on networks
Easy wireless connection to the Internet.

N300 Micro USB WiFi Adapter N300MA
User Manual
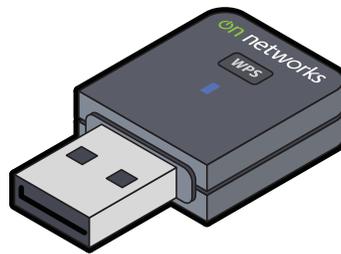
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Getting Started

1

This chapter describes how to install your micro USB adapter with custom setup and how to connect to a wireless network. For help with express installation, see the *N300 Micro USB WiFi Adapter N300MA Installation Guide*.

What You Need Before You Begin

Make sure your computer meets the system requirements. You should also know the name of the wireless network you want to join and its wireless security settings (if used).

- PC with a Pentium 300 MHz or higher compatible processor with a USB 2.0 or 1.1 port.

  The maximum speed of a USB v2.0 port is 480 Mbps. If your computer has a USB v1.1 port, the micro USB adapter is limited to the port's maximum speed of 14 Mbps.

- A CD drive.
- 5 Mbytes of free hard disk space.
- Vista, Windows XP Home, or Windows XP Professional. Some versions of Windows ask for the original Windows operating system installation files to complete the installation of the N300MA software.

> **Note:** Windows XP users must install SP2 or install the KB822603 hot fix (update), which fixes the USB 2.0 host controller driver. Go to the following link to install the hot fix:
> *http://www.microsoft.com/downloads/details.aspx?displaylang= en&FamilyID=733dd867-56a0-4956-b7fe-e85b688b7f86*

Installation with Custom Setup

> **Note:** For help with Express installation, see the *N300 Micro USB WiFi Adapter N300MA Installation Guide.*

First, Install the N300MA Software

1. Insert the *Resource CD* in your computer's CD drive. If the CD main screen does not display, browse the files on the CD and double-click **Autorun.exe**.

2. Click **Setup**. The Software Update Check screen displays.
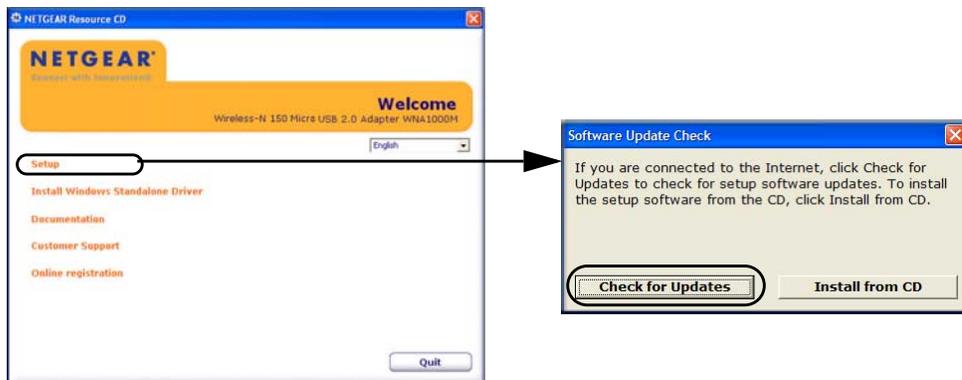
3. If you are connected to the Internet, click **Check for Updates**. If not, click **Install from CD**.

4. Accept the license agreement. Then select **Custom** and click **Next** on the Setup Type screen.
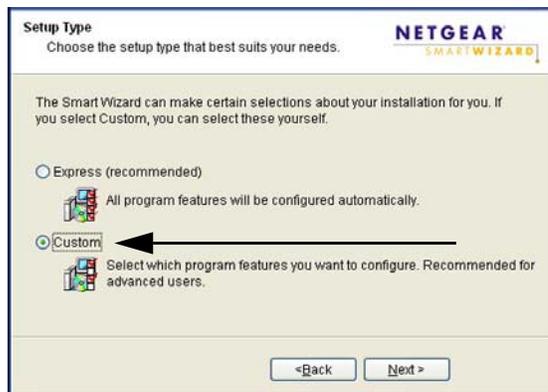
5. When prompted, browse to select the destination folder for your wireless adapter software, and click **Next**.

6. Select one of the following methods to configure and manage your wireless network:

    •   **Smart Wizard**. Manage your wireless networks with the On Networks Smart Wizard.

        -   **Automatically**. Let the Smart Wizard configure the settings for your micro USB adapter.

        -   **Manual**. Specify the settings for your micro USB adapter in the Settings screen.

    •   **Windows Utility**. Connect to and manage your wireless networks using only the Windows configuration utility.

Then, Install Your Micro USB Adapter

You are prompted to insert your adapter:

1. Insert the adapter into a USB port on your computer.

Note: For best results, put the wireless adapter at least 4 feet (1 meter) away from your router.

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2. Click **Next**. The Smart Wizard software detects the adapter.

3. Follow the onscreen prompts to install the driver and complete the installation.

   How you connect to a network depends on what you selected during custom installation.

   • If you installed the Smart Wizard with automatic configuration, see the following section, Using the Smart Wizard to Connect to a Wireless Network."

   • If you installed the Smart Wizard with manual configuration, the Settings tab displays. See *Viewing Wireless Networks in Your Area* on page 17.

   • To use a Windows utility, see your Windows documentation or the On Networks application note at *http://documentation.On Networks.com/reference/enu/winzerocfg/index.htm.*

Using the Smart Wizard to Connect to a Wireless Network

After the software is installed, you are prompted to connect to a wireless network.

1. One of the following screens displays:
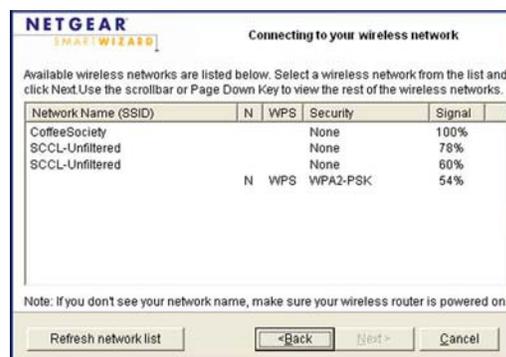
WPS network   **No WPS networks**

   • **WPS network**: A network in your area supports Push 'N' Connect (also called WPS). Click **Next**, and follow the prompts to push the WPS button on your adapter and on your router. Then connect without entering a password.

   • **No WPS networks**: Select a wireless network from the list and click **Next**. To connect to a secure network, you must enter its passphrase or network key.

