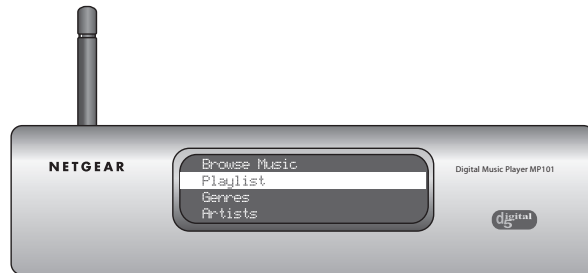


# User's Manual for the MP101 Digital Music Player



## NETGEAR

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# Contents

## Chapter 1

### Setting Up the MP101

|   |     |
|---|-----|
| Welcome .....                                       | 1-1 |
| Scope of the User Manual .....                      | 1-1 |
| Remote Control .....                                | 1-2 |
| Front Panel .....                                   | 1-3 |
| Rear Panel .....                                    | 1-3 |
| Installing the MP101 Digital Music Player .....     | 1-4 |
| Verify That Basic Requirements Are Met .....        | 1-4 |
| First, Install the Media Player Software .....      | 1-4 |
| Next, Connect the MP101 .....                       | 1-5 |
| Connecting to Your Network (Wired Network) .....    | 1-6 |
| Connecting to Your Network (Wireless Network) ..... | 1-6 |
| Home Menu and Browse Music Directory .....          | 1-9 |

## Chapter 2

### Playing Music

|   |     |
|---|-----|
| Playing Songs by an Artist .....          | 2-1 |
| Playing Songs by Genre .....              | 2-2 |
| Playing a Music Playlist .....            | 2-2 |
| Playing an Album .....                    | 2-3 |
| Playing a Track .....                     | 2-4 |
| Displaying Information about a Song ..... | 2-4 |
| Shuffle and Repeat .....                  | 2-5 |
| Playing Music from the Internet .....     | 2-6 |
| Presets .....                             | 2-7 |

## Chapter 3

### Configuration and Maintenance

|                                 |     |
|---------------------------------|-----|
| Accessing the Setup Menu .....  | 3-1 |
| Displaying the IP Address ..... | 3-1 |

|   |     |
|---|-----|
| Setting the IP Address Mode (Dynamic or Static) ..... | 3-2 |
| Displaying Wireless Link Information .....            | 3-3 |
| Manual Wireless Configuration .....                   | 3-3 |
| Upgrading the MP101 Digital Music Player .....        | 3-5 |
| Resetting the Defaults .....                          | 3-5 |
| Viewing Information About the MP101 .....             | 3-6 |
| Choosing a Different Server .....                     | 3-6 |

## **Appendix A**

### **Troubleshooting**

|   |     |
|---|-----|
| Hardware Installation .....             | A-1 |
| Physical Connectivity .....             | A-2 |
| Ethernet Link .....                     | A-2 |
| Wireless Link .....                     | A-2 |
| IP Address .....                        | A-3 |
| Connecting to the Server .....          | A-3 |
| Connecting to the RHAPSODY Server ..... | A-4 |
| Playing Music .....                     | A-4 |
| Firewalls .....                         | A-5 |

## **Appendix B**

### **Wireless Networking Basics**

|   |     |
|---|-----|
| Infrastructure Mode .....                                       | B-1 |
| Ad Hoc Mode (Peer-to-Peer Workgroup) .....                      | B-2 |
| Network Name: Extended Service Set Identification (ESSID) ..... | B-2 |
| Wireless Channels .....   | B-2 |
| WEP Wireless Security .....                                     | B-3 |
| WEP Authentication .....  | B-4 |
| WEP Encryption .....  | B-4 |



# Chapter 1

## Setting Up the MP101

### Welcome

---

The NETGEAR MP101 Digital Music Player brings the media capabilities of your personal computer to the comfortable confines of your living room. Now, all the music stored in your computer can be accessed right from your audio player. You can opt for the convenience of current wireless networking standards or the security and reliability of good old-fashioned wires. NETGEAR Audio's friendly user interface and intuitive navigation puts all of your digital content at your fingertips.

NETGEAR Audio is a client-server system. Media stored in the server is played from the client. The player has no permanent storage thus it is called the "client" because its purpose is to browse and playback content. The PC has permanent storage and thus it is called the "server." Music files are "served" to the player from the PC. The communication between these devices is accomplished across a network, which can either be wired (using the 802.3 Ethernet standard) or wireless (using the 802.11b standard).

### Scope of the User Manual

---

This User Manual provides information about using the NETGEAR MP101 Digital Music Player. For information about how to use the NETGEAR Streaming Media Server software, run the software and click *Help*. See the *MP101 Installation Guide* for information about installing the software.

This chapter describes how to set up the MP101 Digital Music Player on your local area network (LAN).

## Remote Control

Use the remote control to navigate menus in the MP101 Digital Music Player and to select and play music on your audio system.

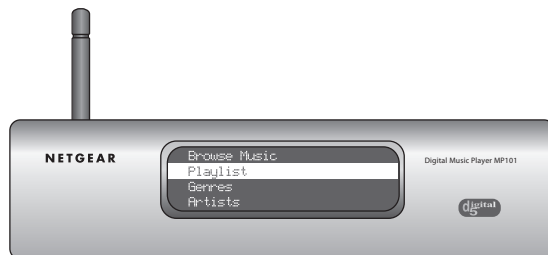


| Button     | Description   |
|------------|---|
| Power Icon | Power   |
| 0-9        | Presets   |
| VOL+       | Increase headphone volume                                   |
| VOL-       | Decrease headphone volume                                   |
| Page ▲     | Scroll up three lines at a time                             |
| Page ▼     | Scroll down three lines at a time                           |
| M          | Memory (used in conjunction with numbered keypad)           |
| ▲          | Scroll up. For <i>Fast Scroll</i> hold for three seconds.   |
| ▼          | Scroll down. For <i>Fast Scroll</i> hold for three seconds. |
| ◀          | Go out one menu level                                       |
| ▶          | Go in one menu level  |
| OK         | Select/Play   |
| Home Icon  | Display Home menu   |
| Disp       | Display additional song Info                                |
| ◀◀         | Previous song   |
|            | Pauses the song   |
| ▶          | Plays the song  |
| ▶▶         | Next song   |
| ◀◀         | Rewind  |
| ■          | Stop playback   |
| ▶▶         | Fast forward  |
| Playlist   | Playlist menu   |
| Genre      | Genre menu  |
| Artist     | Artist menu   |
| Track      | Track menu  |
| Shuffle    | Shuffle mode  |
| Net        | Internet Content  |
| Repeat     | Repeat mode   |

## Front Panel

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The front of the MP101 Digital Music Player has a four-line display. If information is too long to fit horizontally, it scrolls to the left marquee style.

