NOXON iRadio

Detailed manual
ENGLISH

Version 6

Status 8/4/2006

CE / FCC Declaration

We:

TerraTec Electronic GmbH · Herrenpfad 38 · D-41334 Nettetal

hereby declare that the product:

NOXON iRadio (Wireless audio adapter)

to which this declaration refers is in compliance with the following standards or standardizing documents:

- EN 55022:1998 + A1:2000 + A2:2003, CLASS B
- EN 55024: 1998 + A1:2001 + A2:2003
- EN 61000-3-2:2000, Class A
- EN 61000-3-3:1995+A1:2001
- IEC 61000-4-2:2001
- IEC 61000-4-3:2002+A1:2002

- IEC 61000-4-4:2004
- IEC 61000-4-5:2001
- IEC 61000-4-6:2003+A1:2004
- IEC 61000-4-8:2001
- IEC 61000-4-11:2004

This device may only be used in the following environments and operating conditions: residential, commercial and industrial environments, as well as small businesses. The basic protective requirements of EMC Directive 89/336/EEC are thus fulfilled. CE conformity has been demonstrated. As stipulated in R&TTE Directive (1999/5/EC), this device corresponds to a Class 1 radio system (Commission Decision 2000/299/EC).

The device also complies with FCC Part 15, Subpart B, Class B, and ANSI C63.4:2003.

This declaration is based on:

Test report(s) of the ADT-Corp. testing laboratory

Contents

1 - Your new iRadio

Welcome!

We're pleased that you've chosen a TerraTec product. Your iRadio is designed to give you simple, convenient access to thousands of Internet radio stations worldwide—and to audio content within your home network—via wired and wireless network connections!

We would like to start by exciting your imagination a bit and introducing the central features of your new device.

Access your media library! The device integrates into your existing network with ease using a wireless (WLAN or Wifi) or cable (Ethernet, LAN) connection. Simply add a media server to your network (you'll find out how later in this manual) and your complete collection of MP3 and WMA audio files will be available anywhere in your home.

Always online. The NOXON iRadio is an ideal complement to your DSL or other broadband Internet connection. With a flat-rate connection, you can use the NOXON iRadio to enjoy the wide selection of radio stations on the Internet (regardless of whether you access the Internet via your desktop, laptop or router).

Just listening to the radio is history! The iRadio is your key to completely new, active radio listening pleasure—with over 1,500 stations on the Internet!

The days are over in which you were stuck with listening to the programming on a handful of decent FM stations in your "service area"—and the sometimes strange musical tastes of their program directors. No more waiting for programs featuring your favorite music to come on at odd times of day, and then having to put up with annoying commercials! And even then, it was rare to hear the sort of tunes you would put on your shelf at home—or the right sounds to match your momentary mood.

It's a whole different world of radio on the Internet! Your new "service area" is the world—from Albania to Zambia, and everywhere in between! ...

Now you can count on the right music at any hour of the day or night—the choice is all yours. The options are virtually limitless. Your iRadio and the included vTuner premium service (more about that later) puts the vast and growing world of Internet radio at your fingertips. Each of the many presorted categories (rock, pop, hip hop, alternative, jazz, blues, classical and much more) can contain up to several hundred stations from around the world.

The NOXON's capabilities go even further: learn languages with live training material from many different countries, and take acoustic journeys to the remote corners of the globe! International news stations have their own category, as do specialty stations for sports, comedy, weather and much more. Thanks to your NOXON, you can feel right at home while in distant lands—and vice versa. Expand your horizons and keep your finger on the world's pulse—put the thrill back into radio!

Hand and glove. The iRadio not only has a fixed MAC address, but it also supports WEP / WPA encryption to ensure a long and happy integration in your network. The device can also connect to proxy servers with ease. Don't worry if some of these terms don't mean anything to you right now—we'll walk you through the setup on the following pages so that you'll be up and running in no time, even as a network newbie.

Last but not least. We hope you enjoy your iRadio, and would like to suggest that you browse this manual in detail when you get the chance. In addition to the important information about the use of its technology, we have outlined a number of typical applications wherever appropriate. We're convinced that even experienced users will profit from this guide.

Thank you very much.

...your TerraTec Team

Setup, safety and care information.

You need to be aware of some basic information before you start ...

- We recommend setting up the iRadio at a minimum distance of 10cm to walls or other solid objects behind it for optimal sound and realistic bass response.

- Please place the device on an even, dry surface to prevent fire and electrical shock hazards as well as possible damage to the player itself.

- Keep it away from radiators and ensure that the player is at a safe distance from other (HiFi) devices to prevent overheating.

- Do not place objects filled with liquid such as vases or bottles on the audio player.

- Be sure that the voltage is correct before connecting the power supply. (Details are printed on the power supply itself.)

- If you are not going to use the device for an extended period, disconnect it from the power supply. To avoid short circuits, never pull on the cable itself.

- In addition, be sure to unplug the device from the AC outlet in the event of a thunderstorm.

- If the device has been exposed to extreme differences in temperature, allow it to adjust to the room temperature for one hour before plugging it in. Condensation may have formed inside the device which impairs its functionality.

- Use a dry or slightly moistened, lint-free cloth to clean the NOXON. Do not use cleaning products as they may damage the finish of the unit.

To put it simply, just use the device sensibly. The warranty does not cover deliberate damage to the device, of course. Thank you.

From opening the package to installation

Start by making sure that the contents of the package are complete. The NOXON iRadio package should contain at least the following items:

The iRadio as a receiver …

a device-specific power supply,

… an infrared remote control including batteries, as well as:

- 2 software CDs,

- this manual,

- a service request form,

- and a TerraTec registration card with the serial number.

So, before you put your iRadio into operation, please check the configuration of your system and network to ensure that they correspond to the minimum requirements listed on the package. We cannot guarantee its correct operation if your environment does not meet these requirements.

2 - The connectors of your NOXON iRadio

2.1 Overview

After taking the iRadio out of its packaging material, take a moment to get to know its connectors and controls.

A Connection for power supply

B On/off switch

C Reset button

D Network port (RJ-45)

E Speaker port

F Line out

G WLAN antenna

H Label with the serial number

1 Headphone output (1/8" jack)

OK, on we go …

2.2 The headphone output

You probably already guessed it, and it's true–this socket is intended for a 1/8inch headphone jack.

Plugging headphones into this socket automatically disables the Line outputs, a feature known from many older cassette recorders. To adjust the volume, use the remote control as usual.

2.3 The power adapter socket

Plug the power adapter in here. Please use the supplied adapter. While some universal power adapters feature the same plugs and voltage, their amperage is not sufficient. Should you need a replacement, please contact our service.

2.4 WLAN antenna connector

If you have access to a wireless LAN (WLAN), screw the included articulated antenna onto this connector.

If possible, please ensure that the antenna is set to a vertical position to ensure the best possible reception.

2.5 The network port

Use this port if you would like to integrate the NOXON iRadio into your network via a wired connection. To distinguish it from the wireless or WLAN connection, it is frequently referred to as a LAN or Ethernet port. The port supports data rates of 10 and 100 Mbps. To connect the iRadio to your router in this manner, use a standard network cable (twisted pair with RJ45 plugs). To connect it "directly" to your desktop PC or laptop, either use a network switch or a hub. To connect the NOXON without any intermediate devices, use a crossover cable instead of a standard network cable.

Two LEDs near the port show the status of the **link**: (**orange**) indicates a live connection to the juncture / node; network **traffic** is signaled by a (**green**) LED (usually flickering).

2.6 The analog audio output

The line output on the back of the device is intended to be connected to the Line input of a HiFi amplifier or a pair of active speakers (speakers with built-in amplifiers). The output is designed for a voltage level of 2 VRMS. Before making the audio connection to your amplifier, please make sure the volume is at a suitable level to prevent damage to your hardware or your ears.

2.7 The Reset button

Use the tip of a ballpoint pen to press this button of the iRadio. If the NOXON ever freezes unexpectedly, use this button to reboot the device.

To reset the device to its **factory defaults**—which will also permanently clear all settings such as network keys—switch the device on and press the reset button of around ten seconds until the Ethernet LED flashes once. The display will now go blank. Unplug the power adapter from the AC outlet. Reconnect the iRadio after waiting for a few seconds and it will be back in its original state. It will be necessary to run the installation procedure again at this point.

Before making such a drastic move, try a soft reset first: press and hold the **POWER** button on the remote control for several seconds to trigger the soft reset.

Unfortunately, it's impossible to cover the topic of networking without juggling the occasional bit of cryptic terminology. That's why we've included a glossary on page 54, as well as a FAQ with the answers to the most common questions.

3 - The remote control and the buttons on the iRadio

Here it is—your infrared calorie saver. Most of the controls will probably be familiar from other products from the world of consumer electronics. A selection of controls corresponding to those on the remote control are located on the front of the iRadio, as you have probably already discovered on the right.

3.1 The most important buttons for fast orientation

Here is an overview of the most important and frequently-used "keystrokes":
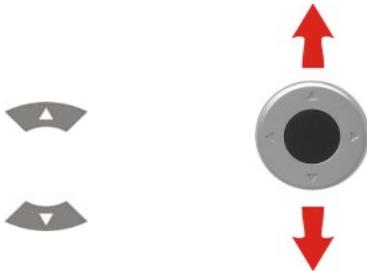
Navigation buttons: Use these buttons to control the highlight bar in the iRadio menus.

Press and hold the navigation buttons when scrolling through long lists to enlarge the navigation increments.

Next / OK and **Back / Cancel**: Use the right arrow button to confirm and the left arrow button for corrections and to cancel actions.

Play: Use this button to play and pause individual radio stations. Playback will start after a short delay while data is being received.

Skip Forward & **Skip Back / Delete**:

Skip to the previous or next track on the playlist.

Skip back also backspaces one character when entering text.

Configuration menu: Available at all times by pressing this button. For more information, see page 27.

3.2 Additional buttons and their functions

On/Off: Wouldn't you know it: Switches the NOXON on—and off, if need be!

Home button: Returns you to the home menu for all playback options.

Internet radio: Jumps directly to the extensive Internet radio station selection lists which are continuously kept up to date for you by your vTuner premium subscription.

Favorites: Opens your Favorites list.

Info: This button displays the playback screen with information on the current program (if nothing is playing, nothing is displayed).