2. The adapter connects to the network, which can take a minute or two. Your settings are saved in a profile, which you can name:

3. Click **Finish**, and the Smart Wizard Settings screen displays.

The icon appears in the system tray and on the desktop so you can open the Smart Wizard to make changes or connect to a different wireless network.

Wireless Network and Internet Connections

The Smart Wizard and micro USB adapter provide several ways to check the status of your connection to a wireless network and to the Internet:

- **N300MA icon.** After you install the N300MA software, the icon appears on the desktop and in the right on the Windows task bar. It is color coded to show the status of the connection.

- **Smart Wizard status bar**. Clicking on the system tray icon opens the Smart Wizard. The status bar at the bottom of the screen shows details about your wireless and Internet connection. See Smart Wizard Status Bar.

- **Adapter LED status lights**. The LED on the micro USB adapter shows the network connection. Solid indicates a connection. The LED blinks when the micro USB adapter is looking for a network association and when it is sending or receiving data. See *Micro USB WiFi Adapter LED* on page 14.

N300MA Icon

This icon is on the desktop and in the Windows system tray. The system tray is on one end of the task bar in the Microsoft Windows desktop. The icon color shows the wireless connection.

Color	Meaning	Recommended Action
Red	The micro USB adapter is not connected to a wireless network.	Check your configuration, or try moving to a location where the wireless signal quality is better.
Yellow	The micro USB adapter has a weak wireless connection.	Move to a better location, such as closer to the wireless access point. Also, look for interference such as from a 2.4 GHz cordless phone or large metal surface.
Green	The wireless connection is good.	No action is required

Smart Wizard Status Bar

For more information, you can view the Smart Wizard status bar. Click the icon to open the Smart Wizard status bar. The Smart Wizard Settings tab displays. The status bar is located at the bottom of the Settings tab.
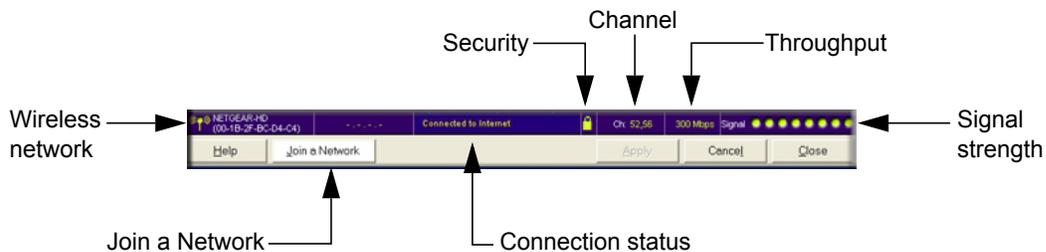
The following table describes how to interpret the Smart Wizard status bar.

Understanding the Status Bar	
Wireless network	Identifies which wireless network you have joined.
Security	• A closed lock indicates that security is enabled. • An open lock indicates an open network without wireless security.
Channel	The wireless channel used by the network. If many wireless networks in your area use the same channel, they can interfere with one another.
Throughput	• To optimize wireless throughput, connect to a network with a high-speed router or access point and a high-speed Internet connection.See Chapter 3. • If your computer has a USB v1.1 port, the micro USB adapter is limited to that port's maximum speed, which is 14 Mbps.

Understanding the Status Bar (Continued)	
Signal strength	More dots indicates a stronger signal. Usually, you experience higher throughput when the signal is strongest.
Join a Network	Click **Join a Network** to open the Connection Wizard.
Connection status	The status of your network connection. • **Connected to Internet**. The wireless Internet connection is OK. • **Connected to Router**. The wireless connection to the router is OK, but the router is not connected to the Internet. **169.254.x.x or ___.___.___.___.** The wireless connection to the router is OK, but there is a problem with the router. See the online help or Chapter 4.

The connection status is useful in isolating a problem. For example, if you are connected to a router, but not to the Internet, check the router's Internet connection.

Internet Connection and Smart Wizard Configuration

You can turn off the Internet notification feature on the Status bar. Right-click the system tray icon to view the **Enable Internet Connected Notification** check mark. If you clear the checkmark, only the IP address is shown.

Windows XP
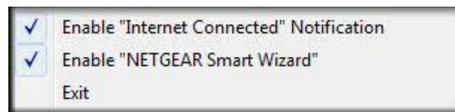
Windows 7 and Vista

In Microsoft Windows 7 and Vista, there is one more option. If you clear the **Enable On Networks Smart Wizard** check mark, the On Networks Smart Wizard is disabled, and you must set up the wireless adapter with auto-configuration.

Micro USB WiFi Adapter LED

The LED shows the status of the wireless link as explained in the following table.

Micro USB WiFi Adapter	LED	Meaning
	Off	• The micro USB adapter in not plugged in to the USB port. • The micro USB adapter is in power save mode (default from power up or reset).
	Slow blinking	• **Alternating amber and blue**. The micro USB adapter is scanning for a network. • **Blue.** The micro USB adapter is connecting to a network at 2.4 GHz.
	Blinking	The micro USB adapter is connected to a wireless network, and is sending or receiving data.
	Solid	The micro USB adapter is connected to a wireless network, but it is not sending or receiving data.

Upgrading the Software

Upgrades might be available at the On Networks website.

To check for an update and install it:

1. Open the Smart Wizard and click the About tab:

2. Click the Software Update **Check** button.

The Smart Wizard goes to the On Networks website and checks for newer software. If there is a newer version of firmware, this screen displays:

3. Click **OK**. When the file has been downloaded, a message like the following displays:
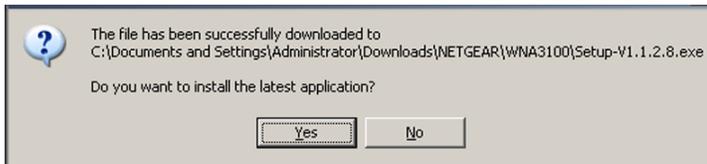
4. Click **Yes**. Follow the installer instructions, and if prompted, restart your computer.

Removing the Software

You can remove the wireless adapter software through the Windows Program List or the Windows Control Panel.

- **Windows Program List**: Select Windows **Start > Micro USB Adapter program group**. Click **Uninstall** and follow the screen prompts.

- **Control Panel**: How you do this depends on your Windows operating system:

  - **Windows 7**: Select Windows **Start >Control Panel > Programs and Features > Micro USB Adapter**. Click **Uninstall** and follow the screen prompts.

  - **Windows Vista**: Select Windows **Start >Control Panel > Programs and Features > Micro USB Adapter**. Click **Uninstall/Change** from the top menu and follow the screen prompts.