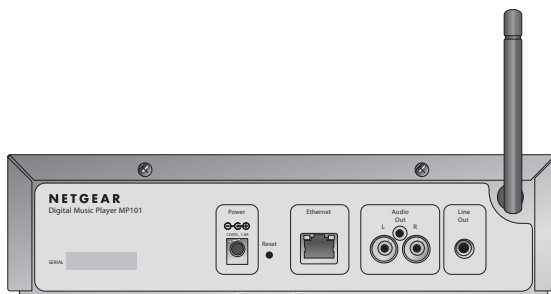


**Figure 1-1: MP101 Front Panel**

## Rear Panel

---

The rear panel of the MP101 contains the connectors.



**Figure 1-2: MP101 Rear Panel**

Viewed from left to right, the rear panel contains the following features:

- AC power adapter outlet
- Hardware Reset push button
- Local (LAN) 10/100 Mbps Ethernet port for connecting the media player to a wired LAN

- Fixed-level Audio Out Left and Right RCA ports for connecting the media player to stereo system
- Volume controlled Audio Out mini-jack for connecting the media player to headphones or powered speakers
- Antenna for wireless network.

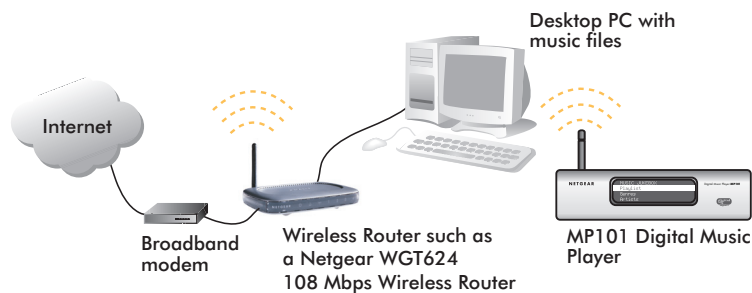
## Installing the MP101 Digital Music Player

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### Verify That Basic Requirements Are Met

Assure that you have the following:

- Network: A wireless (802.11b or 802.11g) or Ethernet network
- Computer: One or more computers running Windows 98SE, 2000, ME, NT or XP
- Internet Access (Optional): Router with multiple network ports connected to the Internet



Have your Ethernet and wireless network settings handy.

### First, Install the Media Player Software

**Warning:** PC firewall software can prevent the music server from communicating with the MP101 Digital Music Player. Consult the NETGEAR Media Server online help for full details about firewall settings.

**Note:** The MP101 is a client that can only play music served from another source such as the NETGEAR Media Server or from an Internet music service such as RHAPSODY.

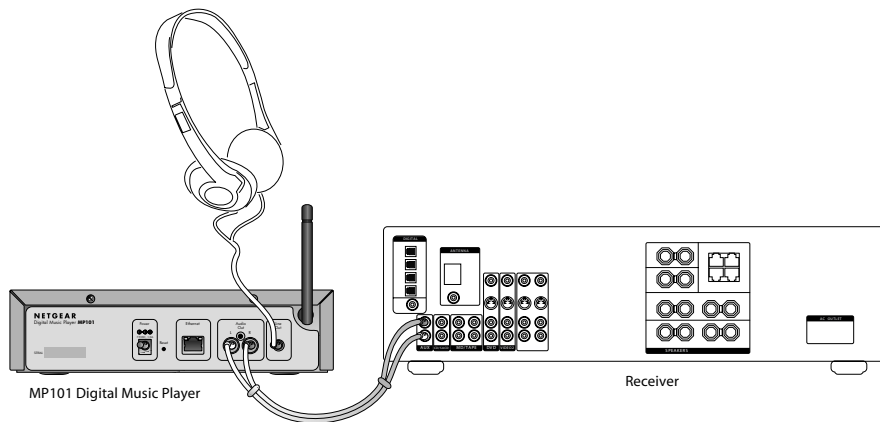
1. Power on your computer and log in as needed.
2. Insert the Resource CD for the MP101 into your CD-ROM drive. The CD main page will load.

- Install the MP101 Server Software to play music stored on your computers.
  - Install RHAPSODY Digital Music Service to take advantage of a 30-day free trial to play music from their vast collection of recordings.
  - View Documentation Resources allows you to view a soft copy of the Installation Guide and this manual.
3. Follow the InstallShield Wizard steps, click **Finish** when done, and restart your computer as needed.
  4. The Media Server software will automatically run. You can optionally scan your hard drive to locate your music files.

## Next, Connect the MP101

The MP101 Digital Music Player connects your home computer network to your audio system.

1. Connect the provided RCA cable from the MP101 Digital Music Player to your audio system. Alternately, you can connect headphones or powered speakers to the mini-jack output, which is volume controlled using the remote control.



2. Connect the MP101 to your network.

**Note:** The MP101 is set from the factory to automatically receive its network settings via DHCP. If DHCP is not running on your network, you will have to set up the IP address of the MP101 in the range of addresses on your network.

- For Ethernet networks, connect via the Ethernet port.
- For wireless networks, no physical connection is needed.

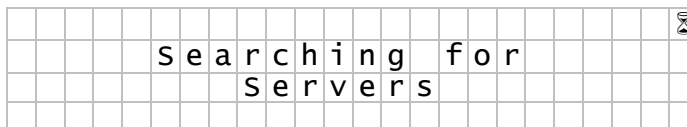
## Connecting to Your Network (Wired Network)

**Important:**

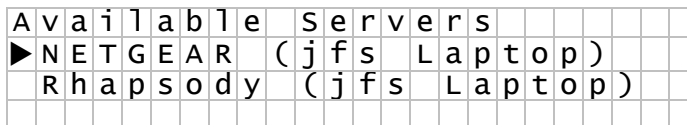
Always have the NETGEAR Media Server software running on your PC *before* turning on the MP101 Digital Music Player.

► To start the MP101 Digital Music Player on a wired Ethernet network:

1. Plug in or turn on your player. The display will show start-up messages as it connects to the wired network, requests an IP address, and searches for servers.



2. If this is the first time using the MP101 Digital Music Player, you will be prompted to select a server:



3. Scroll and select the desired server. You will receive a message confirming the connection and the *Home Directory* for that server will open.

All the music from the connected server is now accessible from the MP101 Digital Music Player. You can access this music by album, artist, genre, and music playlist.

## Connecting to Your Network (Wireless Network)

**Important:**

Always have the NETGEAR Streaming Media Server software running on your PC *before* turning on the MP101 Digital Music Player.

