

**802.11n compliant 2.4GHz
Mini-PCI Module**

User's Manual

REGULATORY STATEMENTS

FCC Certification

The United States Federal Communication Commission (FCC) and the Canadian Department of Communications have established certain rules governing the use of electronic equipment.

Part 15, Class B

This device complies with Part 15 of 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 off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
 - Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and receiver.
 - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.



CAUTION

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. For product available in the USA market, only channel 1~11 can be operated. Selection of other channels is not possible.

Agency in the United States of America:
Company Name: Xterasys Corporation
Tel: 909-590-0600 Fax: 909-590-0388
Address: 4711 CHINO AVE. CHINO, CA91710

IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: VQF-RT2700E ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

Hereby, Ralink, declares that this device is in compliance with the essential requirement and other relevant provisions of the R&TTE Directive 1999/5/EC.

Japanese Notice

本装置は、第二種情報装置（住宅地域またはその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に、近接してご使用になると、受信障害の原因となることがあります。本書の説明にしたがって正しい取り扱いをしてください。

VCCIの対角線長：4.5mm

認定マークの直径：5mm

材質：PVC

地色：T-02015HB（銀）

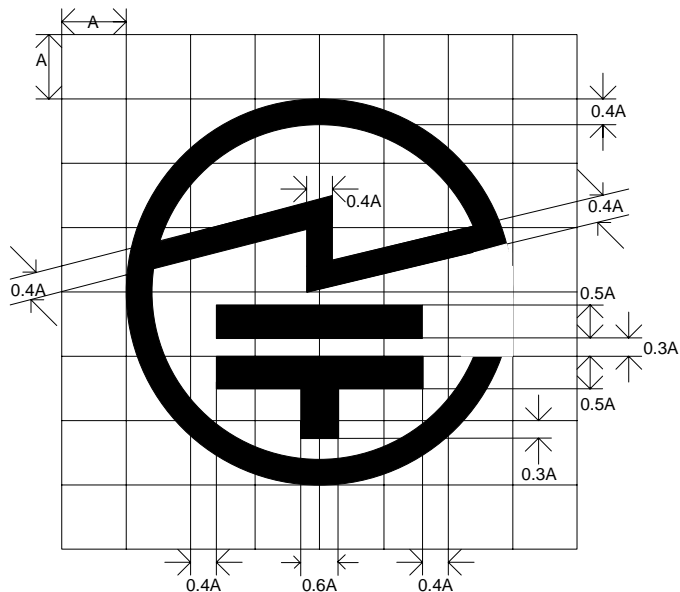
印刷色：Pantone cool gray 11c

粘着材：アクリル樹脂系糊

25mm



認定マークの形状



$A = 0.83\text{mm}$

認定マークの直径 = 5mm

Hardware Quick Installation Guide

Installing the **Wireless Mini PCI Express Module**

1. Power down the computer.
2. Plug the **Wireless PCI Express Minicard Module** board to motherboard minicard slot
3. Connect 2 external antennas used I-PEX connector for WiFi antenna.
4. Power on the computer.



Un-installing the **Wireless Mini PCI Express Module**

1. Power down the computer
2. Removed 2 external WiFi antennas from the **Wireless Mini PCI Express Module**
3. Carefully removed the **Wireless PCI Express Minicard Module** from the motherboard minicard slot.
4. Power on the computer.

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INTRODUCTION

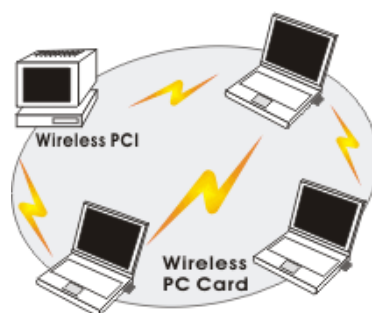
The **11b/g/n 1T1R WLAN Mini Card** is a device that allows you connect your computer to a wireless local area network (LAN). A wireless LAN allows your system to use wireless Radio Frequency (RF) technology to transmit and receive data without physically attaching to the network. The Wireless protocols that come with this product ensure data security and isolation from interference generated by other radio frequencies.

This card also allows you to take full advantage of your computer's mobility with access to real-time information and online services anytime and anywhere. In addition, this device eliminates the bother of pulling cable through walls and under furniture. It even allows you to place your system in locations where cabling is impossible. Modifying and augmenting networks has never been so easy.

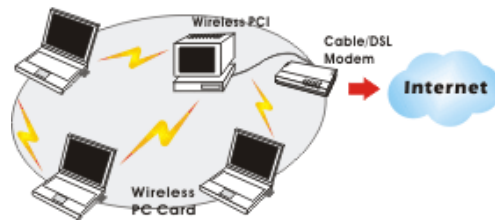
Wireless Network Options

The Peer-to-Peer Network

This network installation lets you set a small wireless workgroup easily and quickly. Equipped with wireless PC Cards or wireless PCI, you can share files and printers between each PC and laptop.

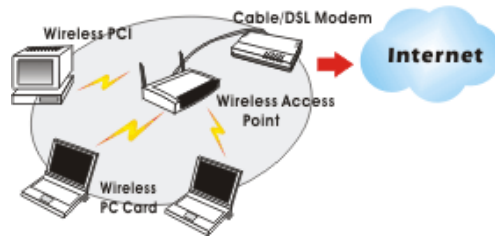


You can also use one computer as an Internet Server to connect to a wired global network and share files and information with other computers via a wireless LAN.



The Access Point Network

The network installation allows you to share files, printers, and Internet access much more conveniently. With Wireless LAN Cards, you can connect wireless LAN to a wired global network via an **Access Point**.



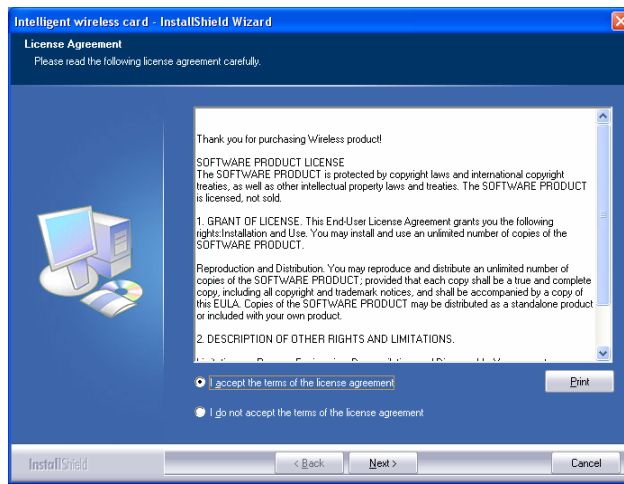
SOFTWARE INSTALLATION

Install the device

1. Make sure the computer is turned off. Remove the expansion slot cover from the computer.
2. Carefully slide the **11b/g/n 1T1R WLAN Mini Card** into the mini PCI slot. Push evenly and slowly and ensure it is properly seated.
3. After the device has been connected to your computer, turn on your computer. Windows will detect the new hardware and then automatically copy all of the files needed for networking.

Install the Driver & Utility

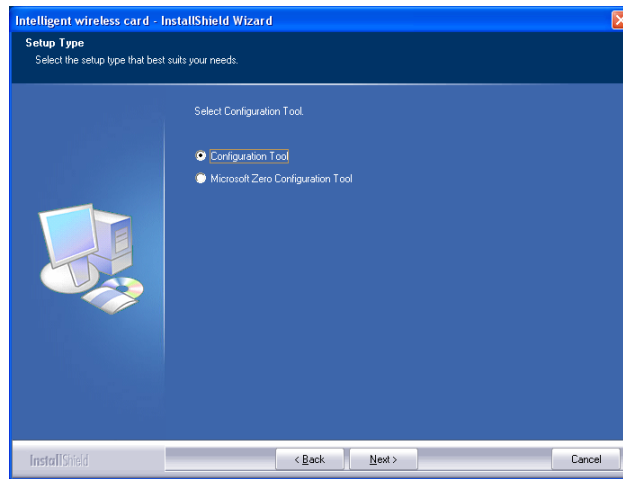
1. Exit all Windows programs. Insert the included CD-ROM into your computer. The CD-ROM will run automatically.
2. When the License Agreement screen appears, please read the contents and select "**I accept the terms of the license agreement**" then click **Next** to continue.



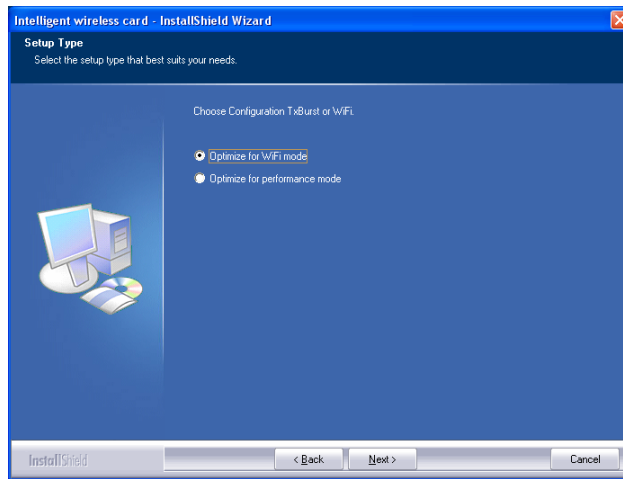
3. Select the check box to choose a **Configuration Tool** from the listed two choices.

- **Configuration Tool:** Choose to use our configuration utility.
- **Microsoft Zero Configuration Tool:** Choose to use Windows XP's built-in Zero Configuration Utility (ZCU).

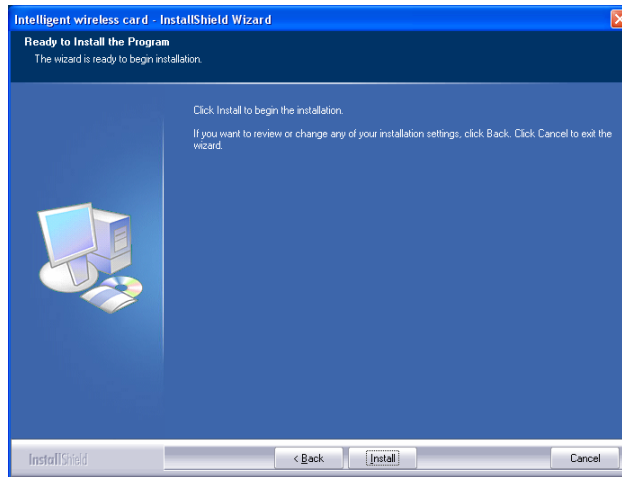
Click **Next** to continue.



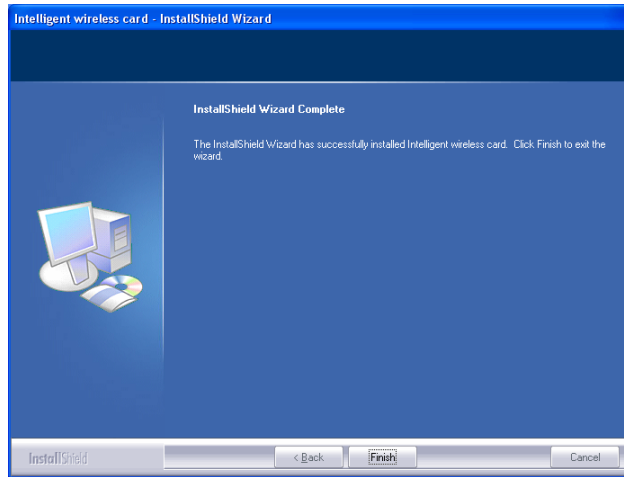
4. There are two modes for you to choose in this screen, either choose WiFi mode or performance mode (TxBurst mode). This mode selection screen is set for the default mode shown in the utility screen, you can still change its mode later in the utility screen. Click **Next** to continue.



5. When you are prompted the following message, please click **Install** to begin the installation.



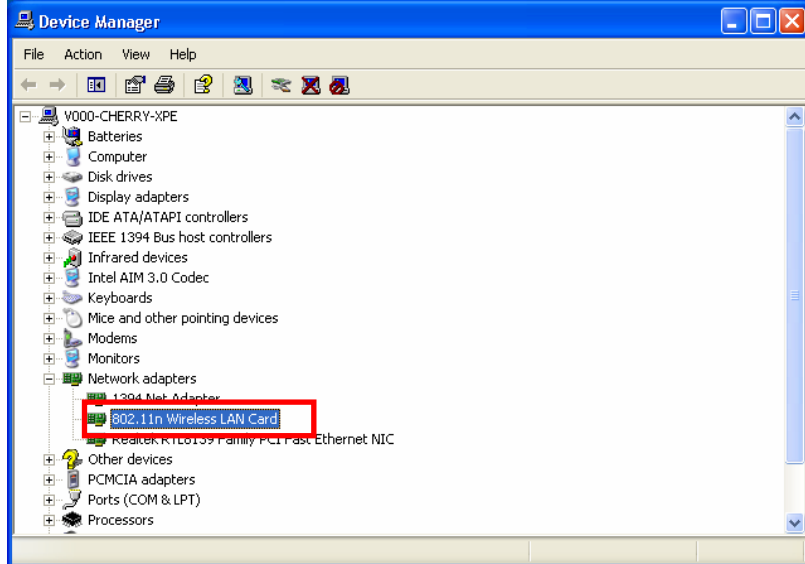
6. When the following screen appears, click **Finish** to complete the software installation.



HARDWARE INSTALLATION

Verification

To verify if the device exists in your computer and is enabled, go to **Start > Control Panel > System (> Hardware) > Device Manager**. Expand the **Network Adapters** category. If the **11b/g/n 1T1R WLAN Half Mini Card** is listed here, it means that your device is properly installed and enabled.



NETWORK CONNECTION

Once the device driver is well installed, a network setting described in the following should be also established.

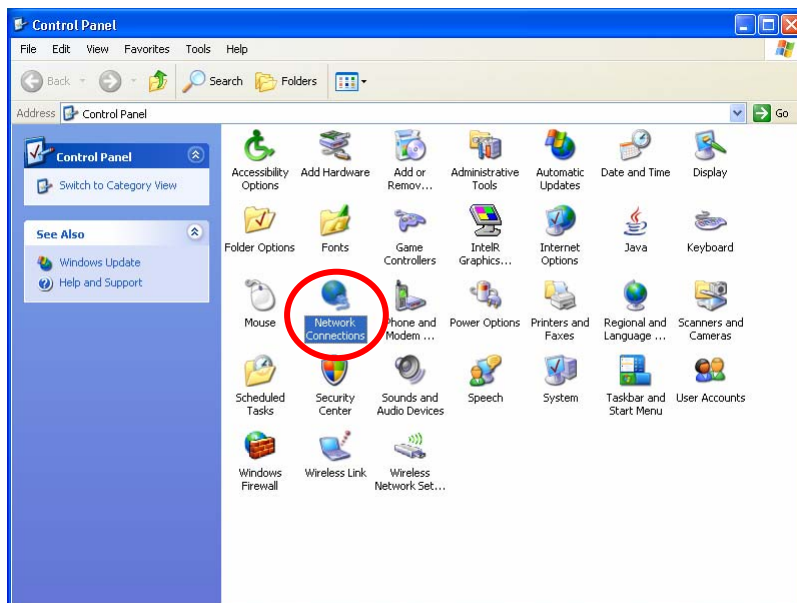
In Windows 2000/ XP

1. (In Windows 2000)

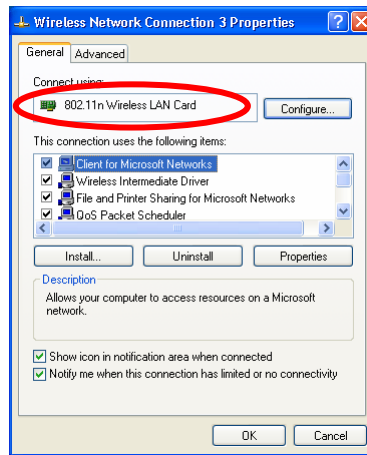
Go to **Start → Settings → Control Panel → Network and Dial-up Connections → Local Area Connection → Properties.**

(In Windows XP)

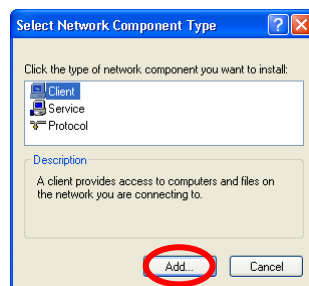
Go to **Start → Control Panel → Network and Internet Connections → Network Connections → Wireless Network Connection → Properties.**



2. Make sure that all the required components are installed.



3. If any components are missing, click on the **Install...** button to select the **Client/Service/Protocol** required. After selecting the component you need, click **Add...** to add it in.

