS server information is also required. IP configuration information (DHCP to assign the IP address, gateway and DNS server IP addresses) is usually obtained from the corporate IT staff.
5. Click OK to finish.

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General Tab

In the Atheros Client Utility, access the General tab by clicking New or Modify on the Profile Management tab. Edit the fields in the General tab to configure the configuration profile. Make sure to also edit the Security and Advanced tabs.

Profile Name	Identifies the configuration profile. This name must be unique. Profile names are not case sensitive.
Client Name	Identifies the client machine.
Network Names (SSIDs)	The IEEE 802.11 wireless network name. This field has a maximum limit of 32 characters. Configure up to three SSIDs (SSID1, SSID2, and SSID3).

Advanced Tab

In the Atheros Client Utility, access the Advanced tab by clicking New or Modify on the Profile Management tab, then clicking the Advanced tab in Profile Management. Edit the fields in the Advanced tab of Profile Management to configure the profile.

Transmit Power Level	Selects the transmit power level in mW. Actual transmit power may be limited by hardware.
Power Save Mode	Specify: • Maximum mode causes the access point to buffer incoming messages for the wireless adapter. The adapter periodically polls the access point to see if any messages are waiting. • Normal uses maximum when retrieving a large number of packets, then switches back to power save mode after retrieving the packets. • Off turns power saving off, thus powering up the wireless adapter continuously for a short message response time.
Network Type	Specifies the network as either infrastructure or ad hoc.
802.11b Preamble	Specifies the preamble setting in 802.11b. The default setting is Short & Long (access point mode), which allows both short and long headers in the 802.11b frames. The adapter can only use short radio headers if the access point supports and uses them. Set to Long Only to override allowing short frames.
Authentication Mode	Select the mode the wireless adapter uses to authenticate to an AP: • Auto causes the adapter to attempt authentication using shared, but switches it to open authentication if shared fails. • Open enables an adapter to attempt authentication regardless of its WEP settings. It will only associate with the access point if the WEP keys on both the adapter and the access point match. • Shared only allows the adapter to associate with access points that have the same WEP key.

For infrastructure (access point) networks, click the Preferred APs button to specify up to four access points to which the adapter should attempt to associate.

Security Tab

In the Atheros Client Utility, access the Security tab by clicking New or Modify on the Profile Management tab. Click the Security tab in the Profile Management window.

Edit the fields in the Security tab of Profile Management to configure the profile. To define the security mode, select the radio button of the desired security mode. Make sure to also edit the General and Advanced tabs.

WPA/WPA2	Enables the use of Wi-Fi Protected Access (WPA). Choosing WPA/WPA2 opens the WPA/WPA2 EAP drop-down menu. The options include: • EAP-FAST • EAP-TLS • EAP-TTLS • PEAP (EAP-GTC) • PEAP (EAP-MSCHAP V2) • LEAP
WPA/WPA2 Passphrase	Enables WPA/WPA2 Passphrase security. Click on the Configure button and fill in the WPA/WPA2 Passphrase.
802.1x	Enables 802.1x security. This option requires IT administration. Choosing 802.1x opens the 802.1x EAP type drop-down menu. The options include: • EAP-FAST • EAP-TLS • EAP-TTLS • PEAP (EAP-GTC) • PEAP (EAP-MSCHAP V2) • LEAP If the access point that the wireless adapter is associating to has WEP set to Optional and the client has WEP enabled, make sure that Allow Association to Mixed Cells is checked on the Security Tab to allow association. **Note:** If the Lock checkbox is checked, you cannot change any values in this profile. See your system administrator.
Pre-Shared Key (Static WEP)	Enables the use of pre-shared keys that are defined on both the access point and the station. To define pre-shared encryption keys, choose the Pre-Shared Key radio button and click the Configure button to fill in the Define Pre-Shared Keys window. If the access point that the wireless adapter is associating to has WEP set to Optional and the client has WEP enabled, make sure that Allow Association to Mixed Cells is checked on the Security Tab to

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	allow association.
None	No security (not recommended).

Using EAP-TLS Security

To use EAP-TLS security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA radio button.
   OR: On the Security tab, choose the 802.1x radio button.
2. Choose EAP-TLS from the drop-down menu.

Enabling EAP-TLS security:

To use EAP-TLS security, the machine must already have the EAP-TLS certificates downloaded onto it. Check with the IT manager.

1. If EAP-TLS is supported, choose EAP-TLS from the drop-down menu on the right, then click the Configure button.
2. Select the appropriate certificate authority from the list. The server/domain name and the login name are filled in automatically from the certificate information. Click OK.
3. Click OK.
4. Activate the profile.

Using EAP-TTLS Security

To use EAP security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA/WPA2 radio button.
   OR: On the Security tab, choose the 802.1x radio button.
2. Choose EAP-TTLS from the drop-down menu.

Enabling EAP-TTLS security:

To use EAP-TTLS security, the machine must already have the EAP-TTLS certificates downloaded onto it. Check with the IT manager.

1. If EAP-TTLS is supported, choose EAP-TTLS from the drop-down menu on the right, then click the Configure button.
2. Select the appropriate certificate from the drop-down list and click OK.
3. Specify a user name for EAP authentication:
   - Check Use Windows User Name to use the Windows user name as the EAP user name.
   - OR: Enter an EAP user name in the User Name field to use a separate user name and password and start the EAP authentication process.
4. Click Advanced and:

- Leave the server name field blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Network Certificate Authority drop-down list. **(recommended)**
- Enter the domain name of the server from which the client will accept a certificate.
- Change the login name if needed.

5. Click OK.
6. Enable the profile.

Using PEAP (EAP-GTC) Security

To use PEAP (EAP-GTC) security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA radio button.
   OR: On the Security tab, choose the 802.1x radio button.
2. Choose PEAP (EAP-GTC) from the drop-down menu.

To use PEAP (EAP-GTC) security, the server must have WPA-PEAP certificates, and the server properties must already be set. Check with the IT manager.

1. Click the Configure button.
2. To avoid the need to log on again after resuming operation (for example, after your computer goes into standby or hibernate mode), check Always Resume the Secure Session.
3. Select the appropriate network certificate authority from the drop-down list.
4. Specify a user name for inner PEAP tunnel authentication:
   - Check Use Windows User Name to use the Windows user name as the PEAP user name.
   - OR: Enter a PEAP user name in the User Name field to use a separate user name and start the PEAP authentication process.
5. Choose Token or Static Password, depending on the user database.
   Note that Token uses a hardware token device or the Secure Computing SofToken program (version 1.3 or later) to obtain and enter a one-time password during authentication.
6. Click Settings... and:
   - Leave the server name field blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Network Certificate Authority drop-down list. **(recommended)**
   - Enter the domain name of the server from which the client will accept a certificate.
   - The login name used for PEAP tunnel authentication fills in automatically as PEAP-*xxxxxxxxxxxx*, where *xxxxxxxxxxxx* is the computer's MAC address. Change the login name if needed.
7. Click OK.
8. Enable the profile.

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Using PEAP-MSCHAP V2 Security

To use PEAP-MSCHAP V2 security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA radio button.
   OR: On the Security tab, choose the 802.1x radio button.
2. Choose PEAP (EAP-MSCHAP V2) from the drop-down menu.

