

USER MANUAL



WIRELESS DIGITAL INTERNET RADIO / MP3 STREAMER / (W)LAN

Freecom MusicPal

Dear User,

Congratulations on the purchase of your **Freecom MusicPal**. The MusicPal enables you to receive Internet Radio or play stored music files from a connected media server (UPnP).

If you are a novice in networks and routing basics, please check out Appendix "Network Basics" to get to know the terminology and processes used in this manual.

Freecom Technologies GmbH • Germany www.freecom.com

Package Contents

Please check the package contents. Make sure it includes the following items:

- Freecom MusicPal
- Power pack
- Network cable (UTP)
- CD-ROM with instruction manual and application software
- · Quick installation guide

Attention!

All rights reserved. The product names contained in this user's guide are used solely for identification purposes and may be trademarks or registered trademarks of those companies. This device is designed for office and home use.

Warning! This device is an appliance made according to EN 55022 class B.

Freecom shall assume no liability for damages of any kind, for loss of data or any consequential claims resulting thereof (including, and without restriction, claims relating to business losses, business interruptions, loss of business data or other financial damage) that result from the use of this Freecom product or improper operation of this Freecom product. This shall also apply in cases where Freecom has been notified that such claims may exist.

Subject to change as technical advances dictate.

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General Information

Technical Support

For any technical questions, please visit our web site at www.freecom.com. This website offers a comprehensive range of information, answers to frequently asked questions, firmware and product guides (available for download). You can also use our forum to exchange experience with other users or discuss any problems or difficulties you may be having.

Or else contact Freecom Support for more in-depth assistance.

Freecom on the Internet

You can find information on the MusicPal and other Freecom products on our Internet home page at the URL address http://www.freecom.com. To do this you require an Internet connection and a web browser, such as Internet Explorer or Firefox.

Trademark

Freecom is a trademark of Freecom Technologies GmbH. Microsoft and Windows are trademarks of the Microsoft Corporation. Other brands and product names are registered trademarks or trademarks of their relevant proprietors.

This product is protected by certain intellectual property rights of Microsoft. Use or distribution of such technology outside of this product is prohibited without a license from Microsoft.

System requirements

Your system needs to meet the following hardware and software requirements for the device to function properly.

Network requirements

- Your PC should be equipped with an Ethernet network interface. If this is not the
 case, first of all a network has to be installed.
- You need a broadband connection (DSL 1 Mbit/s or higher) in combination with a router or similar network devices where DHCP is available.

Software requirements

You only need to meet to the software requirements if you carry out the MusicPal configuration using the HTML configuration on the PC, or wish to use your computer as local UPnP server.

- · Windows Vista
- Windows 2000
- Windows XP
- MacOS X 10.3 or higher

Hardware requirements

You only need to meet to the hardware requirements if you carry out the MusicPal configuration using the HTML configuration on the PC, or wish to use your computer as local UPnP server.

- PC: Intel Pentium III / AMD Duron 900 MHz or higher
- Mac: PowerPC G3/G4/G5, Power Book G3/G4 or Intel Mac
- 256 MB RAM (Vista: 512 MB RAM) or higher
- CD drive for installing software
- LAN / WLAN
- Internet connection for online warranty registration and updates and downloads of software

Compatibility

The following play-list, file and streaming formats can be played with your Freecom MusicPal.

Compatible play-list formats

- m3u
- pls
- asx

Compatible file formats

- WMA
- MP3
- WAV
- LPCM

Compatible streaming formats

- UPnP
- DLNA 1.5

Freecom MusicPal

Safety precautions

To guarantee a faultless functioning of your Freecom MusicPal, please observe the following safety precautions. If you do not observe them, you might lose your warranty claim and damage the MusicPal.

- Mind you don't drop the Freecom MusicPal and don't expose it to other types of sudden mechanical jolts - this might lead to data loss or damage to the device
- Don't use the Freecom MusicPal if the ambient temperature is under 10 °C or over 35 °C.
- If the Freecom MusicPal is moved from a cold environment into a warmer one, please
 let the MusicPal adapt to the ambient temperature before using the device. If you
 don't do this, it might lead to condensation in the casing, which in its turn might
 cause malfunctions in the device.
- Don't place any liquids or drinks on the MusicPal. If liquids get spilt and come in contact with the electronics in the device interior, this damages the hardware and leads to malfunctions.
- Don't use the MusicPal in an environment that is full of dust. Dust in the casing can damage the electronics in the interior and lead to malfunctions in the device.
- Only use the power pack delivered with the MusicPal.
- By opening the MusicPal you forfeit your warranty claim.

Advantages of the Freecom MusicPal

The Freecom MusicPal is the optimal solution for private home entertainment. The uncomplicated installation and configuration enables you to use Freecom MusicPal within a very short time. By connecting to a router or media server (UPnP) through LAN or WLAN it's as easy as winking to play your locally stored music files by means of the media server (UPnP). The Freecom MusicPal also enables you to hear Internet Radio programmes without any problem. Most of the Freecom MusicPal functions can be used at once, with little previous knowledge.

The sound quality depends on the bit rate of the radio stream or of the MP3 files. The basic rule is that the higher the bit rate, the better the sound quality. On Internet Radio higher bit rates also cause a higher data traffic over your Internet connection. In case your Internet connection does not have sufficient bandwidth, then there may be interruptions during playback.

Software features

Media server (UPnP)

Connect to your local media server (UPnP) and access a categorised display of all music files saved there.

Internet Radio

With the provided Internet connection (broadband connection is recommended), you can receive Internet Radio programmes from all over the world.

Hardware features

Display

Clearly laid out and excellently illuminated display.

Control elements on casing

The control elements on the casing front side make child's play of the MusicPal configuration procedure.

• Electrical requirements

Voltage: 100 - 240 V AC

Frequency: 50 Hz - 60 Hz, single-phase

Environmental requirements

Operating temperature: $10^{\circ}\text{C} - 35^{\circ}\text{C}$ ($50^{\circ}\text{F} - 95^{\circ}\text{F}$) Storage temperature: $-10^{\circ}\text{C} - 70^{\circ}\text{C}$ ($14^{\circ}\text{F} - 158^{\circ}\text{F}$)

Air humidity: 20 – 80% relative humidity, no condensation Maximum operating altitude above sea level: 3000 m

Dimensions and weight

Weight: 600 g (21.2 ounce)

Dimensions: 26,5 x 11,5 x 8 cm (10.4 x 4.5 x 3.2 inch)

Chapter 1: Connecting / Installing the Freecom MusicPal

1.1 Hardware (LAN)

Installation of the Freecom MusicPal proceeds according to the following steps:



1. Connect the power pack to your Freecom MusicPal and plug into a power socket.



 Take the enclosed Ethernet cable and use it to connect the LAN port on the back of the Freecom MusicPal with the LAN port of your media server (UPnP) or router/switch.



- 3. Set your router to DHCP in the IP configuration. For more details, refer to the Appendix in this manual.
- Check the LINK/ACT light of the Freecom MusicPal LAN port. If it is illuminated, the Freecom MusicPal is correctly connected.



Select Internet Radio from the main menu of your Freecom MusicPal.

1.2 Hardware (WLAN)



1. Connect the power pack to your Freecom MusicPal and plug into a power socket.



2. Select Settings in the main menu after you have switched on the MusicPal.



- 3. Select WLAN Access Point.
- 4. Select the desired WLAN Access Point from the list. In case your WLAN Access Point is encrypted by WPA/WEP you will be prompted to enter a password.



5. Select Internet Radio from the main menu of your Freecom MusicPal.

1.3 Installation of the Freecom Network Storage Assistant Software (PC)

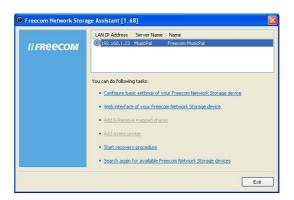
The Freecom Network Storage Assistant quickly detects and performs the basic set up of your MusicPal. When you start it, it displays all MusicPals available in your network and helps you configure the MusicPal.

 Install the Freecom Network Storage Assistant from the enclosed Manual & Application CD.



- 2. Start the Freecom Network Storage Assistant.
- 3. Check the Freecom Network Storage Assistant whether your MusicPal was detected. This may take some time. If your MusicPal is not immediately detected, click "Search again for available Freecom Network Storage devices" to repeat the search.

ΕN



 For a detailed functional description on the Freecom Network Storage Assistant, please refer to chapter 4.

1.4 Installation of the Freecom Network Storage Assistant Software (Mac)

The Freecom Network Storage Assistant quickly detects and performs the basic set-up of your MusicPal. When you start it, it displays all MusicPals available in your network and helps you configure the MusicPal.

- Insert the Freecom MusicPal software & Manual CD into your CD drive. Please click on "Start" in the main directory of the CD.
- 2. Click on "Software Installation" -> "FNS Assistant". The installation starts now. Follow the instructions on the screen.
- 3. Start the Freecom Network Storage Assistant.
- 4. Check the Freecom Network Storage Assistant whether your MusicPal was detected. This may take some time. If your MusicPal is not immediately detected, click "Search again for available Freecom Network Storage devices" to repeat the search.
- 5. For a detailed functional description on the Freecom Network Storage Assistant, please refer to chapter 4.

Chapter 2: Getting to know the Freecom MusicPal

2.1 Connections, LEDs and control elements of the Freecom MusicPal

2.1.1 Freecom MusicPal Front Side:



1 "Navigate" rotary knob

The Navigate rotary knob enables you to navigate within the Freecom MusicPal menu.

- Turning to the left or right navigates up or down through the menu.
- Press the "Navigate" knob to confirm your selection.

2 "Volume" rotary knob

The Volume rotary knob is for volume control of your Freecom MusicPal.

- Rotating the knob to the left or right turns the volume up or down.
- You pause play by briefly pressing the volume knob; press it briefly again to continue playing.
- If you press the volume knob for a longer period (approx. 3 seconds), the Freecom MusicPal switches into standby; date and time are shown on the display.

To restart the Freecom MusicPal, activate any control element...

3 Menu button

The menu button is a quick means of going back to the previous menu.

4 "Favorites" button

Use the Favorites button to change directly to your Favorites list. If you only have one entry in the list, this is played immediately.

ΕN

2.1.2 Freecom MusicPal Rear Side:



Power
 Only use the cable included in delivery to connect up.

2 Loudspeaker output

Here you can connect to headphones or external box systems, for instance from your PC.