Search function: Press "0" in playlists to quickly find entries. The top line of the display will show an input field: _

Creating and deleting favorites: Press the smiley at any time while listening to automatically put the current station or song onto the Favorites list. To access the Favorites, press the Favorites button (see above) or go through the main menu. If you get tired of a Favorite, select it in the Favorites menu and press the frowning face to get rid of it!

Shuffle and **Repeat**:

Plays the contents of a list in random order, or repeats a single item. Press Repeat twice and a little "All" will appear in the display, indicating that everything on the list will be repeated once the last item has been reached.

Save Preset button: Use the Save Preset button to assign titles or stations to the preset number buttons for quick access.

TIP: Press and hold buttons 1-5 to assign the current station to them.

Stop: Stops all playback.

Volume up and down/change case when entering text ("+" button).

Number buttons: Use the number buttons together with the Save Preset button to store and recall radio stations. The buttons are also labeled with letters for text entries as described in the following section on entering letters.

3.3 Entering letters

Letters can be entered into the iRadio via the numerical keypad in the same way you would with a cellphone keypad when writing an SMS. This can be useful when configuring the device or changing the device's name. Here's how text entry works, using the word NOXON as an example.
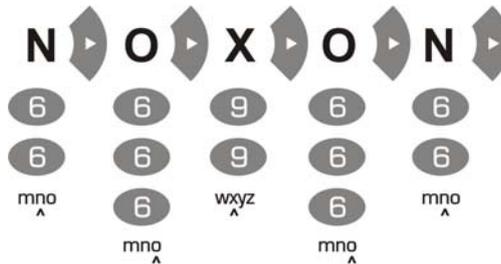
Pressing a button several times in a row switches through the row of available letters. Once you have finished entering your text, press the right arrow button once more to confirm your entry. If you have made a typo, press to delete the character over the cursor. You can also use the navigation buttons to move the cursor to the left and right through text you have already entered. In addition, you can enter the following special characters via the 0 and 1 buttons:

0   * # _ ~ and space

1   . , ? ! - &

3.4 SMS quick-search in lists

We have integrated a quick-search function that you will probably be familiar with from cell phones to save your fingers and your nerves when navigating lists with many entries.

When in a list, press the zero (0) button and a text entry field will appear at the top. Now enter the beginning of the item you want to find using the numerical pad of the remote control as shown above. Confirm your entries with the right arrow (or cancel with the left arrow).

Note: if you search at precisely the moment in which the TwonkyVision MusicServer is rescanning its database, you may get hits that are actually misses.

4 - The first time: switching on the iRadio.

To turn on your NOXON, press the ON/OFF button on the remote control or on the iRadio itself ⏻.

If you have just connected the power adapter and are now trying to turn the device on, don't get nervous if nothing happens at first. It takes around 30 seconds before the iRadio can be switched on after it has been connected for the first time to an AC power source.

When switching the device on for the first time, it will display a language selection dialog. The selection applies to the menus and operating system messages of the iRadio; not to the content it access (e.g. on the Internet).

4.1 The network configuration wizard

When switching it on for the first time, the iRadio does not yet have any information about the possible network environments from which it will be getting its content. After switching it on for the first time and selecting a language, the Configuration Wizard will be displayed automatically.
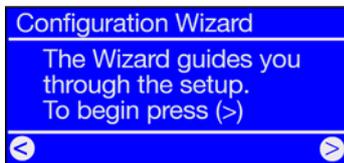
As in other NOXON iRadio menus, press the right arrow button for "Next/OK" and the left arrow button for "Back/Cancel".

If you are not satisfied with the way things are working after running the Wizard, you can run it again by pressing the 🖳 button to open the configuration menu and selecting the Configuration Wizard menu item.

4.2 Wired or radio?

The iRadio is designed to play files located on a network, either the Internet or the your home network. Two options are available for integrating the device into a network:

Via a wired connection (Ethernet, LAN)

Use a standard network cable to connect the device to a router, switch or hub—to connect it to your PC directly, use a crossover cable.

Via a wireless connection

(WLAN, WiFi) A wireless connection uses a radio link to an access point, router or computer.

If both are available, the motto applies : faster is better. Well, in most situations, anyway, but certainly when it comes to networks. To ensure reliable playback without interruptions, the iRadio automatically selects the faster connection when powering up. This means: if a network cable is plugged in and a 'link' is available (orange LED lit), the iRadio will always favor it over the wireless link.

If you would like to switch from Ethernet to WLAN, switch your NOXON off, unplug the power adapter and the network cable, take a deep breath and hold it for a few seconds, reconnect the power adapter, and turn the iRadio on! If a profile for a WLAN connection is already available, it will be used automatically. Otherwise, the setup wizard for a new network connection will be launched, as you can see above.

4.3 For deeper understanding: about routers, SSID, MAC & IPs

You will come across a number of the following topics automatically when integrating your NOXON iRadio. Together with the glossary in the appendix, these brief explanations will give you a better understanding for making decisions with regard to your network settings. A number of items are only relevant in connection with wireless networks. We will continue with the actual configuration in "4.4 Before setup: network profiles".

Setting up the router options

For this purpose, you must be sufficiently familiar with the router—or its administrator—to change its configuration and understand its overall handling. Normally, these devices use Web interfaces for their administration. In other words, you only need to enter a specific address (e.g. 192.168.0.1) in your Web browser for it to display a convenient user interface giving you access to all of the router's options.
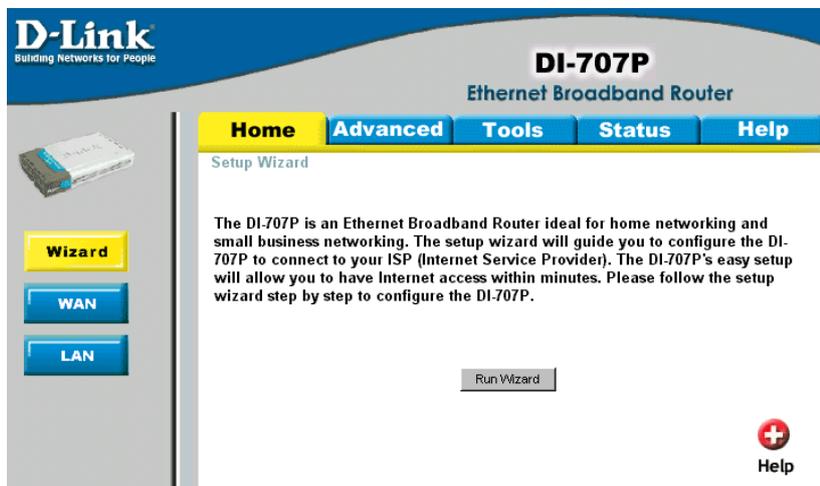
As an example an administration interface of a router.

Hello, here we are: SSID broadcast (WLAN).

As explained in the technical glossary, the abbreviation SSID stands for the network name sent out to all wireless network devices within range, informing them of the presence of a network with this identification. Some routers, however, have an option to suppress the broadcast of the network name. The option is a toggle that is usually called SSID Broadcast. If the broadcast is disabled, you must know the name in order to enter it manually when setting up the iRadio.

To identify or not to identify: the MAC address.

The so-called MAC address is a unique identifier assigned to all network devices. The MAC address is permanently assigned to the device and cannot be modified. They can therefore be used to configure routers to permit only devices with specific MAC addresses to access the network or the Internet.

In such a case, it will be necessary to configure the router with the NOXON's MAC address so that it will be able to establish a network connection. The address can be found on a label on the back of the iRadio.

Sometimes required: a fixed IP.

Under certain circumstances, it can be useful for a device to always have the same address. Most networks these days are set up to assign the so-called IP address—the identifier for the TCP/IP protocol—dynamically. In other words, the first time a device connects, the so-called DHCP server assigns it a valid IP address which the device will keep as long as the address is not needed elsewhere.

This occurs completely automatically, without the user's knowledge. If a network is based on static IPs—i.e. fixed addresses, rather than dynamically assigned ones—there will generally be a precise set of rules governing the addresses that can be assigned. And our friend the iRadio also has such an IP address. If the network requires a fixed address, the rules for assigning them must be known. But once again, a fixed IP is really the exception; generally, everything happens automatically.

4.4 Before setup: network profiles

The iRadio lets you either create a single network profile (a collection of all of the values and settings necessary for a network connection)—this is the default setting, assuming you will use the iRadio in a single location or network—or you can switch to managing multiple profiles. You can also use the configuration menu on the device itself to administer profiles or to create and edit them using a wizard.

You can permanently store up to three network profiles—that way you don't have to enter a full set of parameters every time you move the NOXON to a different network.

5 - Scenario 1 – the wired network integration

If an Ethernet cable of a functioning network is plugged in at the time the device is switched on, follow the steps below to set up the device:
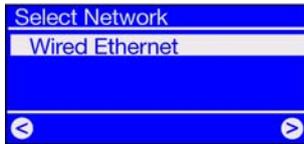
1) If a wired connection is available, then "Wired Ethernet" is the correct choice. (Wireless networks may also appear here if the antenna is installed.)

Confirm with:
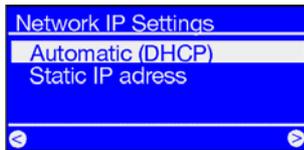
2) At this point, select the method by which the NOXON obtains its **IP address**[*] in the network. Every device in the network must have such an identifier to ensure that the IP packets arrive in the right place.

The address is normally generated automatically via the **DHCP protocol**. In rare cases, however, static IP addresses are assigned—for more information, have a word with your network administrator. For more information on static IPs, see p. 18.
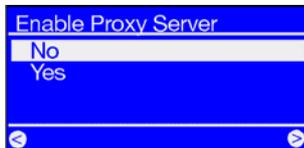
3) At this point you will be asked whether your network uses a so-called **proxy server**.

Most home networks do not. If you are not sure, and cannot be bothered to find out for certain, just select "No"—and hope for the best! If the NOXON will NOT access Internet radio stations after setup is complete (but has no problems playing the MP3 collection within your home network after installing the included software), you may have to correct the configuration at this point. Press the 🖳 button to repeat the Configuration Wizard at any time.

For more information on existing proxy servers, turn to the next page.
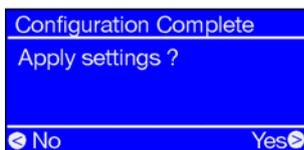
4) Now simply select "Apply Settings".