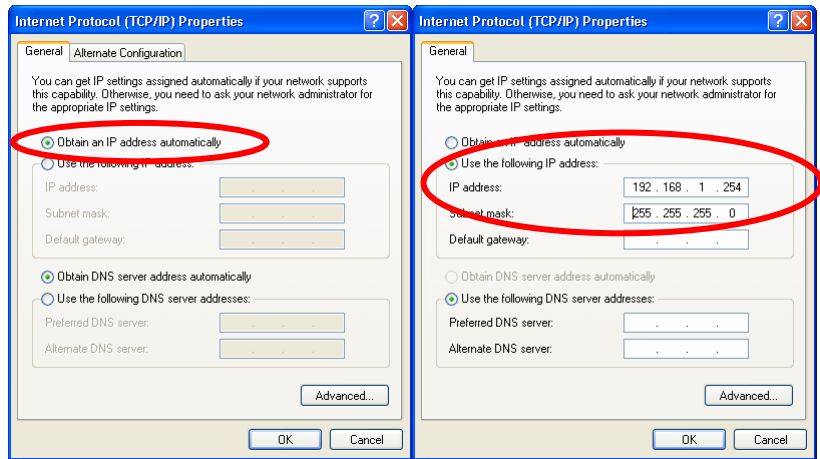


4. For making your computer visible on the network, make sure you have installed **File and Printer Sharing for Microsoft Networks**.

IP Address

Note: When assigning IP Addresses to the computers on the network, remember to have the IP address for each computer set on the same subnet mask. If your Broadband Router use DHCP technology, however, it won't be necessary for you to assign Static IP Address for your computer.

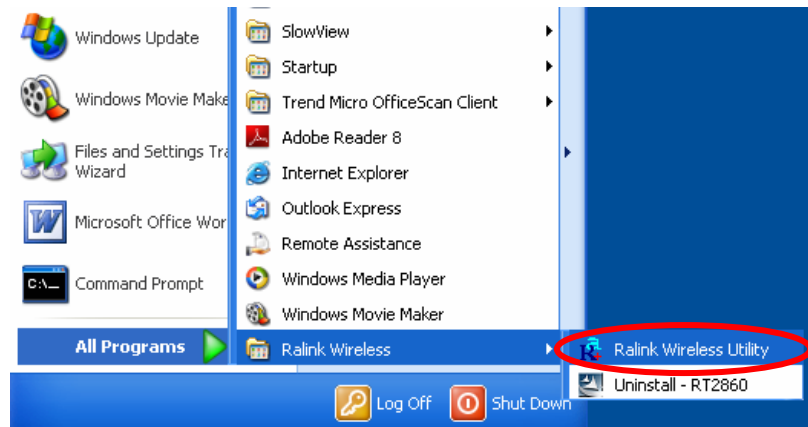
1. To configure a dynamic IP address (i.e. if your broadband Router has the DHCP technology), check the **Obtain an IP Address Automatically** option.
2. To configure a fixed IP address (if you broadband Router is not DHCP supported, or when you need to assign a static IP address), check the **Use the following IP address** option. Then, enter an IP address into the empty field; for example, enter **192.168.1.254** in the IP address field, and **255.255.255.0** for the Subnet Mask.



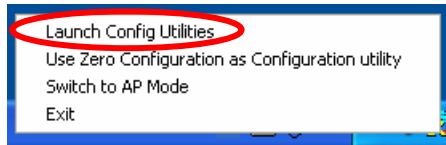
CONFIGURATION UTILITY

After the Wireless adapter has been successfully installed, users can use the included Configuration Utility to set their preference.

Go to **Start** → **(All) Programs** → **Ralink Wireless** → **Ralink Wireless Utility**.



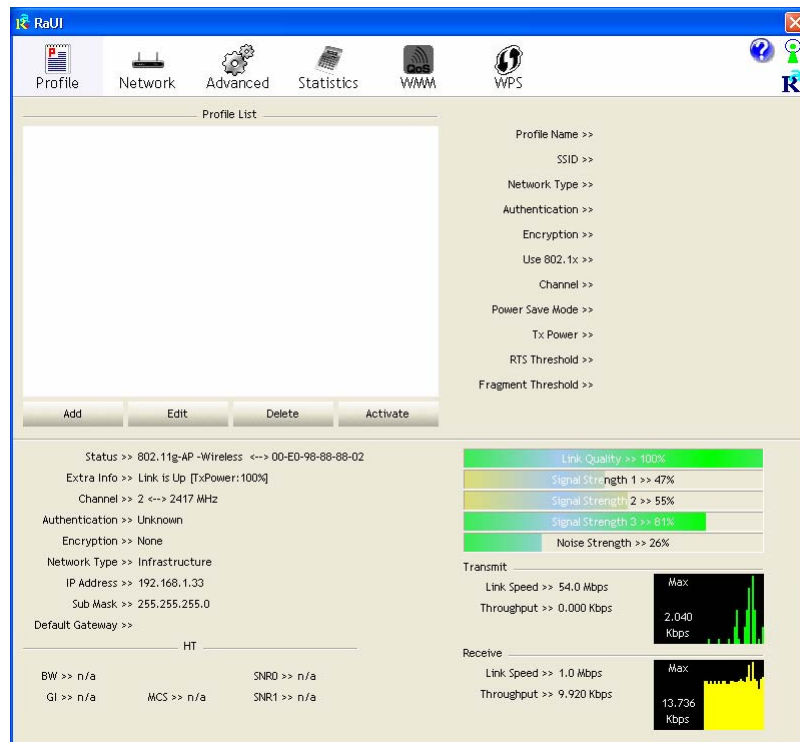
You can also open the Configuration Utility by double clicking the icon or right clicking to select **Launch Config Utilities**.



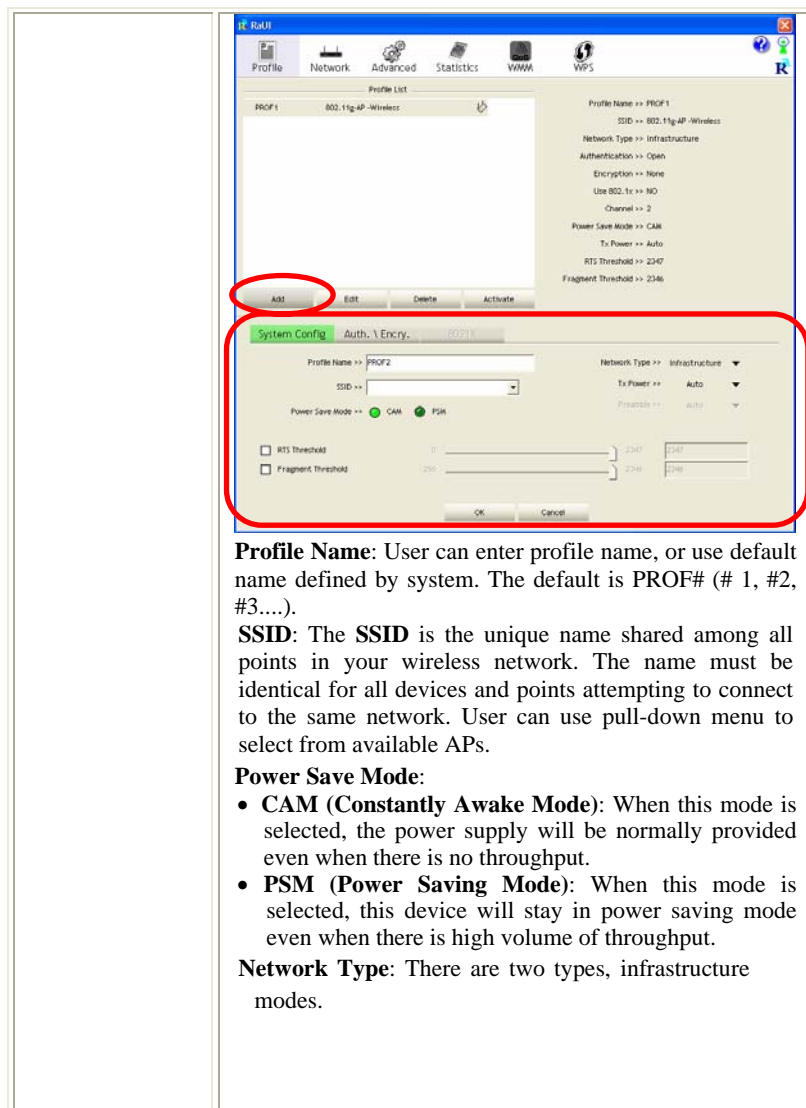
Intelligent Wireless Utility

Profile

Profile can book keeping your favorite wireless setting among your home, office, and other public hot-spot. You may save multiple profiles, and activate the correct one at your preference. The Profile manager enables you to **Add, Edit, Delete** and **Activate** profiles.



Profile Tab	
Profile Name	You may enter a distinctive name of profile in this column. The default is PROF# (# 1, #2, #3....)
SSID	The SSID is the unique name shared among all points in your wireless network.
Network Type	Shows the network type of the device, including infrastructure.
Authentication	Shows the authentication mode.
Encryption	Shows the encryption type.
Use 802.1x	Whether or not use 802.1x feature.
Channel	Shows the selected channel that is currently in use. (There are 13 channels available, depending on the country.)
Power Save Mode	Choose from CAM (Constantly Awake Mode) or Power Saving Mode.
Tx Power	Transmit power, the amount of power used by a radio transceiver to send the signal out.
RTS Threshold	Shows the RTS Threshold of the device.
Fragment Threshold	Shows the Fragment Threshold of the device.
Add	Click to add a profile from the drop-down screen. System Configuration tab:



Profile Name: User can enter profile name, or use default name defined by system. The default is PROF# (# 1, #2, #3....).

SSID: The SSID is the unique name shared among all points in your wireless network. The name must be identical for all devices and points attempting to connect to the same network. User can use pull-down menu to select from available APs.

Power Save Mode:

- **CAM (Constantly Awake Mode):** When this mode is selected, the power supply will be normally provided even when there is no throughput.
- **PSM (Power Saving Mode):** When this mode is selected, this device will stay in power saving mode even when there is high volume of throughput.

Network Type: There are two types, infrastructure modes.

- The **infrastructure** is intended for the connection between wireless network cards and an Access Point. With the wireless adapter, you can connect wireless LAN to a wired global network via an Access Point.

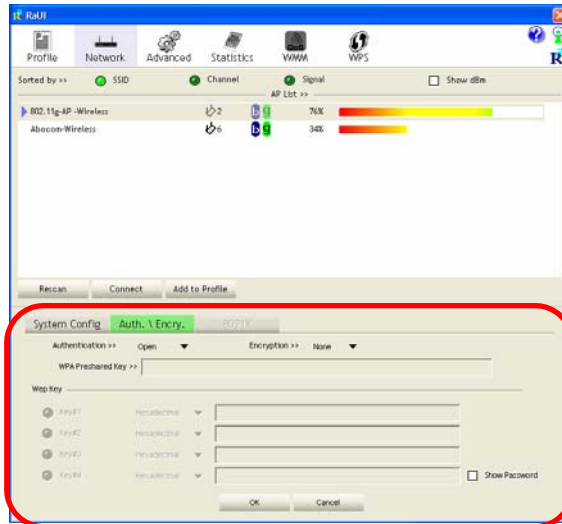
Tx Power: Select the Tx power percentage from the pull-down list including **Auto, 100%, 75%, 50%, 25%, 10%** and **Lowest**.

Preamble: A preamble is a signal used in wireless environment to synchronize the transmitting timing including Synchronization and Start frame delimiter. Select from the pull-down menu to change the Preamble type into **Auto** or **Long**.

RTS Threshold: User can adjust the RTS threshold number by sliding the bar or key in the value directly. The default value is 2347. RTS/CTS Threshold is a mechanism implemented to prevent the "**Hidden Node**" problem. If the "Hidden Node" problem is an issue, users have to specify the packet size. *The RTS/CTS mechanism will be activated if the data size exceeds the value you set.* This value should remain at its default setting of 2347. Should you encounter inconsistent data flow, only minor modifications of this value are recommended.

~~**Fragment Threshold:** User can adjust the Fragment threshold number by sliding the bar or key in the value directly. The default value is 2346. The mechanism of Fragmentation Threshold is used to improve the efficiency when high traffic flows along in the wireless network. If your Wireless LAN Adapter often transmits large files in wireless network, you can enter new Fragment Threshold value to split the packet. The value can be set from 256 to 2346.~~

Authentication and Encryption tab:



Authentication Type: There are seven type of authentication modes including Open, Shared, Leap, WPA, WPA-PSK, WPA2, WPA2-PSK, and WPA-None.

- **Open:** If your access point/wireless router is using "Open" authentication, then the wireless adapter will need to be set to the same authentication type.
- **Shared:** Shared Key is when both the sender and the recipient share a secret key.
- **LEAP:** Light Extensible Authentication Protocol. It is an EAP authentication type used primarily in Cisco Aironet WLANs. It encrypts data transmissions using dynamically generated WEP keys, and supports mutual authentication (only with CCX mode enabled.)
- **WPA-PSK:** WPA-PSK offers two encryption methods, TKIP and AES. Select the type of algorithm,

TKIP or AES and then enter a WPA Shared Key of 8-63 characters in the WPA Pre-shared Key field.

Encryption Type: For open and shared authentication mode, the selection of encryption type are None and WEP. For WPA, WPA2, WPA-PSK and WPA2-PSK authentication mode, the encryption type supports both TKIP and AES.

WPA Pre-shared Key: This is the shared secret between AP and STA. For WPA-PSK and WPA2-PSK authentication mode, this field must be filled with character longer than 8 and less than 32 length.

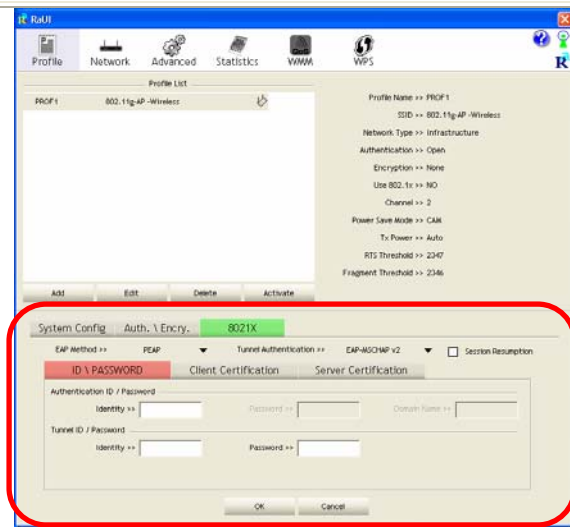
WEP Key: Only valid when using WEP encryption algorithm. The key must match with the AP's key. There are several formats to enter the keys.

- Hexadecimal (40bits): 10 Hex characters.
- Hexadecimal (128bits): 32Hex characters.
- ASCII (40bits): 5 ASCII characters.
- ASCII (128bits): 13 ASCII characters.

Show Password: Check this box to show the password you entered.

802.1x Setting: When user use radius server to authenticate client certificate for WPA authentication mode.

802.1x tab:



EAP Method:

- **PEAP:** Protect Extensible Authentication Protocol. PEAP transport securely authentication data by using tunneling between PEAP clients and an authentication server. PEAP can authenticate wireless LAN clients using only server-side certificates, thus simplifying the implementation and administration of a secure wireless LAN.
- **TLS / Smart Card:** Transport Layer Security. Provides for certificate-based and mutual authentication of the client and the network. It relies on client-side and server-side certificates to perform authentication and can be used to dynamically generate user-based and session-based WEP keys to secure subsequent communications between the WLAN client and the access point.
- **TTLS:** Tunneled Transport Layer Security. This security method provides for certificate-based, mutual authentication of the client and network through an

encrypted channel. Unlike EAP-TLS, EAP-TTLS requires only server-side certificates.

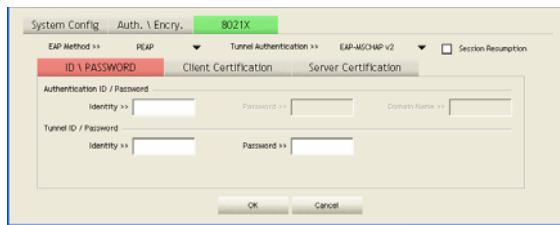
- **EAP-FAST:** Flexible Authentication via Secure Tunneling. It was developed by Cisco. Instead of using a certificate, mutual authentication is achieved by means of a PAC (Protected Access Credential) which can be managed dynamically by the authentication server. The PAC can be provisioned (distributed one time) to the client either manually or automatically. Manual provisioning is delivery to the client via disk or a secured network distribution method. Automatic provisioning is an in-band, over the air, distribution. For tunnel authentication, only support "Generic Token Card" authentication now.
- **MD5-Challenge:** Message Digest Challenge. Challenge is an EAP authentication type that provides base-level EAP support. It provides for only one-way authentication - there is no mutual authentication of wireless client and the network.

Tunnel Authentication:

- **Protocol:** Tunnel protocol, List information including **EAP-MSCHAP v2, EAP-TLS/Smart card, and Generic Token Card.**
- **Tunnel Identity:** Identity for tunnel.
- **Tunnel Password:** Password for tunnel.