3 LAN (RJ45)

The LAN connection creates the connection between the Internet or a local UPnP server.

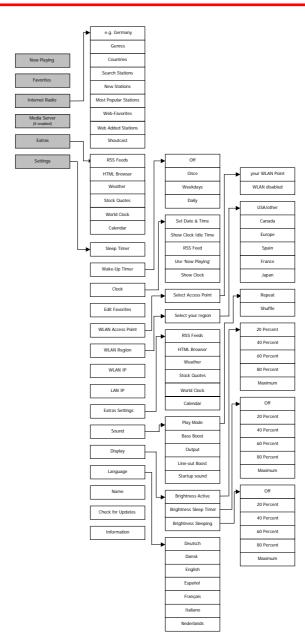
4 LineOut

Here you can connect to your stereo system.

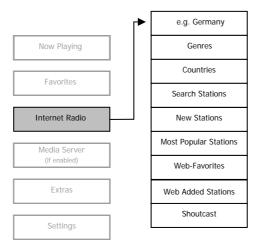
Chapter 3: Freecom MusicPal Functions

Information on operating the device: Turn the right-hand knob to move through the menus. Confirm your selection by pressing the right-hand knob.

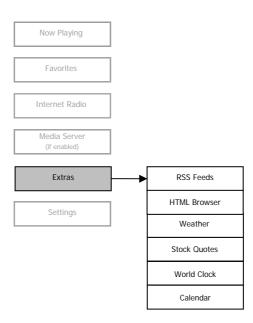
3.1 Overview



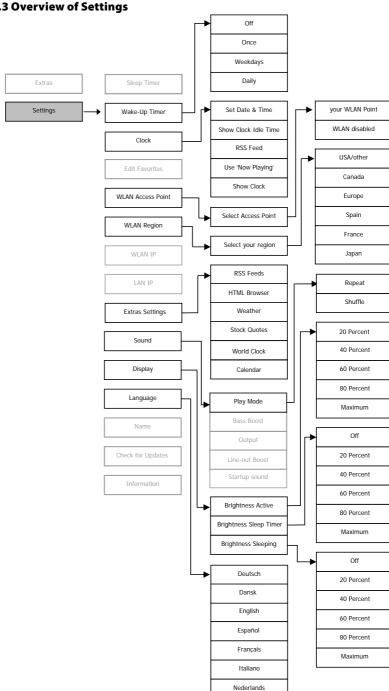
3.1.1 Overview of Internet Radio



3.1.2 Overview of Extras



3.1.3 Overview of Settings

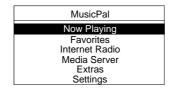


3.2 Now Playing

Note: This menu item is only available while you are playing Internet Radio or local music files.

This feature enables you to navigate directly to what is currently playing without having to navigate through the submenus of Internet Radio and Media Player.

 Select Internet Radio or Media server (UPnP) in your main menu after having switched on the Freecom MusicPal and select the Internet Radio programme or a local music file (you can find further information in Internet Radio and Media server (UPnP)).



- 2. Go back to the Freecom MusicPal main menu. The **Now Playing** menu item was automatically added to your main menu.
- 3. Select **Now Playing** to get a display of what is currently playing.

Options

When the "Navigate" button is pressed in the "Now Playing" menu, the following options are displayed for selection:

Options	
Show Details	
Next Favorite Next Song	
Add to Favorites	
Delete Favorite	
Show Clock	

Show Details Displays information on the stream currently being played.

• Next Favorite Play switches to the next favorite in the favorites list.

Next Song
 Play switches to the next title.

• Add to Favorites Adds the stream currently being played to the favorites list.

EN

Freecom MusicPal

Delete Favorite Deletes the currently selected favorite from the favorites

list.

Show Clock Displays the time in the MusicPal display.

Note: If there are no entries in the favorites list, the menu options "Next Favorite" and "Delete Favorite" are not available.

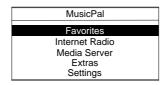
3.3 Favorites

Note: This menu item is only available if an Internet Radio programme or a local music file was added to the favorites.

If there is only one entry in the Favorites list, then the title of this entry appears in the menu. Not until several Favorites are in the "Favorites" list will the menu item "Favorites" be displayed.

This feature enables you quick access to pick your favorite radio programme or local music files.

 Select Internet Radio or Media server (UPnP) in your main menu after having switched on the Freecom MusicPal and select the Internet Radio programme or a local music file (you can find further information in Internet Radio and Media server (UPnP)).



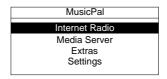
- 2. While playing an Internet Radio programme or local music file, press the Navigate rotary knob.
- Select Add to favorites.
- 4. Go back to the Freecom MusicPal main menu. **Favorites** was automatically added to your main menu.
- 5. Select **Favorites** and you are shown a list of your favorites.
- 6. Now select the Internet Radio programme you want, or a local music file.

Note: You can change or delete your favorites any time at Settings-> Edit Favorites. Find out more at Edit Favorites in this guide.

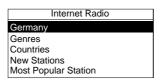
3.4 Internet Radio

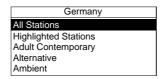
This feature enables you to receive and listen to radio programmes from all over the world.

 Select Internet Radio in your main menu after you have switched on the Freecom MusicPal.



2. Select the category you want.





3. Select the Internet Radio programme you want.



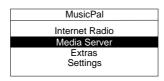
4. After activating the Internet Radio programme you want, the connection to the required sender is constructed.



3.5 Media server (UPnP)

This feature gives you the option of accessing music files on a connected media server (UPnP), and playing them.

 Select Media server (UPnP) in your main menu after you have switched on the Freecom MusicPal.



2. After being able to view your songs or albums, select the category you want. You can select from the following categories. The structure of this menu depends on your UPnP server.



3. Choose a music file and start playing by pressing the right-hand knob.

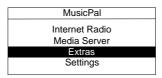


3.6 Extras

This function provides the facility of getting faster access to the options RSS Feeds, HTML Browser, Weather, Stock Quotes, World Clock and Calendar.

Further information on this is available under Extras Settings in this manual.

 Select Extras in your main menu after you have switched on the Freecom MusicPal.

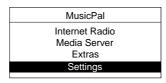


3.7 Settings

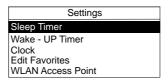
3.7.1 Sleep Timer

This feature enables you to end playing Internet Radio programmes and local music files automatically after a selected period of time.

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the Sleep Timer menu item.



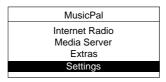
- 3. Select Use Sleep Timer? Yes.
- 4. You can now change the time by using the Navigate rotary knob. By turning the knob you can specify after how many hours and minutes the playback should be stopped. Press the knob to confirm the digit you want and move automatically to the next. After activating all digits, you automatically move to the **Settings** menu.



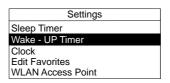
3.7.2 Wake-Up Timer

Use this feature to activate automatic timed control of the Freecom MusicPal. After time-controlled activation, the device plays the Internet Radio programmes or music files from your Favorites folder.

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the Wake-Up Timer menu item.



- 3. Select between the following options:
 - Off
 - Once
 - Weekdays
 - Daily



4. You can now change the time by using the Navigate rotary knob. You can now change the time by turning the knob. Press the knob to confirm the digit you want and move automatically to the next. After activating all digits, you automatically move to the Settings menu.



Snooze Timer (snooze function)

When the alarm of the MusicPal sounds at the time that has been set, you can either stop the alarm or pause it for 10 minutes (snooze function).

Stopping the alarm Press one of the two small buttons of the MusicPal.

(MENU or FAV)

Pausing the sounding Press one of the two large buttons of the MusicPal.

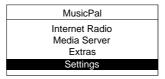
of the alarm for 10 minutes (VOLUME or NAVIGATE)

3.7.3 Clock

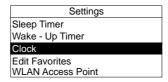
1. Set Date & Time

Using an NTP server

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Clock** menu item.



3. Select the Set Date & Time menu item.



- 4. Select Use NTP-Server? Yes.
- 5. Select which NTP server you wish to use.



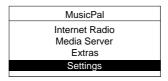
6. Select which time zone you are in.



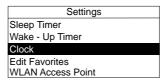
Select whether you want automatic summer- and winter-time synchronisation and confirm your selection by pressing the right-hand rotary knob. If all input was successful, you then move back to the **Clock** menu.

Manual configuration of date and time

1. Select **Settings** after you have switched on the Freecom MusicPal.



2. Select the Clock menu item.



3. Select the Set Date & Time menu item.



- 4. Select Use NTP-Server? No.
- 5. You can now change the date by using the Navigate rotary knob. Turn the knob to select a digit. Press the knob to confirm the digit you want and move automatically to the next.



After confirming all digits you automatically move to the next window, where you are asked to enter the current time.



6. Select which time zone you are in.

Select timezone
Africa
Asia
Atlantic
Australia
Europe
Soloct timozono

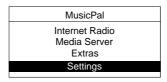
Select timezone
Amsterdam
Andorra
Athens
Belgrade
Berlin

Select whether you want automatic summer- and winter-time synchronisation. If all input was successful, you then move back to the **Clock** menu.

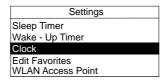
2. Show Clock Idle Time

This feature enables you to set the period which is to elapse until the time is displayed in full-screen mode, if no control elements are being used.

1. Select **Settings** after you have switched on the Freecom MusicPal.



2. Select the **Clock** menu item.



Select the Show Clock Idle Time menu item.



4. Select how many minutes should elapse until the time is shown in full-screen mode. You can choose from the following options:

Show clock

Idle periode:

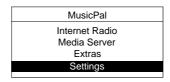
< 2 minutes

- 2 minutes
- 5 minutes
- 15 minutes
- 30 minutes
- 60 minutes
- 120 minutes
- Never
- After activating the time you want, you automatically move back to the Clock menu.

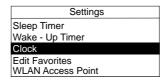
3. RSS Feed

This feature enables you to activate a news ticker in your Freecom MusicPal. Besides this, you have the option of entering the URL address of a news ticker you want.

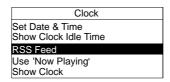
1. Select **Settings** after you have switched on the Freecom MusicPal.



2. Select the **Clock** menu item.



3. Select the RSS Feed menu item.



4. Select between Use RSS feed in clock? Yes or No.

Note: No deactivates the RSS feed.