  - **Windows XP**: Select Windows **Start > Control Panel > Add or Remove Program**, and then select **Micro USB Adapter**.

Network Connections and Wireless Security

2

This chapter explains how to use your micro USB adapter to connect to wireless networks and how to set up wireless security for the micro USB adapter so that it matches the wireless security settings for your network.

Using the Smart Wizard After Installation

When you installed the software from the *Resource CD*, the 📺 icon appeared on your desktop and in the Windows system tray. The Windows system tray is located on the Windows taskbar. You can either double-click this icon on the desktop or click it in the system tray at any time, to use the Smart Wizard. This software automatically restarts when you reboot your computer.

The Smart Wizard provides a complete and easy-to-use set of tools to:

* View details about wireless networks in your area.
* Choose the network that you want to use.
* Configure wireless settings for your micro USB adapter.
* Save your wireless network settings in profiles.
* Remove or reinstall the wireless adapter software.

Disabling the Windows Zero Configuration Utility

If you chose the Windows XP or Windows Vista Zero Configuration utility during installation, and now you want to use the Smart Wizard that is installed on your PC, you must disable the Windows utility. If you are working with the Vista configuration utility, see the On Networks online application note at: *http://documentation.On Networks.com/reference/enu/winzerocfg/index.htm*

To disable the Windows Zero Configuration utility:

1. Attach the wireless adapter to a USB port for your computer.
2. In Windows, select Start > Network Connections.

3. Select Wireless Network Connection, right-click, and then select Properties.
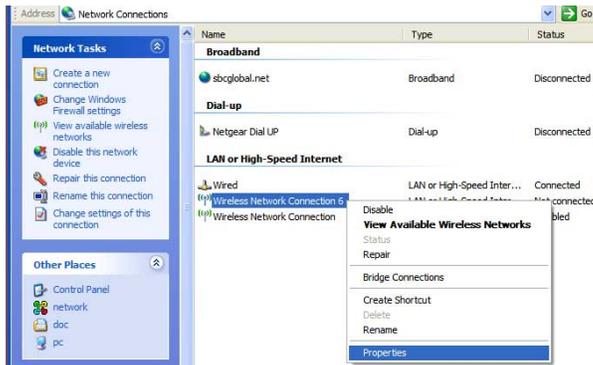
4. Click the Wireless Networks tab. Then clear the **Use Windows to configure my wireless settings** check box.

Viewing Wireless Networks in Your Area

You can use the Networks tab to view all available wireless networks in your area. You can also scan to search for wireless networks and refresh the tab.

To view wireless networks:

1. Use the icon to open the Smart Wizard.

2. Click the Networks tab to display the following screen:

You can click a column heading to sort.

If many networks use the same channel they can interfere with each other. (G) indicates a 2.4 GHz network.

The status bar shows your network connection and Internet connection.

The screen shows the following information for each network scanned:

- **Network Name (SSID)**. The name of the wireless network. As a security measure, some wireless access points do not broadcast the network name. In such cases, the **Network Name (SSID)** field is blank even though the rest of the information is displayed.

- **Channel**. The channel determines which operating frequency is used. In this column (G) indicates a 2.4 GHz network.
- **N**. The access point supports wireless N mode.
- **WPS**. The access point supports WPS.
- **Security**. Identifies whether the wireless network uses security settings such as WPA2-PSK, WPA-PSK, or WEP.
- **Signal**. Identifies the signal strength of the communications.
- **MAC Address**. Identifies the hardware address (MAC address) of the wireless device broadcasting this information.
- **Mode**. Identifies the type of wireless network — Access Point (Infrastructure) or Computer-to-Computer (Ad Hoc)

The buttons located at the bottom of the Networks tab are:

- **Help**. Display online help.
- **Join a Network**. View networks and join a network. See *Joining a Network without WPS* on page 18.
- **Connect**. Connect to the network that you selected.
- **Scan**. Check for wireless networks. Clicking **Scan** refreshes the screen.
- **Close**. Close the window of the Wizard.

Joining a Network without WPS

1. Use the icon to open the Smart Wizard. On the status bar at the bottom of the screen, click **Join a Network**.

If there is a WPS network in your area, the Smart Wizard displays the WPS screen. To bypass WPS, select **No** to avoid connecting, and then click **Next**.

2. Select a network from the drop-down list. If you select a hidden network, you must enter the SSID. Click **Next**.

3. Follow the wizard steps to specify the wireless security if used, and to create a profile.

4. Review you settings, and click **Finish**.

    The status bar shows the status of your wireless connection.

Using Push 'N' Connect to Join a Network

Push 'N' Connect (also called WPS) lets you join a secure wireless network by pushing a button instead of entering a passphrase or network key. Your micro USB adapter works with WPS, but only if the wireless network you want to join also supports WPS. An access point or router that supports WPS has a WPS symbol [ ] on it.

To join a network using WPS:

1. Use the [ ] icon to open the Smart Wizard. On the status bar at the bottom of the screen, click **Join a Network**.

The Smart Wizard detects a WPS network.

2. Select the **Yes, I will connect using Push 'N' Connect** radio button, and then click **Next**.
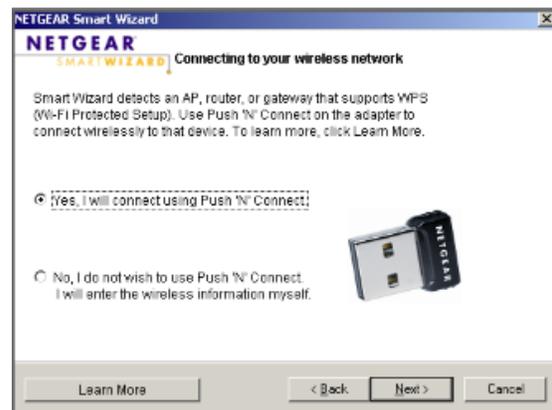
3. Either push the WPS button on the micro USB adapter or click the onscreen WPS button. Click **Next**.

4. On the access point or router for the network you want to join, use its Smart Wizard or WPS configuration utility, and push its WPS button as directed.

    *   The access point or router adds the micro USB adapter to the network.
    *   The micro USB adapter Smart Wizard status bar shows the status of your wireless connection.

5. Click **Close** to exit the Smart Wizard.

6. Close the Smart Wizard or configuration utility for the access point or router.

Creating Profiles to Connect to Networks

The Smart Wizard can create a profile for each wireless network that you join when using your micro USB adapter. If you connect to different networks, name the profiles and save them to easily connect the next time you join the same network. Advanced users can also set up profiles for Ad Hoc mode connections for peer-to-peer networking. See *Working with Ad Hoc Mode* on page 25.