To use PEAP (EAP-MSCHAP V2) security, the server must have WPA-PEAP certificates, and the server properties must already be set. Check with the IT manager.

1. Click the Configure button.
2. Select the appropriate certificate from the drop-down list.
3. Specify a user name for inner PEAP tunnel authentication:
   - Check Use Windows User Name to use the Windows user name as the PEAP user name.
   - OR: Enter a PEAP user name in the User Name field to use a separate user name and start the PEAP authentication process.
4. Click Advanced and:
   - Leave the server name field blank for the client to accept a certificate from any server with a certificate signed by the authority listed in the Network Certificate Authority drop-down list. **(recommended)**
   - Enter the domain name of the server from which the client will accept a certificate.
   - The login name used for PEAP tunnel authentication fills in automatically as PEAP-*xxxxxxxxxxxx*, where *xxxxxxxxxxxx* is the computer's MAC address. Change the login name if needed.
5. Click OK.
6. Enable the profile.

Using LEAP Security

To use security In the Atheros Client Utility, access the Security tab in the Profile Management window. LEAP security requires that all infrastructure devices (e.g. access points and servers) are configured for LEAP authentication. Check with the IT manager.

Configuring LEAP

- On the Security tab, choose the WPA radio button. Choose WPA-LEAP from the drop-down menu.
- OR: On the Security tab, choose the 802.1x radio button. Choose LEAP from the drop-down menu.

1. Click the Configure button.
2. Specify a user name and password. Select to Use Temporary User Name and Password by choosing the radio button:

   - Check Use Windows User Name to use the Windows user name as the LEAP user name.
   - OR: Check Manually Prompt for LEAP User Name and Password to manually login and start the LEAP authentication process.

   Select to Use Saved User Name and Password by choosing the radio button:

   - Specify the LEAP user name, password, and domain to save and use.

3. Enter the user name and password.
4. Confirm the password.
5. Specify a domain name:

   - Check the Include Windows Logon Domain with User Name setting to pass the Windows login domain and user name to the RADIUS server. **(default)**
   - OR: Enter a specific domain name.

6. If desired, check No Network Connection Unless User Is Logged In to force the wireless adapter to disassociate after logging off.
7. Enter the LEAP authentication timeout time (between 30 and 500 seconds) to specify how long LEAP should wait before declaring authentication failed, and sending an error message. The default is 90 seconds.
8. Click OK.
9. Enable the profile.

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Pre-Shared Encryption Keys

Defining pre-shared encryption keys:

1. Click the Pre-Shared Key (Static WEP) radio button on the Security tab.
2. Click the Configure button.
3. Fill in the fields in the Define Pre-Shared Keys dialog box:

Key Entry	Determines the entry method for an encryption key: hexadecimal (0-9, A-F), or ASCII text (all keyboard characters except spaces).
Encryption Keys	Selects the default encryption keys used. Only allows the selection for a shared First, Second, Third, or Fourth key whose corresponding field has been completed.
WEP Keys (1-4)	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.
WEP Key Size	Defines the size for each encryption key. The options include: ◆ 64-bit (enter 10 digits for hexadecimal, 5 ASCII characters) ◆ 128-bit (enter 26 digits for hexadecimal, 13 digits for ASCII) ◆ 152-bit (enter 32 digits hexadecimal, 16 digits for ASCII)

4. Click OK for the changes to take effect.

Overwriting an Existing Static WEP Key

1. Click the Pre-Shared Key radio button on the Security tab.
2. Click on Configure.
3. In the window, all existing static WEP keys are displayed as asterisks for security reasons. Click in the field of the existing static WEP key to overwrite.
4. Delete the asterisks in that field.
5. Enter a new key.
6. Make sure to select the Transmit Key button to the left of this key is selected for the key to transmit packets.
7. Click OK.

Disabling Static WEP

- To disable static WEP for a particular profile, Select any other security option on the Profile Management tab to automatically disable static WEP

- OR: choose None on the Security tab to disable security, and click OK (not recommended).

Using WPA Passphrase Security

To use WPA Passphrase security In the Atheros Client Utility, access the Security tab in the Profile Management window.

1. On the Security tab, choose the WPA Passphrase radio button.
2. Click on the Configure button.
3. Fill in the WPA Passphrase.
4. Click OK.

Zero Configuration

This section describes the operation of the Atheros Client Utility (ACU) and Windows XP Wireless Configuration Service (WZCS).

Wireless Network Configuration

The Windows WZCS is a service that manages the wireless connection in a largely dynamic way. Only minimal connection information must be identified and configured. To set Zero Configuration on Windows XP, take the following steps:

1. In Windows XP, open the Wireless Network Configuration Properties dialog box.
2. Select the check box "Use Windows to configure my wireless network settings" to set Zero Configuration.

When this check box is selected, Windows XP takes control of these settings for all configuration profiles:

- SSID
- Security keys
- Ad hoc settings

Note that Windows XP takes control of these settings for all configuration profiles, thus users can not (create new profiles with different settings while using Windows Zero Configuration.

The Zero Configuration settings override all configuration profiles, even when you select other options. However, the ACU does still control the following settings when Zero Configuration is set:

- Power settings
- Active/Passive scanning (where applicable)
- Transmit power
- Wireless band
- Short/Long preamble (802.11b)

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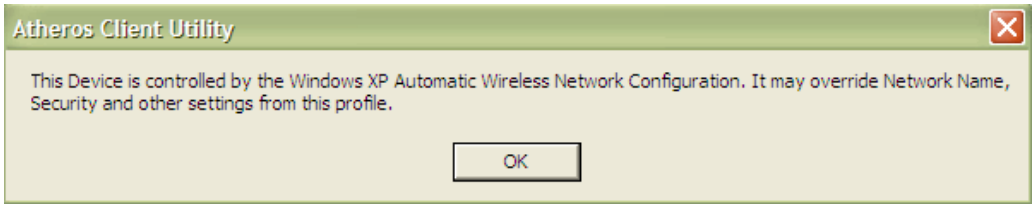
When Zero Configuration is in use, a pop-up message is displayed on the ACU when you attempt to create or edit a configuration profile from the Profile Management tab of the ACU.



To turn Zero Configuration off on Windows XP, take the following steps:

1. In Windows XP, open the Wireless Network Configuration Properties dialog box.
2. Clear the check box "Use Windows to configure my wireless network settings" to set Zero Configuration. When this check box is cleared, all profile settings are controlled by the configuration profile, which is set up from the ACU Profile Management tab.

Check the Status Information or Diagnostics

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

- Check current status
- Check driver information
- Check receive and transmit diagnostics

Current Status

The Current Status tab contains general information about the program and its operations. The Current Status tab does not require any configuration. The following table describes the items found on the Current Status screen.

Profile 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 associated to the wireless network.
Wireless Mode	Displays the wireless mode. Configure the wireless mode on the Advanced tab.
IP Address	Displays the computer's IP address.
Network Type	The type of network the station is connected to. Options include: ◆ Infrastructure (access point) ◆ Ad Hoc Configure the network type on the Advanced tab.
Current Channel	Shows the currently connected channel.
Server Based Authentication	Shows whether server based authentication is used.

Data Encryption	Displays the encryption type the driver is using. Configure the encryption type on the Security tab.
Signal Strength	Shows the strength of the signal.