**Note:** Detailed background on wireless networking can be found in [Appendix B, Wireless Networking Basics](#).

► To start the MP101 Digital Music Player on a wireless network:



- **Manual method.** Select an active key number and enter four hex keys. These values *are not* case sensitive. For 64-bit WEP, enter 10 hex digits (any combination of 0-9 or a-f). For 128-bit WEP, enter 26 hex digits.

c. The current Authentication method is displayed.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |  |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|--|---|---|--|
| A | u | t | h | e | n | t | i | c | a | t | i | o | n |  |   |  |   |   |  |
|   | O | p | e | n |   |   |   |   |   |   |   |   |   |  |   |  |   |   |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |  |   |   |  |
|   | O | K |   | t | o |   | a | c | c | e | p | t | , |  | ► |  | t | o |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |  | e | d |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |  |   |   |  |

Press **[OK]** to accept the setting or press **[►]** to change the setting. Authentication can be set to Open or Shared key.

d. WEP configuration is now complete. The current SSID is displayed.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | E | P |   | S | e | t | t | i | n | g | s |   |   |   |   |   |   |   |
|   | R | e | v | i | e | w |   | S | e | t | t | i | n | g | s |   |   |   |
| ► | J | o | i | n |   | N | e | t | w | o | r | k |   | ( | r | e | b | o |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   | ) |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

You can select Join Network to reboot with the saved WEP settings, or Enter/Review Settings to cycle through the WEP Wizard again.

4. The system reboots. The display will show start-up messages as it connects to the wireless network, requests an IP address and searches for servers.

|  |  |  |  |  |   |   |   |   |   |   |   |   |   |  |   |   |   |   |
|--|--|--|--|--|---|---|---|---|---|---|---|---|---|--|---|---|---|---|
|  |  |  |  |  |   |   |   |   |   |   |   |   |   |  |   |   |   | ⌚ |
|  |  |  |  |  | S | e | a | r | c | h | i | n | g |  | f | o | r |   |
|  |  |  |  |  |   | S | e | r | v | e | r | s |   |  |   |   |   |   |
|  |  |  |  |  |   |   |   |   |   |   |   |   |   |  |   |   |   |   |

5. If this is the first time using the MP101 Digital Music Player, you will be prompted to select a server:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | v | a | i | l | a | b | l | e |   | S | e | r | v | e | r | s |   |   |   |
| ▶ | N | E | T | G | E | A | R |   | ( | j | f | s |   | L | a | p | t | o | p |
|   | R | h | a | p | s | o | d | y |   | ( | j | f | s |   | L | a | p | t | o |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Scroll and select the desired server. You will receive a message confirming the connection and the *Home Directory* for that server will open.

All the music from the connected server is now accessible from the MP101 Digital Music Player. You can access this music by album, artist, genre, and music playlist.



## Home Menu and Browse Music Directory

The Home Menu lets you go to the Browse Music directory or Setup.

► To access the Browse Music Directory:

1. Press the **[Home]** button on the remote control.

[illegible]

2. Select *Browse Music* and the *Browse Music Directory* opens:

|   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|
| B | r | w | s | e | M | u | s | i | c |  |  |  |  |  |  |
| ▶ | A | r | t | i | s | t | s |   |   |  |  |  |  |  |  |
|   | G | e | n | r | e | s |   |   |   |  |  |  |  |  |  |
|   | P | l | a | y | l | i | s | t | s |  |  |  |  |  |  |

3. You can scroll down to display the Album and Tracks menu selections. The buttons at the bottom of the remote control let you go directly to the Artists, Genre, Playlists, and Tracks menus. More detailed instructions for playing music can be found in [Chapter 2](#).

The music files displayed on the MP101 Digital Music Player are *exactly* the same as the contents displayed within the NETGEAR Streaming Media Server software on your computer.



## Chapter 2

# Playing Music

**Note:** The following instructions assume that you are already connected to the desired server. If not, see [Chapter 1, Setting Up the MP101](#) and then continue with the instructions below.

From the *Home* menu, select *Browse Music* and the *Browse Music Directory* opens:

|   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|
| B | r | o | w | s | e |   | M | u | s | i | c |  |  |  |  |  |  |  |  |
| ▶ | A | r | t | i | s | t | s |   |   |   |   |  |  |  |  |  |  |  |  |
|   | G | e | n | r | e |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|   | P | l | a | y | l | i | s | t | s |   |   |  |  |  |  |  |  |  |  |

**Note:** The exact contents of the *Browse Music* menu may be slightly different depending on the server selected. These instructions assume you are browsing the NETGEAR Streaming Media server.

## Playing Songs by an Artist

---

▶ To play songs by an artist:

1. Press the **[Artist]** button on the remote control or select *Artists* from the *Browse Music* directory.

|   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|--|--|--|--|
| A | r | t | i | s | t | s |   |   |   |   |   |   |  |   |   |  |  |  |  |
| ▶ | B | a | r | e | f | o | o | t |   |   |   |   |  |   |   |  |  |  |  |
|   | P | u | b | l | i | c | , |   | J | a | n | e |  | Q | . |  |  |  |  |
|   | S | t | o | p | l | i | g | h | t |   |   |   |  |   |   |  |  |  |  |

2. Scroll to the desired artist. To *fast scroll*, hold down the Up or Down arrows for three seconds. The Left or Right arrows also *fast scroll* at a faster rate.
3. You can play *all songs* by that artist or you can play a *specific album* or *specific song* by the artist:

▶ To play all songs by the artist:

- a. Press **[▶]**. All songs by that artist will be played automatically.

▶ To play a specific album

- a. Scroll to the desired album name

- b. Press **[ ▶ ]**. All songs in the album will be played automatically. The order of the songs on the album is determined by the NETGEAR Media Server settings.
- ▶ To play a specific song by the artist:
- a. Use the Right arrow to list the songs for that artist.
  - b. Scroll to the desired song and press **[ ▶ ]**.

## Playing Songs by Genre

1. Push the **[Genre]** button on the remote control or select *Genre* from the *Browse Music* directory.

[illegible]

2. Scroll to the desired genre. To *fast scroll*, hold down the Up or Down arrows for three seconds. The Left or Right arrows also *fast scroll* at a faster rate.
3. You can play *all songs* within that genre or you can play a *specific song*:
  - ▶ To play all songs within the genre:
    - a. Press [ ▶ ]. All songs within the genre will be played automatically.
  - ▶ To play a specific song within the genre:
    - a. Use the Right arrow to list the songs for that genre.
    - b. Scroll to the desired song and press [ ▶ ].