There are two special profile names: Default and Profile.

- **Default**. This profile scans for any available network. You cannot change this profile name.

- **Profile**. If you do not enter a name in the **Profile Name** field when you connect to a network, the name Profile is used to save your settings. If you do this more than once, you are asked if you want to replace the previous settings stored in Profile.

To set up a profile to connect to a network:

1. Use the icon to open the Smart Wizard. The Settings tab displays:
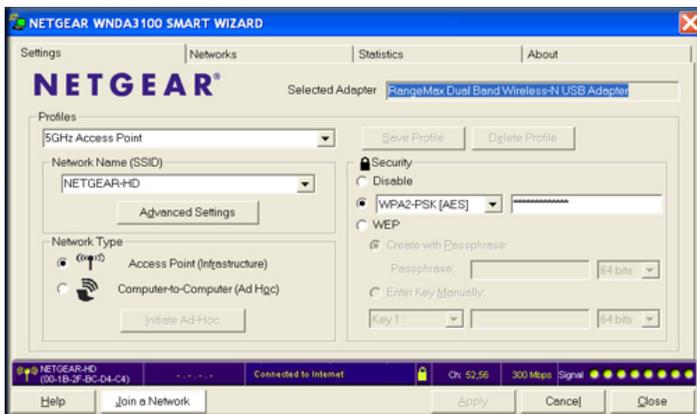
2. In the **Profiles field**, type the name of the profile.
3. In the **Network Name (SSID)** field, select a network or enter the SSID.

   Note: You cannot connect wirelessly unless the network SSID matches exactly the SSID used by the wireless network.

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4. Make sure that the **Access Point (Infrastructure)** radio button is selected. This setting allows you to connect to a wireless router or access point.
5. Click **Save Profile**.
6. Click **Apply**, then click **Close** to exit, or click **Cancel** to return to the previous settings.
7. To make sure your network connection is working, use a browser to connect to the Internet. The status bar in the Smart Wizard shows the current connection status.

Wireless Security

Many networks use wireless security. The first time you join a network that uses wireless security, you must either know its security settings, or use Push 'N' Connect (WPS) for a WPS-compatible wireless network. The main types of wireless security are:

- Wi-Fi Protected Access 2 Pre-Shared Key (WPA2-PSK)
- Wi-Fi Protected Access Pre-Shared Key (WPA-PSK)
- Wired Equivalent Privacy (WEP)

For more information about wireless security, see the wireless reference document at *http://documentation.On Networks.com/reference/enu/wireless/index.htm*.

Setting Up WPA2-PSK or WPA-PSK Wireless Security

1. Use the ⬛ icon to open the Smart Wizard. The Settings tab displays:

2. In the **Profile** field, select the profile, or type in a profile name.
3. In the **Network Name (SSID)** field select the network, or enter the SSID.
4. In the Security section, select the WPA2 or WPA setting for the wireless network that you want to join and enter the passphrase.
5. Click the **Save Profile** button. All the configuration settings are saved in this profile.
6. Click **Apply**, and then click **Close** to exit the Smart Wizard.

Setting Up WEP Encryption Security

1. Use the 🔳 icon to open the Smart Wizard. The Settings tab displays:
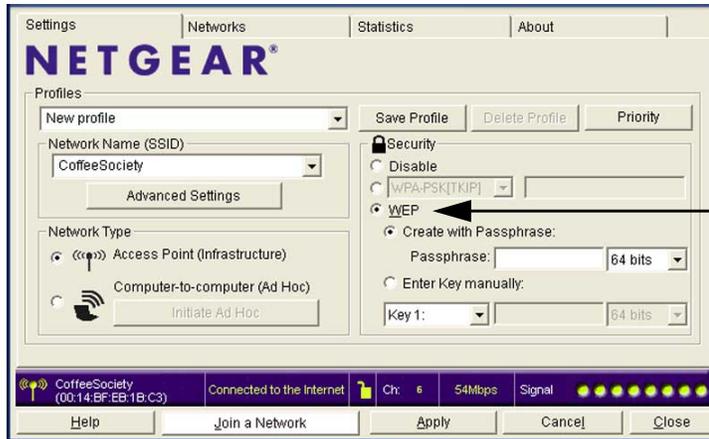
2. In the **Profile** field, select the profile or type in a profile name.

3. In the **Network Name (SSID)** field, select the network, or enter the SSID.

4. In the Security section, select **WEP** and then select the WEP encryption strength:
   - 64-bit WEP data encryption
   - 128-bit WEP data encryption

5. Select **Create with Passphrase**, and enter the passphrase so that the Smart Wizard will generate the WEP keys. The characters are case-sensitive. Be sure to use the same passphrase for all the wireless devices in the network.

   If the wireless network that you want to join does not support the passphrase method, you must enter the keys so that they match the wireless network exactly.

6. Click the **Save Profile** button.

7. Click **Apply** and then click **Close** to exit the configuration utility.

Viewing Statistics

The Statistics tab provides real time and historical trend information about the data traffic and performance of your wireless adapter.

- **Transmit/Receive Performance (%)**. A real-time graph identifies the total, receive, and transmit utilization as a percentage the total possible.

- **Transmit, Receive, and Total (TxRx)**. Radio buttons let you select whether to display the transmit performance, the receive performance, or both in the same graph.

- **Transmit Statistics**. Identifies transmit megabits per second (Mbps), transmit packets per second (Tx Packets/s), total transmitted packets, and transmit errors.

- **Receive Statistics**. Identifies receive megabits per second (Mbps), receive packets per second (Rx Packets/s), total received packets, and reception errors.
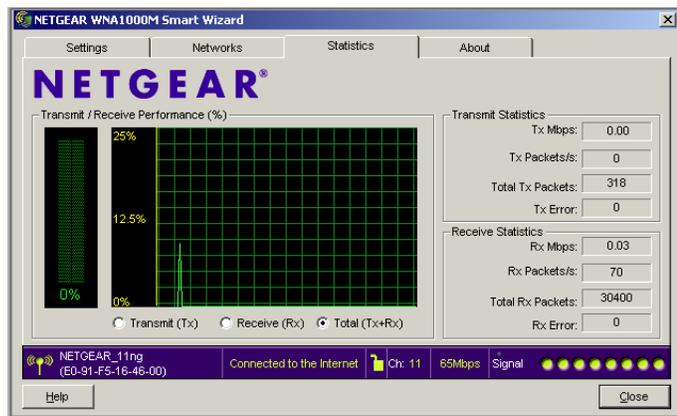
Viewing the About Tab

The About tab displays the current version information and allows you to check for software updates (See *Upgrading the Software* on page 14).