The NOXON will restart automatically, and...

5) ...after a successful restart (and installing the software for wireless access to the music on your hard drive), you will be able to access your music collection across the network—and connect to thousands of Internet radio stations worldwide!

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[*] See the appendix for explanations of the technical terms used.

If you are using a proxy server…

For users of proxy servers, the procedure is different as of Item 3. Proxy servers are common in companies and other major Internet users. Check the Internet settings of the Internet Explorer on a computer connected to the same network to see whether your network is using a proxy server.
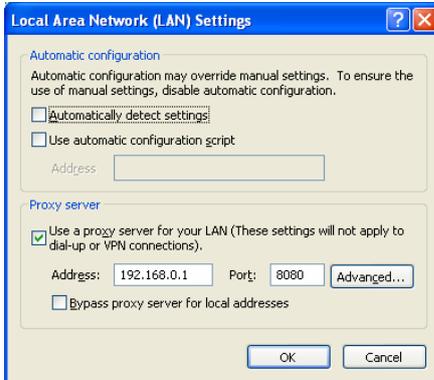
Open the web browser (e.g. the Internet Explorer), select "Internet Options" from the "Tools" menu and select the "Connections" tab. On the bottom third of the tab, you'll find the "LAN Settings…" button. Press the button to open the dialog box shown here.

If a proxy server has been activated there, use the same settings for the iRadio.
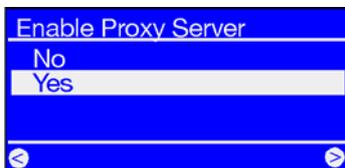
1-3) To set up the iRadio to work with a proxy server, follow **steps 1 & 2 as described above…** and in step 3 (Enable Proxy Server Yes/No), select YES!
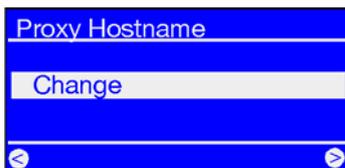
4) Then select "Change" …

5) … and enter the name ("proxy_internet") or the IP address. Use the following buttons: number buttons 1-9, 1 for the dots, Left/Right to move the cursor, and "Skip Back" to delete incorrectly entered characters. (s. chapter 3.1)

Confirm …

6) … enter the correct port—8080 is very common—and the proxy is set up. Again, if you have any doubts about the parameters, please check with your network admin—or with the method described above.
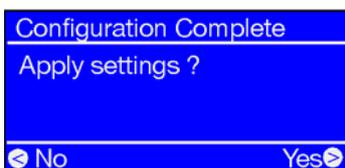
7) Now simply select "Apply Settings", and …

8) …after a successful restart (and installing the software for wireless access to the music on your hard drive), you will be able to access your music collection across the network—and connect to thousands of Internet radio stations worldwide!

Congratulations.

6 - Scenario 2 – the wireless network integration

We would also like to give you the information necessary to integrate your iRadio wirelessly as an alternative to the wired network connection as described under 5.

6.1 Not unimportant: the location

A wireless signal always travels along a direct point-to-point, i.e. antenna-to-antenna, path. The quality of a wireless connection thus stands or falls with the obstacles in the line of sight from the iRadio to the opposite network device. Setting the device up in some locations may therefore result in a poorer signal, even if the actual distance is shorter. For example, if a large amount of masonry or sources of interference are located between the devices, the signal quality will decrease despite the short distance.
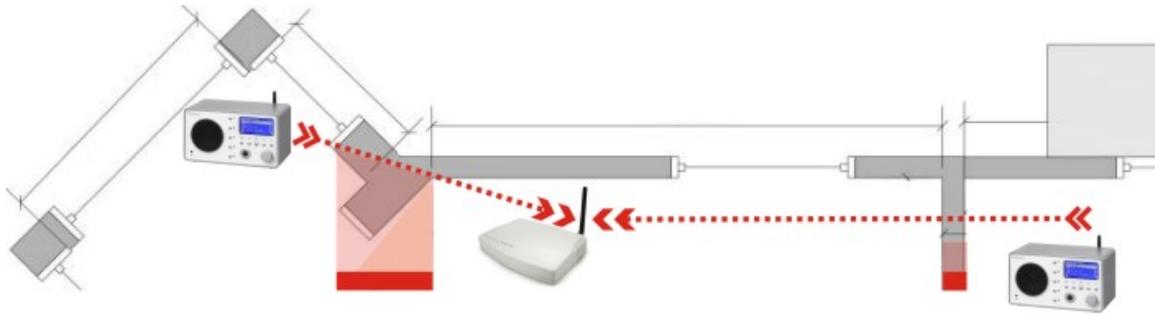
Needless to say, the more powerful the transmitter performance of your router, the greater the range will be.

Note: Use the display of your iRadio (S. 28) to determine the signal strength at selected locations.

6.2 Possible wireless connections

In comparison to wired networks, a wireless link provides considerable additional freedom, but also requires a bit more attention—especially if you do not want to completely neglect security aspects. Before we actually start setting up the NOXON iRadio, we have to make a distinction between two different types of wireless connection.

A - connections to the network/Internet via an access point such as a router[*]

B - direct wireless connections between the NOXON and a PC

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[*] See the appendix for explanations of the technical terms used.

A - via the router (infrastructure).

Access is realized here over one or more access points (AP). The WLAN access point is generally integrated into the broadband router of your Internet access line. While exact figures are not available, one can nevertheless safely assume that this is currently the most common way to use broadband Internet access and share it locally among several users. The iRadio is also the most fun to use this way, as you can receive radio from the Internet or music from other computers in your home network without necessarily having your own computer running at the time.
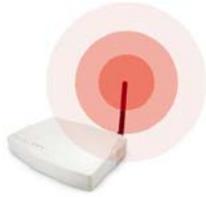
Access point (AP)   **NOXON iRadio**

B - direct communication.

On the other hand, you may wish to set up the iRadio to communicate directly with your desktop or laptop PC, from device to device without an access point. A wireless device-to-device connection is known as an ad hoc network, from Latin: "for this purpose only".

Ad hoc connection   **NOXON iRadio**

6.2.1 Connecting to a router

Using the iRadio with a router generally does not require any configuration work on the router itself. Special settings may be advisable for security reasons, however.
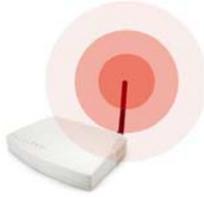
As the media have frequently reported, it's not very advisable to use a router exclusively with its default settings, as that leaves the network wide open for intrusion or misuse of the Internet connection. The advantage of using the router with its default settings is naturally the simplicity with which devices accessing the router can be configured. However, since the need for a basic level of network security has generally been accepted, please read "4.3 For deeper understanding: about routers, SSID, MAC & IPs" for background information on the relevant terms.

For more information on setting up a router, see p. 26. First, we would like to describe an alternative to access via a router: a direct wireless link to an individual computer.

6.2.2 Direct (ad hoc) radio connection with a PC

To establish a direct connection between the iRadio and a computer—in most cases a notebook with an integrated wireless network adapter—let's first have a look at how to set up a Windows PC for an ad hoc network in six steps so that the iRadio can access it.

A wireless network adapter can only be set up for direct device-to-device (ad hoc) communication, OR for communication with a network access point (infrastructure). Selecting one mode will automatically disable the other.

Please disconnect or disable all network connections other than the wireless one during the setup to eliminate possible sources of danger. This will ensure that Windows will not attempt to communicate with the iRadio by any other way.

To do so, click "Start", open the "Control Panel" and "Network Connections" under Windows. This will display an overview of all available network resources (see the illustration below). Disable all of the entries other than your wireless adapter by right-clicking the respective symbol of the connection to open their context menus and selecting "Disable". Everything but wireless. –

Some systems will also display a "Network Bridge" here. Do not disable or bypass this until all other attempts fail.

Unfortunately, experience has shown that Windows occasionally develops a completely inscrutable life of its own that cannot be dealt with effectively using esoteric methods. If the idea doesn't bother you too much, simply use the crude but effective approach and pull the plug of the network cable to support our efforts.

Open the overview of network connections as described above and follow the instructions below…

Double-click the network connection you will be using, followed by "Properties" to open its settings.

Go to the "Wireless Networks" tab for an overview similar to the one shown here.

Some wireless adapters provide these functions via their own software, in which case you should find comparable instructions in its documentation. Alternatively, you can put a check next to "Use Windows to configure my wireless network settings"—if you know what you're doing.
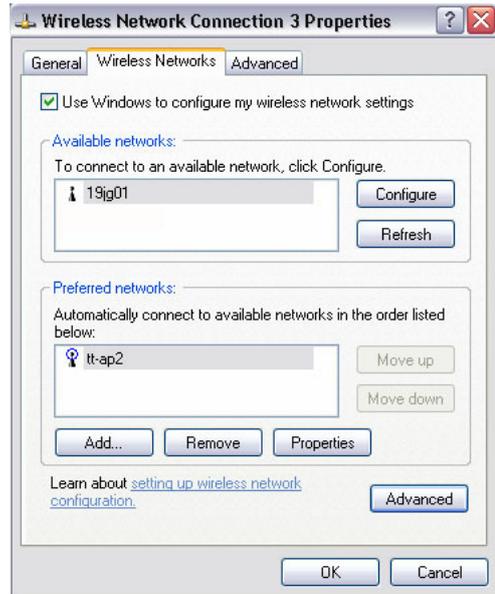
Switch to the "Advanced" tab (not the "Advanced" button, we'll come to it later) and ensure that your settings are as they are shown here.
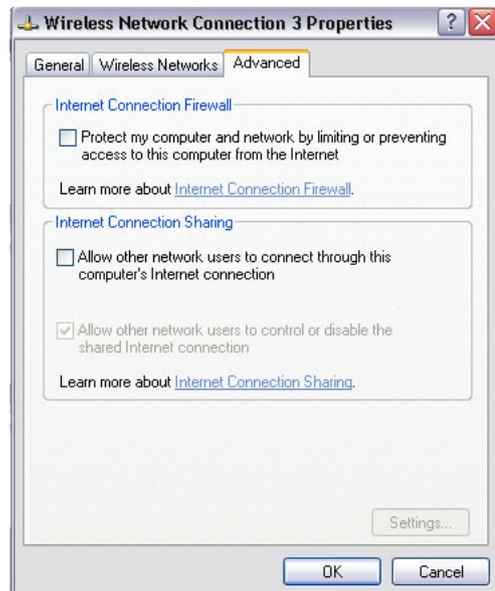
Switch back to the "Wireless Networks" tab and click the "Advanced" button. The dialog box shown here will open. Choose "Computer-to-computer (ad hoc) networks only" and click "Close" to exit the dialog box.
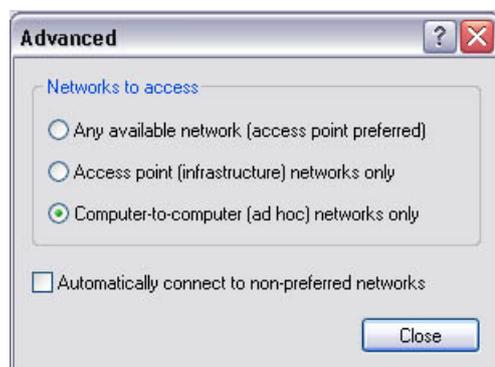
In the already-familiar window, click "Add..." to assign a variety of parameters to your ad hoc network.