Click the Advanced button to see the advanced status diagnostics.

Adapter Information Button

The Adapter Information button contains general information about the network interface card (the wireless network adapter) and the network driver interface specification (NDIS) driver. Access the adapter information from the Diagnostics tab.

Card Name	Name of the wireless network adapter.
MAC Address	MAC address of the wireless network adapter.
Driver	Driver name and path of the wireless network adapter driver.
Driver Version	Version of the wireless network adapter driver.
Driver Date	Creation date of the wireless network adapter driver.
Client Name	Name of the client computer.

Diagnostics Tab

The ACU Diagnostics tab provides allows retrieval of receive and transmit statistics. The Diagnostics tab does not require any configuration. It lists these receive and transmit diagnostics for frames received by or transmitted by the wireless network adapter:

- Multicast packets transmitted and received
- Broadcast packets transmitted and received
- Unicast packets transmitted and received
- Total bytes transmitted and received

The Adapter Information button has general information about the wireless network adapter and NDIS driver. The Advanced Statistics button to shows statistics for diagnostics for frames received by or transmitted to the wireless network adapter:

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Transmitted Frames

- Frames transmitted OK
- Frames retried
- Frames dropped
- No ACK frames
- ACK frames
- RTS frames
- Clear-to-send (CTS) frames
- No CTS frames
- Retried RTS frames
- Retried data frames

Received Frames

- Frames received OK
- Beacons
- Frames with errors
- CRC errors
- Encryption errors
- Duplicate frames
- AP mismatches
- Data rate mismatches
- Authentication time-out
- Authentication rejects: the number of AP authentication failures received by the wireless network adapter
- Association time-out
- Association rejects: the number of AP authentication rejects received by the wireless network adapter
- Standard MIC OK
- Standard MIC errors
- CKIP MIC OK
- CKIP MIC errors

Scan Available Networks

Click the Scan button on the Profile Management tab to scan for available infrastructure and ad hoc networks. On this list, click Refresh to refresh the list at any time.

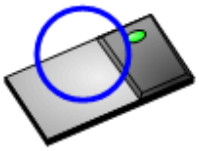
Connecting to a different network

- Highlight a network name and click the Activate button to connect an available network. If no configuration profile exists for that network, the Profile Management window opens to the General tab. Fill in the profile name and click OK to create the configuration profile for that network.

Infrastructure (AP) Network

Connected Infrastructure (AP) Network

Ad Hoc Network



Connected Ad Hoc Network

Encryption Active

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Display Settings

To change the display settings, choose Options > Display 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 dBm.

Refresh Interval Use the up/down arrows to set the display refresh interval in seconds.

Data Display Sets the display to cumulative or relative:

- Relative displays the change in statistical data since the last update.
- Cumulative displays statistical data collected since opening the profile.

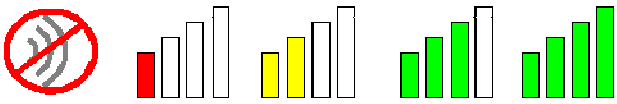
ACU Tools

Use the Action menu to access the Atheros Client Utility tools:

Enable/Disable Radio	Enable or disable the RF Signal on all Atheros station reference designs.
Enable/Disable Tray Icon	Enable or disable the tray icon.
Troubleshooting	Run the optional Troubleshooting Utility.
Manual LEAP Login	Log in to LEAP manually, if LEAP is set to manually prompt for user name and password on each login.
Reauthenticate	Reauthenticate to a LEAP-configured access point.
Exit	Exit the Atheros Client Utility application.

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).



Hold the mouse cursor over the tray icon to display the current configuration profile name and association, as well as transmit and receive speed and the wireless adapter name and IP address. Right-click on the tray icon to:

Help Open the online help.

Open Atheros Client Utility Launch the Atheros Client Utility (ACU). Use the ACU to configure a profile or view status and statistics information.

Troubleshooting Run the Troubleshooting Utility.

Preferences Set the ACU startup and menu options. Check to start the program automatically when Windows starts, and check menu items that should appear on the popup menu.

Enable/Disable Radio Enable or disable the RF signal.

Manual LEAP Login Log in to LEAP manually, if LEAP is set to manually prompt for user name and password on each login.

Reauthenticate Reauthenticate to the access point.

Select Profile Click a configuration profile name to switch to. If no configuration profile exists for a connection, add a profile.

Show Connection Status This window displays connection information:

Active Profile	Displays the active configuration profile name.
Auto Profile Selection	Shows whether auto profile selection is enabled.
Connection Status	Displays whether the adapter is connected to a wireless network.
Link Quality	Lists the quality of the link connection.
SSID	Displays the SSID of the associated network.
Access Point Name	Shows the name of the AP the wireless adapter is connected to.
Access Point IP Address	Shows the IP address of the access point the wireless adapter is connected to.
Link Speed	Lists the speed of the link connection.
Adapter IP Address	Displays the IP address of the wireless adapter.

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Exit Exit the Atheros Client Utility application.

The colors are defined as follows:

Color	Quality	RSSI*
Green	Excellent	20 dB +
Green	Good	10-20 dB +
Yellow	Poor	5-10 dB
Red	Poor	< 5 dB
Gray	No Connection	No Connection

*Received signal strength indication RSSI. Displayed in dB or percentage. Enable or disable the tray icon in the Action menu.

Uninstall an Old Driver

Uninstall an old driver before upgrading to a new NDIS driver release.

To remove the newly installed driver from the system if the system does not have previously installed versions of the NDIS driver, proceed to Step 4.

1. To remove the NDIS driver from the OS, go to Device Manager, right-click Atheros AR500x Wireless Network Adapter, and choose Uninstall.
2. Click OK to uninstall the device.
3. When the device is uninstalled from Device Manager, search for and delete the driver files that reside in the system.
    a. Go to the Start menu and choose Search > For Files or Folders.
    b. Enter **oem*.inf** in the Search for files or folders named: field, and enter **Atheros** in the Containing text: field.
    c. Click Search Now. A few files matching these criteria are possible, if previous drivers have not been removed properly.
    d. Choose the files that have been found and delete them from the system.
4. To complete the uninstallation, remove the file **ar5211.sys** from the folder **\WINNT\system32\drivers**.

Additional Security Features

These security features prevent attacks on a wireless network's WEP keys. The wireless adapter automatically supports each of these features, but these features must be enabled on the access point.

Message Integrity Check (MIC)

MIC prevents bit-flip attacks on encrypted packets. In a bit-flip attack, someone intercepts an encrypted message retransmits it after some alterations. Thus the receiver accepts the message as legitimate. The MIC adds some bytes to each packet to protect it against tampering.

Temporal Key Integrity Protocol (TKIP)

This feature prevents attacks on WEP in which someone catches encrypted packets and uses their initialization vector (IV) to decipher the WEP key. TKIP removes the predictability to protect both unicast and broadcast WEP keys.

Broadcast Key Rotation

EAP authentication provides dynamic unicast WEP keys for wireless adapters, but uses static broadcast keys. In broadcast WEP key rotation, the access point supplies a dynamic broadcast WEP key and changes it at intervals.