Session Resumption: User can click the box to enable or disable this function.

ID\PASSWORD tab:



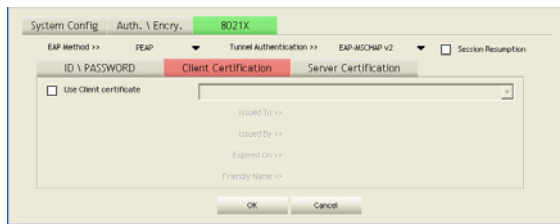
ID/ PASSWORD: Identity and password for server.

- **Authentication ID / Password:** Identity, password and domain name for server. Only "EAP-FAST" and "LEAP" authentication can key in domain name. Domain name can be keyed in blank space.
- **Tunnel ID / Password:** Identity and Password for server.

OK: Click to save settings and exit this page.

Cancel: Click to call off the settings and exit.

Client Certification tab:



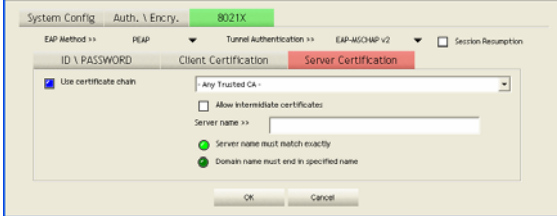
Client Certification: Client Certificate for server authentication.

Use Client certification: Choose to enable server authentication.

OK: Click to save settings and exit this page.

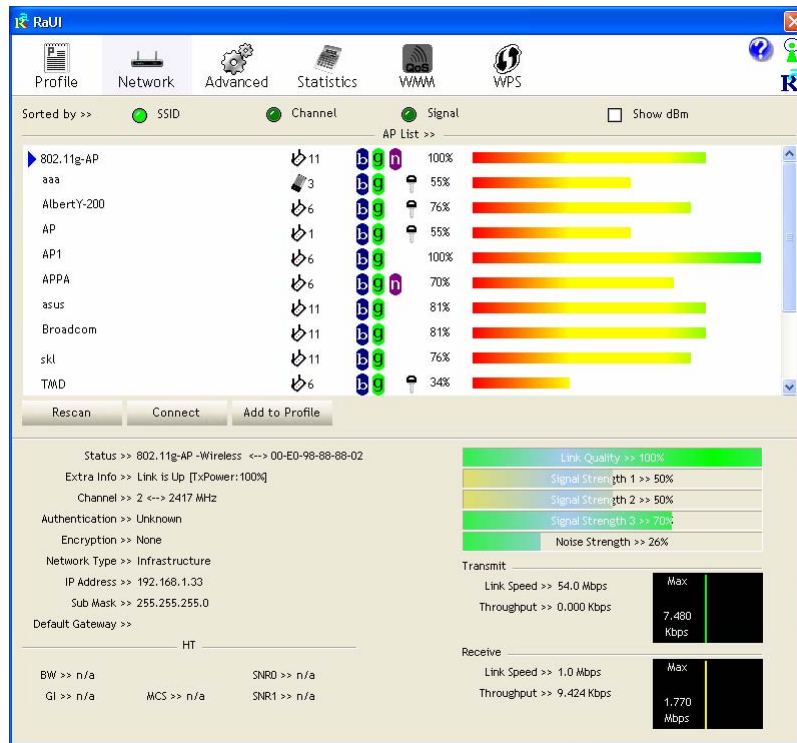
Cancel: Click call off the settings and exit.

Server Certification tab:

	 <p>Use Certificate chain: Choose use server that issuer of certificates.</p> <p>Allow intimidate certificates: It must be in the server certificate chain between the server certificate and the server specified in the certificate issuer must be field.</p> <p>Server name: Enter an authentication sever root.</p> <p>Server name must match exactly: Click to enable or disable this function.</p> <p>Domain name must end in specified name: Click to enable or disable this function.</p> <p>OK: Click to save settings and exit this page.</p> <p>Cancel: Click call off the settings and exit.</p>
Delete	Click to delete an existing profile.
Edit	Click to edit a profile.
Activate	Click to make a connection between devices.

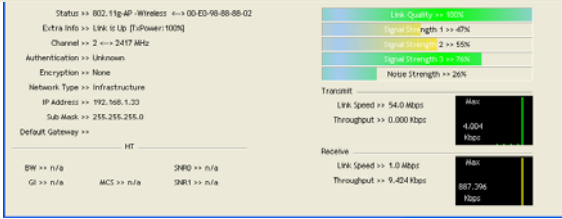
Network

The Network page displays the information of surrounding APs from last scan result. The tab lists the information including SSID, Network type, Channel, Wireless mode, Security-Enabled and Signal.



Network Tab

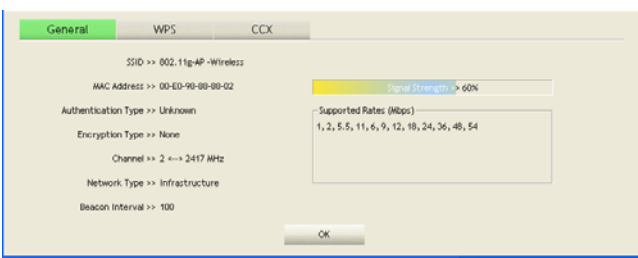
Sorted by	Indicate that AP list are sorted by SSID, Channel or Signal.
Show dBm	Check the box to show the dBm of the AP list.
SSID	Shows the name of BSS network.
Network Type	Network type in use, Infrastructure for BSS.
Channel	Shows the currently used channel.
Wireless mode	AP support wireless mode. It may support 802.11a, 802.11b, 802.11g or 802.11n wireless mode.

Encryption	Shows the encryption type currently in use. Valid value includes WEP, TKIP, AES, and Not Use.
Signal	Shows the receiving signal strength of specified network.
Rescan	Click to refresh the AP list.
Connect	Select an item on the list and then click to make a connection.
Add to Profile	Select an item on the list and then click to add it into the profile list.
Link status	 <p>The screenshot displays a network status window with the following information:</p> <ul style="list-style-type: none"> Status: 802.11g-AP - Wireless Extra Info: Link is Up (100%) Channel: 2 @ 2417 MHz Authentication: Unknown Encryption: None Network Type: Infrastructure IP Address: 192.168.1.23 Sub Mask: 255.255.255.0 Default Gateway: HT: <ul style="list-style-type: none"> BW: n/a GI: n/a MCS: n/a SMB0: n/a SMB1: n/a Link Quality: 100% Transmit: <ul style="list-style-type: none"> Link Speed: 54.0 Mbps Throughput: 0.000 kbps Receive: <ul style="list-style-type: none"> Link Speed: 1.0 Mbps Throughput: 9.424 kbps
Status	Shows the current connection status. If there is no connection existing, it will show Disconnected.
Extra Info	Shows the link status.
Channel	Shows the current channel in use.
Authentication	Authentication mode used within the network, including Unknown, WPA-PSK, WPA2-PSK, WPA and WPA2.
Encryption	Shows the encryption type currently in use. Valid value includes WEP, TKIP, AES, and Not Use.
Network Type	Network type in use, Infrastructure for BSS.
IP Address	Shows the IP address information.
Sub Mask	Shows the Sub Mask information.
Default Gateway	Shows the default gateway information.
Link Quality	Shows the connection quality based on signal strength and

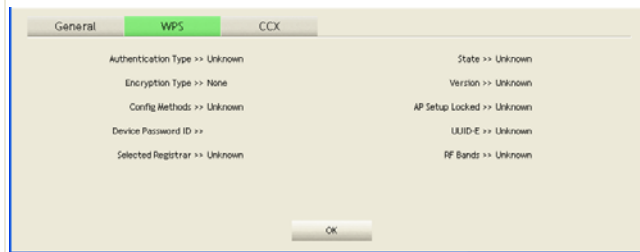
	TX/RX packet error rate.
Signal Strength 1, 2 and 3	Shows the Receiving signal strength, you can choose to display as percentage or dBm format.
Noise Strength	Shows the noise signal strength.
Transmit	Shows the current Link Speed and Throughput of the transmit rate.
Receive	Shows the current Link Speed and Throughput of receive rate.
Link Speed	Shows the current transmitting rate and receiving rate.
Throughput	Shows the transmitting and receiving throughput in the unit of K bits/sec.

AP information

When you double click on the intended AP, you can see AP's detail information that divides into three parts. They are General, WPS, CCX information. The introduction is as following:

General	 <p>General information contain AP's SSID, MAC address, Authentication Type, Encryption Type, Channel, Network Type, Beacon Interval, Signal Strength and Supported Rates.</p> <p>OK: Click this button to exit the information screen.</p>
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WPS



WPS information contains Authentication Type, Encryption Type, Config Methods, Device Password ID, Selected Registrar, State, Version, AP Setup Locked, UUID-E and RF Bands.

Authentication Type: There are four types of authentication modes supported by RaConfig. They are open, Shared, WPA-PSK and WPA system.

Encryption Type: For open and shared authentication mode, the selection of encryption type are None and WEP. For WPA, WPA2, WPA-PSK and WPA2-PSK authentication mode, the encryption type supports both TKIP and AES.

Config Methods: Correspond to the methods the AP supports as an Enrollee for adding external Registrars.

Device Password ID: Indicate the method or identifies the specific password that the selected Registrar intends to use.

Selected Registrar: Indicate if the user has recently activated a Registrar to add an Enrollee. The values are "TRUE" and "FALSE".

State: The current configuration state on AP. The values are "Unconfigured" and "Configured".

Version: WPS specified version.

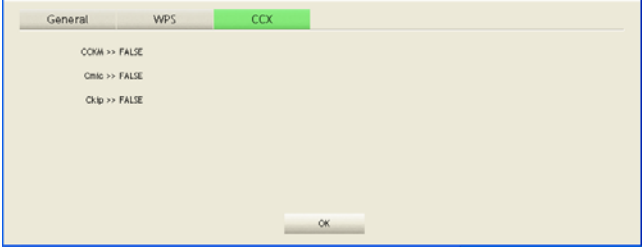
AP Setup Locked: Indicate if AP has entered a setup locked state.

UUID-E: The universally unique identifier (UUID) element generated by the Enrollee. There is a value. It is 16 bytes.

RF Bands: Indicate all RF bands available on the AP. A dual-band AP must provide it. The values are "2.4GHz" and "5GHz".

OK: Click this button to exit the information screen.

CXX



The screenshot shows a configuration window with three tabs: 'General', 'WPS', and 'CXX'. The 'CXX' tab is selected and highlighted in green. Below the tabs, there are three lines of text: 'CCKM >> FALSE', 'Cmic >> FALSE', and 'Ckip >> FALSE'. At the bottom center of the window is an 'OK' button.

CCKM information contains CCKM, Cmic and Ckip information.
OK: Click this button to exit the information screen.

Advanced

This Advanced page provides advanced and detailed settings for your wireless network.

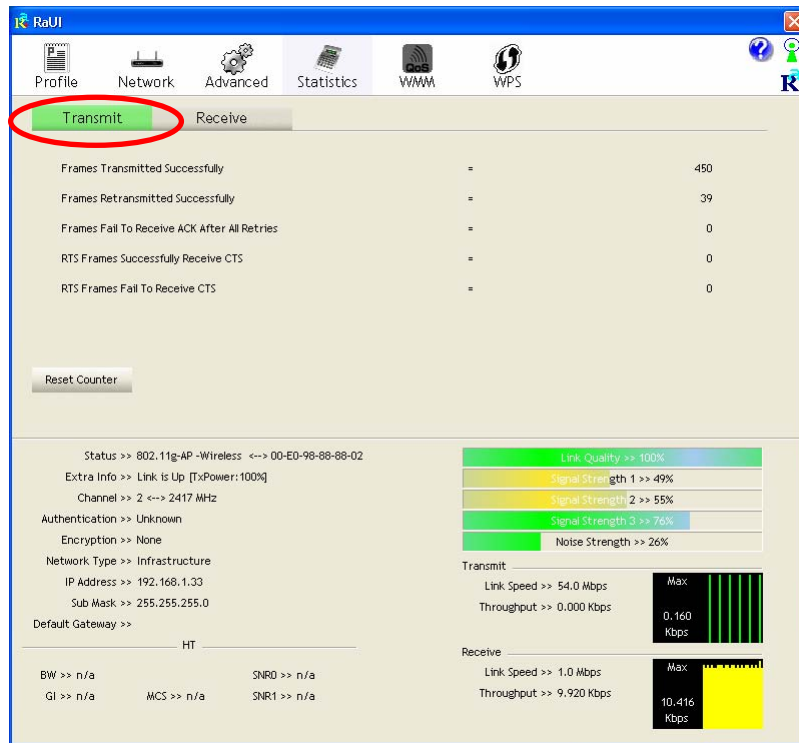
The screenshot shows the RaUI Advanced configuration window. The 'Wireless mode' is set to '802.11 B/G/N mix'. Other options include 'Enable CCX (Cisco Compatible eXtensions)', 'Turn on CCKM', 'Enable Radio Measurements', 'Non-Serving Channel Measurements limit' (250 ms), 'Enable TX Burst', 'Enable TCP Window Size' (checked), 'Fast Roaming at' (-70 dBm), and 'Show Authentication Status Dialog'. The '11 B/G' mode is set to '0: CH1-11'. The status section shows 'Status >> 802.11g-AP -Wireless <-> 00-E0-98-88-88-02', 'Link is Up [TxPower:100%]', 'Channel >> 2 <-> 2417 MHz', 'Authentication >> Unknown', 'Encryption >> None', 'Network Type >> Infrastructure', 'IP Address >> 192.168.1.33', 'Sub Mask >> 255.255.255.0', 'Default Gateway >> HT', 'BW >> n/a', 'SNR0 >> n/a', 'GI >> n/a', 'MCS >> n/a', 'SNR1 >> n/a'. The right side shows 'Link Quality >> 100%', 'Signal Strength 1 >> 51%', 'Signal Strength 2 >> 50%', 'Signal Strength 3 >> 70%', 'Noise Strength >> 26%', 'Transmit Link Speed >> 54.0 Mbps', 'Throughput >> 0.000 Kbps', and 'Receive Link Speed >> 1.0 Mbps', 'Throughput >> 9.920 Kbps'.

Advanced Tab	
Wireless mode	Select wireless mode. There are 802.11b/g/n mixed, 802.11b only and 802.11b/g mixed modes are supported. Default mode is 802.11b/g/n mixed.
Enable Tx Burst	Check to enable the burst mode.
Enable TCP Window Size	Check to increase the transmission quality.
Fast Roaming at	Check to set the roaming interval, fast to roaming, setup by transmits power.
Show	When you connect AP with authentication, choose

Authentication Status Dialog	whether show "Authentication Status Dialog" or not. Authentication Status Dialog displays the process about 802.1x authentications.
Select Your Country Region Code	Select your country region code from the pull-down menu. (for USA frequency band only.)
Enable CCX (Cisco Compatible extensions)	Check to enable the CCX function. <ul style="list-style-type: none"> • Turn on CCKM • Enable Radio Measurements: Check to enable the Radio measurement function. • Non-Serving Measurements limit: User can set channel measurement every 0~2000 milliseconds. Default is set to 250 milliseconds.
Apply	Click to apply above settings.

Statistics

The Statistics screen displays the statistics on your current network settings.



Transmit	
Frames Transmitted Successfully	Shows information of frames successfully sent.
Frames Retransmitted Successfully	Shows information of frames successfully sent with one or more retries.
Frames Fail To Receive ACK After All Retries	Shows information of frames failed to transmit after hitting retry limit.
RTS Frames Successfully Receive CTS	Shows information of successfully received CTS after sending RTS frame.

RTS Frames Fail To Receive CTS	Shows information of failed to receive CTS after sending RTS.
Reset Counter	Click this button to reset counters to zero.