First enter the name of the network, also known as the SSID (Service Set Identifier). The other options shown would work with the iRadio and can be selected. You can also use a WEP (Wired Equivalent Privacy) key by specifying it later during the further configuration of the device. (see page 6.3 Setting up the wireless connection on the NOXON iRadio)
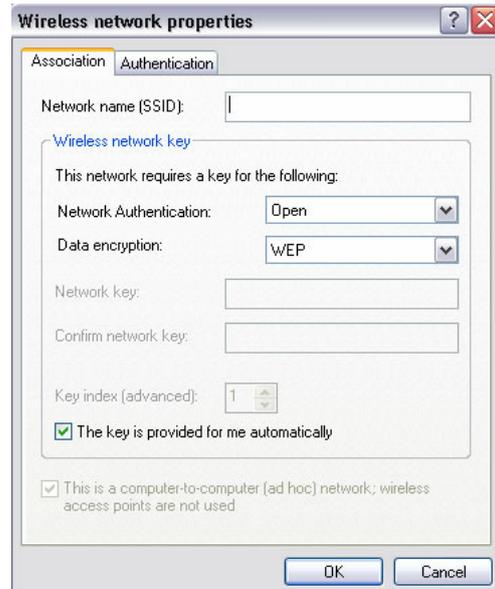
After a few moments, the dialog box should look similar to this one. The icon in front of the network indicates that it is active. A red X there indicates a problem. The computer may be still trying to locate its own network, however, so please be patient.
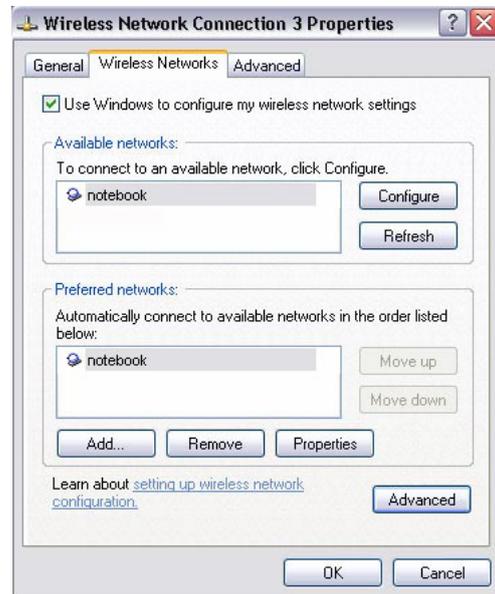
Some WLAN network adapters do not apply these settings immediately. To ensure that the network settings you have configured are actually used, disable and re-enable the selected wireless network connection one more time.

The network connection is now set up on the computer side. To enjoy your music, you now need an audio server. We'll show you how easy that is to realize using the included (software based) TwonkyVision UPnP Media Server in our example. For more information, please see page 34. You will also need to adapt the iRadio to your network environment. For instructions, please go on reading.

6.3 Setting up the wireless connection on the NOXON iRadio

Just a reminder: During the course of the configuration, confirm your entries by pressing the right navigation button on the remote control or on the device, or press the left button to cancel or correct your entries. Use the same buttons to move the cursor in data entry situations. You will also need the number buttons 1-9, the "1" button (pressed repeatedly) for the dots, "Left/Right" to move the cursor, "+" to change case, and "Skip Back" to delete incorrectly entered characters. (see page 12 et sqq.)
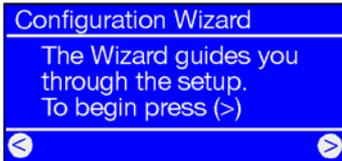
While still in its factory default state, the NOXON will start the configuration wizard to complete the integration in your network.
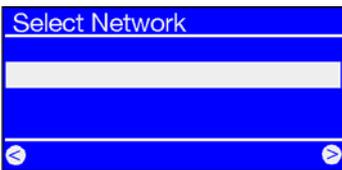
The names of the detectable access points (routers) and existing ad hoc networks are shown here.

If you know of a name that should be on the list but is missing, start by checking the distance to the router or computer. Go ahead and place the NOXON iRadio right next to it to exclude distance as a possible source of errors.

Also, SSID broadcasting may be disabled on the router, in which case it will not be visible on the list. If that's the case, select "Edit Network SSID" and enter the name manually (s.a. chapter 4.3 For deeper understanding: about routers, SSID, MAC & IPs, page 17).
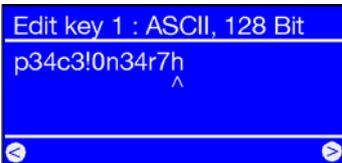
When selecting a network protected by **WEP encryption**, you will be prompted to enter the appropriate key. The person who set up your network should know this key. The information in parentheses in the top line does not appear until the number of characters you have entered corresponds to a valid key.

If you are using **WPA encryption** in your network, the screen will be the same except for the title bar; in that case you can use a string of characters containing at least eight letters.

Tip: While a technically skilled person with the proper equipment can crack this encryption, WPA is clearly more secure than WEP. Unfortunately, older wireless network equipment frequently does not support it.

From here on, the configuration steps are the same as those described in "5 - Scenario 1 – the wired network integration" on p. 19, starting with item 2. For the sake of brevity, please continue at that point!

7 - The configuration menu of your iRadio

Press the ⌨ button of the remote control to open the configuration menu of the device. There you will find the following entries:

Configuration menu	
Device status	View the current parameters such as the device's current IP address.
Internet radio (RSDB)	Submenu for RSDB settings—see The RSDB – Radio Station Database, p. 29
Wizard	Start the network configuration wizard here.
Language	Select a language for the menus here.
Configuration	To the Settings submenu (see below).
Profile selection	Use this menu item to select a different profile (see below).

Internet radio (RSDB)	This submenu contains the following functions:
RSDB version	Displays the current version of the Internet radio database and the version of the **vTuner pay-service**, **PREMIUM**.
Auto update	If this option is enabled, the list will be updated automatically whenever a new one is available.
Update RSDB	Launch a manual update here.

Options	This submenu contains the following functions:
Profile management	With the profile management activated, another profile is selected automatically any time the connection is lost. This also lets you switch locations easily without setting up the same profile each time. Enable or disable profile management here. Select the profile you intend to use under "Profile Selection".
Key management	If more than one key has been stored, the key management will attempt to use them to maintain contact to the network access point.
Device name	Assign a name to the device here.

8 - Playback options

8.1 The iRadio display

Before we cover the playback options, let's have a look at the playback window.
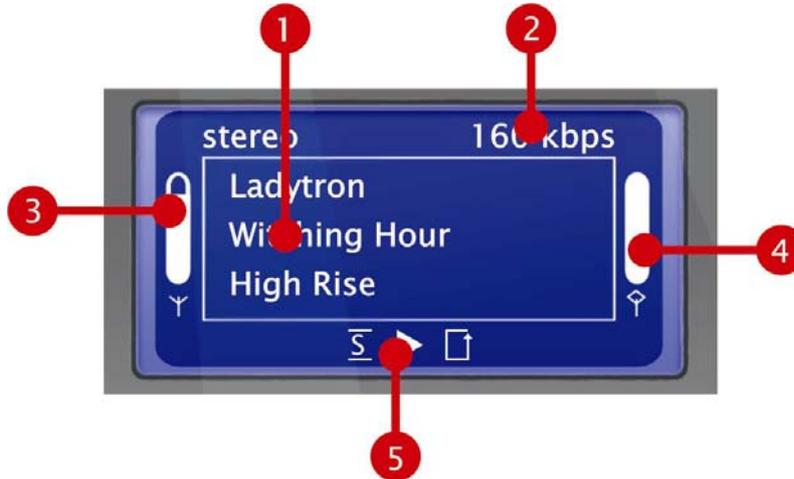
1. Information on the current track or station. Title information on the current MP3/WMA file or additional information on the current radio program is displayed here.

2. The details of the current playback mode, mono/stereo and the **data rate**.
The data rate is a measure of quality and an indication of the data volume of a digital source. The play-back quality of your audio files or an Internet radio station depends on the data rate.
Your iRadio has no influence on it.

3. The **signal strength** of the wireless network integration is indicated here—a peaked bar indicates excellent strength. It is also helpful in finding the best position for the device.

4. The playback **buffer status** can be seen here. An emptying bar indicates a poor network connection, and that not enough data is being transferred to ensure continuous playback. Interruptions may occur as a result.

5. The $\underline{S}$ is displayed when shuffle mode (random selection of audio files) is activated. It corresponds to the icon on the remote control used to activate shuffle mode. The small triangle indicates that playback is currently active—it is also retained in the menu. ⌐↑ The familiar repeat icon refers to the current ti-tle, or to the entire playlist when followed by "all".

In case you were wondering what the single and double notes in the NOXON menus mean: a single note indicates that the entry is a single track (mp3, wma, etc.), while the double note identifies the entry as a playlist (e.g. m3u, pls).

8.2 Internet radio – a whole new world of radio!

In 1 - Your new iRadio p. 5, we already introduced the impressive Internet radio capabilities of your NOXON! The big advantage of the NOXON over the time-honored way of listening to Internet radio via your computer's web browser is that your NOXON can tap into the full variety of the Internet WITHOUT relying on your computer—by connecting directly to the router that provides your Internet access.