Bluetooth Adapter Installation and Operation

Getting Started

This chapter describes how to install, uninstall, launch, and use the Bluetooth Suite. The following major topics are covered in this chapter:

- "Installing the Bluetooth Suite"
- "Launching the Bluetooth Suite"
- "Introduction to the Bluetooth Suite"
- "Uninstalling the Bluetooth Suite"

DO NOT COPY

Installing the Bluetooth Suite

You either received a password from Atheros to download the Bluetooth Suite software from the Atheros web site or received the Bluetooth Suite on a CD.

NOTE: If you are installing Bluetooth Suite on a machine that already has an existing Bluetooth Suite, you need not uninstall it because Bluetooth Suite supports the upgrade feature. If you need to uninstall Bluetooth Suite, refer to "Uninstalling the Bluetooth Suite" on page 2-10 on how to uninstall Bluetooth Suite.

Software installation is a three-step process and it is important to perform these steps before you can use the Bluetooth Suite:

1. Installing the Bluetooth Suite
2. Installing the radio (profile) drivers
3. Updating the drivers

All these steps are explained in the installation process.

Downloading the Bluetooth Suite

1. Go to the Atheros Support web site: https://support.atheros.com/
2. Login to the web site using your user name and password provided by Atheros Support.
3. Go to the **AR3011 Software Package & Documentation** tab of the Atheros web site.

4. Download the appropriate Bluetooth Suite release, extract the files, and save them on your system.
6. Install the Bluetooth Suite by double-clicking on the Bluetooth Suite **setup.exe** file.
7.

Follow the rest of the installation procedure described in "Copying Bluetooth Suite from the CD" on page 2-2.

Copying Bluetooth Suite from the CD

1. Insert the CD containing the Bluetooth Suite into the CD drive.
2. Double Click on the Bluetooth Suite **setup.exe** file.

The InstallShield Wizard starts to prepare the package for installation. The **Welcome to InstallShield Wizard for** Bluetooth Suite screen (see Figure 2-1) is displayed.

Figure 2-1. **Bluetooth Suite - Welcome Screen**

3. Click Next.
   You will see the **Customer Information** screen. See Figure 2-2.

Figure 2-2. **Bluetooth Suite Customer Information Screen**

4. Enter the user name and company name and choose the intended user of this application - "**Anyone who uses this computer (all users)**" or "**Only for me**" and click **Next**.

   You will see Choose Destination Location screen. See Figure 2-3.

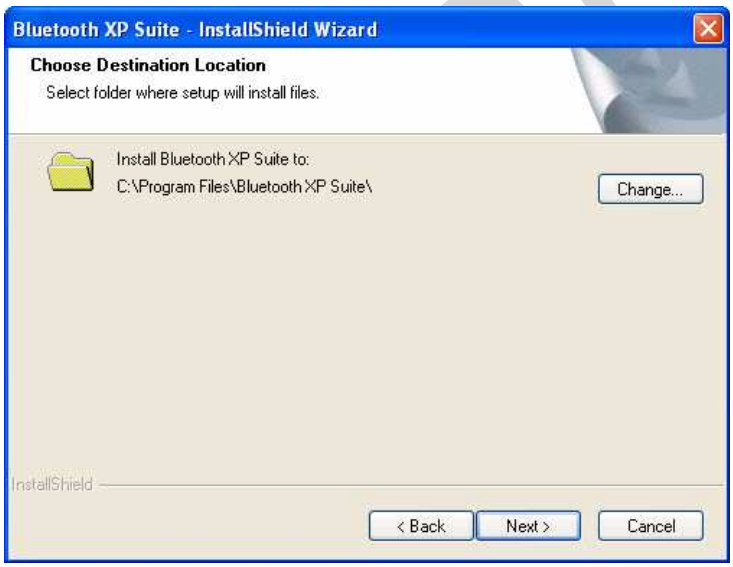

Figure 2-3. **Bluetooth Suite Choose Destination Location**

5. The default destination location is already selected. Click Change to browse to a different destination.
6. Click **Next**.
   You will see **Start Copying Files** screen that displays the current settings including user

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information, setup type, and destination directory. This allows you to review and modify the setup information. See Figure 2-4.

Figure 2-4. **Bluetooth Suite - Start Copying Screen**

7. Click **Next.** The Bluetooth Suite begins to configure and copy the new software. It also removes any backup files. When the Bluetooth Suite installation is complete, you will see the Finish screen. See Figure 2-5.

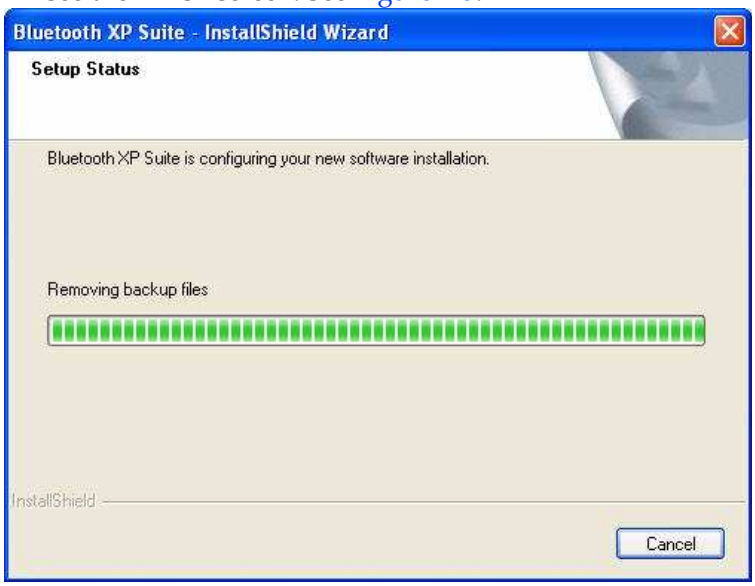

Figure 2-5. **Bluetooth Suite - Installation Setup Status**

8. When prompted to restart your computer, select **Yes, I want to restart my computer now** option and click **Finish**.

Figure 2-6. **Bluetooth Suite - Finishing the Installation**

The installation is complete. This process creates a 'Launch Bluetooth Suite' shortcut on your desktop. Now you are ready to run Bluetooth Suite.

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Launching the Bluetooth Suite

1. Insert the Bluetooth Suite USB device into the USB port of your system.

NOTE: You can insert the Bluetooth Suite USB device in any USB port. You might see **Found New Hardware** message.

2. Double click on the **Bluetooth Suite** icon on your desktop or choose **start** > **All Programs** > **Bluetooth Suite** > **Launch Bluetooth Suite**.

It displays the blank Atheros Bluetooth **Suite** screen.

NOTE: If no Bluetooth devices are found within range, it is normal for new installation. Bluetooth Suite screen does not display such devices when launched for the first time. You need to click on the Discovery button the top left panel of the window to see all the Bluetooth devices in range. See Figure 2-7.