The screenshot shows the RaUI interface with the 'Receive' tab highlighted in red. The 'Statistics' section is active, displaying the following data:

Category	Value
Frames Received Successfully	16
Frames Received With CRC Error	758
Frames Dropped Due To Out-of-Resource	0
Duplicate Frames Received	0

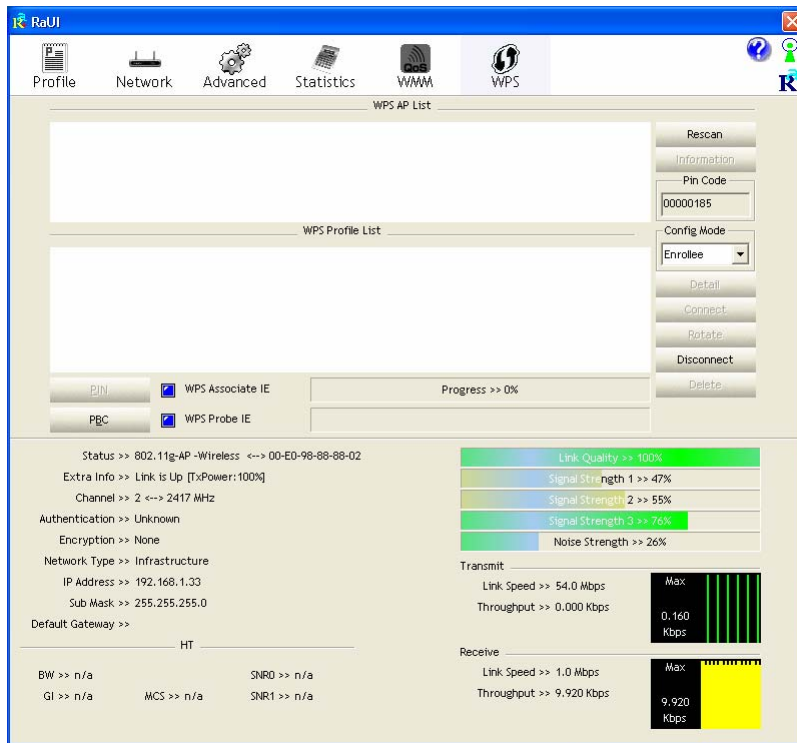
Below the statistics, there is a 'Reset Counter' button. The interface also shows network status information such as 'Link Quality >> 100%', 'Signal Strength 1 >> 55%', 'Signal Strength 2 >> 55%', and 'Signal Strength 3 >> 76%'. Additionally, it displays 'Transmit' and 'Receive' throughput graphs and various network parameters like IP Address (192.168.1.33) and Sub Mask (255.255.255.0).

Receive Statistics	
Frames Received Successfully	Shows information of frames Received Successfully.
Frames Received With CRC Error	Shows information of frames received with Error

WMM Enable	Check the box to enable Wi-Fi Multi-Media function.
WMM- Power Save Enable	Select which ACs you want to enable.
Direct Link Setup Enable	Check the box to enable Direct Link Setup.
MAC Address	<p>The setting of DLS indicates as follow :</p> <p>Fill in the blanks of Direct Link with MAC Address of STA, and the STA must conform to two conditions:</p> <ul style="list-style-type: none"> • Connecting with the same AP that supports DLS feature. • DSL enabled.
Timeout Value	Timeout Value represents that it disconnect automatically after few seconds. The value is integer that must be between 0~65535. It represents that it always connects if the value is zero. Default value of Timeout Value is 60 seconds.
Apply	Click this button to apply the settings.
Tear Down	Select a direct link STA, then click "Tear Down" button to disconnect the STA.

WPS

The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. The STA as an Enrollee or external Registrar supports the configuration setup using PIN (Personal Identification Number) configuration method or PBC (Push Button Configuration) method through an internal or external Registrar.



WPS AP List	Display the information of surrounding APs with WPS IE from last scan result. List information included SSID, BSSID, Channel, ID (Device Password ID), Security-Enabled.
Rescan	Issue a rescan command to wireless NIC to update information on surrounding wireless network.
Information	Display the information about WPS IE on the selected network. List information included Authentication Type,

	Encryption Type, Config Methods, Device Password ID, Selected Registrar, State, Version, AP Setup Locked, UUID-E and RF Bands.
PIN Code	8-digit numbers. It is required to enter PIN Code into Registrar using PIN method.
Config Mode	Our station role-playing as an Enrollee or an external Registrar.
Detail	Information about Security and Key in the credential.
Connect	Command to connect to the selected network inside credentials. The active selected credential is as like as the active selected Profile.
Rotate	Command to rotate to connect to the next network inside credentials.
Disconnect	Stop WPS action and disconnect this active link. And then select the last profile at the Profile Page. If there is an empty profile page, the driver will select any non-security AP.
PIN	Start to add to Registrar using PIN (Personal Identification Number) configuration method. If STA Registrar, remember that enter PIN Code read from your Enrollee before starting PIN.
PBC	Start to add to AP using PBC (Push Button Configuration) method.
WPS associate IE	Send the association request with WPS IE during WPS setup. It is optional for STA.
WPS probe IE	Send the probe request with WPS IE during WPS setup.

	It is optional for STA.
Progress Bar	Display rate of progress from Start to Connected status.
Status Bar	Display currently WPS Status.

Radio On/Off



Click this icon to turn on radio function.



Click this icon to turn off radio function.

About



Click this button to show the information of the wireless card including, RaConfig Version/ Date, Driver Version/ Date, EEPROM Version, Firmware Version and Phy_Address.

RaUI

Profile Network Advanced Statistics WMM WPS

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RaConfig Version >> 2.0.2.0 Date >> 05-15-2007
 Driver Version >> 1.0.3.0 Date >> 05-07-2007
 EEPROM Version >> 1.1
 Firmware Version >> 0.7
 Phy_Address >> 00-12-0E-00-00-12

WWW.RALINKTECH.COM

Status >> 802.11g-AP -Wireless <-> 00-E0-98-88-88-02

Extra Info >> Link is Up [TxPower:100%]
 Channel >> 2 <-> 2417 MHz

Authentication >> Unknown
 Encryption >> None
 Network Type >> Infrastructure
 IP Address >> 192.168.1.33
 Sub Mask >> 255.255.255.0
 Default Gateway >> _____ HT _____

BW >> n/a SNR0 >> n/a
 GI >> n/a MCS >> n/a SNR1 >> n/a

Link Quality >> 100%
 Signal Strength 1 >> 45%
 Signal Strength 2 >> 50%
 Signal Strength 3 >> 70%
 Noise Strength >> 26%

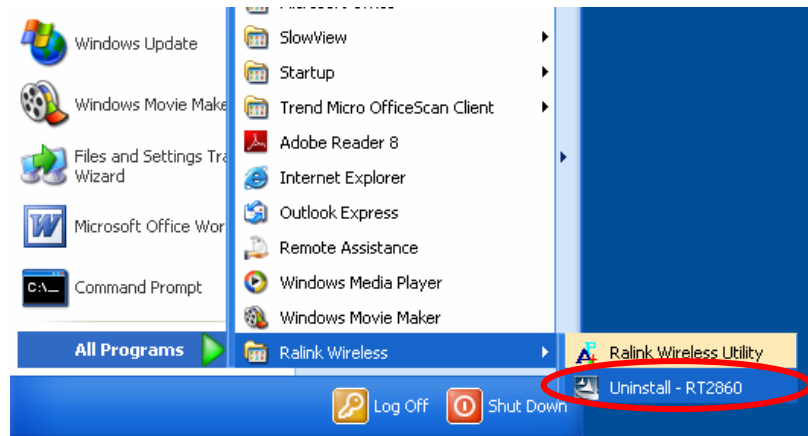
Transmit
 Link Speed >> 54.0 Mbps
 Throughput >> 0.000 Kbps

Receive
 Link Speed >> 1.0 Mbps
 Throughput >> 9.424 Kbps

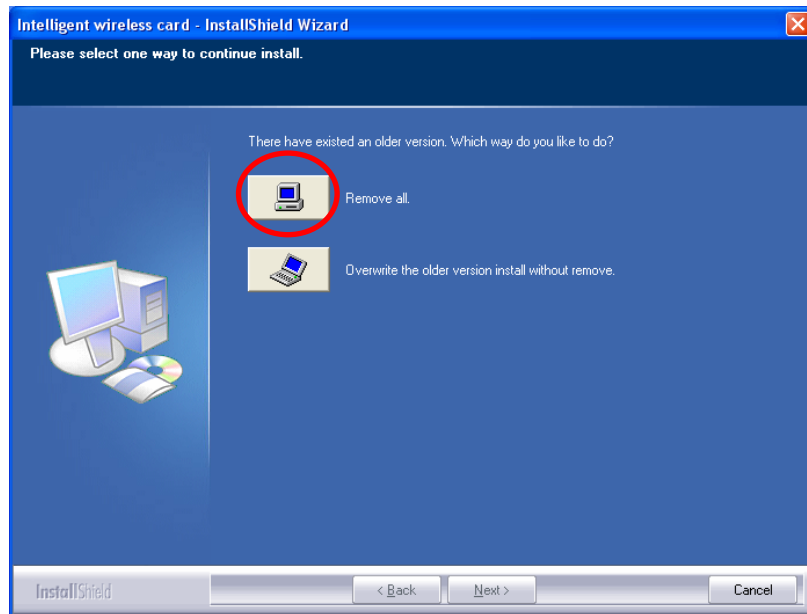
UNINSTALLATION

In case you need to uninstall the utility and driver, please refer to below steps. (As you uninstall the utility, the driver will be uninstalled as well.)

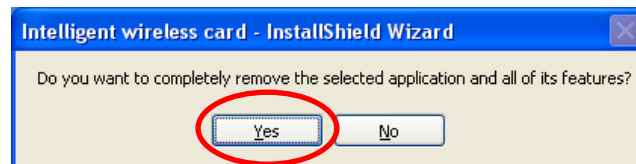
1. Go to **Start → Programs → Ralink Wireless → Uninstall**.



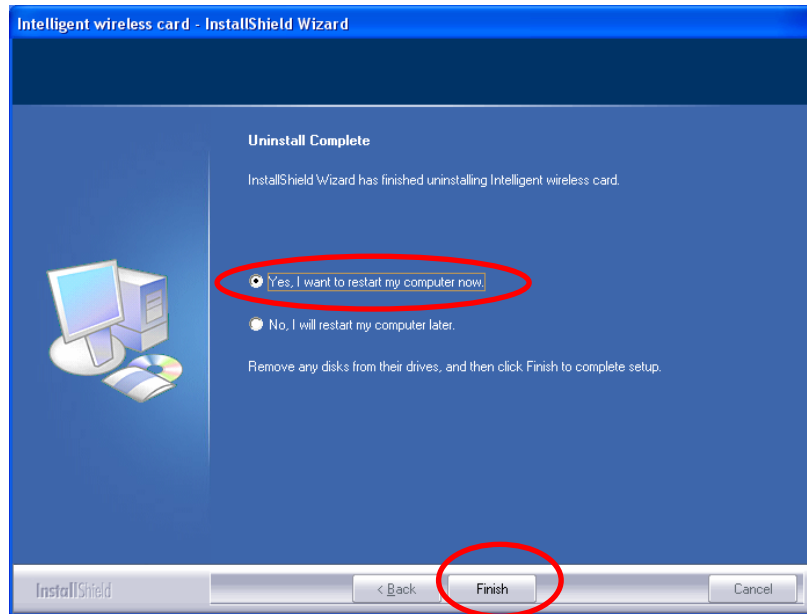
2. Select **Remove all** button and click **Next** to start uninstalling.



3. Click **Yes** to complete remove the selected application and all of its features.



4. Select **“Yes, I want to restart my computer now”** and then click **Finish** to complete the uninstallation.





**Manual
For
Motorola Bluetooth
Version 2.1.2**

Notices

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Information on the World Wide Web

Additional company and product information can be found on our Internet Web site at:
<http://www.motorola.com/pcsolutions>

1 Installation

To install Motorola Bluetooth, you'll need a PC with Microsoft Windows XP with Service Pack 2 operating system or later.

If you have installed the previous version of Motorola Bluetooth, de-install it before installation of the new version.

To start installation, plug in your Bluetooth dongle (it must be based on CSR Bluetooth chipset) and launch BluetoothSetup.exe from your installation disk – the Installation Wizard will appear.

Follow the steps specified by the Installation Wizard:

- “Welcome” page
- “License Agreement” page
- “Select Destination Location” page – “C:\Program Files\Motorola\Bluetooth,” by default
- “Select Start Menu Folder” page – “Bluetooth,” by default

On the “Ready to Install” Installation Wizard page, click the “Install” button to start the installation process.

When the installation process has completed, click the “Finish” button.

After installation, the Motorola Bluetooth Tray icon should appear in the System Tray and the “My Bluetooth” desktop icon should appear on your desktop.

To un-install Motorola Bluetooth, run the un-installation wizard from the “Start Menu” and follow the wizard instructions. To finish un-installation, reboot the system – all remaining files will be deleted.

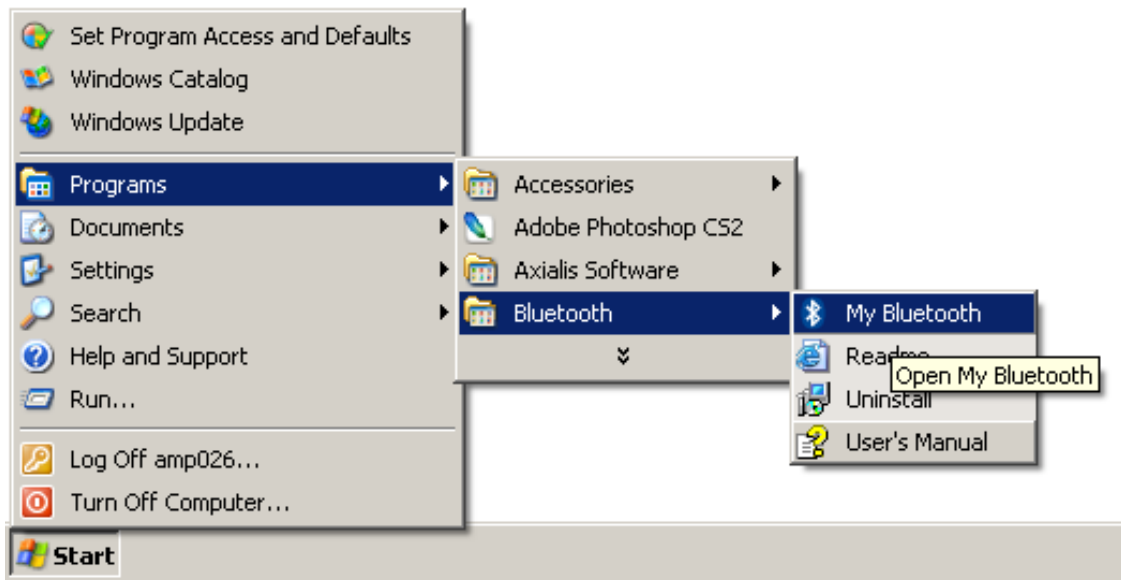
2 Exploring the Bluetooth Environment

“My Bluetooth” explorer window provides you with an easy way to explore your Bluetooth environment. There are several ways to open “My Bluetooth” explorer window:

- Double-click on the “My Bluetooth” desktop icon



- Launch “My Bluetooth” from “Start/Programs/Bluetooth/”



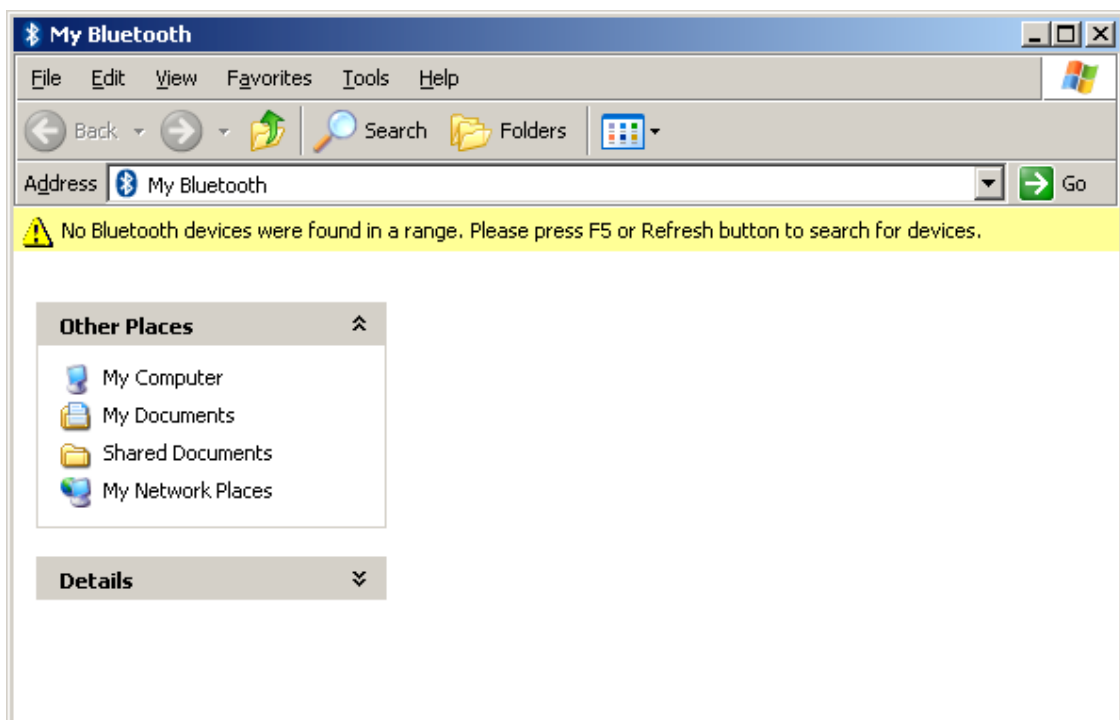
- Double-click on the Motorola Bluetooth tray icon



- Select “Open My Bluetooth” from the Motorola Bluetooth tray application context menu



The “My Bluetooth” window, with no devices found, looks like the screenshot below.