Internet radio   **Router**   **NOXON iRadio**

Caution—transfer volume! Please keep in mind that constantly listening to Internet radio stations will result in the transfer of an enormous data volume over the course of a month. Your contract with your Internet service provider may be subject to a volume limit. Exceeding this limit can result in massive extra charges. We therefore recommend using an Internet access plan without volume restrictions. On the other hand, the actual bandwidth used varies strongly from one station to the next. As you already know from MP3 files, the bit rate is decisive for sound quality—a higher bit rate results in better sound, but also in a greater data volume.

The RSDB – Radio Station Database

The list of radio stations stored in the RSDB (Radio Service Database) of your iRadio is provided and maintained by an exclusive vTuner premium service as mentioned in the previous chapter. The service ensures that you always have a fresh, reliable selection of stations despite the continuous changes in the Internet radio world. Depending on the settings you selected in the configuration menu, the iRadio either automatically contacts the RSDB for updates daily, or waits for you to manually launch an update. For direct access to all available radio stations, press the 🛰 station button! Simply use the usual controls to navigate the presorted station list. If you find something you like, press the preset storage button 🔳 and a number button 🔘 … 🔘 to store the station and access it by pressing that number button in the future.
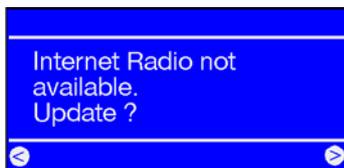
The iRadio will not have a station list until the first time you use it for Internet radio reception. When starting it the first time, the iRadio must download it from the **vTuner premium service**. A subscription to this service is included with your NOXON.

The procedure described below for expanding the list of available radio stations online is also be used as a convenient way of editing the iRadio's Favorites list.

8.3 Managing favorites and own stations

One of the "premium" qualities of the vTuner subscription that comes with your iRadio is that you can customize its list by adding stations of your own to it via your web browser. Here's how:

Open your web browser and go to:

vTuner Premium Service: http://www.radio567.com

Enter the MAC address of your iRadio in the field at the lower left of the page. You can find it on the bottom panel of the device, usually in a format such as **00-11-A5-7B-C5-70**. It's not necessary to enter the separator characters: **0011a57bc570**. The entry is not case-sensitive.

Click [Go]!
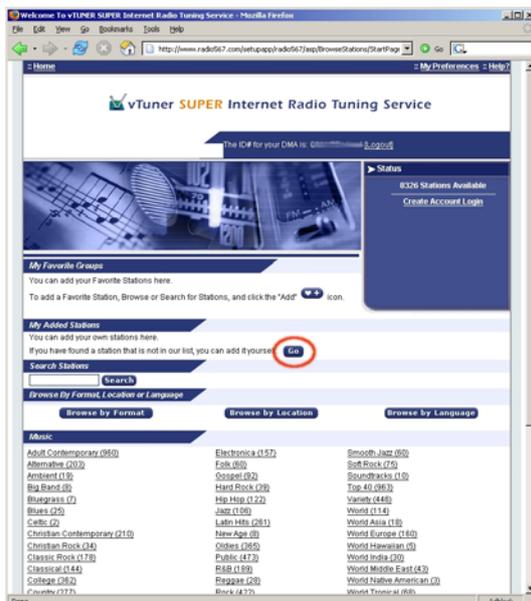
You should now be seeing something like this.

To add stations of your own and play them on your iRadio, register with **vTuner**.

Click the link at the top right, "Create Account Login". On the following page, enter your e-mail address and a password. If you do not want to receive consumer information, remove the check next to "Receive program updates and special offers", then click [Register] and you're finished.

You can now add your favorite station by clicking [Go] in "My Added Stations"—enter the name of the station, its web address (URL), its geographic origin (e.g. Germany) and its "format" or genre. Click "Go", and your new station will appear in the menu under "My Added Stations".

Please note that the iRadio cannot support every data format on the Internet—you may find that it does not support one or the other station. Please observe the notes toward the back of this manual—sometimes it's just a bit more difficult to get a radio stream up and running...

MP3 remains one of the most popular formats—not only for music files but also for Internet streams—and the wide range of stations using this format should be supported as a rule!

The web interface is also useful when you want to take your time and browse the vast number of stations (which are available for listening both here and on your NOXON) with greater convenience than you could with the remote control. When you find something you like, use this easy method to add the station to your Favorites online and on your NOXON:
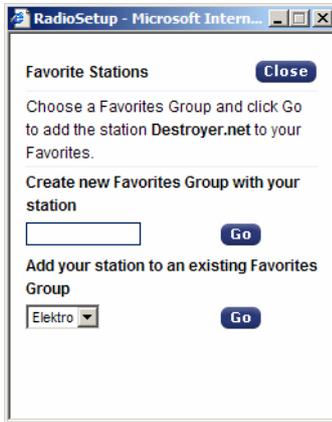
You can, for example, sample a genre such as Electronica and a specific station (e.g. Destroyer.net) by clicking ▶Play , then click the ♥+ button to add the station to an existing or new Favorites group (e.g. Electro). After the next update of your NOXON's Internet radio database, the station will appear in the Favorites list under the group name (groups can only be created in the web interface).

You can also manage Favorites without a web browser:

It doesn't matter whether you are listening to an individual song, radio station or playlist—simply press ☺ to add anything that's currently playing to your Favorites. To remove an item from your Favorites, press—

☹ ... you guessed it.

You can open the Favorites list at any time quickly and easily by pressing the ⊛ button.

Tip: The presets are available as well as the Favorites list, and while both work with files and radio stations, the idea is to use the presets rather for radio stations and the Favorites for individual tracks, albums and playlists.

8.4 Playing MP3/WMA files from the local network

| MP3 / WMA file | UPnP server | Computer in network | NOXON iRadio |
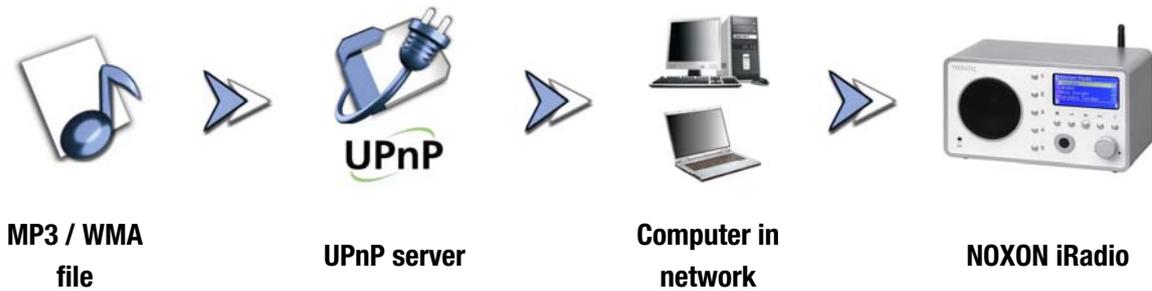
You can share music files for playback in your network using special server software running on a computer or other device. The iRadio requires a **UPnP-compatible** server to provide it with files. A simple Windows file share is not readable. Thanks to the included software, however, it will not be necessary for you to give up on the folder structure that you may have spent years setting up.

Unlike inflexible static file shares, the iRadio offers a flexible sorting via a virtual a UPnP media server that improves the flexibility of your collection—a track can be found via the artist, genre, album or the folder structure. And don't worry, "setting up a server" is not as much work as it was just a few short years ago. Just launch **TwonkyVision TwonkyMusic** and you're ready to go! For more information, see page 34.

One advantage: you can run multiple UPnP servers within the same network—no need for Dad to listen to Sis' tunes, and vice versa! Each active UPnP server appears separately in the iRadio menu for fast, easy access.

Noxon iRadio
- [MyServer] TwonkyMusic
- Favorites
- Internet Radio

If you have a MusicServer running in your network, you'll be shown the main menu listing all available sources, including your server, when you press the ⌂ button. Following the default settings of the server software, the computer name or network ID of the computer on which the server is running will be displayed in parenthesis for the latter.

[MyServer] Musicserver by T
- Album
- All Tracks
- Genre
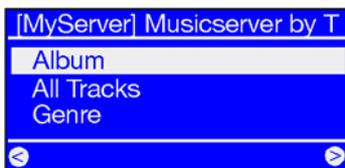
Navigate to the right and you will be shown this overview of available tracks.

The entries are generated by MusicServer based on the title information of the MP3 and WMA files.

The so-called ID3 tags of files in well-organized collections contain information about the artist, album, title, genre, year released and so on. The display may look completely different when using a different UPnP server application, as this data is only received by the iRadio, not generated by it.

If we stay with our TwonkyVision MusicServer, the following selections will be available:

Albums Contains a list of all available albums in the library.

All Tracks Here you can find a list of all of the tracks available on the server. Shuffling really comes into its own here.

Genre Blues, Pop, Funk and Soul are possible genre entries. Select a genre to display a list of all tracks of the genre.

Genre Index The genres are sorted alphabetically here: ABC, EFG etc.—for B as in Blues...

Genre/Artist Once you have selected a genre, choose an artist to narrow the selection down further.

Artist Select your music by artist.

Artist Index Artists are presorted here in name groups: ABC, EFG and so on.

Artist Albums The album selection will be shown after you choose an artist.

Year/Artist Select the year first, then the artist—who would have thought that you have tracks THAT old in your collection?!

Folder Use this option to navigate directly in the file system. In other words, folder and file names will be displayed instead of title information (ID tag entries).

Tip: if you are not happy with the other display options, you can naturally create and use your own system by intelligently renaming the folders and files!

Playlists Here you have access to stored playlists. In other words, all found *.m3u files or other files containing playlists will be available here.

The "Last Played" entry selects the last playlist used, while "Most Played" selects the list most played since the server was set up.

For further navigation, use the usual buttons on the remote control. Once you've reached the item you were looking for, just press Play, and after a brief moment to fill the iRadio cache, off you go. Press and hold the navigation buttons when scrolling through long lists to enlarge the navigation increments. We would also like to once again point out the search function; see "3.4 SMS quick-search in lists" on page 14.

9 - Your own UPnP music server

As mentioned in "8.4 Playing MP3/WMA files from the local network", a virtual music server is necessary in order to play music files located in your network on the iRadio.