The following information is displayed in the About tab:

- **Region**. This is the region setting for the wireless adapter. The approved channels for the region are automatically scanned. Governments regulate the channels used for wireless transmission. Operating the wireless adapter in a different region might violate local laws.

- **Driver Version** and **Driver Date**: The wireless adapter driver version and release date.
- **MAC Address**. The Media Access Control (MAC) address of the adapter. This is a unique 48-bit hardware address. Some wireless networks restrict access based on a list of known MAC addresses. To connect to such a network, you must first provide the MAC address shown here to the network administrator.
- **IP Address**. The IP address assigned to this adapter.
- **Smart Wireless Utility**. The version and release date of the Smart Wizard.

> **Note:** The **Get Info** button displays technical messages that can be used for troubleshooting.

Advanced Settings

You can use the Advanced Settings screen to configure the preamble (GHz) that the adapter uses. The available settings are Auto and 2.4 GHz. The 2.4GHz range is commonly used by cordless telephones.

> **Note:** The default settings for the **Fragmentation Threshold** field and **RTS/CTS Threshold** field usually work fine. Do not change them unless you have a specific reason to do so.

By changing the preamble setting, you have the option to connect to the following types of wireless networks.

- 2.4 GHz only. Connect only to 2.4GHz access points, up to 150 Mbps.
- 2.4 GHz. Connect to 802.11b/g access points, up to 54 Mbps.

To change the preamble (GHz) setting:

1. On the Settings tab, click the **Advanced Settings** button.

   > **Note:** *For Windows Vista computers, you must have administrator rights. Otherwise, this option is not available for selection.*

2. In the Advanced section of the screen, adjust the settings as needed.

   Changing the setting in the **Preamble** field affects which options are available in the Wireless Mode section of this screen. You
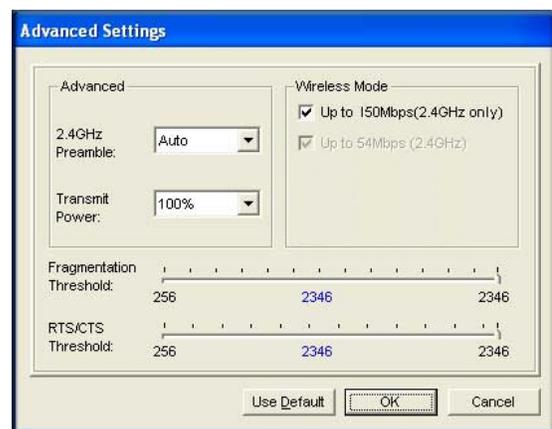
can change the preamble for better throughput if you experience interference, such as from a cordless telephone. Many cordless phones use 2.4 GHz.

- **Auto**. Up to 150 Mbps.
- **2.4 GHz**. Use a 2.4 GHz preamble.
- **Long**.

3. Click **OK**.

Working with Ad Hoc Mode

Ad Hoc Mode is an advanced feature that allows you to create a wireless network between two computers without using a router or access point. For example, this mode is used when two Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

Note: Ad Hoc mode does not work using DHCP settings. Ad Hoc mode requires either static IP addresses (such as 192.168.0.1) or the IPX protocol. For help setting up static IP addresses, see the PC Networking Tutorial on the *Resource CD*.

For more information about wireless network modes, see the wireless reference document at: *http://documentation.On Networks.com/reference/enu/wireless/index.htm.*

Creating an Ad Hoc Mode Profile

1. Use the ![icon] icon to open the Smart Wizard. The Settings tab displays:
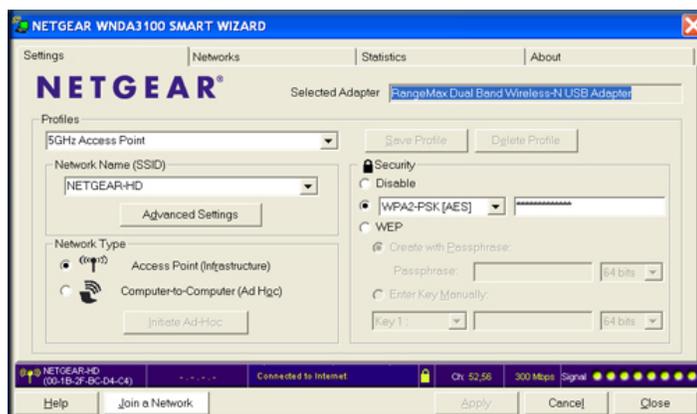
2. Enter the network settings.
   a. Select **Computer-to-Computer (Ad Hoc)** for the network type.
   b. Select or enter the network name (SSID) for the Ad Hoc network.

    c. In the **Profile** field, type the name of the profile.

    d. Click **Apply**.

3. Save your settings in a profile.

    a. Click **Save Profile**, and all the configuration settings are saved in this profile.

    b. Click **Apply**, then click **Close** to exit the Smart Wizard, or click **Cancel** to return to the previous settings.

4. Configure the computer network settings.

    a. Configure each computer with either a static IP address or with the IPX protocol.

    b. Restart the computers.

5. Verify wireless connectivity between your peer devices with the ping program:

    a. On the Windows taskbar, select Start > Run.

    b. Assuming the target PC is configured with 192.168.0.1 as its IP address, type:

    ping -t 192.168.0.1

    and then click **OK**.

    c. A continuous ping will be sent to the device with the 192.168.0.1 static IP address. The ping response should change to Reply.

    At this point the connection is established.

Note: If you cannot connect, see *Removing the Software* on page 15. For problems accessing network resources, the Windows client and rile and print sharing software might not be installed or configured correctly on your computers. See the link to Internet Networking and TCP/IP Addressing: in Appendix B.

Starting a Computer-to-Computer (Ad Hoc) Network Connection

1. On the Settings tab of the Smart Wizard, select or type the network name (SSID).
2. Select the **Computer-to-Computer (Ad Hoc)** network type.

Note: For Windows Vista computers, you must have administrator rights. Otherwise, this option is not available for selection.

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3. Click **Initiate Ad Hoc**. The Ad Hoc Setting screen displays:

4. In the **Start Ad Hoc** drop-down list, select the wireless standard (802.11b or 802.11g) for your Ad Hoc computer-to-computer network.
5. In the **Channel** field, **Automatic** should work. If there is interference from a nearby wireless device, select a different channel. You can use the Networks tab to view channels in use in your area. The channel number differs depending on the country. The connection speed automatically defaults to the highest speed.
6. Click **OK**.