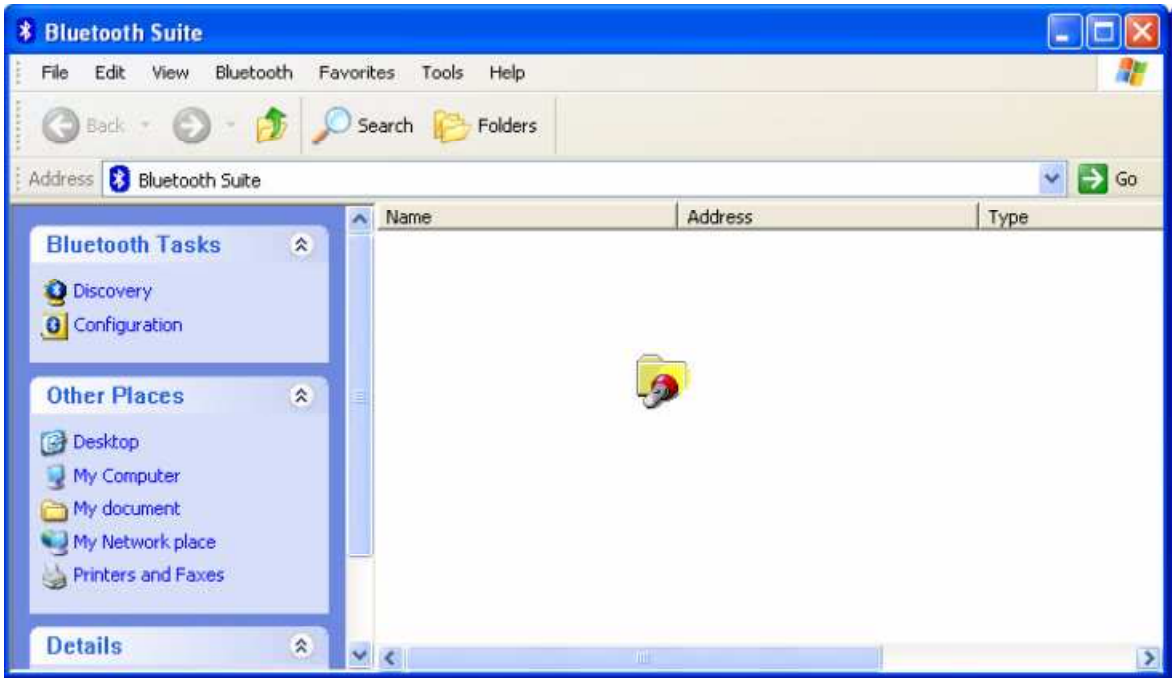

Figure 2-7. **Bluetooth Suite Startup Screen During Discovery**

When the Bluetooth Suite finds devices in range, it displays them. See Figure 2-8.

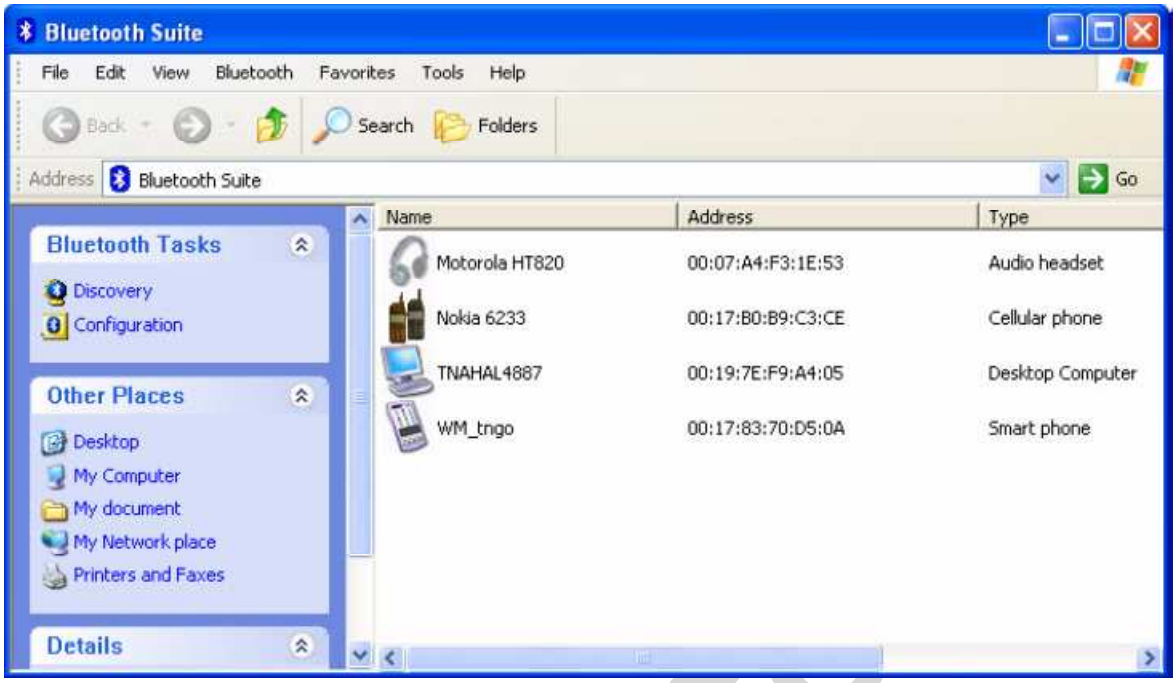

Figure 2-8. **Discovered Bluetooth Devices**

NOTE: Trusted remote devices will show Paired status in Device list, and Connected remote devices will show Connected status in Device list. Other devices will display Inrange status.

Introduction to the Bluetooth Suite

Now that you have successfully launched the Bluetooth Suite, spend few minutes in getting to know your Bluetooth Suite. The following few pages explain various features and components associated with the Bluetooth Suite GUI.

The **My Bluetooth Suite** is the main screen that consists of three major parts:

- Menu bar
- Bluetooth Tasks area
- Bluetooth devices along with their IP addresses and types are displayed on the right panel.

In addition, there is a Bluetooth Suite Tray which allows you to launch the Bluetooth Suite.

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Menu Bar

Bluetooth menu is the primary menu on the **Bluetooth Suite** screen. The options associated with this menu are:

- Search for Device
- Bluetooth Configuration
- Bluetooth Help Topics
- Bluetooth Exchange Folder
- About Bluetooth

NOTE: Some of these functions are available from the Bluetooth Suite Tray.

These options are described below in detail.

Search For Device

Clicking this button begins to search for remote Bluetooth devices in range. Found devices will display in right panel.

Bluetooth Configuration

Clicking on the Configuration menu option displays the Bluetooth Suite Configuration screen which allows you to specify Bluetooth Suite tasks and settings associated with Bluetooth device recovery and device filters. This function is also available through the toolbar. Nine configuration screens are associated with Bluetooth Suite. Those screens are:

- Bluetooth Suite Settings
- Local Device
- Bluetooth Security
- Profile Manager
- Shared Folders
- Object Push
- Audio
- Basic Imaging
- Personal Area Networking
- Fax Server Configuration
- Sync

These options are described in detail in Chapter 3.

Bluetooth Help Topics

Click this button to display any help topics.

Bluetooth Exchange Folder

Clicking this button to display the content of Bluetooth exchange folder. From Bluetooth Suite window, choose **Bluetooth->Bluetooth Exchange Folder** to access Exchange share folder for Object Push feature.