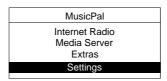


- 5. Select **Use RSS feed in clock? Yes**. You can now change the URL address of the RSS feed by using the Navigate rotary knob. Turn the knob to select a letter, a digit or a special character. Confirm the character you want by pressing the Navigate knob; the input marker jumps automatically to the next character. Confirm the URL address by turning the rotary knob until you see the sign "-".
- 6. After confirming your entry, you move automatically to the **Clock** menu.

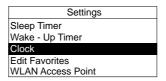
4. Use 'Now Playing'

This function gives you the facility to have the title currently being played in the MusicPal display shown below the time.

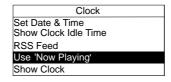
1. Select **Settings** after you have switched on the Freecom MusicPal.



2. Select the Clock menu item.



3. Select the **Use 'Now Playing'** menu item.



4. Select between Use 'Now Playing' in clock? Yes or No.

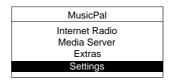


5. After confirming your entry, you move automatically to the **Clock** menu.

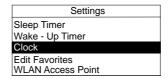
5. Show Clock

This feature enables you to display your system clock time and date in full-screen mode.

1. Select **Settings** after you have switched on the Freecom MusicPal.



2. Select the **Clock** menu item.



3. Select the **Show Clock** menu item.

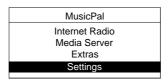


4. You can now see the current system time and system date and the RSS feed (if provided) in full-screen mode on your Freecom MusicPal display.

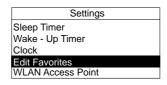
3.7.4 Edit Favorites

The feature enables you to edit your Favorites list or delete entries in the Favorites list.

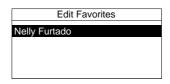
 Select **Settings** in your main menu after you have switched on the Freecom MusicPal.



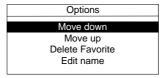
2. Select the Edit Favorites menu item.



A list of your current favorites is set up.



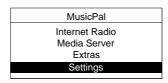
- 3. Press the Navigate rotary knob to select the radio programme or local music file you wish to edit or delete.
- 4. Select between the following options:
 - Move down
 - Move up
 - Delete Favorite
 - Edit name



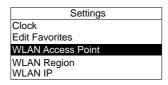
After changing one of the available options, you move automatically to your Favorites list.

3.7.5 WLAN Access Point

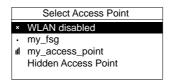
 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the WLAN Access Point menu item.



3. After selecting the **WLAN Access Point** menu item, the accessible access points now appear in your environment.



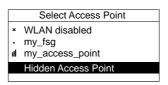
4. Select the **WLAN Access Point** you want to connect to it. In case your Wireless Access Point is encrypted by WPA/WEP you will be prompted to enter a password.

Note: Select "WLAN disabled" to deactivate the WLAN connection.

Connecting with hidden WLAN Access Points

Many WLAN-routers support the function of suppressing the display of the network name (ESSID). To connect to a hidden network, follow the procedure outlined below:

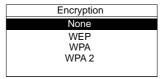
1. In the menu Select Access Point, select Hidden Access Point.



2. By means of the "Navigate" button, enter the exact name (ESSID) of the hidden network



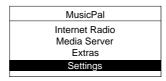
- 3. Select the encryption method used by the selected WLAN network:
- None (no encryption, not recommended)
- WEP
- WPA
- WPA2



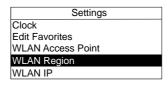
4. If your WLAN Access Point uses encryption, please enter the password with the help of the "Navigate" button.

3.7.6 WLAN Region

1. Select **Settings** in the main menu after you have switched on the Freecom MusicPal.



2. Select WLAN Region.



3. Select the continent or country you are in.

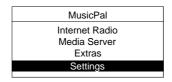
Select your region
USA / other
Canada
Europe
Spain
France

3.7.7 LAN IP/WLAN IP

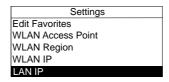
This feature enables you to assign an IP address to the Freecom MusicPal, so as to be able to use the **Internet Radio** and **Media server (UPnP)** features.

1. Using DHCP

 Select **Settings** in your main menu after you have switched on the Freecom MusicPal.



2. Select the LAN IP or WLAN IP menu item.



- 3. Select Use DHCP? Yes.
- 4. The connected router or media server (UPnP) now automatically assigns an IP address to your MusicPal. You then move to the **Settings** submenu.

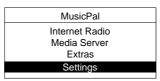
3.7.8 Extras Settings

1. RSS Feeds

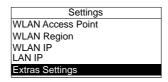
This function gives you the facility to have another menu option called **Extras** in the main menu.

You can have individual news stories displayed under this new menu option.

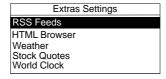
1. Select **Settings** in the main menu after you have switched on the Freecom MusicPal.



2. Select Extras Settings.



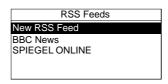
3. Select **RSS Feeds** to add a new feed.



 Select Show RSS Feeds in Extras menu? Yes to have the RSS Feeds displayed in the menu Extras.

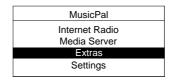


5. Select **New RSS Feed** to add new feeds.

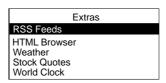


Calling an RSS Feed:

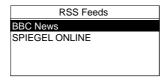
1. Select **Extras** in your main menu.



2. Select RSS Feeds.



3. Select the desired provider that you have inserted.

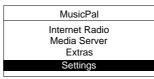


4. Select the desired headline to have the complete story displayed.

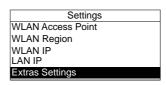
2. HTML Browser

This function provides the facility to have HTML pages displayed.

 Select Settings in the main menu after you have switched on the Freecom MusicPal.



2. Select Extras Settings.



3. Select HTML Browser to add a new feed.



Select Show HTML Browser in Extras menu? Yes to have the HTML Browser displayed in the menu Extras.

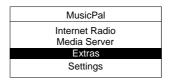


5. Select New Website, to add new feeds.

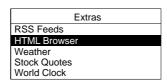


Calling an HTML Browser:

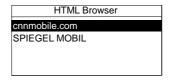
1. Select **Extras** in your main menu.



2. Select HTML Browser.



3. Select the desired provider that you have inserted.



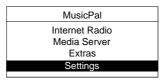
4. Select the desired headline to have the complete story displayed.

3. Weather

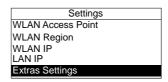
This function provides the facility to have a weather forecast displayed for different countries or cities.

Note: This function can only be set via the Web interface.

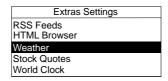
1. Select **Settings** in the main menu after you have switched on the Freecom MusicPal.



2. Select Extras Settings.



3. Select Weather to add a new feed.

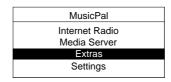


4. Select **Show Weather in Extras menu? Yes**, to have the weather details displayed in the Extras menu.



Calling the Weather:

1. Select **Extras** in your main menu.



2. Select Weather.



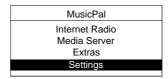
Berlin www.weather.com					
Tonight	2°C				
Sat	7°/1°C				
Sun	4°/-1°C				
Mon	5°/-1°C				

4. Stock Quotes

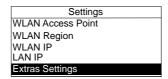
This function provides the facility to have the desired stock quotes displayed.

Note: This function can only be set via the Web interface.

1. Select **Settings** in the main menu after you have switched on the Freecom MusicPal.



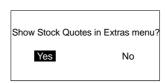
2. Select Extras Settings.



3. Select **Stock Quotes** to add a new feed.

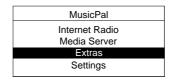


4. Select **Show Stock Quotes in Extras menu? Yes**, to have the stock quotes displayed in the menu Extras.

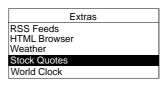


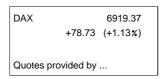
Calling for Stock Quotes:

1. Select **Extras** in your main menu.



2. Select Stock Quotes.

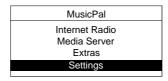




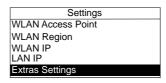
5. World Clock

This function makes it possible to have the time in different countries or cities displayed.

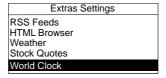
 Select Settings in the main menu after you have switched on the Freecom MusicPal.



2. Select Extras Settings.



3. Select World Clock to add a new feed.



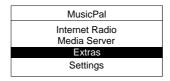
 Select Show World Clock in Extras menu? Yes, to have the world clock displayed in the Extras menu.



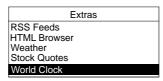
- 5. By using the "Navigate" button, first select the continent and confirm the selection by pressing the "Navigate" button.
- 6. Then, with the "Navigate" button, select the desired city and confirm the selection by pressing the "Navigate" button.

Calling the World Clock:

1. Select **Extras** in your main menu.



2. Select World Clock.

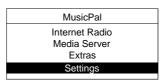


World Clock						
North America -	+					
San Francisco Local Time	6:15 11.1.2008					
Local Timo	17:15 11.1.2008					

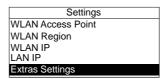
6. Calendar

This function provides the facility to have the calendar displayed.

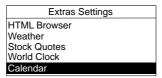
1. Select **Settings** in the main menu after you have switched on the Freecom MusicPal.



2. Select Extras Settings.



3. Select Calendar to add a new feed.

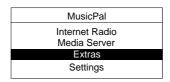


4. Select **Show Calendar in Extras menu? Yes**, to have the calendar displayed in the Extras menu.



Calling the Calendar:

1. Select **Extras** in your main menu.



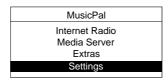
2. Select Calendar.

Extras
HTML Browser
Weather
Stock Quotes
World Clock
Calendar

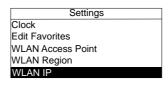
January 2008						
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Manual configuration of the IP address (LAN IP/WLAN IP)

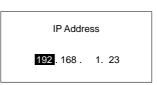
 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the LAN IP or WLAN IP menu item.



- 3. Select Use DHCP? No.
- 4. You can now change the digits by turning the Navigate rotary knob. Press the knob to confirm the digit you want and move automatically to the next. After confirming all digits you move automatically to the next window, where you are asked to enter the subnet mask.



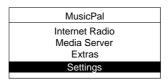
5. Configure the subnet mask, the gateway and the DNS server just the way you did the IP address. Here, too, you have to confirm all digits every time before moving to the next window. You can find further information on networks and network basics in the Appendix.

3.7.9 Sound

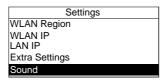
1. Play Mode

This function makes it possible for you to make settings for the Play mode.