9.1 TwonkyMusic

Several NOXON-iRadio-compatible alternative music servers are available, most of which are not free of charge. However, the iRadio comes with **TwonkyVision TwonkyMusic** at no extra cost—we have determined that working with this UPnP application was the least complicated and caused the fewest problems with files that could not be found, or with abstract interpretations of special characters and umlauts in entries. After all, a few Björk or Motörhead tracks are essential to any collection. The software not only supports Windows, but also Mac OS X, Linux, and other system platforms.

Another advantage is that you are not dependent on perfectly groomed ID tags—you can also navigate using folders and file names. (The ID tag is a part of an MP3 file that contains information on the artist, album, etc.)

Installation.

We will be describing the Windows installation below, but the included CD also contains versions for other operating systems.

Insert the software CD in your CD drive. An autostarter will appear with a menu from which you can launch the TwonkyMusic MusicServer setup. If it does not, go to "START", select "RUN...", click "BROWSE..." and in "LOOK IN:" select the drive containing the CD. Change to the folder "\Software\TwonkyVision\Windows". Select the file "TwonkyMusicSetup.exe" and click "OPEN".

Note: the "TwonkyVision Upgrade Key" included with the CD is a 10-euro credit valid toward the next upgrade!

When the setup routine starts, select your language and click "OK".
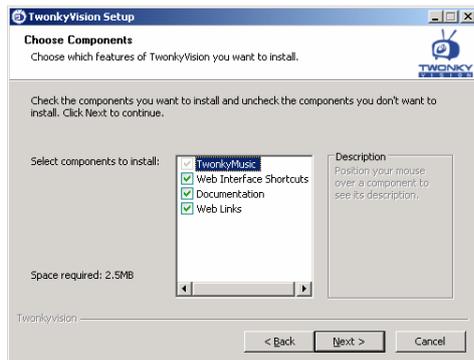
Once you have accepted the license agreement, you will have the opportunity to select the optional components for installation.

TwonkyMusic. No way around this one—it's what we're here for, after all.

Web interface shortcuts. Shortcuts in the Programs group to the web interface—certainly advisable.

Documentation. Extremely comprehensive music server documentation.

Web links. Links to the TwonkyVision website.

Select the options you would like to install and click "Next >".

You can already take care of some of the basic configuration at this point to get you started as quickly as possible.

Install TwonkyMusic as a system service. This option keeps the music server in memory continuously and starts it every time Windows starts.

Detect and use Winamp's playlist music database. If you manage your files in the Winamp media library, you can also use it for the music server by selecting this option.

Detect and use iTune's playlist music database. Same applies for iTunes…

Select your media root directory. Enter the root folder of your music collection here. This folder will be used as the starting point for indexing your media files when starting the server.

Next, select the program group and folder, click "Next" a couple of times and you're done. To start the server, click "Start TwonkyMusic" in the new program group, and your music server will start indexing your music files.

Caution: firewall. If you are running a firewall on the same system as the music server, you may have to set it up to explicitly allow the music server and the sharing of your music files. Once again, please have a word with your network administrator for more information.

The web interface

TwonkyMusic's web interface is designed to let you configure the various settings of your TwonkyMusic UPnP server. To access the web interface, either use the TwonkyMusic Web Configuration entry in the TwonkyVision program group of the Start menu, or by double-clicking the Twonky icon in the system tray. Either way, your Internet browser will open and display the web interface. We will not be covering every minute detail of the web interface at this point, as the comprehensive documentation on the CD does a good job of that. We would like to show you a few configuration examples and their effects, however. Off we go…

Web interface – Status

When opening the web interface, the first thing you will see is the welcome screen with the music server's current status information.

A few explanations…

Restart server is useful if anything ever gets stuck.

Rescan content directories manually launches a rescan of your media files to include new material, for example.

The IP of your iRadio client and other information is also shown.

Web interface - Content

Switch to the Content section to access the following options:

Content locations specifies the folders to be read. When entering multiple folders, separate them with commas.

Rescan in minutes specifies the intervals at which the server should automatically scan for new music files.

Additional information

- Detailed documentation for the TwonkyVision MediaServer can be found in the TwonkyVision program group of the Start menu, and on the CD.

- The CD also contains versions of the server for other operating systems.

- If you would like to share other file types (videos, photos, etc.) for other UPnP devices, we recommend checking out the music server's big brother, TwonkyMedia.

For a quickie—say, when dropping in on a special friend with your flash drive, iRadio and some choice party tracks—just copy TwonkyMusic.exe from the flash drive or CD into the MP3 folder, launch the file, and your server is off and running...
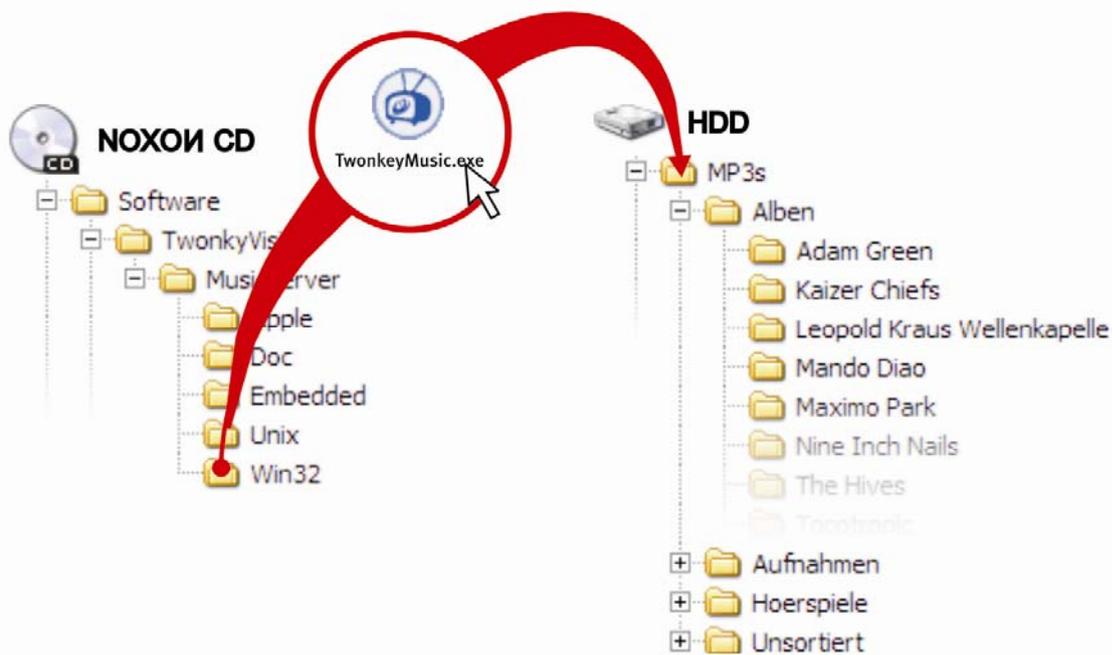
9.2 UPnP servers and Macintosh

We recommend the included Elgato EyeConnect application when using the NOXON iRadio in a Mac environment. The documentation for EyeConnect can be found on the included CD or at the Elgato website:

http://www.elgato.com

9.3 UPnP media server alternatives

The following is an overview of alternatives to the TwonkyMusic UPnP media server software (for support, please contact the respective vendors):

	Comment	Vendor
Musicmatch Jukebox	Musicmatch Jukebox (MMJB) is a complete media management and UPnP server package. While it is a convenient solution, free alternatives are available by combining TwonkyVision and iTunes (or Amarok).	Musicmatch **www.musicmatch.com**
Nero MediaHome	With its Home software, Ahead is taking a first step toward the digital home. It is especially popular among NeroSuite users thanks to its seamless integration. A media server is also available as a part of the well-known burner tool. Doesn't get along with umlauts very well and only runs under Windows, but permits the file types to be displayed by the NOXON to be specified precisely.	Nero MediaHome by Ahead, part of NeroReloaded **www.ahead.de**
Microsoft MediaConnect	MediaConnect is Microsoft's UPnP implementation, which can be installed like any other application under Windows XP. It also supports files subject to Microsoft Digital Rights Management.	Free of charge at **www.microsoft.com**
Elgato EyeConnect	EyeConnect is currently one of the most convenient UPnP implementations for Apple Macintosh. After starting and a brief configuration, it makes the content of the iTunes library available to the NOXON, including support for static and dynamic playlists. AAC content (with DRM) is not supported at the present.	Commercial software, but included with your NOXON! **www.elgato.com**
Allegro Mediaserver	To the best of our knowledge, Allegro Media Server is the oldest UPnP implementation for Apple Macintosh, even running under OS9.	**www.allegrosoft.com**

9.4 Playing DRM-protected media

9.4.1 What is DRM, and how does the NOXON manage it?

Illegal copying and developments related to the protection of digital content have been issues associated with compressed music since the outset. For a long time, the available solutions either did not convince the industry or were hacked shortly after their release. This was one of the reasons for the sluggish adoption of the Internet as a distribution channel by the major labels.

A music industry solution: DRM.

After a number of often painful compromises with regard to consumer-friendliness, the market is tending toward a single system, **Microsoft Digital Rights Management, or DRM**. It specifies the number of times a track can be burnt onto a CD or copied to an external medium, or in the worst case, how long you can listen to a track.

The fact that the DRM protection has been developed by Microsoft provides are a number of advantages for the customer: better interoperability between devices and greater competition between content platforms.

Each standardization has its advantages and disadvantages. This is not an issue for users of the MP3 format, by the way.

Where will I encounter DRM?

DRM content can be found on virtually all platforms that support online music purchasing. Portals such as Musicload (musicload.de) or the napster subscription service (napster.com) use this form of protection. A wide range of commercial Internet radio stations also use DRM to avoid licensing disputes with the music industry.

If you purchase a CD and rip it at home, you will of course have "clean" MP3 files that can be played on all platforms without time or technical restrictions.

That is not necessarily the case for "copy-protected" media that deliberately deviate from standards in order to "confuse" playback devices such as car stereos, DVD players, PC drives and some CD players to prevent ripping. Copy-protected audio CDs are clearly labeled, however, and can thus be distinguished easily from "normal" CDs.

How does DRM work with the NOXON?