## Playing a Music Playlist

- To play a music playlist:

1. Push the **[Playlist]** button on the remote control or select *Playlist* from the *Browse Music* directory.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|
| M | u | s | i | c | P | l | a | y | l | i | s | t |   |  |  |  |  |  |  |
| ▶ | P | a | r | t | y | M | u | s | i | c |   |   |   |  |  |  |  |  |  |
|   | R | o | m | a | n | t | i | c | S | o | n | g | s |  |  |  |  |  |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |

2. Scroll to the desired playlist and press **[▶]** to play the songs within that playlist.

## Playing an Album

▶ To play an album:

1. Select *Albums* from the *Browse Music* directory.

|   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|
| B | r | o | w | s | e | M | u | s | i | c |  |  |  |  |  |  |  |  |  |
|   | P | l | a | y | l | i | s | t | s |   |  |  |  |  |  |  |  |  |  |
| ▶ | A | l | b | u | m | s |   |   |   |   |  |  |  |  |  |  |  |  |  |
|   | T | r | a | c | k | s |   |   |   |   |  |  |  |  |  |  |  |  |  |

2. Scroll to the desired artist. To *fast scroll*, hold down the Up or Down arrows for three seconds. The Left or Right arrows also *fast scroll* at a faster rate.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|
| A | L | B | U | M | S |   |   |   |   |   |   |   |   |   |  |  |  |  |  |
| ▶ | B | o | r | n |   | i | n |   | H | a | w | a | i | i |  |  |  |  |  |
|   | D | o | n | ' | t | G | o |   |   |   |   |   |   |   |  |  |  |  |  |
|   | T | o | o |   | M | u | c | h |   |   |   |   |   |   |  |  |  |  |  |

3. You can play the *entire album* or you can play a *specific song* in the album:

▶ To play the entire album:

- a. Press **[▶]**. All songs in the album will be played automatically. The order of the songs on the album is determined by the NETGEAR Media Server settings.

▶ To play a specific song within the album:

- a. Use the Right arrow to list the songs in the album.
- b. Scroll to the desired song and press **[▶]**.

## Playing a Track

---

► To play a track:

1. Push the **[Track]** button on the remote control or select *Tracks* from the *Browse Music* directory.

|   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|
| T | r | a | c | k | s |   |   |   |   |   |  |  |  |  |  |  |  |  |  |
| ♪ | B | e | w | i | l | d | e | r | e | d |  |  |  |  |  |  |  |  |  |
|   | B | l | a | c | k | b | i | r | d |   |  |  |  |  |  |  |  |  |  |
|   | B | l | o | w |   |   |   |   |   |   |  |  |  |  |  |  |  |  |  |

2. The tracks are listed in alphabetical order. Scroll through the available tracks. To *fast scroll*, hold down the Up or Down arrows for three seconds. The Left or Right arrows also *fast scroll* at a faster rate.
3. Press **[►]** to play the track.

## Displaying Information about a Song

---

This option is only available when a song is listed or playing:

► To display information about a song:

1. When a song is playing, the display will show the song name, artist, album, genre and time elapsed.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |   |   |       |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|---|---|-------|
| ♪ | L | e | t |   | i | t |   | b | e |   |   |   |   |  |  |  |   |   |       |
| ▶ | B | e | a | t | l | e | s |   |   |   |   |   |   |  |  |  |   |   |       |
|   | G | r | e | a | t | e | s | t |   | H | i | t | s |  |  |  |   |   |       |
|   | R | o | c | k |   |   |   |   |   |   |   |   |   |  |  |  | 0 | 0 | : 2 2 |

2. Press **[Disp]** to display the song number, bit rate, sampling rate, file format, total time of the song and time remaining in the song:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ♪ | L | e | t |   | i | t |   | b | e |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | S | o | n | g |   | 1 | / | 7 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | 1 | 2 | 8 |   | k | b | p | s | , |   | 4 | 4 | . | 1 |   | k | H | z |   |   |   |   |
|   | M | P | 3 | , |   | T | o | t | a | l | : | 0 | 3 | : | 5 | 3 |   | 0 | 3 | : | 3 | 1 |

3. Press **[Disp]** to return to the standard display.

**Note:** You can browse music while music is playing using the navigation arrow buttons. To return to displaying song information, press the **[HOME]** button.

► To use Shuffle:

|  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|--|--|--|--|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|
|  |  |  |  |  |   |   |   | M | O | D | E |  |  |  |  |  |  |  |  |
|  |  |  |  |  | N | O | R | M | A | L |   |  |  |  |  |  |  |  |  |

|   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|
|   |   |   |   |   |   | M | O | D | E |   |   |   |  |  |  |  |  |  |  |
| S | H | U | F | F | L | E | N | O | R | M | A | L |  |  |  |  |  |  |  |

► To use Repeat:

[illegible]

```

      Mode
  REPEAT ALL

```

[illegible]

## Playing Music from the Internet

**Note:** The following instructions assume that you already have a RHAPSODY account. A free 30-day trial can be installed from the Resource CD.

You can use the MP101 Digital Music Player to play music over the Internet from RHAPSODY Digital Music Service. You have access to all the tracks, albums, playlists and digital radio stations on the My Library tab in your RHAPSODY account.

► To play music over the Internet, choose your RHAPSODY server in the MP101 server list:

1. Access your RHAPSODY account from a computer that is on your home network.

**Note:** Be sure that UPnP Server is enabled in the RHAPSODY application. This setting can be found in the Options -> User Settings menu item, under the UPnP tab. The UPnP Server will be enabled by default if RHAPSODY is installed from the MP101 Resource CD.

2. Press the **[Home]** button on the remote control.

|   |   |   |   |   |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|--|---|---|---|---|---|--|--|--|--|--|--|--|
| M | P | 1 | 0 | 1 |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|   | B | r | o | w | s | e |  | M | u | s | i | c |  |  |  |  |  |  |  |
| ► | S | e | t | u | p |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|   |   |   |   |   |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |

3. Select *Setup* and the *Setup* menu opens:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| S | e | t | u | p |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|   | N | e | t | w | o | r | k |   | S | e | t | u | p |   |   |   |   |  |  |
|   | M | a | i | n | t | e | n | a | n | c | e |   |   |   |   |   |   |  |  |
| ► | A | v | a | i | l | a | b | l | e |   | S | e | r | v | e | r | s |  |  |

4. Select *Available Servers*.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | v | a | i | l | a | b | l | e |   | S | e | r | v | e | r | s |   |   |   |   |
| ▶ | N | E | T | G | E | A | R |   | ( | j | f | s |   | L | a | p | t | o | p |   |
| ▶ | R | h | a | p | s | o | d | y |   | ( | j | f | s |   | L | a | p | t | o | p |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

5. Select the desired RHAPSODY server. You will receive a message confirming the connection. The Home menu opens.

|   |   |   |   |   |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|--|---|---|---|---|---|--|--|--|--|--|--|--|
| M | P | 1 | 0 | 1 |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
| ► | B | r | o | w | s | e |  | M | u | s | i | c |  |  |  |  |  |  |  |
|   | S | e | t | u | p |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|   |   |   |   |   |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |



6. Select *Browse Music* to open the *Browse Music Directory* for the server:

[illegible]

7. All the music from the *My Library* folder on the RHAPSODY server is now accessible from the MP101 Digital Music Player. You can access this music by artist, album, tracks, playlists or radio stations.
8. Scroll and select the tracks you would like to play.