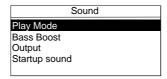
 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Sound** menu item.



3. Select the **Play Mode** menu item.



4. You can now make settings for the Play mode.



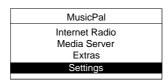
Note: Repeat stands for "Repeat title"

Shuffle stands for "Random playing of a title"

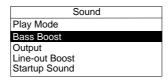
2. Bass Boost

Use this function to boost the bass sound of your Freecom MusicPal.

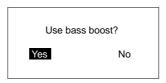
1. Select **Settings** after you have switched on the Freecom MusicPal.



2. Select Sound.



3. Select the Bass Boost menu item.

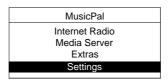


4. Select **Use bass boost? Yes** to activate the bass boost. If you don't want to boost the bass tones, select **Use bass boost? No.** After selecting the option you want, you automatically move to the **Sound** menu.

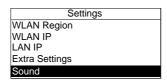
3. Output

This feature enables you to activate or deactivate the loudspeaker output.

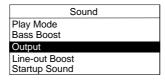
1. Select **Settings** after you have switched on the Freecom MusicPal.



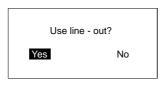
2. Select Sound.



3. Select the **Output** menu item.



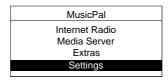
4. Select **Use line-out? Yes** to activate Line-Out and to deactivate the internal loud-speaker, otherwise select **Use line-out? No.** After selecting the option you want, you automatically move to the **Sound** menu.



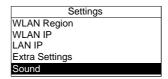
4. Line-out Boost

This function makes it possible to boost the loudness at the Line Out output.

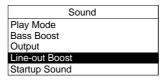
 Select Settings in your main menu after you have switched on the Freecom MusicPal.



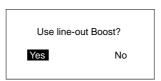
2. Select the **Sound** menu item.



3. Select the Line-out Boost menu item.



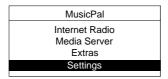
4. Select **Use line-out Boost? Yes** to boost the loudness at the Line-Out output. Upon selecting the desired option, you will automatically be taken to the **Sound** menu.



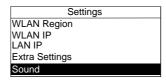
5. Startup Sound

This feature enables you to play a melody when you start the Freecom MusicPal.

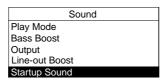
 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Sound** menu item.



3. Select the **Startup Sound** menu item.



 Select Play startup sound? Yes to activate Startup Sound, otherwise select Play startup sound? No. After selecting the option you want, you automatically move to the Sound menu.

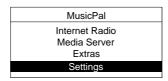


3.7.10 Display

1. Brightness Active

This function gives you the facility to regulate the brightness of the display when there is activity.

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Display** menu item.



3. Select the menu option **Brightness Active** to regulate the brightness when active.



- 4. You can now regulate the brightness.
- · 20 percent
- 40 percent
- 60 percent
- 80 percent
- Maximum
- Brightness Active

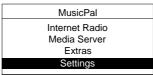
 20 Percent
 40 Percent
 60 Percent
 80 Percent
 Maximum

5. After confirming your entry, you move automatically to the **Display** menu.

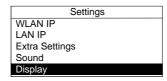
2. Brightness Sleep Timer

This function provides you the option to regulate the brightness of the display after a certain time.

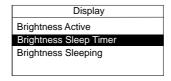
 Select **Settings** in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Display** menu item.



3. Select **Brightness Sleep Timer** to regulate the brightness in the Sleep Time.



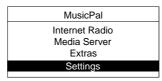
- 4. You can now regulate the brightness.
- Off
- · 20 percent
- · 40 percent
- · 60 percent
- · 80 percent
- Maximum
- Brightness Sleeptime
 Off
 20 Percent
 40 Percent
 60 Percent
 80 Percent
 Maximum

5. After confirming your entry, you move automatically to the **Display** menu.

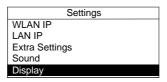
3. Brightness Sleeping

This function can be used to regulate the brightness of the display while sleeping.

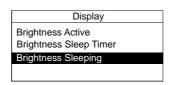
 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Display** menu item.



3. Select **Brightness Sleeping** to regulate the brightness in the Sleeping mode.



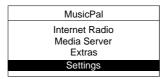
- 4. You can now regulate the brightness.
- · Off
- · 20 percent
- 40 percent
- 60 percent
- 80 percent
- Maximum
- Brightness Sleeping
 Off
 20 Percent
 40 Percent
 60 Percent
 80 Percent
 Maximum

5. After confirming your entry, you move automatically to the **Display** menu.

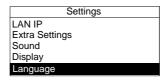
3.7.11 Language

This feature enables you to change the system language.

 Select **Settings** in your main menu after you have switched on the Freecom MusicPal.



2. Select the **Language** menu item.



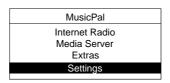
3. Select the system language you want. After selecting the system language you want, you automatically move to the **Settings** menu.

3

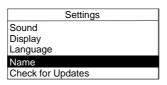
3.7.12 Name

This feature enables you to change the device name of the Freecom MusicPal.

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the "Name" menu item.



3. You can now change the device name by using the Navigate rotary knob. Turn the knob to select a letter, a digit or a special character. Confirm the character you want by pressing the Navigate knob; the input marker jumps automatically to the next character. Confirm the device name you want by turning the right Navigate knob until you see this sign "—".



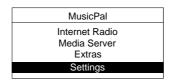
4. After confirming the device name the MusicPal restarts and opens the main menu.

3.7.13 Check for Updates

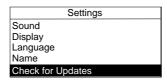
This function can be used for adding updates and patches related to your MusicPal free of cost to the latest software version.

Note: To be able to carry out this function, the Freecom MusicPal must be connected to the Internet.

 Select **Settings** in your main menu after you have switched on the Freecom MusicPal.



2. Select the Check for Updates menu item.



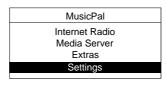
3. Select **Check New** to update your software version.

Information: This process can take a few minutes. Do not switch off the device during this time.

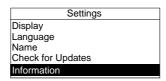
3.7.14 Information

This feature gives you an overview of the firmware currently being used and also network information, such as the LAN IP address being used, the subnet mask, and so on. Proceed by selecting the **Information** menu item in the **Settings** submenu.

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the Information menu item.



3. After selecting **Information**, the system information is shown on your screen.



Chapter 4: The Freecom Network Storage Assistant (PC/Mac)

The Freecom Network Storage Assistant helps you to locate each MusicPal in your network. When started, it displays all MusicPals available in your network and helps you configure the MusicPal. You can also configure the basic settings and quickly find the configuration website using the Freecom Network Storage Assistant. You may also perform any of the functions of the Freecom Network Storage Assistant manually.

4.1 Features of the Freecom Network Storage Assistant (PC)

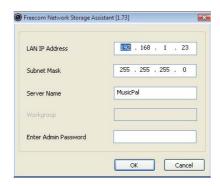


The default password and login name for the MusicPal are:

Login Name: admin
Password: admin

4.1.1 Configure basic settings of your Freecom MusicPal

In this screen, you can set an IP address, subnet mask, device name and workgroup name for your MusicPal. With this information, it is easy to locate your MusicPal in the network without the wizard. To change the settings, you have to first enter the administrator password.

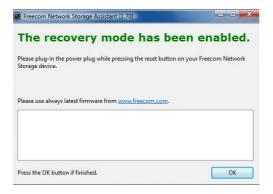


4.1.2 Accessing your MusicPal web interface

When you click this menu item, the web interface of your MusicPal opens in your default browser.

4.1.3 Start recovery procedure

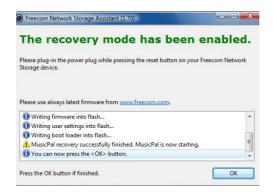
This procedure can reset and repair an MusicPal to factory default settings if you cannot access your MusicPal anymore. Your user data will not be deleted!



To restore your settings, please proceed as follows:

- a) Enable the Recovery mode by clicking 'Start the recovery procedure' in the Freecom Network Storage Assistant.
- b) Unplug the MusicPal's AC power pack.
- c) Keep the 'Menu' button pressed down and reattach the AC power supply.
- d) Release the 'Menu' button after 1 second.
- e) When a message appears on the Freecom Network Storage Assistant telling you that the recovery is finished, click on "OK".

ΕN



4.1.4 Repeat search for available Freecom MusicPal

Click here to repeat the search for your MusicPal if it was not detected during the first search. Please make sure that your network is configured as described above in this manual and that all cables are properly attached.

4.2 Features of the Freecom Network Storage Assistant (Mac)

The Freecom Network Storage Assistant helps you to locate each MusicPal in your network. When started, it displays all MusicPals available in your network and helps you configure the MusicPal. You can also configure the basic settings and quickly find the configuration website using the Freecom Network Storage Assistant. You may also perform any of the functions of the Freecom Network Storage Assistant manually.



The default password and login name for the MusicPal are:

Login Name: admin

Password: admin

4.2.1 Configure basic settings of your Freecom MusicPal

In this screen, you can set an IP address, subnet mask, device name and workgroup name for your MusicPal. With this information, it is easy to locate your MusicPal in the network without the wizard. To change the settings, you have to first enter the administrator password.



4.2.2 Web interface of your Freecom Network Storage device

When you click this menu item, the web interface of your MusicPal opens in your default browser.

4.2.3 Search again for available Freecom Network Storage device

Click here to repeat the search for your MusicPal if it was not detected during the first search. Please make sure that your network is configured as described above in this manual and that all cables are properly attached.

Chapter 5: Configuring the Freecom MusicPal through the Web Interface

5.1 Overview



- Now Playing
- : Settings
 - : Sleep Timer
 - : Wake-Up Timer
 - : Clock
 - Set Date & Time
 - Show Clock Idle Time
 - RSS Feed
 - . Use 'Now Playing'
 - Show Clock
 - > Edit Favorites
 - : WLAN Access Point
 - ⇒ WLAN Region.
 - > WLAN IP
 - > LAN IP
 - Extras Settings
 - >RSS Feeds
 - > HTML Browser
 - : Weather
 - Stock Ouotes
 - : World Clock
 - ⇒ Calendar
 - : Sound
 - ⇒ Play Mode
 - ⇒Bass Boost
 - : Output
 - : Line-out Boost
 - Startup Sound
 - : Display
 - . Brightness Active
 - : Brightness Sleep Timer
 - : Brightness Sleeping
 - ⇒ Language
 - : Name
 - : Check for Updates
 - : Information
- Administration
 - : Change password
 - ⇒ Settings
 - ⇒ Update Firmware

5.2 How do I access the configuration menu?

1. First of all, create the connection between your Freecom MusicPal and the PC.



- Usually you can access the web configuration of the MusicPal by opening your Explorer and entering the following in the address line: http://192.168.1.23
- 3. Now mouse-click the top right corner on **Change Settings** and log in with the word **admin** as your user name and also password. (You can change the password any time through the web configuration!)