The iRadio is well-suited for DRM content, as it supports the most common DRM standard in version 10—Microsoft Windows Media DRM 10 (for WMA audio files). To allow the iRadio to play DRM content, you need server software capable of the following:

        A - verifying that the tracks were legitimately purchased and the licenses are valid

        B - providing tracks for playback on DRM-enabled devices

        C - managing the capabilities and rights of the playback devices

Effects of DRM on your NOXON device

The NOXON supports the disabling of the digital output to prevent lossless copying. When listening to DRM content it may therefore be necessary to use an analog connection to your amplifier in addition to the digital line.

A further effect is that the iRadio will remain silent if it encounters a DRM method it doesn't support. At present, the iRadio supports DRM10 only. It is therefore not possible to play tracks purchased at the iTunes Music Store, for example.

Please note: when it comes to DRM, the NOXON is absolutely passive. It will not infect existing files with DRM or make any other changes to played content under any circumstances.

As the strengths of TwonkyMusic lie elsewhere and digital rights management has not been implemented in it, we would like to introduce an alternative to TwonkyMusic, **Windows Media Connect**, Microsoft's free UPnP server capable of playing DRM content. Windows Media Connect is a free Microsoft UPnP server.

9.4.2 Windows Media Connect

Microsoft is kind enough to offer the Windows Media Connect free of charge at present via the following link:

http://www.microsoft.com/windows/windowsmedia/devices/wmconnect/

If the link does not work, use the Windows Update function to install the software. Once the installation is complete, you can find it under "START" / "PROGRAMS" / "ACCESSORIES" / "ENTERTAINMENT" / "Windows Media Connect".
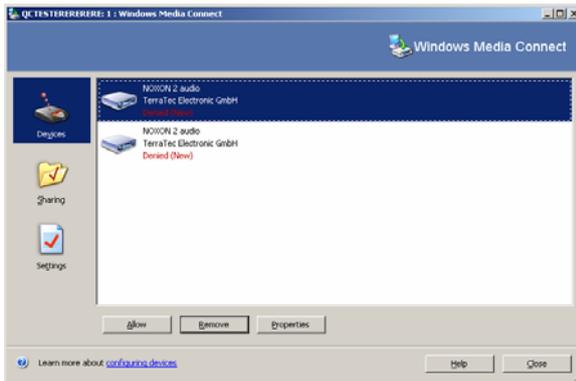
This window should be displayed the first time you open it with the NOXON turned on. This view shows all media players found in your network. By default, **Windows Media Connect** denies access. To enable your iRadio, select it in the list and click the Allow button.
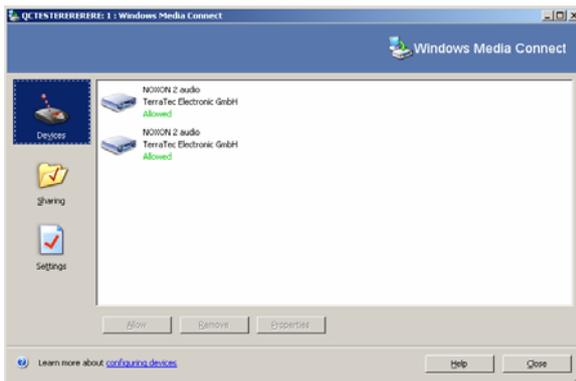
The window should now look something like this.
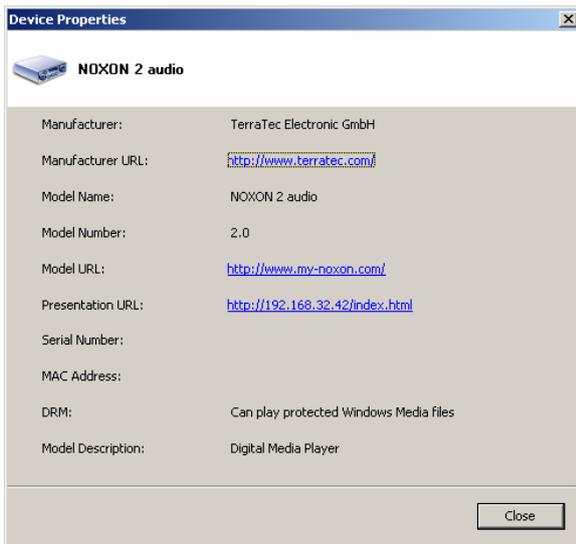
Click Properties for detailed information on your network player.

Note: The "DRM" entry is important here. If it does not state that the iRadio can access protected content, please contact our software manufacturer.

For more information on how to use and manage content, please see the online help. Have fun with your music shopping!

Appendix

A - Concepts and solutions—for the technically inclined…

Here are a few advanced approaches to using the capabilities of your NOXON. We hope you enjoy exploring them. (We would like to point out, however, that TerraTec cannot provide technical support in connection with the following.)

A1 Creating your own Favorites from links

The web interface

Before we get started, we really should point out that the Web interface is not supported by our customer service. You'll surely be able to imagine why after reading the following section.

Something we haven't mentioned until now—as average users are unlikely to be interested in it—is the possibility to access the iRadio directly via its Web interface to insert links of your own.

To access the iRadio web interface, simply enter the current **IP address** of your NOXON in your web browser (e.g. Internet Explorer, Mozilla Firefox). The IP address can be found under "Device Status" in the NOXON's configuration menu ().

Entering the IP address—in this case, 192.168.0.225—into your Web browser and clicking "Favorites" will bring up the following screen:
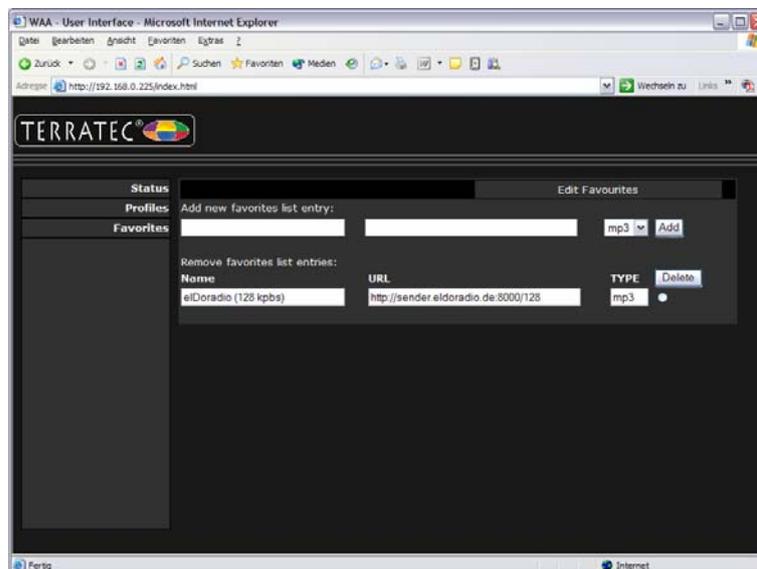
Despite the breathtaking selection of international radio stations in the iRadio, you may find that one of your favorite local stations is missing or is only available in low quality. In such cases, manually adding favorites via the interface described above can be a solution.

The structure

Unfortunately, time and again the endings of links for MP3 radio streams refer to specific formats that are not actually available, so a bit of experimentation may be unavoidable. An example: At TerraTec, we're big fans of the college station elDoradio at www.eldoradio.de, which provides the following link for its 128 Kbps stream: **http://www.eldoradio.de/broadcast/128.pls**. One could, without suspecting anything, enter it in the interface as PLS, but that would not be successful. It won't work until you enter **http://sender.eldoradio.de:8000/128** and set the selection box to MP3.

Unfortunately, it would go beyond the scope of this manual to cover every option, definition and format description here—a wide range of rather individual solutions can be found on the Internet, and it is naturally not possible to provide support for all of them (although we are continuously expanding the capabilities of the NOXON and making the new features available on our website as firmware upgrades). So we'll just have to leave you to rely fully on your play instincts and the methods starting on page 43. Experience has shown, however, that the vast majority of stations listed on

http://www.shoutcast.com

can be whipped into shape for the NOXON favorites like this:

Open the link listed under "Tune In" with Winamp, and while the station is playing, press ALT+3 (or 'View file info…'). The following info window contains details on the data stream—and the first line contains the link to the radio stream that we need to enter in the Web interface mentioned above.

A couple of screenshots:

> [ALT + 3] >

A2 Extracting Internet radio URLs

Audio streams are easy to find on broadcasters' websites, but adding them to the iRadio's local station list can sometimes be a problem.

In many cases, it is not in the interest of the stream provider to make the content available for standalone players—in all fairness, small providers in particular depend on revenue generated by advertising on the website. The licensing terms of the stream providers must also be observed. In general, you should apply the terms of fair use.

To save your own streams, use the iRadio's web interface. (see previous chapter A1 and p. 42). The URL (the unique address of the stream) which is necessary to enter the station can be found on the website of an Internet radio station using the following methods:

1. **The simple method**

   As a rule, stream providers are experts that know the precise addresses of their streams. Maybe the provider has mentioned the URLs in support forums or FAQs. The provider may also provide them on request by e-mail.

2. **Linked?**

   The link can often be found behind a button or linked text. Simply copy the link by right-clicking it in the browser window and using the "Copy" menu item.

3. **That wasn't so hard!**

   If you can't get the address using the above technique, have a quick look at the source code of the web page. In Mozilla Firefox, for example, right-click the page and select **View Page Source** in the context menu. A brief search will usually turn up entries like this:

   <PARAM NAME="FileName" VALUE="*mms://stream.de/stream*">

   <embed src="*mms://stream.de/stream*">

   The stream address itself is enclosed in quotation marks. Simply copying the address to the NOXON's Favorites will make the station available, provided the station's format is supported by the device.

All providers share a common technological basis for their streams. The possibilities for individuality are essentially restricted to connection establishment and authentication. Little effort is therefore required to make most streams "iRadio-compatible".

Unfortunately, there are a few exceptions. If you are not successful with the approach described above, check our website at **www.terratec.com/support**. We will be providing further information and more detailed technical descriptions there.

Unsupported formats

The iRadio supports MP3 and WMA streams. RealAudio (RA) streams are currently not supported. Such streams are becoming increasingly less widespread, however.

For a number of helpful demonstrations of the techniques to extract the URLs of radio streams as described above, please visit www.terratec.de/support.