**Note:** The RHAPSODY server may not support all of the features that are available on the NETGEAR Media Server.

## Presets

You can program up to 10 Presets to remember locations in the *Browse Music* menu hierarchy that can be easily accessed at a later time. The MP101 will allow you to program different presets on three different servers.

### ► To Program a Preset

1. Navigate through the *Browse Music* directory to the location where you would like to place the preset.
2. Press the **[M]** button, then hold one of the number buttons **[0.9]** until the following screen is displayed.

[illegible]

- To access a previously programmed Preset press the **[M]** button followed by the appropriate number button **[0..9]**.



# Chapter 3

## Configuration and Maintenance

This chapter describes how to use the configuration and maintenance features of your MP101 Digital Music Player.

### Accessing the Setup Menu

---

► To access the Setup menu:

1. Press the **[Home]** button on the remote control.

|   |   |   |   |   |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|--|---|---|---|---|---|--|--|--|--|--|--|--|
| M | P | 1 | 0 | 1 |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|   | B | r | o | w | s | e |  | M | u | s | i | c |  |  |  |  |  |  |  |
| ► | S | e | t | u | p |   |  |   |   |   |   |   |  |  |  |  |  |  |  |
|   |   |   |   |   |   |   |  |   |   |   |   |   |  |  |  |  |  |  |  |

2. Select *Setup* and the Setup menu opens:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| S | e | t | u | p |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| ► | N | e | t | w | o | r | k |   | S | e | t | u | p |   |   |   |   |  |  |
|   | M | a | i | n | t | e | n | a | n | c | e |   |   |   |   |   |   |  |  |
|   | A | v | a | i | l | a | b | l | e |   | S | e | r | v | e | r | s |  |  |

### Displaying the IP Address

---

► To display the current IP Address:

1. From the Setup menu, select *Network Setup*.

|   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|
| N | e | t | w | o | r | k |   | S | e | t | u | p |  |  |  |  |  |  |  |
| ► | I | P |   | A | d | d | r | e | s | s |   |   |  |  |  |  |  |  |  |
|   | W | i | r | e | l | e | s | s |   |   |   |   |  |  |  |  |  |  |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |

2. From the Network Setup menu, select *IP Address*.

[illegible]

3. Select *Current* to display the IP Address.

|  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--|--|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | I | P | A | d | d | r | e | s | s |   |   |   |   |
|  |  |  |  | 1 | 9 | 2 | . | 1 | 6 | 8 | . | 0 | . | 1 | 2 |   |
|  |  |  |  | S | u | b | n | e | t | M | a | s | k |   |   |   |
|  |  |  |  | 2 | 5 | 5 | . | 2 | 5 | 5 | . | 2 | 5 | 5 | . | 0 |

## Setting the IP Address Mode (Dynamic or Static)

- To set the IP Address mode:

1. From the Setup menu, select *Network Setup*.

[illegible]

2. From the Network Setup menu, select *IP Address*.

[illegible]

3. Select *Mode*. The Mode menu opens. Select the correct mode. If DHCP is selected, the MP101 will get it's IP address from a DHCP server on the network. If Static is selected, you must enter an IP address.

[illegible]

- To assign a Static IP address:

4. Select *Static IP Address*.

|   |   |   |   |   |  |   |   |  |   |   |  |   |  |  |  |  |  |  |  |
|---|---|---|---|---|--|---|---|--|---|---|--|---|--|--|--|--|--|--|--|
| E | n | t | e | r |  | I | P |  |   |   |  |   |  |  |  |  |  |  |  |
| [ |   | 0 | ] | . |  | 0 | . |  | 0 | . |  | 0 |  |  |  |  |  |  |  |

5. Use the number buttons on the remote control to enter the IP Address. Use the **[OK]** button to save each number and move to the next field. After the IP address is set, enter the subnet mask.

|   |   |   |   |   |  |   |   |   |   |   |  |   |  |  |  |  |  |  |  |
|---|---|---|---|---|--|---|---|---|---|---|--|---|--|--|--|--|--|--|--|
| E | n | t | e | r |  | M | a | s | k |   |  |   |  |  |  |  |  |  |  |
| [ |   | 0 | ] | . |  | 0 | . |   | 0 | . |  | 0 |  |  |  |  |  |  |  |

## Displaying Wireless Link Information

The Wireless menu can be used to see the current link status and to manually configure the wireless network. Manual configuration may be necessary if SSID broadcast is disabled in the Access Point or if you want to set up an Ad Hoc network.

► To display the current wireless link status:

1. From the Setup menu, select *Network Setup*.

|   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|
| N | e | t | w | o | r | k | S | e | t | u | p |  |  |  |  |  |  |  |  |
| I | P | A | d | d | r | e | s | s |   |   |   |  |  |  |  |  |  |  |  |
| ► | W | i | r | e | l | e | s | s |   |   |   |  |  |  |  |  |  |  |  |

2. From the Network Setup menu, select *Wireless*.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|
| W | i | r | e | l | e | s | s |   |   |   |   |   |   |   |   |   |  |  |  |
| ► | L | i | n | k | I | n | f | o |   |   |   |   |   |   |   |   |  |  |  |
| A | v | a | i | l | a | b | l | e | N | e | t | w | o | r | k | s |  |  |  |
| N | e | w | / | H | i | d | d | e | n | N | e | t | w | o | r | k |  |  |  |

3. From the Wireless Menu, select *Link Info*. The current SSID, channel and network mode are displayed. Scroll down to see the WEP status and signal strength.

## Manual Wireless Configuration

**Note:** Detailed background on wireless networking can be found in [Appendix B, Wireless Networking Basics](#).

In order to configure the MP101 to work in a network where the SSID broadcast is disabled, it is necessary to manually configure the wireless settings. Also, it may be necessary to manually configure an Ad Hoc network.