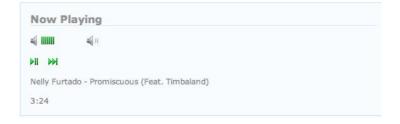
4. You are now logged into the web configuration of the Freecom MusicPal.

5

5.3 Now Playing

Use this feature to receive a display of what the Freecom MusicPal is currently playing. It distinguishes between Internet Radio or a local music file.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Now Playing** in the left-hand menu bar.
- 3. When you play a music title from a UPnP-Server, you have the following options:
- Loudness control: Regulate the loudness of the playing via the Web-Interface
- Pause/Play: Pause or start the playing
- Next title: Play the next music title
- Title display: displays the title currently being played
- Playing time: displays the time of the current music title



5.4 Settings

5.4.1 Sleep Timer

This feature enables you to end playing Internet Radio programmes and local music files automatically after a certain period of time.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Sleep Timer in the left-hand menu bar.



- 3. Set the time you want.
- 4. Mouse-click Apply.

5.4.2 Wake-Up Timer

Use this feature to activate automatic timed control of the Freecom MusicPal. After time-controlled activation, the device plays the Internet Radio programmes or music files from your Favorites folder.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Wake-Up Timer** in the left-hand menu bar.



- 3. Select the time you want the Freecom MusicPal to be activated. Also select the days this is to be done. You can choose between the following options:
 - Off
 - Once
 - Weekdays
 - Daily
- 4. Mouse-click Apply.

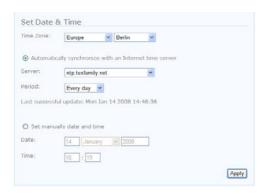
5.4.3 Clock

Use this feature to configure time and date settings of the Freecom MusicPal.

1. Set Date & Time

Using an NTP server

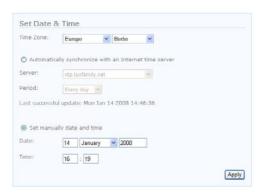
- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Set Date & Time** in the left-hand menu bar.



- 3. Click Automatically synchronise with an Internet time server.
- Select the NTP server you want and specify the synchronising interval. Mouse-click Apply.

Manual configuration of time and date

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Set Date & Time in the left-hand menu bar.

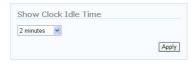


- 3. Select the time zone you are in and whether you want automatic synchronisation of summer- and wintertime.
- 4. Use the keypad to enter the current time and date. To prevent incorrect entries, the current month is specified by means of a drop-down box.
- 5. Mouse-click Apply.

2. Show Clock Idle Time

This feature enables you to set the period which is to elapse until the time is displayed in full-screen mode, if no control elements are being used.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Show Clock Idle Time** in the left-hand menu bar.



Freecom MusicPal

- Select how many minutes should elapse until the time is shown in full-screen mode. You can choose from the following options:
 - 2 minutes
 - 5 minutes
 - 15 minutes
 - · 30 minutes
 - 60 minutes
 - 120 minutes
 - Never
- 4. Mouse-click Apply.

3. RSS Feed

This feature enables you to activate a news ticker in your Freecom MusicPal. Besides this, you have the option of entering the URL address of a news ticker you want.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **RSS Feed** in the left-hand menu bar.
- 3. Select whether you wish to activate an RSS feed, otherwise remove the check in front of **Use RSS feed in clock**.



- 4. Use the keypad to enter the URL address of the RSS feed you want. If you have removed the check in front of **Use RSS feed in clock**, you can ignore this entry.
- 5. Mouse-click Apply.

4. Use 'Now Playing'

This function gives you the facility to have the title currently being played in the MusicPal display shown below the time.

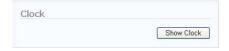
- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Settings** in the left-hand menu bar.
- Select the Clock menu item.
- 4. Select the Use 'Now Playing' menu item.
- 5. Select Use 'Now Playing' in clock? and click on Apply.



5. Show Clock

This feature enables you to display your system clock time and date and the RSS feed (if provided).

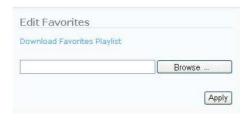
- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Show Clock** in the left-hand menu bar.
- 3. Click **Show Clock** again on the right side of the screen.



5.4.4 Edit Favorites

This feature enables you to add Internet Radio stations as well as local music files to your bookmarks or to download the Favorites list.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Edit Favorites** in the left-hand menu bar.

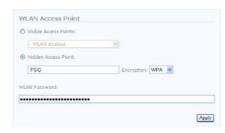


- 3. You can download the Favorites list of the Freecom MusicPal as an m3u file. To do this, click on **Download Favorites Playlist**.
- 4. To upload an own Favorites list, click on **Browse** and select the new m3u file.
- 5. Mouse-click Apply.
- 6. The new Favorites list now appears under Favorites in your MusicPal.

5.4.5 WLAN Access Point

Use this feature to search for available WLAN access points in your environment and if need be to connect up with them.

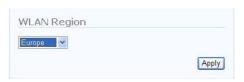
- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click WLAN Access Point in the left-hand menu bar.
- In the drop-down box, select the WLAN Access Point you wish to be connected to.



- 4. To connect, enter the password of your **WLAN Access Point**. If your WLAN Access Point does not require a passport, leave the WLAN Password box empty.
- 5. Mouse-click Apply.

5.4.6 WLAN Region

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click WLAN Region in the left-hand menu bar.



- 3. Select the continent or country you are in.
- 4. Mouse-click Apply.

5.4.7 LAN IP/WLAN IP

This feature enables you to assign an IP address to the Freecom MusicPal, to be able to use the **Internet Radio** and **Media server (UPnP)** features.

1. Using DHCP

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click LAN IP or WLAN IP in the left-hand menu bar.



3. Click DHCP Client.



4. Mouse-click Apply.

ΕN

2. Manual configuration of the IP address (LAN IP/WLAN IP)

- 1. Log into the web configuration of your Freecom MusicPal.
- Mouse-click LAN IP or WLAN IP in the left-hand menu bar.
- 3. Click Fixed IP address.



- Enter the IP-address, the Subnet Mask, the Gateway and the DNS Server you want.
- 5. Mouse-click Apply.

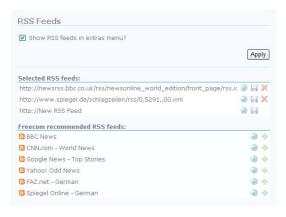
5.4.8 Extras Settings

1. RSS Feeds

This function gives you the facility to have another menu option called **Extras** in the main menu.

You can have individual news stories displayed under this new menu option.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Settings** in the left-hand menu bar.
- 3. Select the Extras Settings menu item.
- 4 a. Select an RSS feed from the list. Now click on Add (🝨).

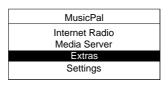


Freecom MusicPal

- 4b. Copy an RSS feed from the desired Website and insert the link in **Selected RSS Feeds**. Now click on the icon Save (],
- 5. Mouse-click Apply.

Calling an RSS Feed:

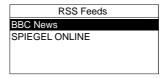
1. Select **Extras** in your main menu.



2. Select RSS Feeds.



3. Select the desired provider that you have inserted.



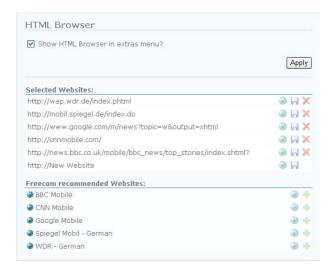
4. Select the desired headline to have the complete story displayed.

2. HTML Browser

This function gives you the facility to have another menu option called **Extras** in the main menu.

You can have individual news stories displayed under this new menu option.

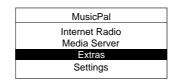
- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Settings** in the left-hand menu bar.
- 3. Select the Extras Settings menu item.
- 4 a. Select an **HTML Browser** from the list. Now click on Add ().



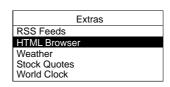
- 4 b. Copy an **HTML Browser** from the desired Website and insert the link in **Selected Websites**. Now click on the icon Save ().
- 5. Mouse-click **Apply**.

Calling an HTML Browser:

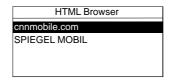
1. Select **Extras** in your main menu.



2. Select HTML Browser.



3. Select the desired provider that you have inserted.



4. Select the desired headline to have the complete story displayed.

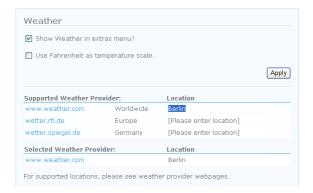
3. Weather

This function provides the facility to have a weather forecast displayed for different countries or cities.

- 1. Log into the web configuration of your Freecom MusicPal.
- Mouse-click Weather in the left-hand menu bar.



3. Select a provider and insert the desired city.

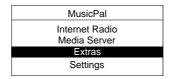


4. Mouse-click Apply.

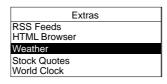
Note: You can have this option displayed in the main menu under Extras.

Calling the Weather:

1. Select Extras in your main menu.



2. Select Weather.



Berlin www.weather.com					
Tonight Sat	2°C 7°/1°C				
Sun	4°/-1°C				
Mon	5°/-1°C				

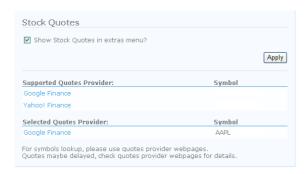
4. Stock Quotes

This function provides the facility to have the desired stock quotes displayed.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Stock Quotes in the left-hand menu bar.



3. Select a Website and enter an abbreviated code for the desired stock about which you wish to be informed.

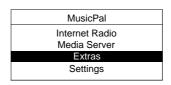


4. Mouse-click Apply.

Note: You can have this option displayed in the main menu under Extras.