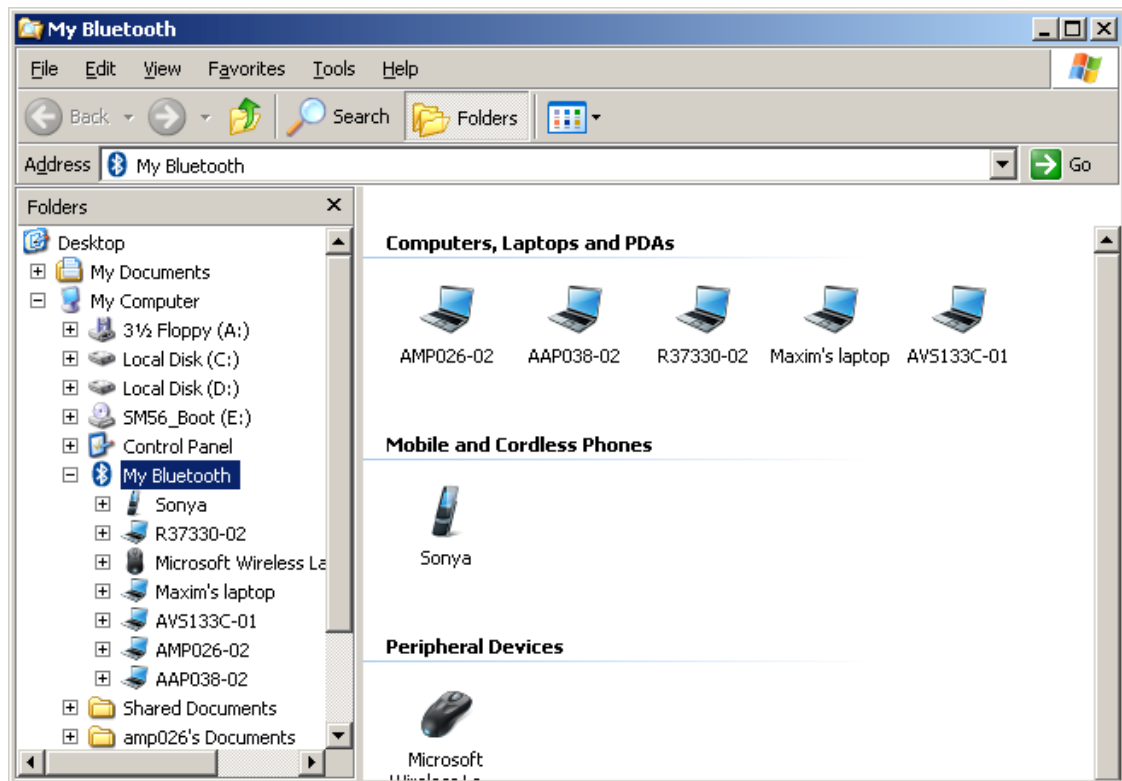
If it's the first time you've opened a “My Bluetooth” window, there will be no devices found and the “My Bluetooth” window will be empty. Press the “F5” or Refresh button to start device discovery.

You can verify if the software is discovering devices with the Motorola Bluetooth tray icon. A blue, blinking icon with white Bluetooth logo indicates that device discovery is in progress.

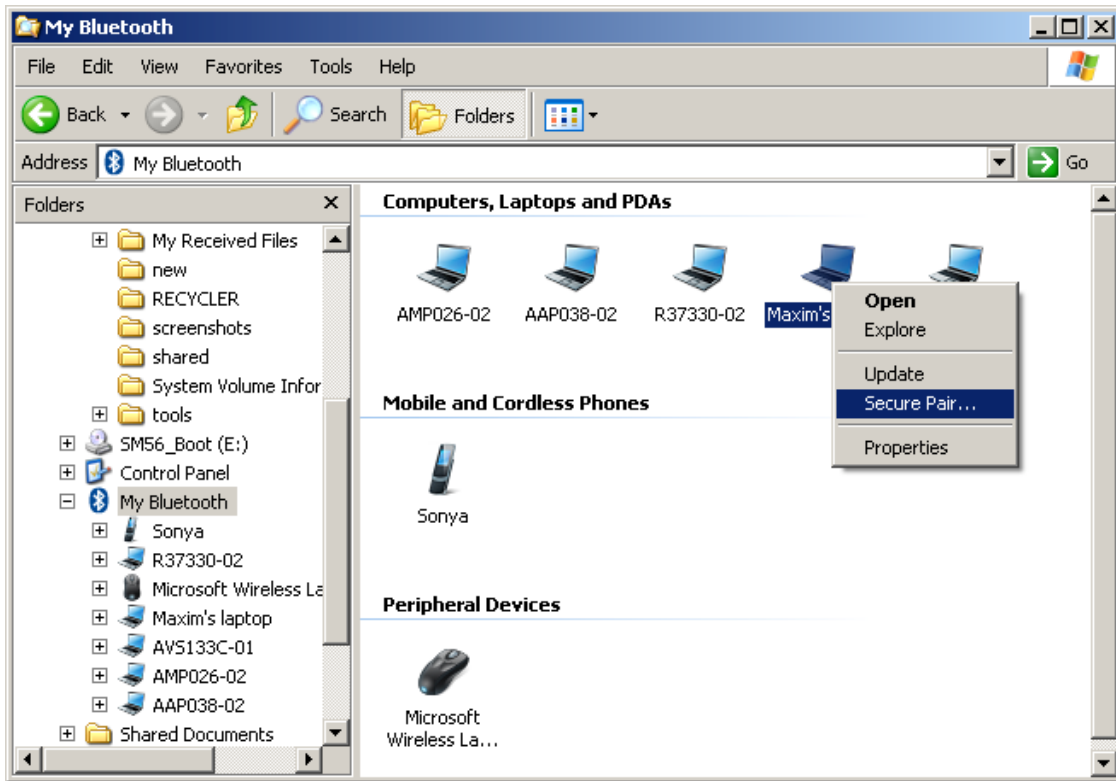
As soon as a new device is discovered, the “My Bluetooth” window is updated to show the device found.

When the tray icon switches from a blue revolving to a blue solid state, it means that device discovery is finished and you can explore the found devices.

You can view the “My Bluetooth” window in various ways. The example window below shows device icons in groups arranged by “Device Type.”



Most Bluetooth devices require authentication (or pairing) to allow connection. Right-click on the device you would like to pair with and select “Secure Pair...” in the context menu.

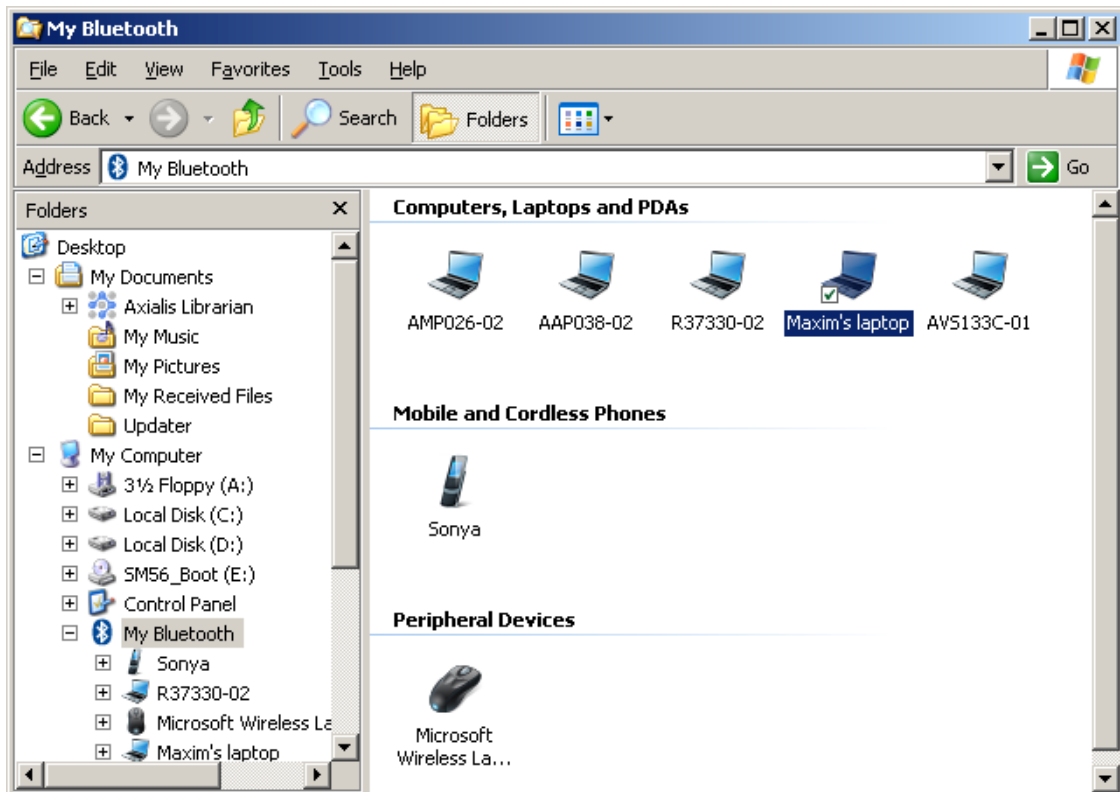


The “Secure Pairing Request” window will appear, requesting that you enter a secret PIN code to pair with the selected device.



Enter any numeric code in the “PIN Code” field and click the “OK” button. This PIN code needs to be repeated on the device you are pairing with.

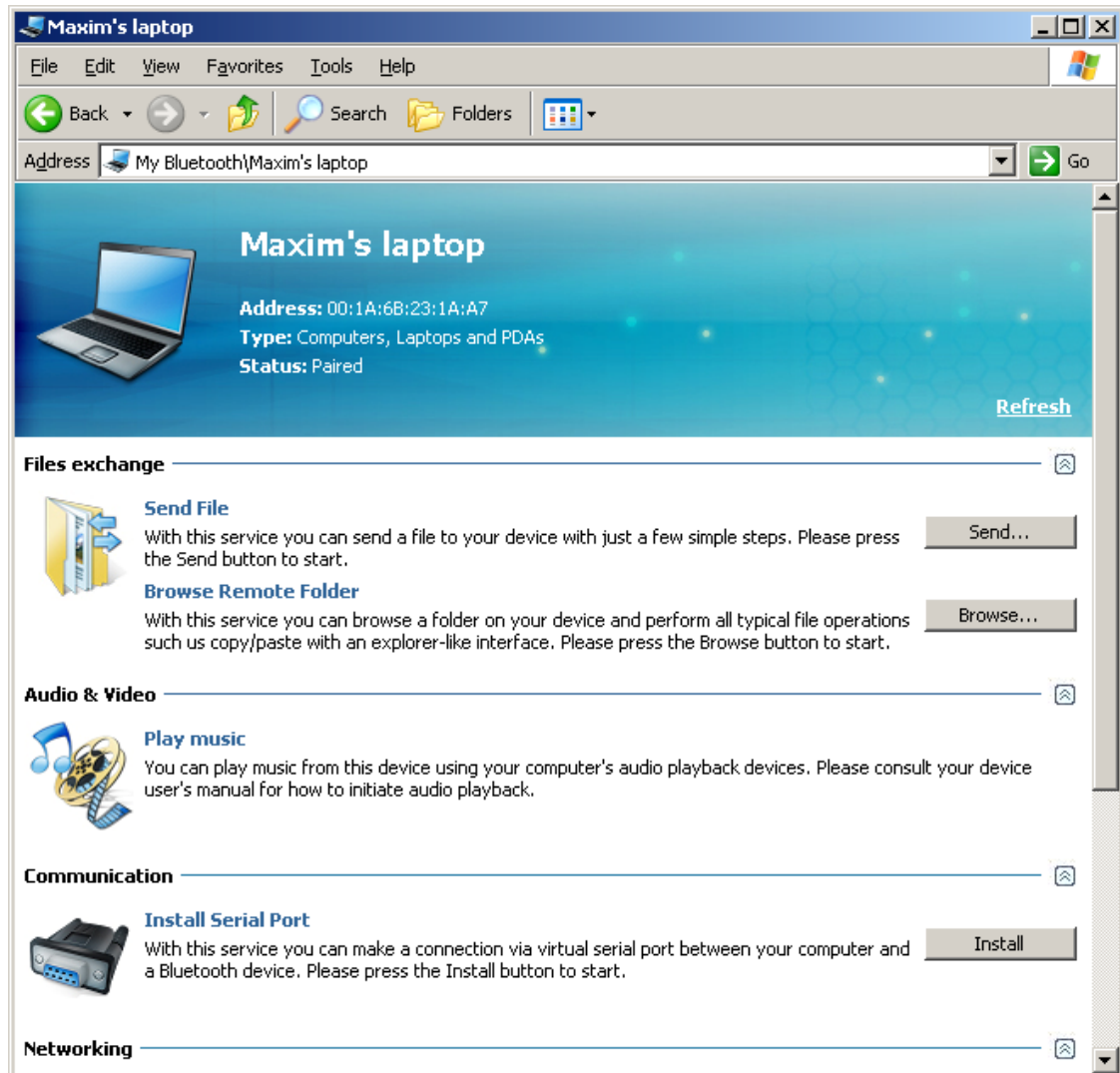
If secret PIN codes entered on the PC and on the device are the same, then the PC with Motorola Bluetooth becomes paired with another Bluetooth device, and a green mark is shown on the icon of the paired device.



To discover what Bluetooth services are available on the device, double-click on the device icon and the service discovery procedure will be started and the “My Bluetooth” view will be changed to the services view.

During service discovery, the Motorola Bluetooth tray icon blinks with a green Bluetooth logo.

As soon as Bluetooth services discovery is finished, “My Bluetooth” will be updated to show the services found, which means that PC is connected to the device and is ready to start using services the device provides.



The following sections provide details about particular Bluetooth services usage.

If you want to un-pair from an already paired device, right-click on the device icon and select "Unpair" in the context menu.

3 Files Transfer over Bluetooth

There are two basic ways to transfer files between your PC and a Bluetooth device:

- Using the file transfer folder on a remote device
- Using the “send-to” wizard

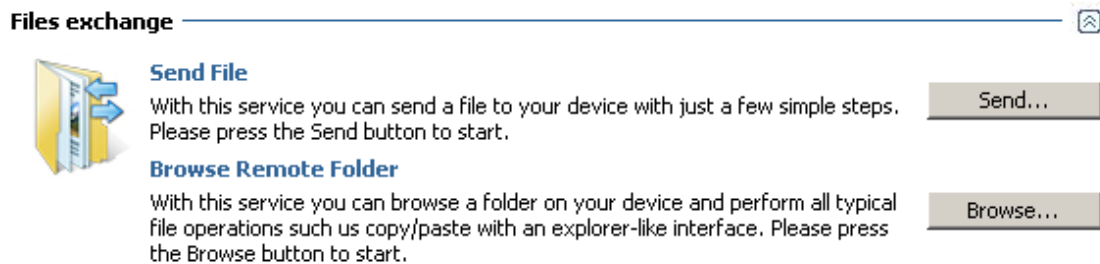
Using File Transfer Folder

File transfer folder provides you with the most powerful way of file exchange. Using it, you can:

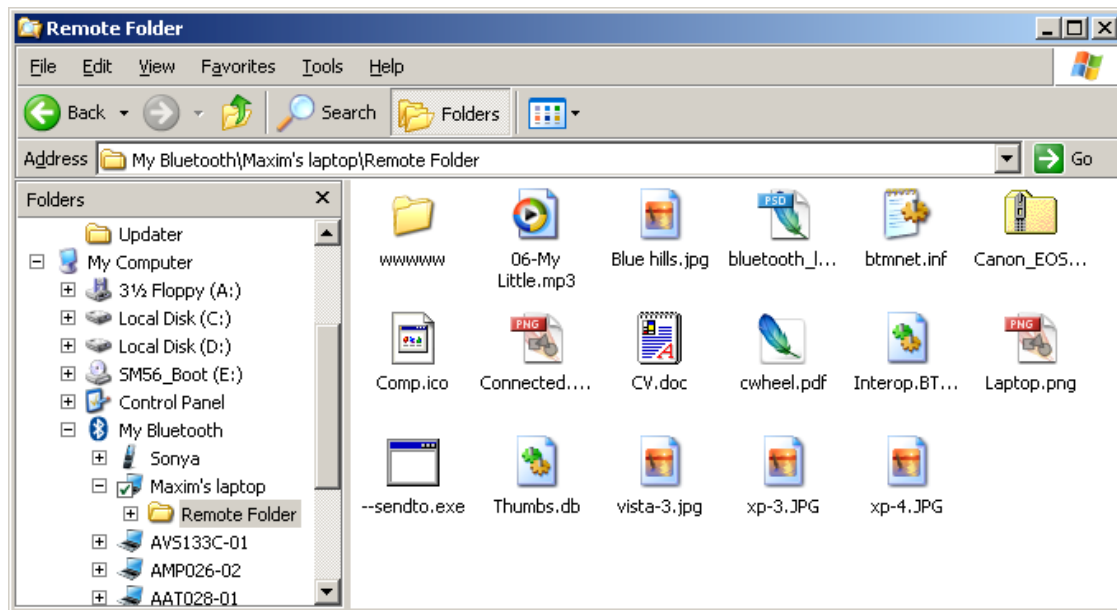
- Browse the file system on the Bluetooth device
- Transfer files between your PC and the Bluetooth device
- Manipulate objects (files and folders) on the Bluetooth device (including object removal and the creation of new folders)

And everything noted above can be done with an easy explorer-like interface.