Bluetooth Places Panel

When you launch the Bluetooth Suite, various Bluetooth devices in the Bluetooth neighborhood are listed on the right panel. These typically consist of audio devices, computers (both laptop and desktop), phones, peripheral devices such as Fax, printer, mouse, headset, and imaging devices. If any of these devices are discovered, they are listed on the right window panel. For example, if a Bluetooth mouse is discovered in the Bluetooth neighborhood, it is shown as peripheral pointing device, its brand name, address, and service status (in range, paired, connected or disconnected). You can select a device and right mouse click button to select the following:

- Name discovery
- Delete
- Pair
- Service Discovery
- Properties

See Figure 2-9 for details.

Figure 2-9. **Bluetooth Places Device Options**

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Uninstalling the Bluetooth Suite

Anytime you install a new version of Bluetooth Suite, you need to uninstall any existing version of the Bluetooth Suite. Follow this procedure to uninstall the Bluetooth Suite.

1. Make sure the Bluetooth dongle is removed from any system USB port.
2. Choose **start** > **All Programs** > **Bluetooth Suite** > **Uninstall Bluetooth Suite**.

The system prepares for uninstallation. A screen is briefly displayed that shows that it is ready to uninstall the program. You will see another screen that prompts you to completely remove the application and all of its features. See Figure 2-10.

Figure 2-10. **Bluetooth Suite Uninstallation Prompt**

3. Click **Yes.**

You will see a Setup Status screen showing that application is being removed followed by another screen showing Uninstall Complete. See Figure 2-11.

Figure 2-11. **Finishing Bluetooth Suite Uninstallation**

4. Click **Yes, I want to restart my computer now.**

5. `Click` **Finish.**

The uninstall is complete. You are ready to reinstall the Bluetooth Suite.

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Connecting to an HID Device

This chapter describes how to connect the Bluetooth laptop to a Bluetooth HID (Human Interface Device) such as a mouse.

Setup Requirements

You need the following devices and equipment in order to accomplish this task:

- A PC system running Windows with Bluetooth Suite
- Atheros Bluetooth USB Adapter (dongle)
- Bluetooth mouse with batteries or keyboard

Launching the Bluetooth Suite

1. Double click on the **Launch Bluetooth Suite** icon on your desktop or launch it from **start** > **All Programs** > **Bluetooth Suite** > **Launch Bluetooth Suite**. It displays theBluetooth Suite start-up screen. See Figure 4-1.
2. Put your mouse in searchable (pairing mode) by doing the following:
   a. Turn On the mouse by pressing down its power On/Off button. Refer to the mouse documentation on how to do it.
   b. Press the connect button on the mouse to put it in pairing (discoverable) mode. Refer to the mouse documentation for additional information.
3. Right mouse click on the **Bluetooth Suite Tray**, and choose **My Bluetooth Place** option.

It displays all the peripheral devices in the right panel of the screen indicating that these devices are in range and available to be connected. It also shows the device name, address, type and status (in range, paired, or connected).

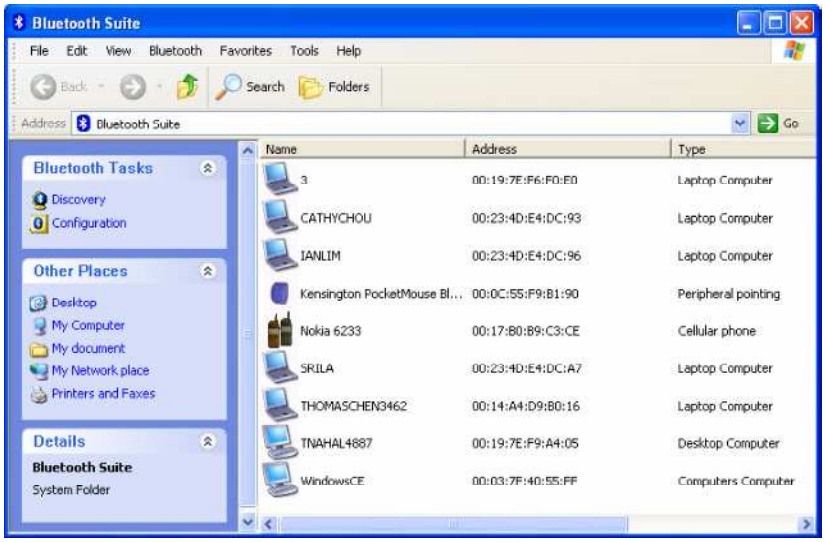

Figure 4-1. **Bluetooth Places Screen**

4. Make sure the device that you wish to pair or connect is powered up and in discoverable mode. If it is in range and has previously been paired, turning on the device will automatically pair it.
5. Right click on the mouse and choose **Pair**. It displays the Bluetooth Pairing Passcode screen. See Figure 4-2.

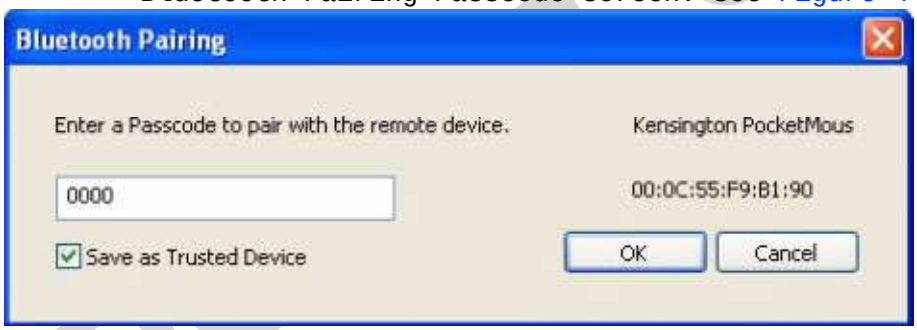

Figure 4-2. **Entering Bluetooth Pairing Passcode**

6. Enter a passcode to pair with the remote device and click **OK**.

NOTE: The default code shown is 0000. Refer to the documentation of your mouse to find out the passcode of your device and how to change it.

7. Highlight the mouse device under Peripheral Devices in the left panel and choose **Service Discovery**. Highlight the device. Using your laptop pointing device, right click on the Human Interface Device service and choose the **Connect** option to connect to the mouse.

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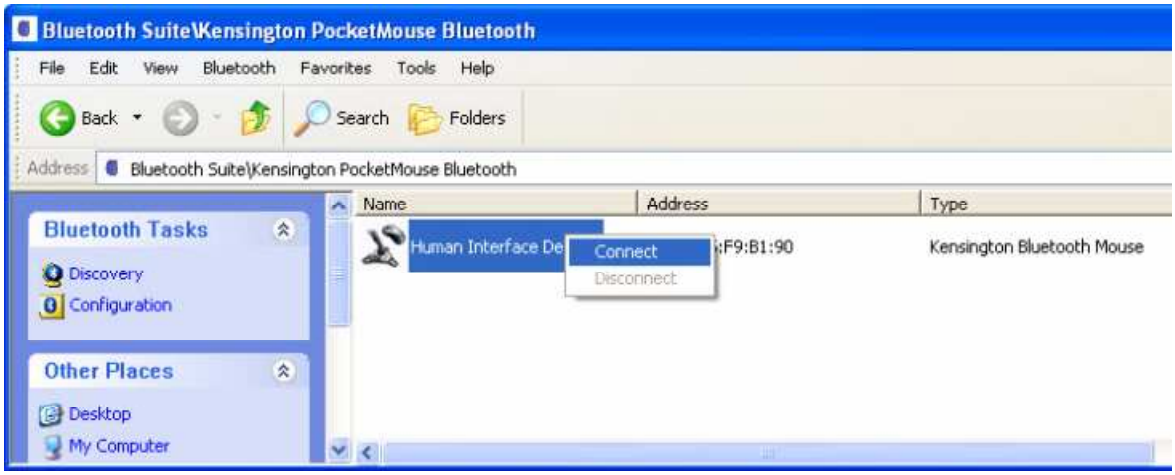

Figure 4-3. **Connecting the Mouse**

8. Right click the **Connect** button.

9. You will be prompted to make sure the device is in discoverable mode. Make sure the device in ON and in connectable mode. See Figure 4-4.