► To configure wireless settings manually:

1. From the Setup menu, select *Network Setup*.

|   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|
| N | e | t | w | o | r | k | S | e | t | u | p |  |  |  |  |  |  |  |  |
|   | I | P | A | d | d | r | e | s | s |   |   |  |  |  |  |  |  |  |  |
| ► | W | i | r | e | l | e | s | s |   |   |   |  |  |  |  |  |  |  |  |
|   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |

2. From the Network Setup menu, select *Wireless*.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| W | i | r | e | l | e | s | s |   |   |   |   |   |   |   |   |   |   |  |  |
|   | L | i | n | k | I | n | f | o |   |   |   |   |   |   |   |   |   |  |  |
|   | A | v | a | i | l | a | b | l | e | N | e | t | w | o | r | k | s |  |  |
| ► | N | e | w | / | H | i | d | d | e | n | N | e | t | w | o | r | k |  |  |

3. From the Wireless menu, select *New/Hidden Network*. The current wireless settings, if any, will be displayed in the second row for your reference.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | E | P | S | e | t | t | i | n | g | s |   |   |   |   |   |   |   |   |   |   |
| ( | I | F | 3 | ) | N | E | T | G | E | A | R |   |   |   |   |   |   |   |   |   |
|   | J | o | i | n | N | e | t | w | o | r | k | ( | r | e | b | o | o | t | ) |   |
| ▶ | E | n | t | e | r | / | R | e | v | i | e | w | S | e | t | t | i | n | g | s |

4. Select *Enter/Review Settings*. The current SSID will be shown.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| S | S | I | D |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|   | N | E | T | G | E | A | R |   |   |   |   |   |   |   |   |   |   |   |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|   | O | K | t | o | a | c | c | e | p | t | , | ► | t | o | e | d | i | t |  |

Press **[OK]** to accept the setting or press **[►]** to change the setting. Enter a value of up to 32 alphanumeric characters for the SSID. After entering the new SSID, press **[OK]** to save.

5. The Wireless Mode is displayed.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| M | o | d | e |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|   | I | n | f | r | a | s | t | r | u | c | t | u | r | e |   |   |   |   |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|   | O | K | t | o | a | c | c | e | p | t | , | ► | t | o | e | d | i | t |  |

Press **[OK]** to accept the setting or press **[►]** to change the setting. Options for wireless mode are Infrastructure and Ad/Hoc. If Ad/Hoc is chosen, you will also need to choose a location along with a wireless channel.

6. The WEP Security screen will now be displayed. Detailed instructions for configuring WEP can be found on [page 1-7](#) in Step 3.
7. The system reboots and connects to the selected wireless network.

## Upgrading the MP101 Digital Music Player

### Important:

Do not play music on the MP101 Digital Music Player during the upgrade.

► To upgrade the MP101 Digital Music Player:

1. On your PC, download new firmware from the <http://www.NETGEAR.com> support site.
2. Run the firmware installer program, as described in the firmware release notes.
3. From the Setup menu, select *Maintenance*.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|
| M | a | i | n | t | e | n | a | n | c | e |   |   |   |  |   |   |   |   |   |   |   |
| ► | U | p | g | r | a | d | e |   |   |   |   |   |   |  |   |   |   |   |   |   |   |
|   | R | e | s | e | t |   | F | a | c | t | o | r | y |  | D | e | f | a | u | l | t |
|   | A | b | o | u | t |   |   |   |   |   |   |   |   |  |   |   |   |   |   |   |   |

4. Select *Upgrade* to upgrade. The display will show messages as information that is downloaded to the player. When the upgrade is complete the display will show the following message:

|  |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |  |  |  |
|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|---|---|--|--|--|
|  |  |  |  |  |  |  | U | p | g | r | a | d | e |   |   |   |   |  |  |  |
|  |  |  |  |  |  |  | C | o | m | p | l | e | t | e |   |   |   |  |  |  |
|  |  |  |  |  |  |  | R | e | b | o | o | t | i | n | g |   |   |  |  |  |
|  |  |  |  |  |  |  | P | l | e | a | s | e |   | w | a | i | t |  |  |  |

The unit reboots and reconnects to the last network used.

## Resetting the Defaults

► To reset the MP101 Digital Music Player back to the factory defaults:

1. From the Setup menu, select *Maintenance*.

[illegible]

2. Scroll and select *Reset Factory Default*. The following messages are displayed:

[illegible]

```

      Rebooting
Please wait

```

The player is rebooted with the factory settings in place

## Viewing Information About the MP101

- To view information about the MP101 Digital Music Player:

1. From the Setup menu, select *Maintenance*.

[illegible]

2. Scroll and select *About*. The screen will display the current firmware version and the MAC address of the MP101.

## Choosing a Different Server

When you turn on the MP101 Digital Music Player you are automatically connected to the last server used. Follow the procedures here if you wish to play music from a different server.

- To connect to a different server:



1. From the Setup menu select *Available Servers*.

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| A | v | a | i | a | b | e |
| N | E | T | G | E | A | R |
| R | h | a | p | s | d | y |

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| S | e | r | v | e | r | s |
| ( | j | f | s | L | a | p |
| ( | j | f | s | L | a | p |

2. Select the desired server. You will receive a message confirming the connection. The Home menu for the selected server opens.

[illegible]

3. Select *Browse Music* to open the *Browse Music Directory* for that server.



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# Appendix A

## Troubleshooting

This chapter gives information about troubleshooting your MP101 Digital Music Player. After each problem description, instructions are provided to help you diagnose and solve the problem.

### Hardware Installation

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The MP101 is a client that can only play music served from another source such as the NETGEAR Media Server or from an Internet music service such as RHAPSODY.

After you plug in the MP101, the following sequence of events should occur:

1. When power is first applied, verify that the NETGEAR splash screen is displayed.
2. After showing the firmware version, the network should be detected
  - If you are connecting to an Ethernet network, the display should show *Connecting to Wired Network*. If not, see “Ethernet Link” on page A-2.
  - If you are connecting to a Wireless network, the display should show a message that indicates that wireless networks were found. Once a network has been chosen, a message will be displayed indicating that the MP101 is associating with the network. If this does not happen, see “Wireless Link” on page A-2.
3. An IP address should be displayed. This address will normally come from a DHCP server on your network. This server is usually part of a router or firewall that is connected to the internet. By default, NETGEAR routers assign an IP address in the 192.168.0.x range.

If the MP101 is unable to get an IP address using DHCP, it will default to the 169.254.x.x range. This is called an Auto-IP address. An Auto-IP address will allow to computers to communicate in the absence of a DHCP server.

If the MP101 receives an Auto-IP address instead of the correct address for your network, see [IP Address on page A-3](#).

4. The message *Searching for Servers* should be displayed. You will then be able to choose which server to use from the list of servers found. If only one server is found, the MP101 will automatically connect to it. If you get the message *No Servers Found*, or if the MP101 cannot find the correct server, see [Connecting to the Server on page A-3](#). If the MP101 cannot find your RHAPSODY server, see [Connecting to the RHAPSODY Server on page A-4](#).
5. Once a server is selected, the *Home Menu* should be displayed. Navigate through the *Browse Music* menus and select a song. If the song does not play, see [Playing Music on page A-4](#).