To start browsing the file system on a Bluetooth device, click the “Browse...” button in the “Files exchange” section of its services view window.



The file structure of this Bluetooth device will appear as below. (Please note that the files and folders on your device may be different.)

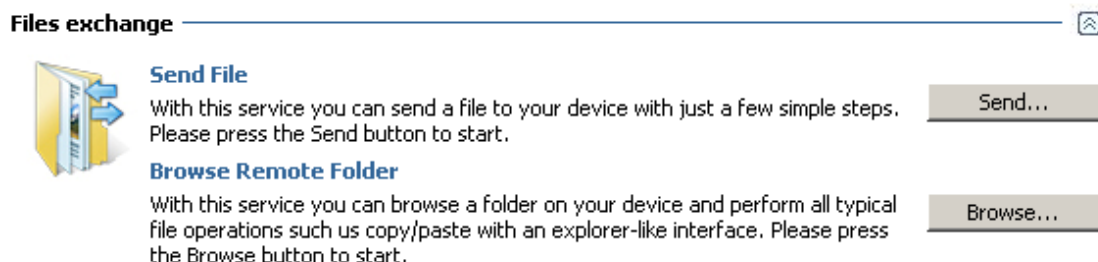


You can easily explore the device file structure in the explorer window and transfer files between your PC and a device.

Using the Send-To Wizard

If your Bluetooth device does not have File Transfer Folder, or if you prefer a wizard-like interface, the “Send File to Bluetooth Device” wizard can be used to send files to other Bluetooth devices.

To launch the wizard, click the “Send...” button in the “Files exchange” section of its services view window.



The “Send File to Bluetooth Device” wizard will appear.

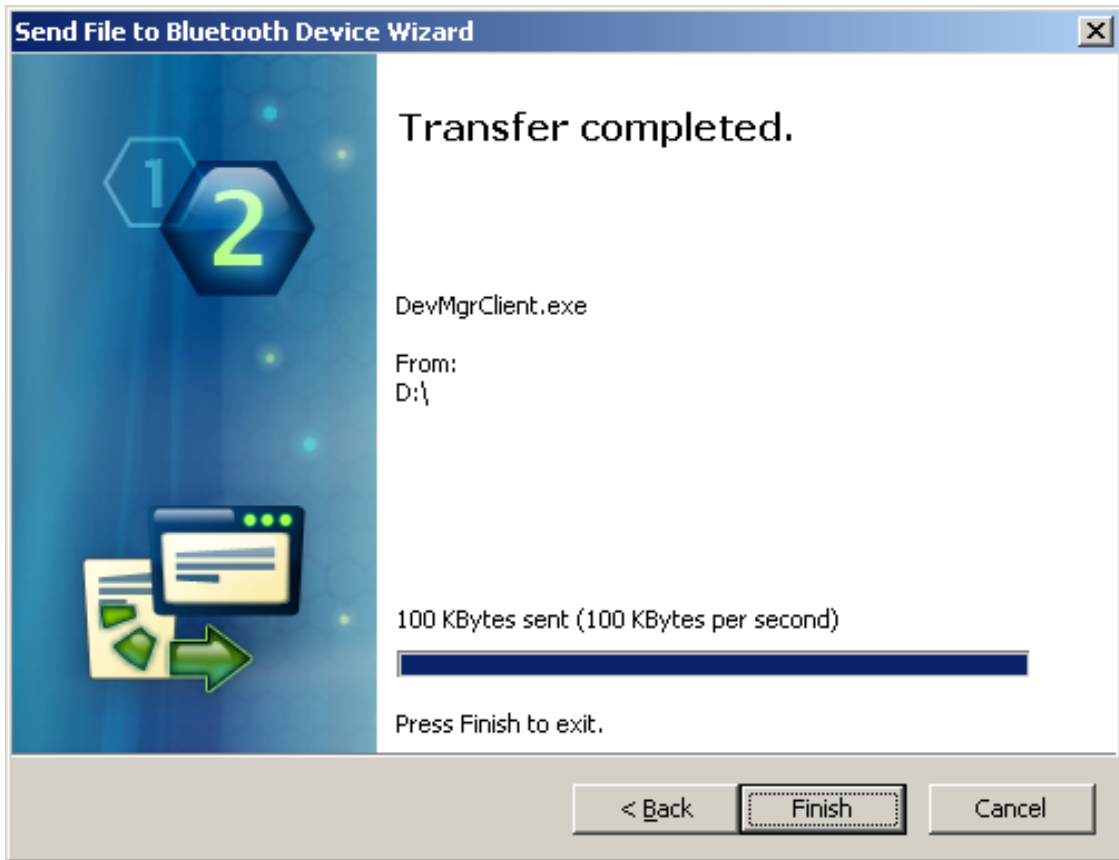


In the “Send to Bluetooth Device” wizard, click the “Browse...” button to select file to be sent to a Bluetooth device.

After a file is selected, click “Next” – the transfer process will start with a progress bar appearing on your monitor, indicating the current transfer status.



When the transfer process is complete, the wizard page will be updated, showing transfer statistics.



Click “Finish” to close the “Send File to Bluetooth Device” wizard.

When another Bluetooth device initiates file transfer to your PC (for example, using the “Send via Bluetooth” command), the message window will appear where a destination path for incoming files can be selected.



After a path is selected, click “Accept” and the file transfer will start.



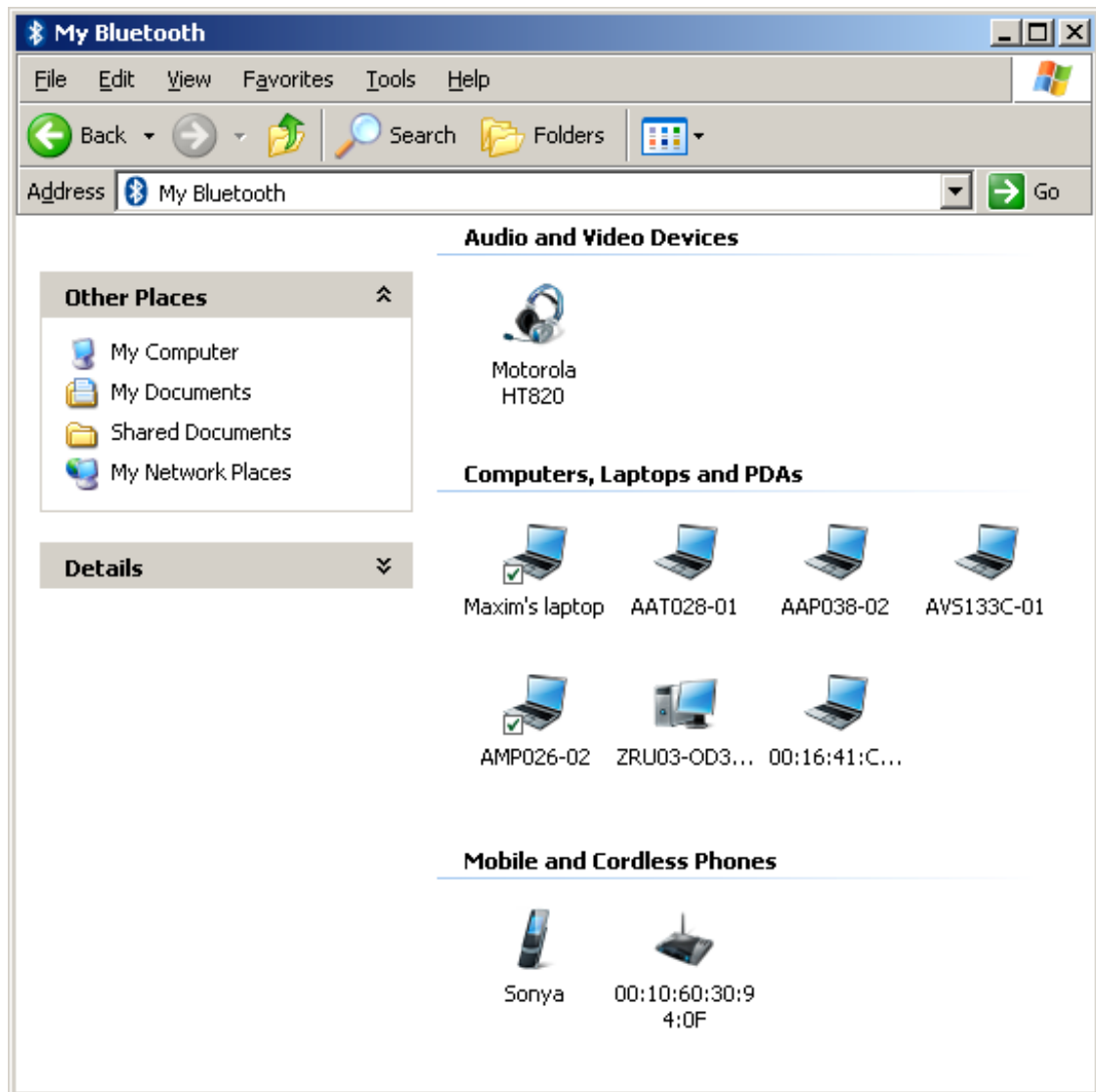
After the file transfer is finished, the window will be updated to remind you where the received file has been saved.



Click the “Hide” button to close this window, or the “Open Folder” button to open the folder where the received file was saved.

4 Using Bluetooth Headsets

With Motorola Bluetooth, you can use stereo headsets with your PC. Turn on your headset device and wait while Motorola Bluetooth finds it. The headset will be displayed in the “Audio and Video Devices” group.

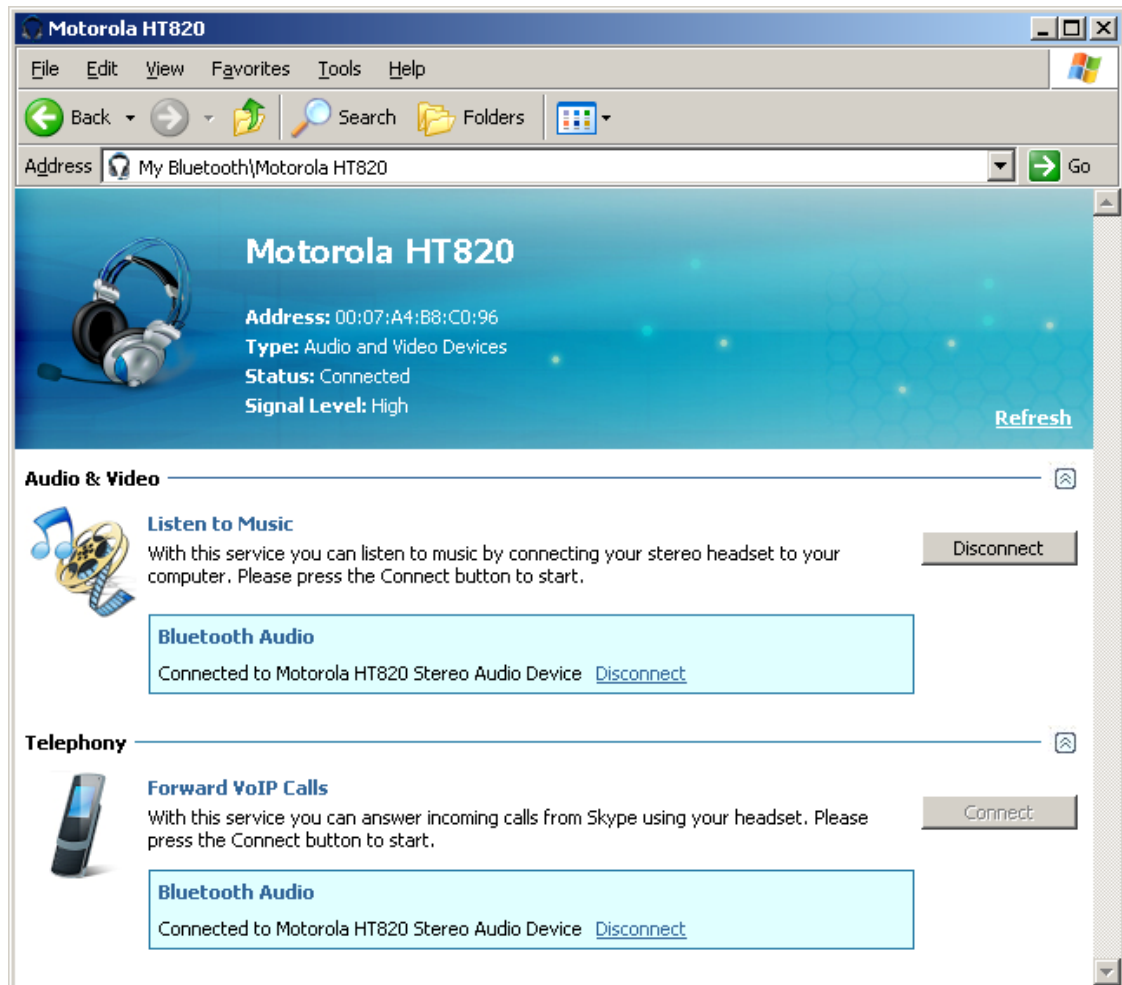


Double-click on the headset device icon in the “My Bluetooth” explorer window to open a list of available services on this device.



To connect the headset to your PC, click on the “Connect” button in the “Audio & Video” section of the services view. You may need to perform additional actions on your device to accept connection. (For example, some headsets may require pairing to accept connection.)

As soon as connection is established, the service view will be updated to inform you of the established connection.



Now you can use your headset to listen to music from your PC.

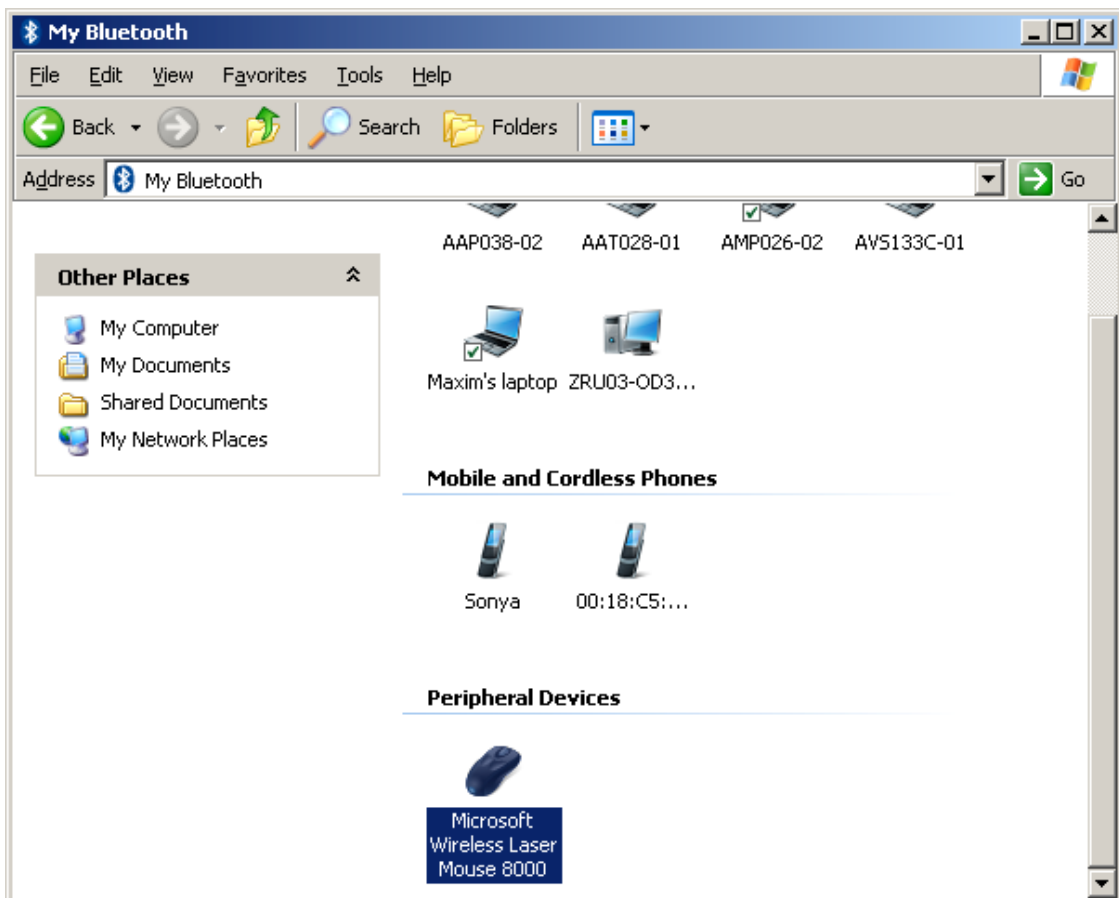
Please note: you are allowed to have only one audio connection at a time. If you want to connect to another audio device, you will need to disconnect from the existing audio connection first.