Wireless Network Performance

3

This chapter explains how to maximize the performance of your micro USB adapter within your network.

Optimizing Wireless Performance

The position of your micro USB adapter and the local environment can affect its wireless performance.

- Use the plastic cradle that came in the package with your adapter. This lets you place the adapter in a better position for wireless communication.

- Make sure you do not have interference from other wireless equipment, especially those in the 2400–2500 MHz frequency band. Common sources of interference are:
  - Other computers and fax machines (no closer than 1 foot)
  - Copying machines, elevators, and cell phones (no closer than 6 feet)
  - Microwave ovens (no closer than 10 feet)

How the wireless router or access point is set up also affects wireless communication. For best performance, try the following:

- For better throughput and a higher link rate, set your router or access point wireless mode to **Up to 150 Mbps** or **HT 20/40 Mbps**.

- For a faster connection, set the security for the router as WPA2 or WPA + WPA2 mixed wireless security instead of WPA (TKIP). Wi-Fi regulations allow only the adapter to connect at up to 54 Mbps when WPA (TKIP) security mode is set on the router.

- Avoid using the same wireless channel as your neighbor. To find out which channels are in use in your area, select the Smart Wizard Networks tab. It lists wireless networks in your area including the channel used by each.

Optimizing Your Network Bandwidth

The speed of network connections depends on the type of equipment that you use. Try to use high-speed technologies for network connections with the heaviest traffic to avoid lower-speed bottlenecks. The following illustration shows a home network that includes many different connection speeds.
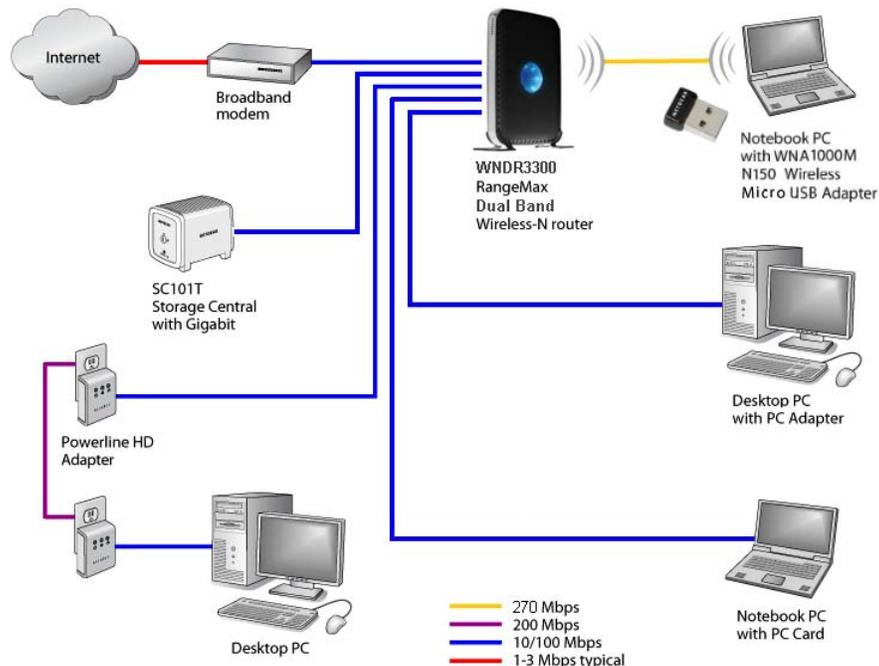
Figure 1. Home Network

In this network, the two PCs with gigabit (1000 Mbps) Ethernet adapters have a gigabit connection through the router to the storage server. With a high-speed router this connection allows for extremely fast backups or quick access to large files on the server. The PC connected through a pair of Powerline HD adapters is limited to the 200 Mbps speed of the Powerline HD connection. Although any of the links in this example would work for high-traffic applications such as streaming HD video, the use of older devices such as 10 Mbps Ethernet or 802.11b wireless would create a bottleneck.

In planning your network, think about which tasks will have the heaviest traffic flow between them. Examples are:

- A media center in one room streaming high-definition video from a server in another room
- A storage device that is used for backing up your computers

Networking Technology and Connection Speed

Common connection types and their speed and security considerations are:

- **Broadband Internet**
Your Internet connection speed depends on your modem type, such as ADSL or cable modem, as well as the speed of the sites to which you connect, and general Internet traffic. ADSL and cable modem connections have a lower data rate *to* the Internet (upstream) than *from* the Internet (downstream). Keep in mind that when you connect to someone else who also has an ADSL or cable modem connection, the data rate between your sites is limited by each side's upstream data rate. A typical residential ADSL or cable modem connection provides a downstream throughput of about 1 to 3 megabits per second (Mbps). Newer technologies such as ADSL2+ and Fiber to the Home (FTTH) l increase the connection speed to tens of Mbps.

- **Wireless**
A high-speed wireless router can provide a wireless data throughput of up to 150 Mbps with excellent range and coverage. WPA and WPA2 wireless security are extremely strong.

   To get the best performance, connect to networks that use newer routers. Your micro USB adapter will work with older 802.11b and 802.11g routers, but the use of these older wireless technologies in your network can result in lower throughput overall. In addition, many older wireless products do not support the latest security protocols, WPA and WPA2.

- **Powerline**
You can use Powerline connections for rooms that are upstairs or too far from your router for a good wireless connection. On Networks's Powerline HD products deliver up to 200 Mbps to any outlet. Data transmissions are encrypted for security, and you can set up a network password to prevent neighbors from connecting.

- **Wired Ethernet**
Wired Ethernet remains a good choice for speed, economy, and security. Gigabit Ethernet can extend up to 100 meters.

> **Note:** Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, can lower actual data throughput rate.

Assessing Your Network Speed Requirements

Because your Internet connection is likely to operate at a much lower speed than your local network, faster local networking technologies might not improve your Internet experience. However, many emerging home applications require high data rates. For example:

- Streaming HD video requires 10 to 30 Mbps per stream. Because latency and packet loss can disrupt your video, plan to provide at least twice the capacity you need.

- Streaming MP3 audio requires less than 1 Mbps per stream and does not strain most modern networks. Like video, however, streaming audio is also sensitive to latency and packet loss, so a congested network or a noisy link can cause problems.

- Backing up computers over the network has become popular due to the availability of inexpensive mass storage. The following table shows the time to transfer 1 gigabyte (1 GB) of data using various networking technologies.