Figure 4-4. **Putting Device in Connectable Mode**

10. Click **OK.**

You will notice that the Wizard begins to install software for the HID device. As soon as the installation is complete, the screen disappears.

Its service status of the HID changes from Disconnected to Connected. Your mouse is now connected and ready to use. You can perform normal mouse functions using this mouse.

Connecting to a Sync Device

This chapter describes how to connect a Bluetooth laptop to a Bluetooth device that supports Synchronization profile. The following topics are covered in this chapter:

- "Setup Requirements"
- "Launching the Synchronization Process"

Setup Requirements

You need the following devices and equipment in order to accomplish this task:

- A laptop system running Windows XP with Bluetooth Suite
- Bluetooth USB Adapter
- A Bluetooth device such as an e-mail tool and calendar that supports sync profile

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Launching the Synchronization Process

1. Launch the Bluetooth Suite.
2. Choose **My Bluetooth Place** from the Bluetooth tray on your desktop. It displays the **My Bluetooth Place** start-up screen.
3. Right mouse click the blank panel and choose **Device Discovery** option. See Figure 10-1.

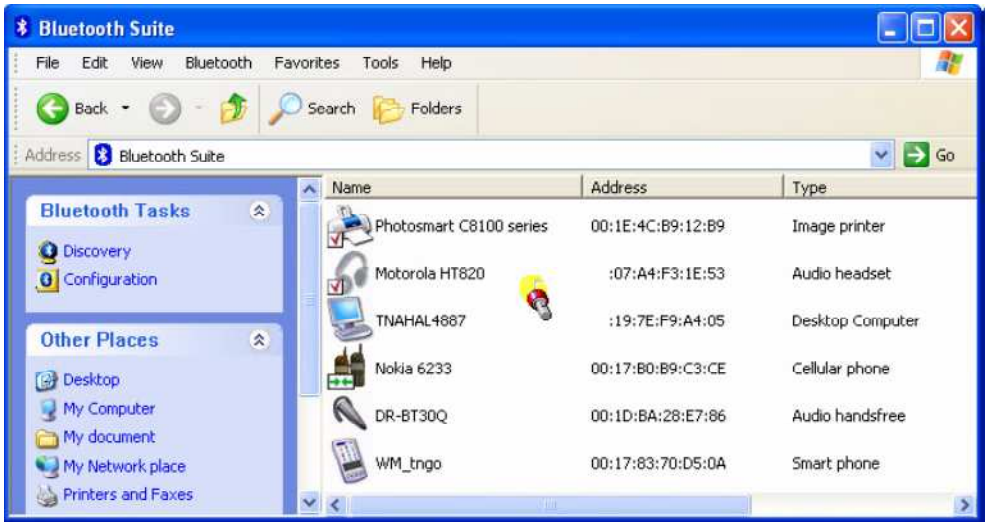

Figure 10-1. **Bluetooth Suite Discovery Screen**

4. Highlight the device that you wish to sync with and pair it. See Figure 10-2.

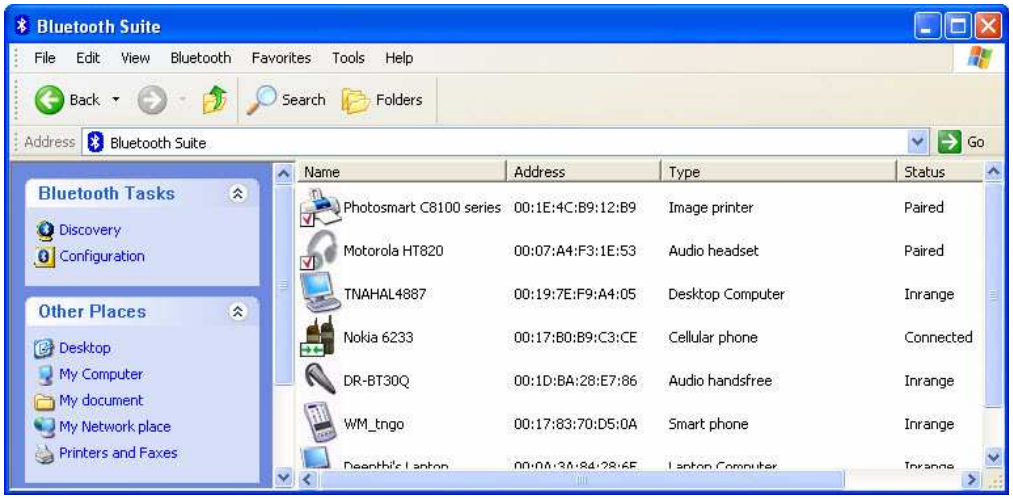

Figure 10-2. **Pairing the Device for Syncing**

5. Right mouse click on the desired bluetooth device and select the **Pair** option.
6. Enter the pairing code (0000) to pair it and click **OK**. See Figure 10-3.

Figure 10-3. **Bluetooth Devices Pairing**

7. You will see the passcode prompt. Enter the passcode (default is 0000) for the selected device and click **OK**.

NOTE: The default code shown is 0000. Refer to the documentation of your device to find out the passcode of your device and how to change it.

8. Right click the **SYNC** icon on My Bluetooth Place under the specified device screen and choose **Synchronization** option. See Figure 10-4.

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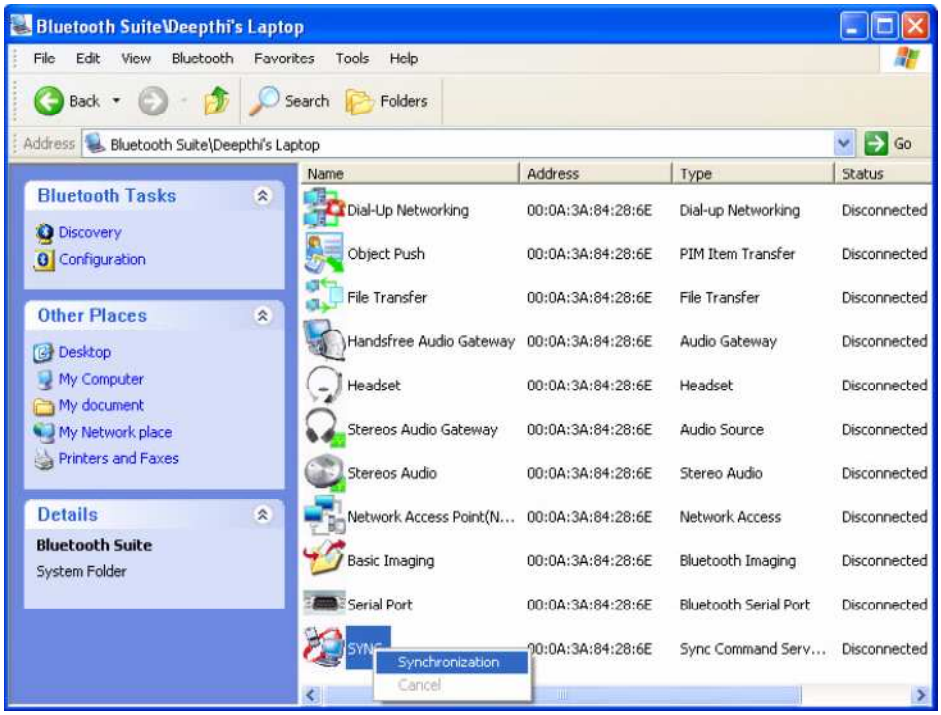

Figure 10-4. **Bluetooth Synchronization**

It displays the Sync screen which allows you to specify sync parameters for both client and server. See Figure 10-5.