To disconnect from an existing audio connection, click on the “Disconnect” button in the “Audio & Video” section of the services view.

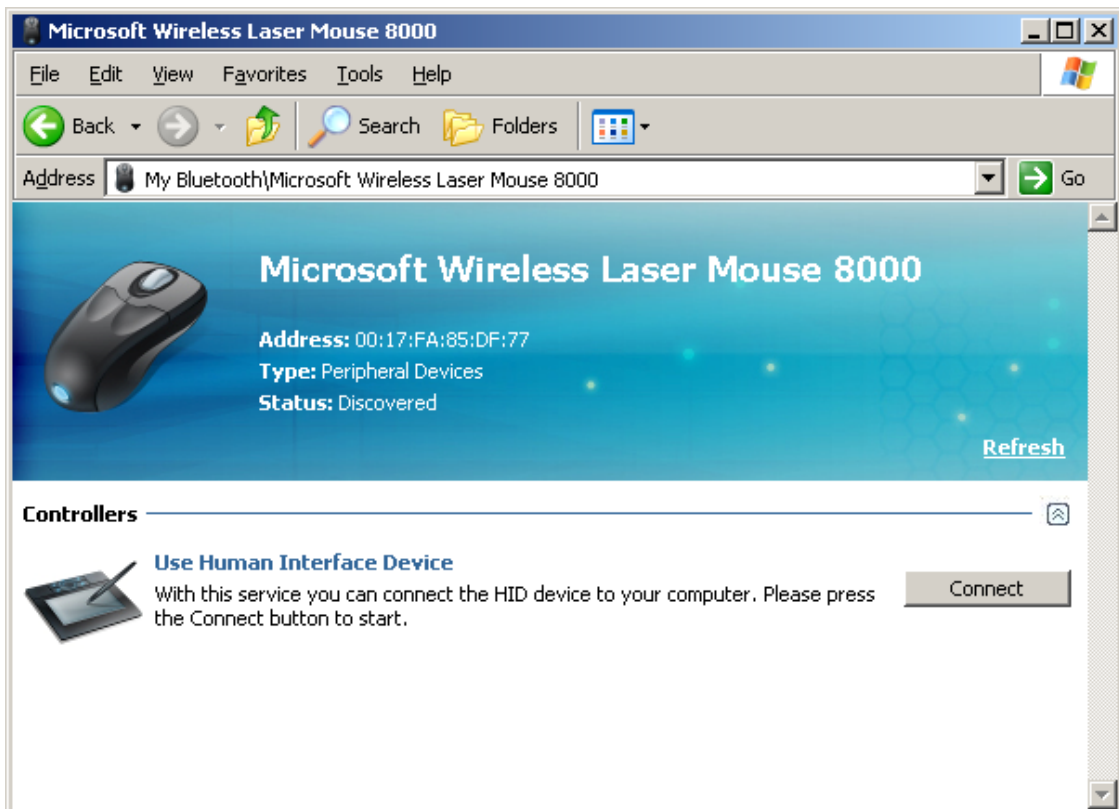
5 Using a Bluetooth Mouse and Keyboard

With Motorola Bluetooth, you can easily connect and use various Bluetooth devices, such as a mouse, keyboard and other Human Interface devices (such as gaming pads and the like).

Turn on your Bluetooth Human Interface and wait while Motorola Bluetooth finds it; the device will be displayed in the “Peripheral Devices” group.

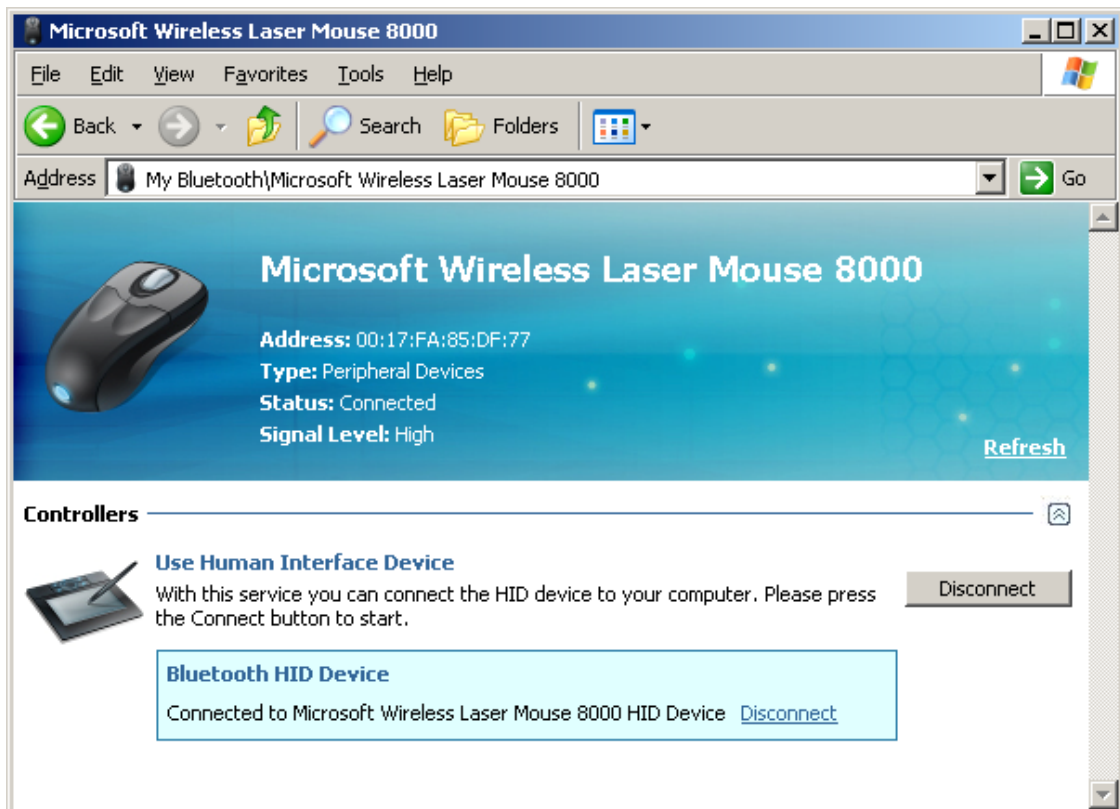


Double-click on the device icon in the “My Bluetooth” explorer window to open the list of available services on this device.



Click on “Connect” to establish connection with your device. You may need to perform additional actions on your device to accept the connection (for example, some devices may request you perform pairing before connection is established).

After connection is established, the service view is updated to inform you that your device is connected.



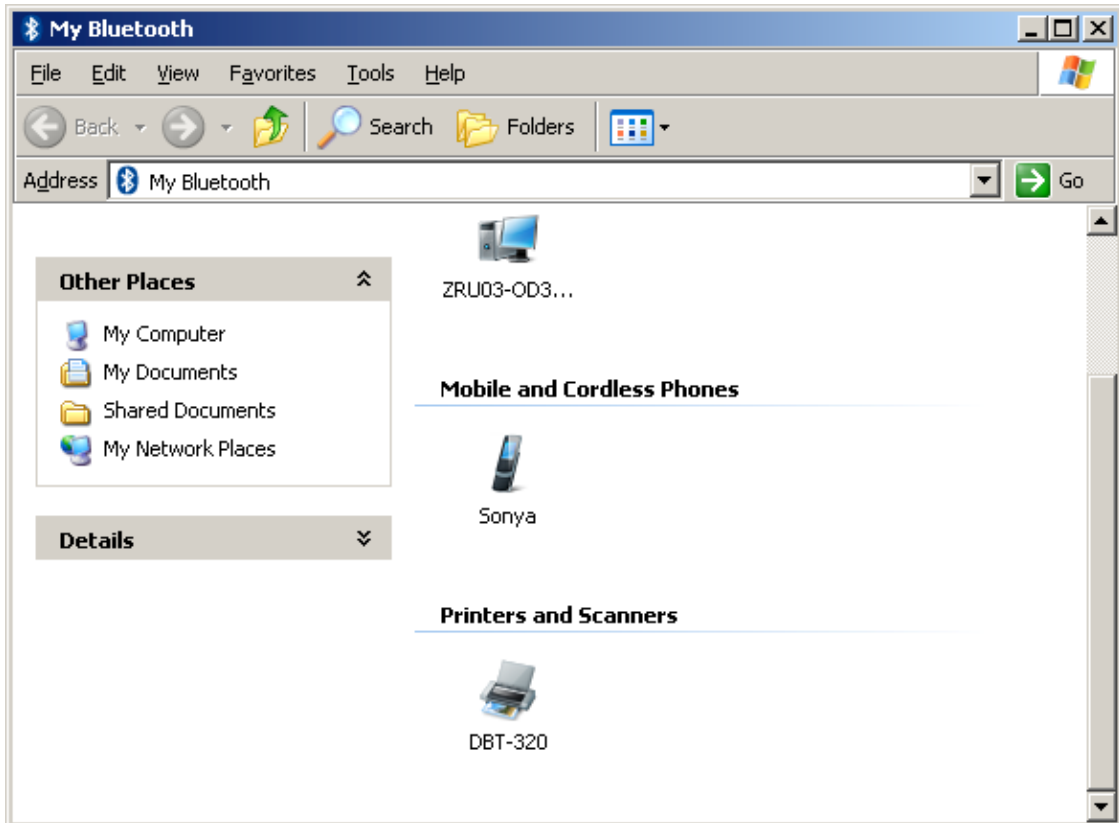
Now you can use your Bluetooth Human Interface device as an ordinary device (keyboard, mouse, etc).

To disable a connection with the device, click on the “Disconnect” button.

6 Using a Bluetooth Printer

With Motorola Bluetooth, you can easily use your Bluetooth printer.

Turn on your Bluetooth printer and wait while Motorola Bluetooth finds it; it will be displayed in the “Printers & Scanners” group.



Double-click on the device icon in the “My Bluetooth” explorer window to open the list of services available on this device.



If your printer supports printing without additional drivers, “Print Files” section will appear in the “Imaging” group in the service you for the printer. To use this capability, just press the “Print...” button to select a file and start printing. Please note that only pictures and simple text documents can be printed with this service.

To use your Bluetooth printer with other Windows applications, you need to install a driver for it first. Click on the “Install” button to start driver installation. When you do, the service view is updated to inform you that driver installation is in progress, and the standard Windows “Add Printer Device Wizard” is activated.

To proceed with the installation of the driver, you may need an installation CD with drivers for your particular Bluetooth printer.

As soon as driver installation is finished, the “Install” button will change to “Uninstall” in the service view. Now you can use your Bluetooth printer as a regular printer.

To uninstall a driver for your Bluetooth printer, click on the “Uninstall” button.

7 Using a Bluetooth Network

Most Bluetooth mobile phones provide Bluetooth networking service. Using such services, you can establish a regular TCP/IP networking connection with the device.

If the device provides Bluetooth networking services, a “Networking” section will be available in the service view for that device.

Networking 



Join a Local Bluetooth Network
With this service you can connect several Bluetooth devices into Ad-Hoc local network. Please press the Connect button to start.

Make a Peer-to-Peer Network Connection
With this service you can make a network connection between two Bluetooth devices. Please press the Connect button to start.

Connect

Connect

Click on the “Connect” button to establish a networking connection. You may need to perform additional actions on your device to accept the connection.

As soon as connection is established, the service view is updated to inform you that the device is connected.

Networking 



Join a Local Bluetooth Network
With this service you can connect several Bluetooth devices into Ad-Hoc local network. Please press the Connect button to start.

Make a Peer-to-Peer Network Connection
With this service you can make a network connection between two Bluetooth devices. Please press the Connect button to start.

Connect

Disconnect

Bluetooth Network
Connected to Maxim's laptop Network Device [Disconnect](#)

Please note: you are allowed to have only one networking connection at a time. If you need to establish a networking connection with another device, you need to disable your previous networking connection first.


To disable a networking connection, click on the “Disconnect” button.


8 Using Bluetooth Serial Ports

With virtual serial ports, Bluetooth may be used as a cable replacement for legacy applications that need a serial connection to operate.

After the virtual serial port is configured, any legacy application may be run on either device, using the virtual serial port as if there was a real serial cable connecting the two devices.

If the device supports Bluetooth serial ports, a “Communication” section will be available in the service view for that device.


Communication 




Install Serial Port

With this service you can make a connection via virtual serial port between your computer and a Bluetooth device. Please press the Install button to start.

Click the “Install” button to configure a serial port for the device. As soon as the driver is configured, the service view is updated to inform you of installed serial ports.


Communication 



Install Serial Port

With this service you can make a connection via virtual serial port between your computer and a Bluetooth device. Please press the Install button to start.

Installed Serial Port(s):

 Outgoing serial port (COM3) [Remove](#)

Please note: serial ports installed for a particular device can be used only for communication with that device. You will need to install additional serial ports if you want to configure serial connections with other Bluetooth devices.

To remove a Bluetooth serial port, click on the “Remove” link for that port.

9 Personal Information Management

Some phones and other devices provide access to contacts and other PIM data over Bluetooth.

If the device supports access to PIM data over Bluetooth, a “Data Synchronization” section will be available in the service view for that device.

Data Synchronization



Synchronize PIM Data

With this service you can synchronize your contacts and other PIM data between PC and a Bluetooth device. Please press the Backup or Restore button to start.

Backup...

Restore...

With Motorola Bluetooth you can read contacts from your device and save them into a file for backup purpose, and write contacts from a file to the device (restore them from the backup file).

10 Controlling and Configuring Motorola Bluetooth

With Motorola Bluetooth tray applications, you can easily control and configure your Bluetooth device operation.

Motorola Bluetooth tray allows you to:

- Open a Motorola Bluetooth user-interface explorer window
- Open the folder where files received over Bluetooth are saved
- Change Bluetooth settings
- Enable/disable Bluetooth

Right-click on the Motorola Bluetooth Tray icon – the context menu will appear:



Motorola Bluetooth Tray Icon States

The Motorola Bluetooth tray icon state informs you of the state of your Bluetooth dongle.

- If you don't see a Motorola Bluetooth tray icon, your Bluetooth dongle is not plugged into your PC.
- If the icon appears as a solid red Bluetooth logo, your Bluetooth dongle is disabled.
- If the icon appears as a solid white Bluetooth logo, your Bluetooth dongle is plugged into your PC, enabled and is ready for Bluetooth environment surfing.
- If the icon appears as a blinking white Bluetooth logo, Bluetooth software is in discovery mode, searching for other Bluetooth devices.
- If the icon appears as a solid green Bluetooth logo, Bluetooth software is in use and connected to at least one remote Bluetooth device.
- If the icon appears as a blinking green Bluetooth logo, Bluetooth software is in discovery mode, searching for services available on a remote Bluetooth device.

My Bluetooth Settings

The “My Bluetooth Settings” setup window is launched with the “My Bluetooth Settings...” command in the Motorola Bluetooth tray application context menu.

General Settings

The first page in the “My Bluetooth Settings” window is a “General Settings” page.