Table 1. Theoretical Transfer Time for 1 Gigabyte

Network Connection	Theoretical Raw Transfer Time
Gigabit Wired Ethernet	8 seconds
RangeMax Dual Band Wireless-N	26 seconds
Powerline HD	40 seconds
100 Mbps Wired Ethernet	80 seconds
802.11g wireless	150 seconds
802.11b wireless	700 seconds
10 Mbps Wired Ethernet	800 seconds
Cable Modem (3 Mbps)	2700 seconds
Analog Modem (56 kbps)	144,000 seconds (40 hours)

Troubleshooting

4

This chapter provides information about troubleshooting your micro USB adapter. You can also refer to the Knowledge Base on the On Networks website at *http://support.On Networks.com*.

Frequently Asked Questions (FAQs)

The micro USB adapter LED is not lit.

The micro USB adapter is not inserted securely in the USB port (or USB cable if used) or the N300MA software is not installed.

* Remove and reinsert the micro USB adapter.
* Check the Windows device manager to see if the micro USB adapter is recognized and enabled. Re-install the N300MA software, if necessary.
* Insert the micro USB adapter in a different USB port on your computer if one is available.

I cannot connect to a wireless network.

* Make sure that your micro USB adapter is inserted securely into the USB port on your computer or the USB cable if you are using it. The micro USB adapter LED should light up or blink (see *Micro USB WiFi Adapter LED* on page 14 for details).
* Click the ![icon] icon to open the Smart Wizard and then click the Networks tab to view the networks in your area. Make sure the signal strength is strong and that you have selected the correct wireless network.
* If the network uses wireless security, you need to either know the wireless security settings or use Push 'N' Connect if the network supports WPS. Some networks also restrict use to only computers or wireless devices with known MAC addresses. If that is the case, use the Smart Wizard About tab to find the MAC address for your micro USB adapter and provide it to the network administrator.

When I connect to the network I cannot access the Internet.

Click to open the Smart Wizard, and then check the connection status in the status bar at the bottom of the screen.
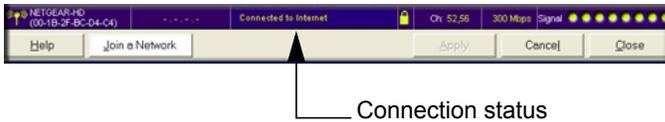
Connection status

Here is a list of connection statuses and their meanings:

- **Connected to Internet**: The wireless Internet connection is OK.
- **Connected to Router**: The wireless connection to the router is OK, but the router is not connected to the Internet.
- **169.254.x.x or ___.___.___.___**: The wireless connection to the router is OK, but there is a problem with the router.

If the router's Internet connection is not working, restart the modem, router, and computer.

When I connect to the network I cannot access shared resources such as printers.

- Check to make sure the router or access point is physically connected to the Ethernet network.
- Make sure that the IP addresses and the Windows networking settings are configured correctly. See the link to Internet Networking and TCP/IP Addressing: in Appendix B.

How can I improve the speed of my wireless connection?

You can use the USB cable and adapter that came in the package to position the micro USB adapter for better wireless communication.

The connection speed can vary depending on the type of USB port on your computer, the capacity of the router or access point for the wireless network, and the type of Internet connection. You can view the throughput in the status bar at the bottom of the Smart Wizard screen.

- If the throughput is 54 Mbps you could be connected to an 802.11g network, or the wireless-N network could be set with WPA (TKIP) security.

  Wi-Fi regulations allow the micro USB adapter to connect only at up to 54 Mbps when WPA (TKIP) security mode is set on the router. For a faster connection, set the security for the router as WPA2 or WPA + WPA2 mixed wireless security. Then the wireless adapter can connect in 802.11n mode.

- If you do not have a USB 2.0 port on your computer, the throughput is limited to the 14 Mbps of the older USB 1.1 standard.
- For more information about connection speeds, see *Optimizing Wireless Performance* on page 28.

The Smart Wizard keeps asking me to save settings.

If you change the settings, the Smart Wizard offers you the chance to save the changes. To avoid this prompt, click **Apply** before you close the Smart Wizard.

Two N300MA icons are in the Windows system tray.

You have an older software version installed on your system and it needs to be removed. See *Removing the Software* on page 15.

How can I view the IP address for the micro USB adapter?

Click the icon to open the Smart Wizard. Then click the About tab to view the IP address.

No IP address is assigned to the micro USB adapter.

This can occur if you upgraded your micro USB adapter software and did not reboot your computer.

- Either restart your computer, or connect to a different access point.
- It does not usually help to shut down the Smart Wizard or disable or enable the micro USB adapter.

Ad Hoc Mode Is Not Working Correctly

You must click the **Initiate Ad Hoc** button before you click **Apply**.

> **Note:** Be sure that all computers in your Ad Hoc network are configured with static IP addresses in the same subnet.

To start an Ad Hoc network:

1. Fill in the **Network Name (SSID)** field.
2. Select the **Computer-to-Computer (Ad Hoc)** network type.
3. Click **Initiate Ad Hoc**.
4. Accept the default settings, or make your changes and click **OK**.

Click **Apply**.

Windows XP Occasional Connection Problems

Windows XP users who apply Windows XP Hotfix (SP2) Q815485 from the Windows XP Update Service might not be able to connect to the Internet, might have dropped wireless

connections, or both when using the Micro USB Adapter. You can delete this Hotfix from the Add or Remove Programs utility in the Control Panel.

To delete Windows XP Hotfix (SP2) Q815485:

1. Select Start > Control Panel > Add/Remove Programs.
2. Select Windows XP Hotfix (SP2) Q815485, and then click **Remove**.
   - You might receive an error message that states that some program on the computer might not work correctly if the update is removed.
   - You can ignore this error message, and then click **Yes** to remove the update.
3. Restart your computer, and rerun the Smart Display Setup Wizard.

This should solve your connection issue. You can restore this hotfix by following this link: *http://microsoft.com/downloads/details.aspx?FamilyId= 009D8425-CE2B-47A4-ABEC-274845DC9E91&displaylang=en*

Technical Specifications and Factory Default Settings

A

Technical Specifications

The following table provides technical specifications for the micro USB adapter.

Feature	Description
Antenna	2 integrated internal wireless antennas
Standards	802.11n, 802.11g, or 802.11b
Radio Data Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, 72, and up to 270Mbps (Auto Rate Sensing)
Frequency	2.4 GHz to 2.5 GHz CCK and OFDM Modulation);
Power	5V Bus powered
Emissions	FCC, CE
Bus interface	USB 2.0
Provided drivers	Microsoft Windows 7, Vista, Windows XP
Operating Environment	Operating temperature: 0 to 40° C
Encryption	40-bit (also called 64-bit) and 128-bit WEP data encryption, and WPA-PSK
Warranty	Limited 1-year warranty

Factory Default Settings

The following table lists the default settings of your micro USB adapter.