Calling for Stock Quotes:

1. Select **Extras** in your main menu.



2. Select Stock Quotes.



5. World Clock

This function makes it possible to have the time in different countries or cities displayed.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click World Clock in the left-hand menu bar.

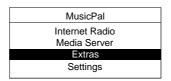


3. Mouse-click Apply.

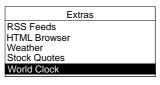
Note: You can have this option displayed in the main menu under Extras.

Calling the World Clock:

1. Select **Extras** in your main menu.



2. Select World Clock.

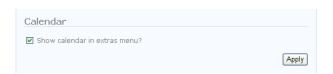


World Clock
North America +
San Francisco 6:15 11.1.2008 Local Time
17:15 11.1.2008

6. Calendar

This function provides the facility to have the calendar displayed.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Calendar in the left-hand menu bar.

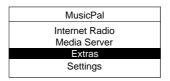


3. Mouse-click Apply.

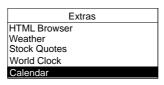
Note: You can have this option displayed in the main menu under Extras.

Calling the Calendar:

1. Select **Extras** in your main menu.



2. Select Calendar.



	January 2008								
	1	2	3	4	5	6			
7	8	9	10	11	12	13			
14	15	16	17	18	19	20			
21	22	23	24	25	26	27			
28	29	30	31						

5.4.9 Sound

1. Play Mode

This function makes it possible for you to make settings for the Play mode.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Select the **Sound** menu item.
- 3. Mouse-click **Play Mode** in the left-hand menu bar.
- 4. You can now make settings for the Play mode.



Note: Repeat stands for "Repeat title"

Shuffle stands for "Random playing of a title"

2. Bass Boost

Use this function to boost the bass sound of your Freecom MusicPal.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Bass Boost in the left-hand menu bar.

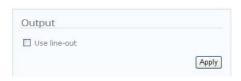


- If you wish to activate the Bass Boost, place a check in front of Use bass boost, otherwise remove this check.
- 4. Mouse-click Apply.

3. Output

This feature enables you to activate or deactivate the loudspeaker output.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Output in the left-hand menu bar.

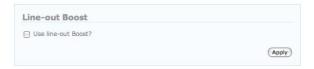


- 3. If you wish to activate Output and to deactivate the internal loudspeaker, place a check in front of **Use line-out**, otherwise remove this check.
- 4. Mouse-click Apply.

4. Line-out Boost

You can use this function to activate or disable the loudspeaker output.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Line-out Boost in the left-hand menu bar.



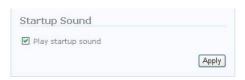
- If you wish to activate Line-out Boost and increase the loudness at the Line-Out output, please set a checkmark in front of Use line-out Boost?, otherwise, please remove the checkmark.
- 4. Mouse-click Apply.

Freecom MusicPal

5. Startup Sound

This feature enables you to play a melody when you start the Freecom MusicPal.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Startup Sound** in the left-hand menu bar.



- If you wish to activate Output, place a check in front of Play Startup Sound?, otherwise remove this check.
- 4. Mouse-click Apply.

Apply

Apply

5.4.10 Display

1. Brightness Active

This function gives you the facility to regulate the brightness of the display when there is activity.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Settings** in the left-hand menu bar.
- 3. Select the **Display** menu item.
- 4. Select the menu option **Brightness Active** to regulate the brightness when active.

Brightness Active

Maximum 💌

- 5. You can now regulate the brightness.
- · 20 percent
- · 40 percent
- 60 percent
- 80 percent
- Maximum
- 6. Mouse-click Apply.

2. Brightness Sleep Timer

This function provides you the option to regulate the brightness of the display after a certain time.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Settings in the left-hand menu bar.
- 3. Select the **Display** menu item.
- 4. Select **Brightness Sleep Timer** to regulate the brightness in the Sleep Time.

Brightness Sleep Timer

Maximum 💌

- 5. You can now regulate the brightness.
- Off
- · 20 percent
- · 40 percent
- · 60 percent
- · 80 percent
- Maximum
- Mouse-click Apply.

Freecom MusicPal

3. Brightness Sleeping

This function can be used to regulate the brightness of the display while sleeping.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Settings** in the left-hand menu bar.
- 3. Select the **Display** menu item.
- 4. Select **Brightness Sleeping** to regulate the brightness in the Sleeping mode.

Brightness Sleeping

~

Apply

- 5. You can now regulate the brightness.
- · Off
- · 20 percent
- 40 percent
- 60 percent
- 80 percent
- Maximum
- 6. Mouse-click Apply.

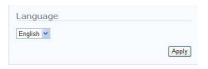


ΕN

5.4.11 Language

This feature enables you to change the system language of the MusicPal.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Language in the left-hand menu bar.

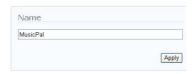


- 3. Select the language you want.
- 4. Mouse-click Apply.

5.4.12 Name

This feature enables you to change the device name of the Freecom MusicPal.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click Name in the left-hand menu bar.



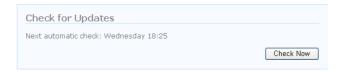
- 3. Use the keypad to enter the device name you want.
- 4. Mouse-click Apply.

5.4.13 Check for Updates

This function can be used for adding updates and patches related to your MusicPal free of cost to the latest software version.

Note: To be able to carry out this function, the Freecom MusicPal must be connected to the Internet.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Settings** in the left-hand menu bar.
- 2. Mouse-click **Check for Updates** in the left-hand menu bar.



4. Select **Check New** to update your software version.

Information: This process can take a few minutes. Do not switch off the device during this time.

5.4.14 Information

This feature gives you an overview of the firmware currently being used and also network information, such as the LAN IP address being used, the subnet mask, and so on.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Information** in the left-hand menu bar.



5.5 Administration

5.5.1 Change password

Use this feature to change the password for access to the web configuration.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Change password** in the left-hand menu bar.



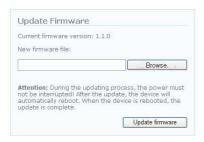
- First enter your old password and then select your new one. Enter it twice to be sure.
- 4. Mouse-click Apply.

5.5.2 Update Firmware

Use this feature to update the firmware of your Freecom MusicPal, or to install an earlier firmware.

Note: You can download the latest firmware at http://www.freecom.com/.

- 1. Log into the web configuration of your Freecom MusicPal.
- 2. Mouse-click **Update Firmware** in the left-hand menu bar.



- 3. With **Browse**, select the backup location of the firmware you wish to install.
- 4. Mouse-click **Update Firmware** and follow the instructions on the monitor.

Chapter 6: Freecom MusicPal in practical usage

6.1 What do I need what for?

Your MusicPal now downloads the current radio programme lists and makes a list of them.

Radio

Music

What can my Freecom MusicPal do, and what do I have to do to be able to play Internet radio or local music files?

Internet Radio **MP3 Streamer UPnP** Internet Connection This refers to devices that are situated in your local network. Create a connection between your DSL modem and your router. **UPnP UPnP** Server (hardware) Server (software) Router This refers to a locally This refers to a locally Your router now has a connected server, e.g. the Freecom Storage Gateway. connected PC, which works as server by means of software. connection to the Internet, and all connected devices automatically receive a connection to the Internet. MusicPal MusicPal Your MusicPal now has the capability of playing local music files on your PC or server. Your MusicPal now has a connection to the Internet and can create all required data for Music (MP3 etc.)

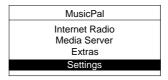
6.2 Media server (UPnP) in connection with the Freecom MusicPal

The following tutorial explains how you can to establish a LAN or WLAN connection to your media server (UPnP).

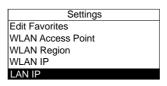
6.2.1 LAN

Use a network cable (RJ45) to create a connection between your **media server (UPnP)** and the Freecom MusicPal. Start the media server (UPnP) and your Freecom MusicPal. Configure the **LAN IP** in the **Settings** submenu. If configured in your media server (UPnP), select **Use DHCP? Yes.** Otherwise select **Use DHCP? No** and specify your IP address yourself. After you have configured the **LAN IP**, select the **Media server (UPnP)** menu item in the main menu. You can find further information on networks and network basics in the Appendix.

 Select **Settings** in your main menu after you have switched on the Freecom MusicPal. Carry out navigation by using the Navigate rotary knob. Turn to right or left to navigate up or down through the menu. Press the right-hand knob to confirm your selection.



2. Select the **LAN IP** menu item in the main menu.

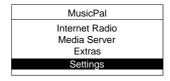


3. Decide between **Use DHCP? Yes** or **Use DHCP? No** and confirm your selection by pressing the Navigate rotary knob.

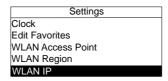
6.2.2 WLAN

Start the **Media server (UPnP)** and your Freecom MusicPal. Configure the **WLAN IP** in the **Settings** submenu. If configured in your media server (UPnP), select **Use DHCP? Yes**. Otherwise select **Use DHCP? No** and specify your IP address yourself. After you have configured the **WLAN IP**, select the **Media server (UPnP)** menu item in the main menu.

 Select Settings in your main menu after you have switched on the Freecom MusicPal. Carry out navigation by using the Navigate rotary knob. Turn to right or left to navigate up or down through the menu. Press the right-hand knob to confirm your selection.



2. Select the **WLAN IP** menu item with the same navigation as in the main menu.



3. Decide between **Use DHCP? Yes** or **Use DHCP? No** and confirm your selection by pressing the Navigate rotary knob.

6.3 Using your PC as media server (UPnP) (playing MP3s from your local PC)

To use your PC as media server (UPnP) you need Windows Media Player 11. You can do this through the "Windows Update" feature, or download directly from www.microsoft.com.

The following explains how you can connect your Freecom MusicPal by means of a router or a direct connection to your computer. The computer acts here as a media server (UPnP), and after a successful configuration you can play released music files from your computer on the Freecom MusicPal.

6.3.1 Connecting the Freecom MusicPal

Connect up the Freecom MusicPal correctly before putting it into operation.

1. Direct connection

First of all, create the connection between your Freecom MusicPal and your computer. To do this, use the delivered network cable. After connecting up the two devices, you can now connect up the power supply to the Freecom MusicPal. Only use the cable also included in delivery.

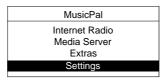
2. Connecting through a router

First of all, create the connection between your Freecom MusicPal and the router. To do this, use the delivered network cable.