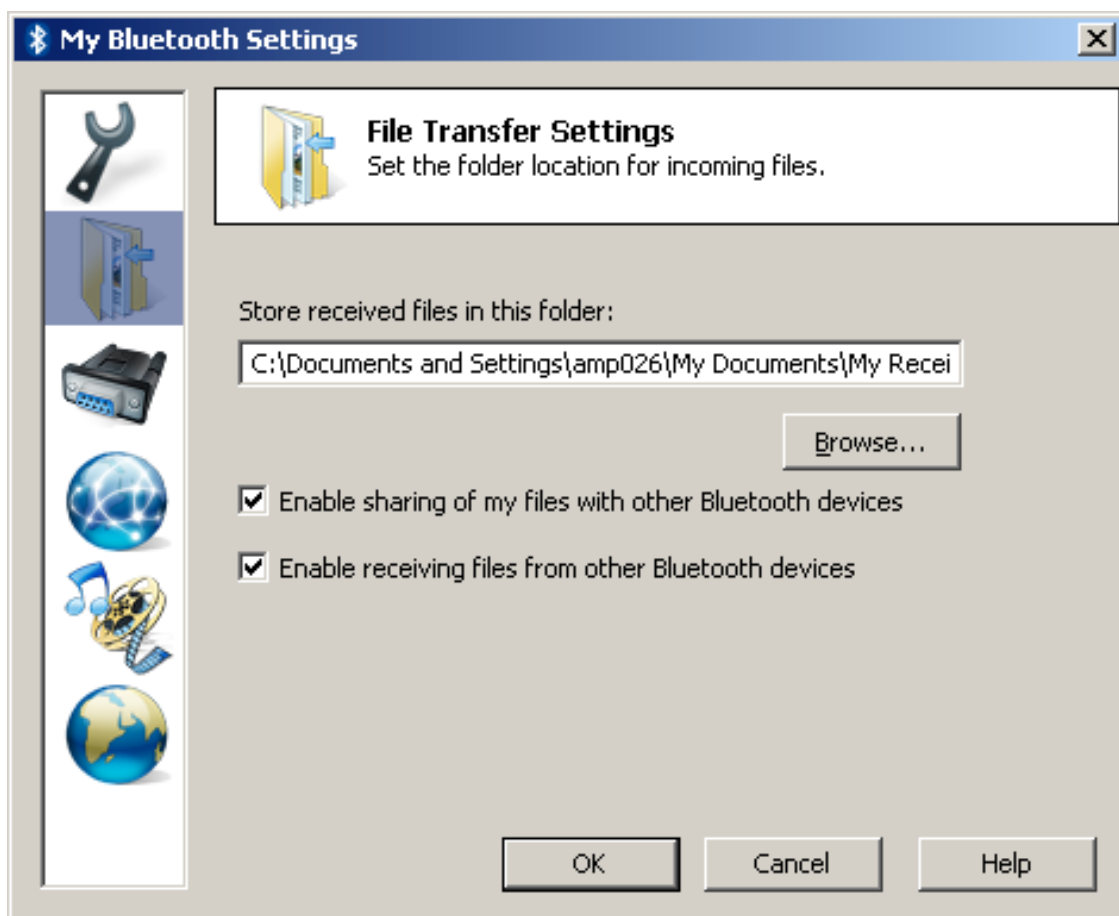
On this page you can:

- Configure the name and device type of your PC that other Bluetooth devices will see.

- Make your PC undiscoverable by other Bluetooth devices by unchecking the “Allow Bluetooth devices to find this computer” option.
- Switch on/off connection notification balloons with the “Notify me when other Bluetooth devices want to connect” option.

File Transfer Settings

The second page in the “My Bluetooth Settings” window is the “File Transfer Settings” page.



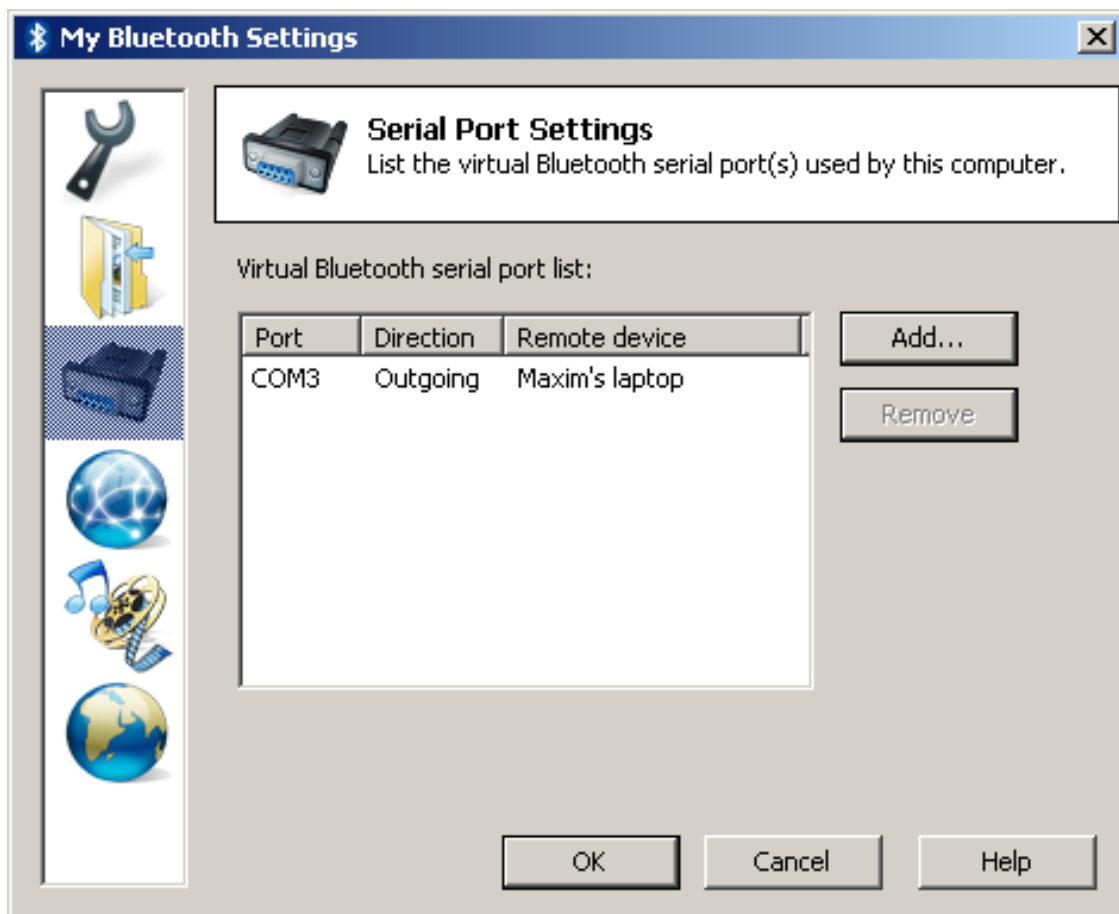
On this page you can:

- Select the default folder where received-over-Bluetooth files will be saved.
- Disable/enable accessing Bluetooth File Transfer folder on your PC with the “Enable sharing of my files with other Bluetooth devices” option.

- Disable/enable receiving objects/files from other Bluetooth devices with the “Enable receiving files from other Bluetooth devices” option.

Serial Port Settings

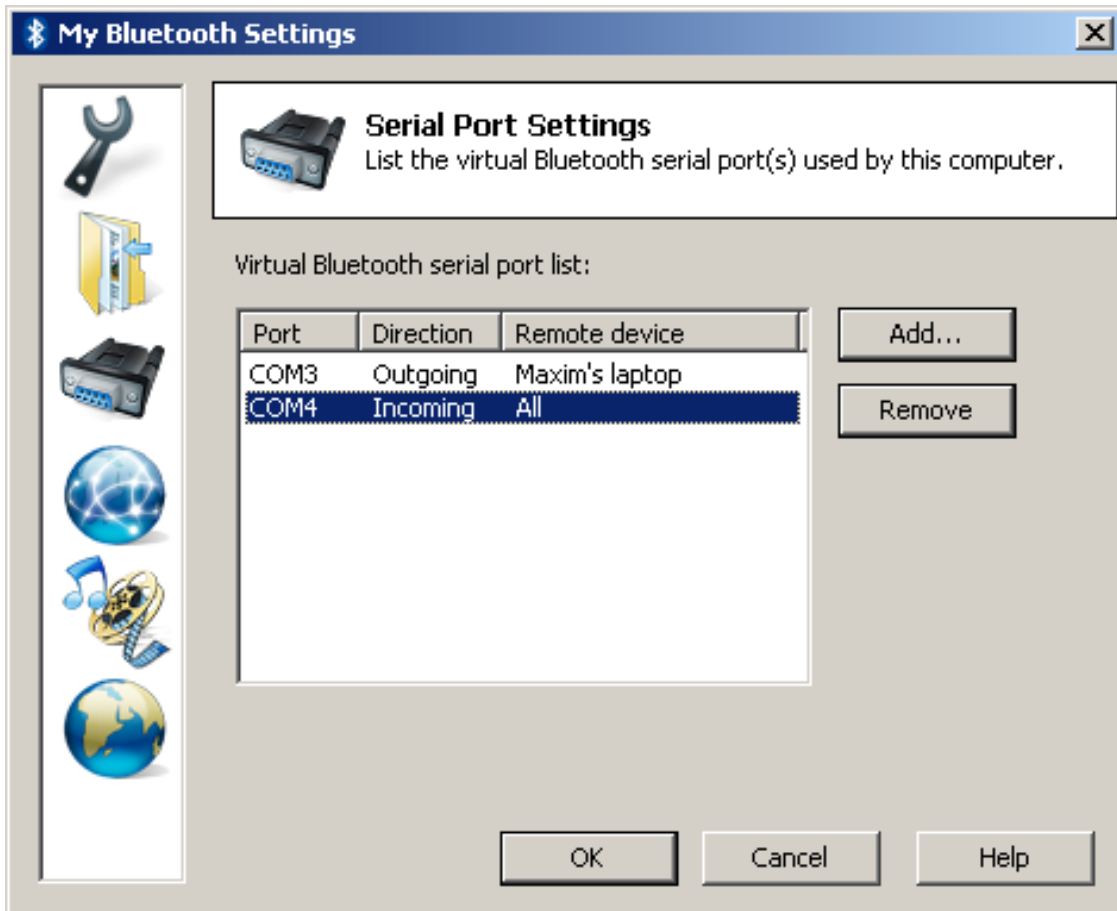
The third page in the “My Bluetooth Settings” window is the “Serial Port Settings” page.



On this page, you can manage virtual Bluetooth serial ports on your PC. All configured Bluetooth serial ports are shown on this page.

Also, you can add incoming Bluetooth serial ports on your PC. Incoming serial ports allow any other Bluetooth device to initiate serial port connection to your PC (in contrast to outgoing serial ports configured for particular devices).

To add an incoming Bluetooth serial port, click on the “Add...” button.

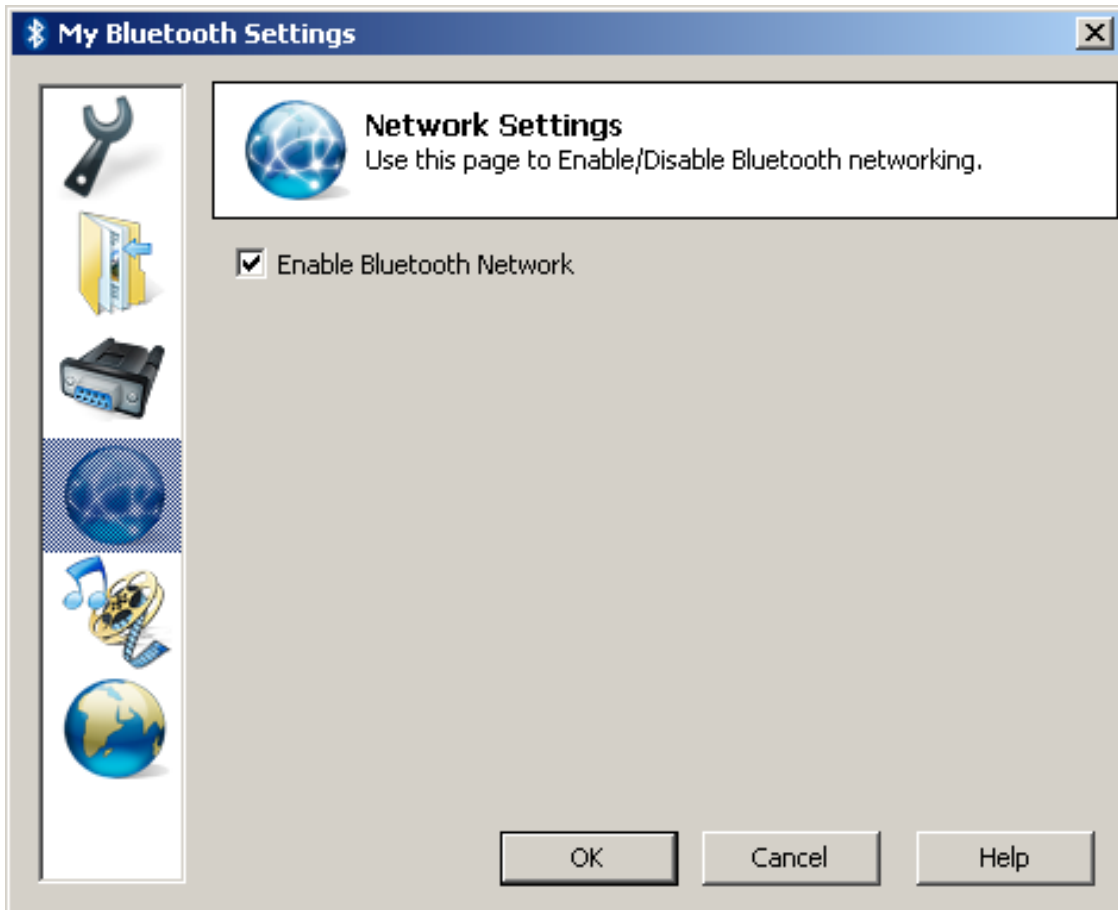


Also, you can remove any Bluetooth serial port (incoming or outgoing) on this page.

If you need to remove a Bluetooth serial port, select it from the list and click on the “Remove” button.

Network Settings

The fourth page in the “My Bluetooth Settings” window is the “Network Settings” page.



On this page, you can disable/enable Bluetooth Networking capability on your PC.

By default, Bluetooth Networking is disabled. So, you need to enable it in order to allow other Bluetooth devices to initiate networking connection to your PC.

Audio Settings

The fifth page in the “My Bluetooth Settings” window is the “Audio Settings” page.



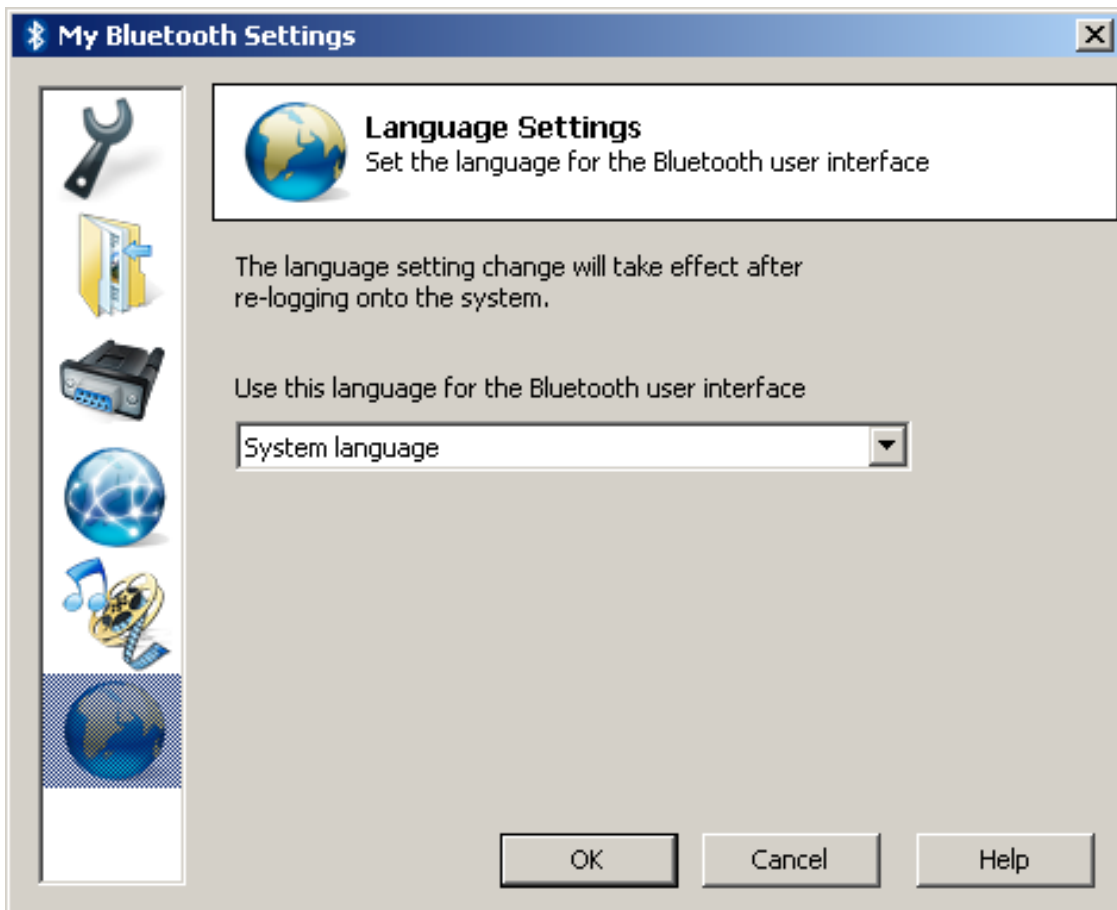
On this page, you can enable/disable Bluetooth audio capability on your PC.

By default, Bluetooth Audio is disabled. So, you need to enable it in order to allow other Bluetooth devices to initiate audio connection to your PC.

Motorola Bluetooth is able to perform audio playback from Bluetooth devices to audio devices connected to your PC. By default, the music will be played to Windows default audio device, but you can change it on this page.

Language Settings

The sixth page in the “My Bluetooth Settings” window is the “Language Settings” page.



On this page, you can explicitly select the language for the Motorola Bluetooth user interface.

By default, Motorola Bluetooth tries to select Windows system language for its interface, and, if it is not supported, the English language is selected.