Default Settings		
Smart Wizard		Enabled
Wireless	Wireless communication	Enabled
	Wireless Network Name (SSID)	Any (will connect to the first wireless network that responds.
	Security	Disabled
	Network type	Infrastructure
	Transmission speed	Auto[1]
	Country/Region	United States (varies by region)
	Operating mode	802.11n, 802.11g, 802.11b
	Data rate	Up to 270Mbps

1 Maximum wireless signal rate (IEEE Standard 802.11). Actual throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate

Related Documents

<div style="text-align:right">**B**</div>

This appendix provides links to reference documents you can use to gain a more complete understanding of the technologies used in your On Networks product.

Document	Link
Windows XP and Vista Wireless Configuration Utilities Application Note	http://documentation.On Networks.com/reference/enu/winzerocfg/index.htm
Internet Networking and TCP/IP Addressing:	http://documentation.On Networks.com/reference/enu/tcpip/index.htm
Wireless Communications:	http://documentation.On Networks.com/reference/enu/wireless/index.htm
Preparing a Computer for Network Access:	http://documentation.On Networks.com/reference/enu/wsdhcp/index.htm
Virtual Private Networking (VPN):	http://documentation.On Networks.com/reference/enu/vpn/index.htm
Glossary:	http://documentation.On Networks.com/reference/enu/glossary/index.htm

Notification of Compliance

C

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

Note: This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

FCC Requirements for Operation in the United States

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals

FCC Declaration of Conformity

We, On Networks, Inc., 350 East Plumeria Drive, San Jose, CA 95134, declare under our sole responsibility that the N300 Micro USB WiFi Adapter N300MA complies with Part 15 Subpart B of FCC CFR47 Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Radio Frequency Interference Warnings & Instructions

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 uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an electrical outlet on a circuit different from that which the radio 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 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.

FCC Radiation Exposure Statement:

This equipment complies with the US/Canada portable RF exposure limits set forth for an uncontrolled environment and are safe for the intended operation as described in this manual. Further RF exposure reduction can be achieved if the product is kept as far as possible from your body, and the device can be set to a lower output power, if such function is available.

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

SAR compliance has been established in typical laptop computer(s) with a USB port. Other applications, like handheld PCs or similar devices, have not been verified and may not comply with related RF exposure rules; such use shall be prohibited.

The USB dongle transmitter is approved for use in typical laptop computers. To comply with FCC RF exposure requirements, a USB dongle transmitter should not be used certain laptop and tablet computer configurations where the USB connectors on the host computer are unable to provide or ensure the necessary operating configurations intended for the device and its users or bystanders to satisfy RF exposure compliance requirements.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

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.

Radiation Exposure Statement:

This product complies with the US/Canada portable RF exposure limits set forth for an uncontrolled environment and are safe for intended operation as described in this manual. Further RF exposure reduction can be achieved if the product is kept as far as possible from your body, or you can set the device to a lower power output setting, if such function is available.

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.

NOTE IMPORTANTE:

Déclaration d'exposition aux radiations:

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrûlé.

Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

Europe – EU Declaration of Conformity

Marking with the above symbol indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC).

This equipment meets the following conformance standards:

- EN300 328 (2.4Ghz), EN301 489-17, EN60950-1
- This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

- In Italy, the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.
- This device may not be used for setting up outdoor radio links in France, and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information contact the national spectrum authority in France.

For complete DoC, visit the On Networks EU Declarations of Conformity website at:
http://kb.On Networks.com/app/answers/detail/a_id/11621

Table 2. EDOC in Languages of the European Community

Language	Statement
Cesky [Czech]	*On Networks* Inc. tímto prohlašuje, že tento Radiolan je ve shode se základními požadavky a dalšími príslušnými ustanoveními smernice 1999/5/ES.
Dansk [Danish]	Undertegnede *On Networks Inc.* erklærer herved, at følgende udstyr Radiolan overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *On Networks Inc.*, dass sich das Gerät Radiolan in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *On Networks Inc.* seadme Radiolan vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *On Networks Inc.*, declares that this Radiolan is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente *On Networks Inc.* declara que el Radiolan cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *On Networks Inc.* ΔΗΛΩΝΕΙ ΟΤΙ Radiolan ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente *On Networks Inc.* déclare que l'appareil Radiolan est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente *On Networks Inc.* dichiara che questo Radiolan è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *On Networks Inc.* deklarē, ka Radiolan atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *On Networks Inc.* deklaruoja, kad šis Radiolan atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *On Networks Inc.* dat het toestel Radiolan in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *On Networks Inc.*, jiddikjara li dan Radiolan jikkonforma mal-htigijiet essenzjali u ma provvedimenti ohrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.

Table 2. EDOC in Languages of the European Community

Language	Statement
Magyar [Hungarian	Alulírott, *On Networks Inc.* nyilatkozom, hogy a Radiolan megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym On Networks Inc. oświadcza, że Radiolan jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
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Slovensko [Slovenian]	On Networks Inc. izjavlja, da je ta Radiolan v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*On Networks Inc.* týmto vyhlasuje, že Radiolan spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	*On Networks Inc.* vakuuttaa täten että Radiolan tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *On Networks Inc.* att denna Radiolan står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Íslenska [Icelandic]	Hér með lýsir *On Networks Inc.* yfir því að Radiolan er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
Norsk [Norwegian]	*On Networks Inc.* erklærer herved at utstyret *Radiolan* er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

GPL License Agreement

GPL may be included in this product; to view the GPL license agreement go to *ftp://downloads.On Networks.com/files/GPLnotice.pdf*.

For GNU General Public License (GPL) related information, please visit *http://kbserver.On Networks.com/kb_web_files/open_src.asp* .

Interference Reduction Table

The table below shows the Recommended Minimum Distance between On Networks equipment and household appliances to reduce interference (in feet and meters).

Household Appliance	Recommended Minimum Distance (in feet and meters)
Microwave ovens	30 feet / 9 meters
Baby Monitor - Analog	20 feet / 6 meters
Baby Monitor - Digital	40 feet / 12 meters
Cordless phone - Analog	20 feet / 6 meters
Cordless phone - Digital	30 feet / 9 meters

Household Appliance	Recommended Minimum Distance (in feet and meters)
Bluetooth devices	20 feet / 6 meters
ZigBee	20 feet / 6 meters