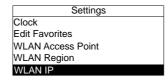
Important: Do <u>not</u> plug the network cable into the WLAN port of your router. Now connect up your computer with the router using another network cable. If both devices are successfully connected to the router, you can now connect up the Freecom MusicPalpower supply. Only use the cable included in delivery.

6.3.2 Configuring the Freecom MusicPal

 Select Settings in your main menu after you have switched on the Freecom MusicPal.



2. Select the LAN IP or WLAN IP menu item.



3. In the menu item select **Use DHCP? No**. Select **Use DHCP? Yes** when connecting through a router.

Attention: If the Freecom MusicPal was connected with the computer through a router, steps 4+5 are dispensed with.

4. You can now change the digits by turning the Navigate rotary knob. Press the knob to confirm the digit you want and move automatically to the next. After confirming all digits you move automatically to the next window, where you are asked to enter the subnet mask.



5. Configure the subnet mask, the gateway and the DNS server just the way you did the IP address. Here, too, you have to confirm all digits every time before moving to the next window. You can find further information on networks and network basics in the Appendix.

6.3.3 Configuring the computer

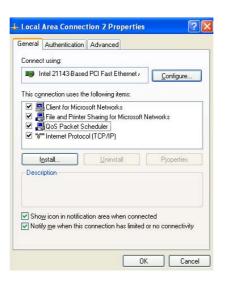
1. Mouse-click your task bar on:

For Windows XP/VISTA: Start -> System Control
For Windows 2000: Start -> Settings -> System Control

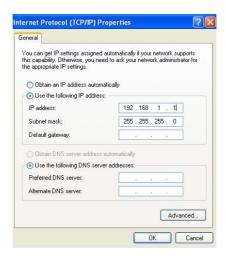


- 2. Mouse-click network connections in the subsequent windows.
- 3. Now you have an overview of all your computer's network connections.
- 4. Now right-click the network connection connected to your Freecom MusicPal and select the **Properties** menu item.

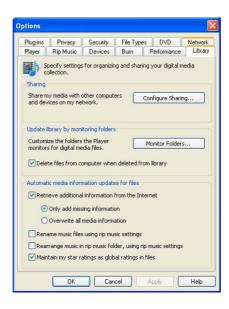
5. In the subsequent window double-click "Internet protocol (TCP/IP)".



6. Select "Use following IP address". It is imperative here to note that the first three digits of the IP address are the same as the first three digits of the specified IP address in your Freecom MusicPal. The subnet mask should look exactly the same as your Freecom MusicPal: 255.255.255.0 You no longer need to attend to the DNS server any further. Connect your Freecom MusicPal to the computer through a router, select "Automatically assign IP address" and "Automatically assign DNS server address".



- 7. Mouse-click OK to confirm your input. Now close all the windows you opened in the previous steps.
- 8. Open the Windows Media Player 11 and proceed as follows: Extras -> Plug-Ins -> Options...
- 9. Mouse-click the registration card media library in the newly opened window.



10. Click Configure Sharing...

Freecom MusicPal

11. Place a check in front of "Share my media to:" in the subsequent window.



- 12. Select the media to be released by marking it and then click Allow.
- 13. Now click OK and close all the windows you opened in the previous steps.
- 14. Now you can select the media server (UPnP) on your Freecom MusicPal and play the released music files from your computer.

Note:

You can only play files on the Freecom MusicPal that you added to the media library. The Windows Media Player 11 uses "Own Music" as default file.

Path: C:\Documents and Settings\User\Own Files\Own Music

You can specify which folder you want the media library to monitor apart from this one. To do this, proceed as follows:

Windows Media Player 11 -> Extras -> Plug-Ins -> Options... -> Media Library -> Monitor Folder -> Extended Options -> Add

You can add as many folders as you like. All folders you list here are automatically added to the media library. If you copy files into the relevant folder later, the media library updates itself automatically.

6.4 Using your Mac as media server (UPnP)

If you wish to use your Mac as media server (UPnP) in order to play MP3 data stored in your Mac on your Freecom MusicPal, your Mac has to be set up as UPnP server. To do this you need external software, since Mac OS X does not itself provide this feature.

We recommend using TwonkyMedia; you download a version at http://www.twonkyvision.de/Download/TwonkyMedia/index.html.

6.5 How can I listen to Internet Radio?

Use a network cable (RJ45) or a wireless connection to create a connection between your router and the Freecom MusicPal. Configure the LAN IP or WLAN IP in the Settings submenu. If configured in your router, select **Use DHCP? Yes**. Otherwise select **Use DHCP? No** and specify your IP address yourself. After configuring the LAN IP or WLAN IP, select the **Internet Radio** menu item in the main menu.

You need an Internet connection to use the Internet Radio feature. A broadband connection (DSL) is recommended!

6.6 How can I update my firmware?

- 1. Connect the Freecom MusicPal to your PC.
- 2. Usually you can access the web configuration of the MusicPal by opening your Explorer and entering the following in the address line: http://192.168.1.23



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- 3. Now mouse-click the top right corner on **Change Settings** and log in with **admin** as user name and password. (You can change the password any time through the web configuration!)
- 4. You are now logged into the web configuration of the Freecom MusicPal.



- 5. Mouse-click **Update Firmware** in the left-hand menu bar.
- 6. With **Browse**, select the backup location of the firmware you wish to install.
- 7. Mouse-click Update Firmware and follow the instructions on the monitor.



6.7 The vTuner Premium Internet Radio Service

The Freecom MusicPal includes the vTuner Premium Service of Internet Radio stations. The vTuner Premium Service provides the station guide for your Freecom MusicPal and includes a personal website where you can organize and manage the station list (search for stations, set favorites, add your own stations, etc.).

Before you can establish an account on the website you must use the vTuner Internet Radio service on your Freecom MusicPal. To initialize the vTuner Service, you just select Internet Radio, browse the station list, select and play a station.

After using the vTuner Internet Radio guide on the device you can establish your personal website:

1. Registration

In order to be able to mark your own favorites on the Internet page http://freecom.vtuner.com, you must first register. However, this means that you must enter your WLAN-MAC address in the field ID.



You can find the WLAN-MAC address either on the underside of your MusicPal or in the menu option "Settings" under "Information".



Now click on the button "Create Account Login", to generate an account.

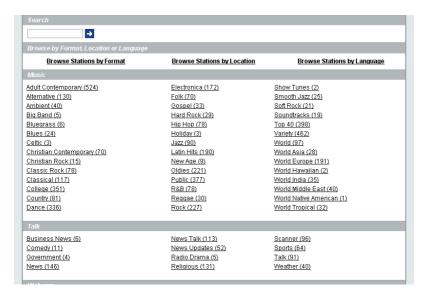


Now enter your e-mail address and select a password.

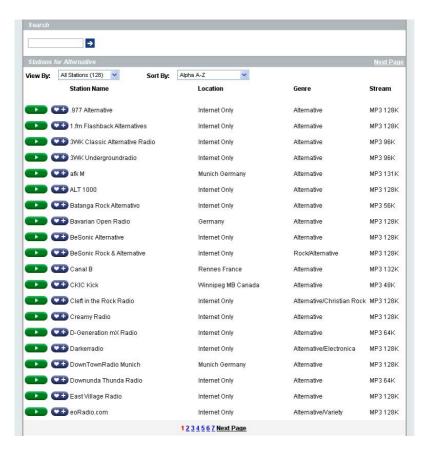


2. Administration of the Favorites

You can now either select a genre, or sort the stations according to language or location.



Now select a radio station and click on the blue icon .



Freecom MusicPal

In this window, you can either assign an existing group to the station, or you can generate a new group.

You will find this group in your MusicPal in the menu option "Web favorites".



Appendix: Network Basics

Networks and Routing Basics

This chapter provides an overview of IP networks, routing, and firewalls. This is by no means a complete overview! If you are looking for more information, you can use your favorite search engine to find information on the internet. Suffice to say, there is plenty.

Basic Router Concepts

Even though the amount of bandwidth in your local area network (LAN) can be provided easily and relatively inexpensively, the price of the connection to the internet is much higher. Because of this expense, Internet access is usually provided by a slower-speed wide-area network (WAN) link such as a cable or DSL modem. To use this WAN link efficiently, a mechanism must be in place for selecting and transmitting only the data traffic meant for the Internet. The function of selecting and forwarding this data is performed by a router.

What is a Router?

A router splits the information meant for your network and meant for other networks, so the available bandwidth is used efficiently. The router sends data based on network layer information in the data and on routing tables maintained by the router. The routing tables are built by gathering and exchanging information with other routers in the network. The router builds up a logical picture of the overall network. Using this information, the router chooses the best path for forwarding network traffic. Routers vary in performance and scale, number of routing protocols supported, and types of physical WAN connection they support.

Routing Information Protocol

One of the protocols used by a router to build and maintain a picture of the network is the Routing Information Protocol (RIP). Using RIP, routers periodically update one another and check for changes to add to the routing table.

IP Addresses and the Internet

For a computer to communicate with other computers and Web servers on the Internet, it must have a unique IP address. An IP address (IP stands for Internet Protocol) is a unique number that identifies the location of your computer on a network.

Basically, it works like your street address - as a way to find out exactly where you are and deliver information to you. The IP address is written as 4 numbers between 0 and 255. such as "192.168.0.12".

This serves the same basic function as a street address. It helps you find out where you currently are, while also providing other information. The IP address consists of four numbers between 0 and 255 (e.g., 192.168.0.12).

Domain Name Server

The computer address is difficult to read, which is why a second system is used in the Internet by the name of DNS (Domain Name Server). This translates human-readable names such as www.sharemydisk.com into computer readable names like 82.161.11.206. Each Internet user must have an IP address. You do not need the human-readable name, but it is quite useful if you want other users to find you. A few examples of this include: if you operate a web server or if you want to show your friends images stored on your computer. Many large companies such as ISPs maintain their own DNS server and let their customers use the server to search for addresses.

Internet address classes

The Internet Assigned Numbers Authority (IANA) allocates certain blocks of addresses to organizations. Individual users or small organizations can obtain their addresses either from the IANA or from an Internet service provider (ISP). You can visit the IANA homepage at www.iana.org. The IANA issues different class of IP addresses. There are five standard classes of IP addresses. They are:

Class A

Class Aaddresses can have up to 16,777,214 hosts on a single network. They use an eight-bit network number and a 24-bit node number. Class A addresses are in this range: 1.x.x.x to 126.x.x.x.