## Physical Connectivity

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### Ethernet Link

Because the MP101 incorporates Auto Uplink technology (also called Auto MDI/MDI-X), it is capable of automatically sensing the polarity of the Ethernet connection. You can therefore connect using either a standard or crossover Ethernet cable. The Ethernet port of your MP101 will automatically configure itself properly.

If connecting to your network using Ethernet the link LED on the back of your MP101 and on your hub or router should both be on. If not, try the following:

- Make sure that the Ethernet cable connections are secure at the router and at the hub or workstation.
- Make sure that power is turned on to the connected hub or workstation.

### Wireless Link

If you are unable to detect any wireless networks, try the following:

- Your wireless access point may be too far from the MP101. It may be necessary to move either the AP and MP101 closer together.
- If your access point is configured to disable broadcast of SSID, the MP101 will not be able to detect it. You will need to manually configure your wireless settings as described in “Manual Wireless Configuration” on page 3-3.
- The MP101 cannot connect to the wireless network while it is connected to the Ethernet network. Disconnect your Ethernet cable.

## IP Address

---

If the MP101 is unable to receive a valid IP address, try the following:

- Verify that a working DHCP server is on your network. PCs on the network should get IP addresses in the correct range.
- If you are using a wireless network, verify that the MP101 is associated with the correct SSID. The SSID that is being used can be displayed by following instructions in [Displaying Wireless Link Information on page 3-3](#).
- If you are using a wireless network, verify that the WEP settings on the MP101 match the settings on your access point. Instructions for setting WEP can be found on [page 1-7](#). If you are using a passphrase, note that it is case-sensitive. Using the WEP Wizard you can view the hex key generated by the passphrase algorithm directly. This must match the setting on your access point.

## Connecting to the Server

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If the MP101 cannot find the correct server, try the following:

- Verify that the NETGEAR Media Server is running on your PC. You should be able to see the icon in the system tray. If it is not on the network, there will be a red bar through the icon.
- Verify that the MP101 and the PC running the Media Server software are on the same subnet and that they can communicate with each other. In most cases, this means that the first three fields of the two IP address should be the same. Communication can be verified using the Windows Ping utility.

1. From the Windows toolbar, click on the **Start** button and select **Run**.
2. In the field provided, type ping followed by the IP address of the MP101. Displaying the IP address is described in [Displaying the IP Address on page 3-1](#).

```
ping 192.168.0.2
```

3. Click on OK. You should see a message like this one:

```
Pinging <IP address> with 32 bytes of data
```

If the path is working, you see this message:

```
Reply from < IP address >: bytes=32 time=NN ms TTL=xxx
```

If the path is not working, you see this message:

Request timed out

4. If you cannot ping the MP101 your network may not be working correctly.
- The Status Bar of the NETGEAR Media Server, which can be found at the bottom of the window, should show “Media Player is on the network.” If the Status Bar shows “Media Server is not on network!”, verify that your PC has a valid IP address and that the correct adapter is chosen. The adapter is chosen using the Change Adapter button under the System tab.
  - If multiple adapters are installed in your PC, the Media Server software can only monitor one of them at a time. Verify that the correct adapter is chosen. The adapter is chosen using the Change Adapter button under the System tab.

## Connecting to the RHAPSODY Server

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If the MP101 cannot find your RHAPSODY server, try the following:

- The RHAPSODY application must be running on your PC. This application is different from the NETGEAR Media Server.
- Verify that the version of the RHAPSODY server installed supports UPnP and that the UPnP server is running. The RHAPSODY application shipped on the *NETGEAR MP101 Digital Music Player Resource CD* supports UPnP and has the server running by default after installation. The status of the RHAPSODY UPnP server can be displayed in the Options menu, User Settings selection under the UPnP tab. The **Start UPnP Server once logged in** box should be checked and the **Status** should indicate **Running**.

## Playing Music

---

If the MP101 cannot play music from the NETGEAR Media Server or the RHAPSODY server, try the following:

- Verify that the file is not corrupt by double clicking it in the Media Files tab on the Media Server.
- If you are running personal firewall software it may block access to music on your PC. See [Firewalls on page A-5](#).
- If you are playing from a RHAPSODY server, verify that the **My Library** folder is not empty. The MP101 can only play music from the **My Library** folder.

## **Firewalls**

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If you are using a firewall, it is best if all of your devices are behind the firewall. If this is not possible, then the next best alternative is to open the ports required for NETGEAR Streaming Media to work. Please note that the latter alternative will reduce some of the protection afforded by the firewall, but is necessary for streaming media devices to work. The ports that must be opened include:

UDP Ports: 1360, 1900.

TCP Ports: 1025 – 1035, 3640, 3641, 4000, 4001, 7000 – 7010, 49200 – 49210.

Personal Firewall products can also interfere with the MP101 operation. Detailed instructions for configuring personal firewall products can be found by clicking Help in the NETGEAR Media Server software under the Troubleshooting section.





# Appendix B

## Wireless Networking Basics

The MP101 player conforms to the Institute of Electrical and Electronics Engineers (IEEE) 802.11 standard for wireless LANs (WLANs). On an 802.11 wireless link, data is encoded using direct-sequence spread-spectrum (DSSS) technology and is transmitted in the unlicensed radio spectrum at 2.4 GHz. The maximum data rate for the 802.11b wireless link is 11 Mbps, but it will automatically back down from 11 Mbps when the radio signal is weak or when interference is detected.

The 802.11 standard is also called Wireless Ethernet or Wi-Fi by the Wireless Ethernet Compatibility Alliance (WECA, see <http://www.wi-fi.net>), an industry standard group promoting interoperability among 802.11 devices. The 802.11 standard offers two methods for configuring a wireless network - ad hoc and infrastructure.

### Infrastructure Mode

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With a wireless access point, you can operate the wireless LAN in the infrastructure mode. This mode provides wireless connectivity to multiple wireless network devices within a fixed range or area of coverage, interacting with wireless nodes via an antenna.

In the infrastructure mode, the wireless access point converts airwave data into wired Ethernet data, acting as a bridge between the wired LAN and wireless clients. Connecting multiple access points via a wired Ethernet backbone can further extend the wireless network coverage. As a mobile computing device moves out of the range of one access point, it moves into the range of another. As a result, wireless clients can freely roam from one access point domain to another and still maintain seamless network connection.