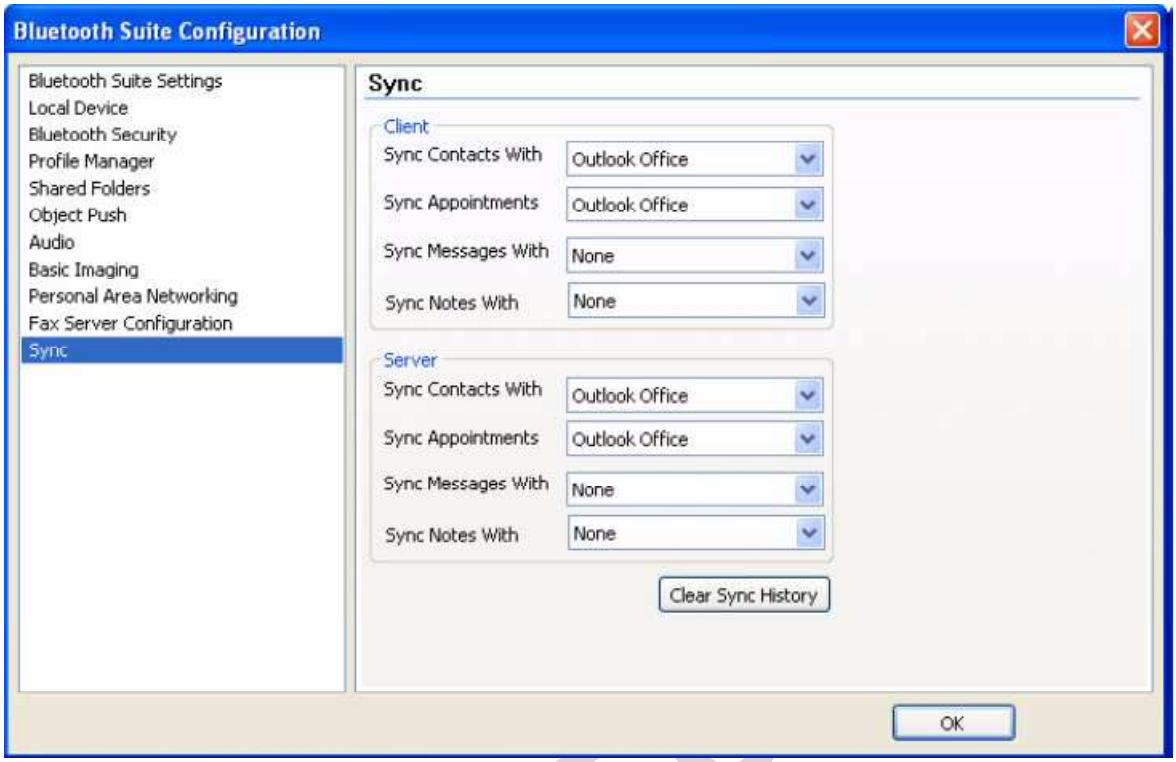

Figure 10-5. **Selecting Items to Synchronize**

9. Select the Sync items under the server and client that you wish to synchronize and click **OK**.

The selected items will be synchronized.

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Advanced Status Information

Click the Advanced button on the Current Status tab of the Atheros Client Utility to see advanced information about the program and its operations. The Current Status tab does not require any configuration. The following table describes the items found on the Advanced Status screen.

Network Name (SSID)	Displays the wireless network name. Configure the network name on the General tab.
Server Based Authentication	Shows whether server based authentication is used.
Data Encryption	Displays the encryption type the driver is using. Configure the encryption type on the Security tab.
Authentication Type	Displays the authentication mode. Configure the authentication mode on the General tab.
Message Integrity Check	Shows whether MIC is enabled. MIC prevents bit-flip attacks on encrypted packets.
Associated AP Name	Displays the name of the access point the wireless adapter is associated to.
Associated AP IP Address	Shows the IP address of the access point the wireless adapter is associated to.
Associated AP MAC Address	Displays the MAC address of the access point the wireless adapter is associated to.
Power Save Mode	Shows the power save mode. Power management is disabled in ad hoc mode. Configure the power save mode on the Advanced tab.
Current Power Level	Displays the transmit power level rate in mW.
Current Signal Strength	Shows the current signal strength in dBm.
Current Noise Level	Displays the current noise level in dBm.
Up Time	Shows how long the client adapter has been receiving power (in hours:minutes:seconds). If the adapter runs for more than 24 hours, the display shows in days:hours:minutes:seconds.
802.11b Preamble	Displays the 802.11b preamble format. Configure the preamble format on the Advanced tab.
Current Receive Rate	Shows the current receive rate in Mbps.
Current Transmit Rate	Displays the current transmit rate in Mbps.
Channel	Shows the currently connected channel.

Frequency	Displays frequency the station is using.
Channel Set	Shows the current channel set.

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Note: The country code selection is for non-US model only and is not available to all US model. Per FCC regulation, all WiFi product marketed in US must fixed to US operation channels only.

Federal Communication Commission Interference Statement

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.

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 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 the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

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Industry Canada statement:

This device complies with RSS-210 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:
Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

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Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.
Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Caution :

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and

(iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

(iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5 250-5 350 MHz et 5 470-5 725 MHz doit se conformer à la limite de p.i.r.e.;

(iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

(iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信法規定作業之無線電通信。
低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤。
2. 系統廠商應於平台上標示「本產品內含射頻模組：XXXyyyLPDzzzz-x」字樣。

MPE Requirements
To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.
To ensure compliance, operations at closer than this distance is not recommended.
Les antennes installées doivent être situées de facon à ce que la population ne puisse y être exposée à une distance de moin de 20 cm. Installer les antennes de facon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l' antenne.
La FCC des éltats-unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son functionnement.

If the FCC ID of this module is not visible when it is installed inside another device, then the outside of the device into which the module is installed must be label with "Contains FCC ID:2AOJ9-7357622 and IC:9871A -7357622".

This radio transmitter (IC:9871A-7357622) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Gain of antenna: 2.6 dBi @ 2.4GHz; 5dBi @ 5GHz max.
Type of antenna: 50ohm, PIFA

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.
Gain d'antenne: 2.6 dBi @ 2.4GHz; 5dBi @ 5GHz maximal
Type d'antenne: 50 ohm, PIFA