Class B

Class B addresses can have up to 65,354 hosts on a network. A Class B address uses a 16-bit network number and a 16-bit node number. Class B addresses are in this range: 128.1.x.x to 191.254.x.x.

Class C

Class C addresses may have up to 254 hosts in one network. Class C addresses use 24 bits for network addresses and eight bits for nodes. They range from 192.0.1x to 223.255.254.x.

Class D

Class D addresses are used for multicasts, in other word messages sent to multiple hosts. Class D addresses range from 224.0.0.0 to 239.255.255.

Class E

Class E addresses are for experimental purposes. For each unique value in the network portion of the address, the range base address (the host address contains only zeroes) is known as the network address and is not usually assigned to a host. The top address of the range (host address contains only ones) is unassigned. It is instead used as the broadcast address for sending a data packet to all hosts with the same network address simultaneously.

Netmask

The partition scheme that separates the different address classes is used to identify a netmask attached to the IP address. A netmask is a 32-bit quantity that, in logical combination (using an AND operator) with an IP address, forms the network address. The netmasks for Class A, B and C are for instance 255.0.0, 255.255.0.0 and 255.255.255.0.

The address 192.168.170.237 is a Class C IP address; its network portion is 192.168.170. Combining it with the Class C netmask using an AND operator as shown in this example leaves only the network portion of the address:

11000000 10101000 10101010 11101101 (192.168.170.237)

combined with:

11111111 11111111 11111111 00000000 (255.255.255.0)

resulting in:

11000000 10101000 10101010 00000000 (192.168.170.0)

An alternative to dotted decimal representation is to express the netmask as the quantity of ones from left to right. This number is added to the IP address after a slash (/) as '/n'. In this example, the address 192.168.170.237/24 could be written. This indicates that the netmask is 24 ones followed by eight zeroes.

Subnet Addressing

You can see that even with a Class C address, there are a large number of hosts per network. It would be a very inefficient use of the amount of IP addresses to supply every LAN with so many IP addresses. A smaller office LANs does not have that many devices. A more efficient technique is known as subnet addressing.

Subnet addressing allows us to split one IP network address into smaller multiple physical networks known as subnetworks. Some of the node numbers are used as a subnet number instead. A Class B address gives us 16 bits of node numbers translating to 64,000 nodes. Most organizations do not use 64,000 nodes, so there are free bits that can be reassigned. Subnet addressing makes use of those bits that are free.

A Class B address can be effectively translated into multiple Class C addresses. For example, the IP address of 172.16.97.235 would be interpreted as IP network address 172.16, subnet number 97, and node number 235. In addition to extending the number of addresses available, subnet addressing provides other benefits. Subnet addressing allows a network manager to construct an address scheme for the network by using different subnets for other geographical locations in the network or for other departments in the organization.

Freecom MusicPal

Although the preceding example uses the entire third octet for a subnet address, note that you are not restricted to octet boundaries in subnetting. To create more network numbers, you only need to shift some bits from the host address to the network address. For instance, to partition a Class C network number (192.68.135.0) into two, you shift one bit from the host address to the network address. The new netmask (or subnet mask) is 255.255.255.128. The first subnet has network number 192.68.135.0 with hosts 192.68.135.126, and the second subnet has network number 192.68.135.128 with hosts 192.68.135.129 to 192.68.135.254.

Attention: The number 192.68.135.127 is not assigned because it is the broadcast address of the first subnet. The number 192.68.135.128 is not assigned because it is the network address of the second subnet.

Freecom strongly recommends that you configure all hosts on a LAN segment to use the same netmask for the following reasons:

- So that hosts recognize local IP broadcast packets
- When a device broadcasts to its segment neighbors, it uses a destination address of the local network address with all ones for the host address. In order for this scheme to work, all devices on the segment must agree on which bits comprise the host address.
- So that a local router or bridge recognizes which addresses are local and which are remote Private IP Addresses

If your local network is not connected to the Internet (for example, when using NAT), you can assign any IP addresses to your computers without problems. But to prevent problems and ease configuration, the IANA has reserved the following three blocks of IP addresses specifically for private networks:

10.0.0.0 - 10.255.255.255 172.16.0.0 - 172.31.255.255 192.168.0.0 - 192.168.255.255

We recommend that you choose your private network number from this range. The DHCP server of the MusicPal is preconfigured to automatically assign private addresses.

For more information about address assignment, refer to RFC 1597, Address Allocation for Private Internets, and RFC 1466, Guidelines for Management of IP Address Space. The Internet Engineering Task Force (IETF) publishes RFCs on its Web site at www.ietf.org.

The IP address shortage

The Internet has grown larger than anyone ever imagined it could be. Although the exact size is unknown, the current estimate is that there are about 100 million hosts and more than 350 million users actively on the Internet. In fact, the rate of growth has been such that the Internet is effectively doubling in size each year.

When IP addressing first came out, everyone thought that there were plenty of addresses to cover any need. Theoretically, you could have 4,294,967,296 unique addresses. The actual number of available addresses is smaller (somewhere between 3.2 and 3.3 billion) because of the way that the addresses are separated into classes, and because some addresses are set aside for multicasting, testing or other special uses.

With the explosion of the Internet and the increase in home networks and business networks, the number of available IP addresses is simply not enough. The obvious solution is to redesign the address format to allow for more possible addresses. This is being developed (called IPv6), but will take many years to implement because it requires modification of the entire infrastructure of the Internet.

There are 2 systems in place now to help bring down the shortage of IP addresses.

DHCP

First, most users today have a dynamically given IP address or DHCP address from their provider. This means that the IP address given to you can change over time. This allows the provider to use the IP address for more then one person or device, since people are often online at different times. Optimal usage of IP addresses is guaranteed.

Your MusicPal gives its internal addresses to your computers in the same way. For the DNS (Domain Name System) it is difficult to translate your domain name "www.yourname. sharemydisk.com" to your IP address if your IP address keeps changing.

The system needs to be updated each time your IP address changes. Hence Dynamic DNS (DDNS) programs. These programs check the latest IP address and update the DNS system accordingly.

Multiple internal but only one external IP address

A second way to overcome this is to have a single device act on behalf of several other devices. Routers are typical examples. You have several PCs connect to the router, but only the router to the Internet. From an internet perspective, there is only one address. This scheme offers the additional benefit of simple firewall-like protection because the internal LAN addresses are not available to the Internet through the translated connection. All incoming inquiries are filtered out by the router. This filtering can prevent intruders from probing your system. However, using port forwarding, you can allow one PC (for example, a Web server) on your local network to be accessible to outside users.

This works like a receptionist at a large office. Nobody knows your number; they all call the main number of the office and are then forwarded by the receptionist to you.

So how does the receptionist know what number to forward the call too? The caller tells the receptionist what name to look for and the receptionist has a list of names and numbers at her disposal so she can translate the name to the phone extension she needs.

On the Internet, it works exactly the same. NAT (RFC 1631) or Network Address Translation allows a single device, such as a router, to act as an agent between the Internet (or "public network") and a local (or "private") network. This means that only a single, unique IP address is required to represent an entire group of computers.

Network Address Translation

When you visit a website via your computer, your router, or more specifically your NAT, remembers which computer on the internal network asked for the information. When the information (in this case the website you asked for) comes back, the router knows which computer on the internal network to send the information to. This is Network Address Translation or NAT.

Developed by Cisco, Network Address Translation is used by a device (firewall, router or computer) that sits between an internal network and the rest of the world. For more information about IP address translation, refer to RFC 1631, The IP Network Address Translator (NAT).

Hosting a server

What If I want to host a server?

For others to be able to view your pictures on your computer, you need to run some type of service or server. A web server such as apache will allow others to securely watch the pictures or files on your site. But how does the NAT of your router know this time to which computer to forward the information?

Since the request comes from the internet, most routers are setup to disallow any traffic going into the internal network. (Firewall protection) In this case, since we want people to be able to see our pictures, we want the router to forward this information. We have to tell the router to do this.

Someone calling from the internet asks your router for a certain "port". This is the same as someone calling the receptionist and requesting a certain person by name. Ports are displayed as numbers but invariably map to pre described services. For instance, when someone requests a web page, they always ask for the service on port 80, the web server. Through NAT, it is possible to "map" a certain request for a service (a request for a port) to a certain PC on the internal network.

MAC Addresses and Address Resolution Protocol

An IP address alone cannot be used to deliver data from one LAN device to another. To send data between LAN devices, you must convert the IP address of the destination device to its media access control (MAC) address. Each device on an Ethernet network has a unique MAC address, which is a 48-bit number assigned to each device by the manufacturer. The technique that associates the IP address with a MAC address is known as address resolution. Internet Protocol uses the Address Resolution Protocol (ARP) to resolve MAC addresses. If a device sends data to another station on the network and the destination MAC address is not yet recorded, ARP is used. An ARP request is broadcast onto the network. All stations on the network receive and read the request. The destination IP address for the chosen station is included as part of the message so that only the station with this IP address responds to the ARP request. All other stations discard the request.

The station with the correct IP address responds with its own MAC address directly to the sending device. The receiving station provides the transmitting station with the required destination MAC address. The IP address data and MAC address data for each station are held in an ARP table. The next time data is sent, the address can be obtained from the address information in the table.

Ethernet Cabling

There are two different types of cabling for Ethernet networks. Originally they used thick or thin coaxial cable, but most installations currently use unshielded twisted pair (UTP) cabling. The UTP cable contains eight conductors, arranged in four twisted pairs, and terminated with an RJ45 type connector. There are 2 types of RJ-45 cables available today, the Media Dependent Interface (MDI) cable and the Media Dependent Interface - Crossover (MDI-X) cable. The first cable is used to connect routers to PCs and the second to connect PCs directly to PCs. The sent and receive wires are switched from beginning to end in the crossover cables. Some Ethernet switch products, such as the MusicPal, are able to sense the polarity of a connection and automatically adapt to the proper cabling type.

Cable Quality

A twisted pair Ethernet network operating at 10 Mbits/second (10BASE-T) will often tolerate low quality cables, but at 100 Mbits/second (10BASE-Tx) the cable must be rated as Category 5, or "Cat 5", by the Electronic Industry Association (EIA). This rating will be printed on the cable jacket. A Category 5 cable will meet specified requirements regarding loss and crosstalk. In addition, there are restrictions on maximum cable length for both 10 and 100 Mbits/second networks.

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