## **Ad Hoc Mode (Peer-to-Peer Workgroup)**

---

In an ad hoc network, computers are brought together as needed; thus, there is no structure or fixed points in the network -- each node can generally communicate with any other node. There is no access point involved in this configuration. This mode enables you to quickly set up a small wireless workgroup and allows workgroup members to exchange data or share printers as supported by Microsoft networking in the various Windows operating systems. Some vendors also refer to ad hoc networking as peer-to-peer group networking.

In this configuration, network packets are directly sent and received by the intended transmitting and receiving stations. As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.

## **Network Name: Extended Service Set Identification (ESSID)**

---

An SSID is a 32 character (maximum) alphanumeric key identifying the name of the wireless local area network. Some vendors refer to the SSID as network name. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. In a setting where there is more than one wireless network, different wireless network names provide a means for separating the traffic. Any device you want to participate in a particular wireless network will need to use this SSID for that network.

## **Wireless Channels**

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IEEE 802.11b wireless nodes communicate with each other using radio frequency signals in the ISM (Industrial, Scientific, and Medical) band between 2.4 GHz and 2.5 GHz. Neighboring channels are 5 MHz apart. However, due to the spread spectrum effect of the signals, a node sending signals using a particular channel will utilize frequency spectrum 12.5 MHz above and below the center channel frequency. As a result, two separate wireless networks using neighboring channels (for example, channel 1 and channel 2) in the same general vicinity will interfere with each other. Applying two channels that allow the maximum channel separation will decrease the amount of channel cross-talk, and provide a noticeable performance increase over networks with minimal channel separation.

The radio frequency channels used are listed in [Table B-1](#):

**Table B-1. 802.11b Radio Frequency Channels**

| Channel | Center Frequency | Frequency Spread        |
|---------|------------------|-------------------------|
| 1       | 2412 MHz         | 2399.5 MHz - 2424.5 MHz |
| 2       | 2417 MHz         | 2404.5 MHz - 2429.5 MHz |
| 3       | 2422 MHz         | 2409.5 MHz - 2434.5 MHz |
| 4       | 2427 MHz         | 2414.5 MHz - 2439.5 MHz |
| 5       | 2432 MHz         | 2419.5 MHz - 2444.5 MHz |
| 6       | 2437 MHz         | 2424.5 MHz - 2449.5 MHz |
| 7       | 2442 MHz         | 2429.5 MHz - 2454.5 MHz |
| 8       | 2447 MHz         | 2434.5 MHz - 2459.5 MHz |
| 9       | 2452 MHz         | 2439.5 MHz - 2464.5 MHz |
| 10      | 2457 MHz         | 2444.5 MHz - 2469.5 MHz |
| 11      | 2462 MHz         | 2449.5 MHz - 2474.5 MHz |
| 12      | 2467 MHz         | 2454.5 MHz - 2479.5 MHz |
| 13      | 2472 MHz         | 2459.5 MHz - 2484.5 MHz |

**Note:** The available channels supported by the wireless products in various countries are different.

The preferred channel separation between the channels in neighboring wireless networks is 25 MHz (5 channels). This means that you can apply up to three different channels within your wireless network. There are only 11 usable wireless channels in the United States. It is recommended that you start using channel 1 and grow to use channel 6, and 11 when necessary, as these three channels do not overlap.

## WEP Wireless Security

---

The absence of a physical connection between nodes makes the wireless links vulnerable to eavesdropping and information theft. To provide a certain level of security, the IEEE 802.11 standard has defined Wired Equivalent Privacy (WEP) for authentication and encryption.

## **WEP Authentication**

The 802.11 standard defines several services that govern how two 802.11 devices communicate. The following events must occur before an 802.11 station such as the one built in to the MP101 can communicate with an Ethernet network through an access point:

1. Turn on the wireless station.
2. The station listens for messages from any access points that are in range.
3. The station finds a message from an access point that has a matching SSID.
4. The station sends an authentication request to the access point.
5. The access point authenticates the station.
6. The station sends an association request to the access point.
7. The access point associates with the station.
8. The station can now communicate with the Ethernet network through the access point.

An access point must authenticate a station before the station can associate with the access point or communicate with the network. The IEEE 802.11 standard defines two types of WEP authentication: Open System and Shared Key.

- Open System Authentication allows any device to join the network, assuming that the device SSID matches the access point SSID. Alternatively, the device can use the “ANY” SSID option to associate with any available access point within range, regardless of its SSID. By default, IEEE 802.11 wireless devices operate in an Open System network.
- Shared Key Authentication requires that the station and the access point have the same WEP Key to authenticate. These two authentication procedures are described below.

## **WEP Encryption**

The IEEE 802.11 standard supports two types of WEP encryption: 40-bit and 128-bit.

The 64-bit WEP data encryption method, allows for a five-character (40-bit) input. Additionally, 24 factory-set bits are added to the 40-bit input to generate a 64-bit encryption key. (The 24 factory-set bits are not user-configurable). This encryption key will be used to encrypt/decrypt all data transmitted via the wireless interface. Some vendors refer to the 64-bit WEP data encryption as 40-bit WEP data encryption since the user-configurable portion of the encryption key is 40 bits wide.

The 128-bit WEP data encryption method consists of 104 user-configurable bits. Similar to the 40-bit WEP data encryption method, the remaining 24 bits are factory set and not user configurable. Some vendors allow passphrases to be entered instead of the cryptic hexadecimal characters to ease encryption key entry.

128-bit encryption is stronger than 40-bit encryption, but 128-bit encryption may not be available outside of the United States due to U.S. export regulations.

When configured for 40-bit encryption, 802.11 products typically support up to four WEP Keys. Each 40-bit WEP Key is expressed as five sets of two hexadecimal digits (0-9 and A-F). For example, "12 34 56 78 90" is a 40-bit WEP Key.

When configured for 128-bit encryption, 802.11b products typically support four WEP Keys but some manufacturers support only one 128-bit key. The 128-bit WEP Key is expressed as 13 sets of two hexadecimal digits (0-9 and A-F). For example, "12 34 56 78 90 AB CD EF 12 34 56 78 90" is a 128-bit WEP Key.

WEP keys can be automatically generated using a Passphrase, which a word or group of printable characters which may be easier to remember than they hex keys. However, not all wireless devices support the passphrase method.

Whatever keys you enter for an AP, you must also enter the same keys for the client adapter in the same order. In other words, WEP key 1 on the AP must match WEP key 1 on the client adapter, WEP key 2 on the AP must match WEP key 2 on the client adapter, etc.

**Note:** The AP and the client adapters can have different default WEP Keys as long as the keys are in the same order. In other words, the AP can use WEP key 2 as its default key to transmit while a client adapter can use WEP key 3 as its default key to transmit. The two devices will communicate as long as the AP's WEP key 2 is the same as the client's WEP key 2 and the AP's WEP key 3 is the same as the client's WEP key 3.



M-10200-01