A3 Synchronizing multiple iRadios

A request we received frequently was to implement the ability to "force" the NOXON to play content remotely. We initially questioned the sense of such a feature, as a decisive selling point of the NOXON is that it's not simply a "dumb" receiver, but that it can actively determine what to play. With conventional transmission systems, both wireless ones and those based on the household electrical grid, it's necessary to choose the tracks to be played at the source—and constantly going off to twiddle with a computer in the house can be a bit detrimental to entertaining the guests of your backyard barbecue.

Nevertheless, we have to admit that such receivers have one major advantage: they all play exactly the same content when controlled centrally!

Being exactly in step acoustically is especially useful when using multiple devices. Some TerraTec customers use NOXONs to deliver chilled sounds to club lounges, while others have whole railway stations or shopping centers covered by a small NOXON armada. It should therefore be possible to deliver the same content to multiple NOXONs in a single wireless LAN, and that with a minimum of interventions—preferably just one—at the NOXON itself.

The NOXON's Internet radio capabilities are the solution to this problem. But before we can take advantage of those capabilities, we have to demystify the term "Internet radio" a bit. Strictly speaking, there's no such thing as genuine Internet radio at the present—each Internet radio session requires a single, dedicated connection to the server, which then streams the content to the NOXON (or any other receiver), not unlike reading a CD in an optical drive.

The technology needed to create "clean" MP3 streams is open, and thus implemented in many programs, such as **Nullsoft Shoutcast** for Windows.

As a result, it's not hard to integrate a simple streaming server in the local network capable of serving identical content such as a playlist in Winamp or VideoLAN Client (VLC) to an infinite number of NOXONs (actually, the number is limited by the bandwidth of your network). In other words, the technology is called "Internet radio", but it really doesn't matter whether the server is located on another continent or in your home, right next to your NOXON. All that matters is that the stream is available to the NOXON via TCP/IP, and that there's enough bandwidth for the transmission.

A3.1 Installation under Windows operating systems

Winamp and Shoutcast is a proven combination for Windows operating systems. A Winamp player with a Shoutcast plugin provides the content to a local or remote Shoutcast server, which in turn broadcasts the data to the terminal devices.

The combination can be installed quickly—visit **http://www.nullsoft.com** and download Winamp Lite, the Shoutcast plugin and the Shoutcast server.

All of the programs can be installed via the Nullsoft installer and need only a minimum of configuration work. The complete configuration of the Shoutcast server is stored in a single text file located by default at /Program Files/Shoutcast/sc_serv.ini. A number of cosmetic points, such as the name of the server, can be set up there. You should also use the "Password = (your password)" option to protect the server against overly communicative users of your network.

The text console of the Shoutcast server during startup

Double-click sc_serv.exe to launch the Shoutcast server. A text console will open, informing you of the status of the server. And with that, you have set up your Shoutcast transmitter—all you need now is to send some content to it using the Winamp player.

Very few things need to be set up here, and they are all available in the Winamp configuration: right-click, Options, Preferences. First, integrate the Shoutcast relay plugin into the signal chain. Simply select "Nullsoft Shoutcast Source Plugin" under "Plugin/DSP Effect". The configuration of the plugin should now open automatically. If not, open it manually with "Configure Active Plugin".
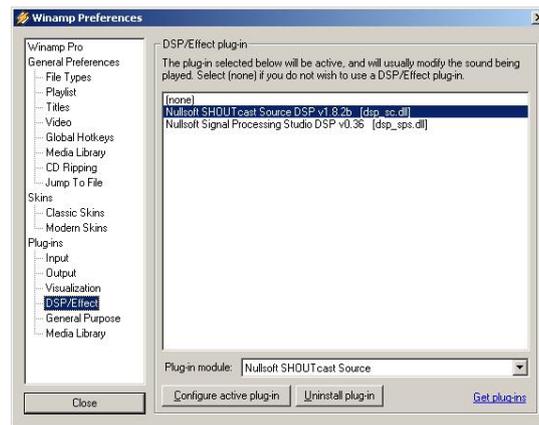
The Winamp default settings

The Input, Output and Encoder tabs require special attention here. The Input tab should normally specify "Winamp". You can, of course choose an audio input of the computer to create a PC babyphone or another "listening device". Under Encoder, select an ear-friendly bit rate—128k to 192k would be appropriate. Under Output, specify the local Shoutcast server and its password in a profile. If Winamp and the Shoutcast server are located on the same machine, enter "localhost" as the server. Click "Connect" and Winamp will set up the connection. Both Winamp and the server will signal this in their diagnostic displays.

English
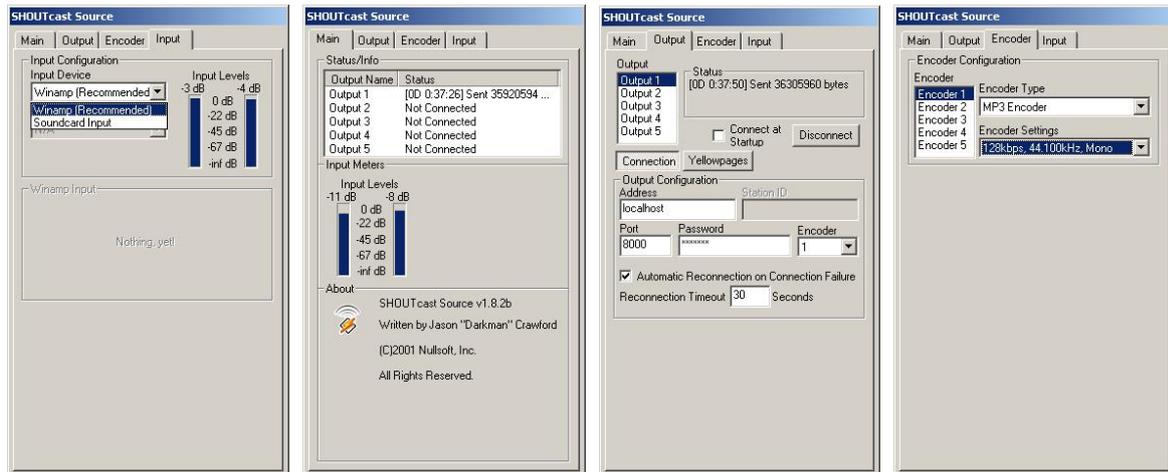
Shoutcast default settings:

A3.2 iRadio settings

The final step is to inform the NOXON of your homegrown stream. Simply use the device's web interface for this.

First, we need to find out the IP address of the server's computer by entering "**ipconfig**" at the command prompt. In our example, the address is **192.168.32.46.** The Shoutcast server uses port 8000 by default, so the correct address for the stream in this case would be **http://192.168.32.46:8000**.

Enter **http://(iRadio-IP)** in your browser to open the web interface of the NOXON. To find the IP address of the NOXON, see the device's Status menu.

Enter the address of the new stream and give it a meaningful name. Click "Add", and it will appear on the NOXON's Favorites list in future. All NOXONs that are aware of this stream and that are within the server's range can now play the same content in a synchronized manner.

B - Dealing with tough network problems...

B1 The necessary basic knowledge

Time to get technical! At this point we will be taking a closer look at what happens when establishing a connection between the NOXON and the media or music server. While it might seem a bit dry and obscure for the layman, possessing this knowledge will make a definite impression in certain circles. But of course, it would be even better if it were to help you get to the bottom of any communication problems between the server and the NOXON. Unfortunately, from time to time it may be impossible to establish a connection to the media server. Problems that cannot be solved with the information provided earlier tend to be nontrivial, but a systematic approach can nevertheless pinpoint them fairly quickly. Performing the troubleshooting work takes basic knowledge of network technology and an understanding of some specialized terminology.
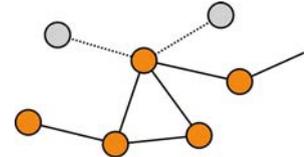
My type, your type. As a rule, the current version of the Internet protocol (IPv4) distinguishes between A, B, C and MC address ranges. With the exception of the MC network, they are very similar technically and roughly describe the size and scope of the network (number of computers per network). The smallest network type, the C network for a maximum of 254 computers, is generally used in home environments. As described above, most of the computers then "answer" to addresses such as 192.168.0.100, 192.168.0.55 or similar, sharing the first three blocks, i.e. 192.168.0. All of the computers on the network can be reached via a single IP address, the so-called broadcast address, 192.168.0.255 (in the network, 192.168.0.0/24). A slight modification of this technique is used by our NOXON. If you have set everything up correctly, the NOXON will be located in the same network address range as the music server. Let's have a closer look at the connection process.

1   The music server starts and sends a broadcast ("Hello, I'm a music server and this is my address!") to the address 239.255.255.250. This address is in the MC or multicast range (similar to a broadcast address like the one above, but one that reaches all lower-level networks at the same time) and will be received by all devices, including the NOXON. The NOXON continuously monitors port 1900 for such broadcasts in order to detect new media server friends.

    Note: The SSDP service is used by Windows to detect Universal Plug & Play components such as our NOXON. The service is enabled by default in Windows XP and searches in the background for suitable devices.

2   The NOXON, on the other hand, sends a normal TCP/IP connection request to the target port 8080 (HTTP), transmitting its so-called client description to the music server. This description contains information on the NOXON and what it can play.

3   The server in turn sends a detailed description of itself (server, version and available services) to the NOXON. Everything is provided by the music server, depending also on the server's version and type. If you decide to sort by ARTIST, for example, the NOXON will send a query to the server ("Send me a list of all of the artists you have stored!"). The server will then send the contents of the directory, in this case the ARTIST list according to the filter rules transmitted by the NOXON.

4   Select a track to play and the music server will transfer it. The server will start the transfer on port 1024, but will change it regularly during the transmission.

B2 Known issues

1. Wired connection (LAN)
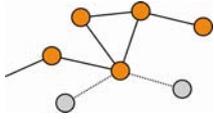
As you may already know from other wired network devices, establishing a link essentially just involves plugging in the cable. Please ensure that a sound physical connection is present **(left LED lit orange)**. If that is the case and a connection is still not available, then the problem will be either the settings of your gateway (the computer in your network that manages the connection to the Internet) or those of your router. The description of the network port on page 10 already brought up this topic, but please also see "4.3 For deeper understanding: about routers, SSID, MAC & IPs" on page 17 for more information. As is often the case in life, it helps to be on good terms with your favorite administrator. Heartfelt thanks and a charming smile often goes a long way.

2. No radio link between the server and NOXON

The fact that an MC broadcast is used for the first connection attempt between the client and server makes this initial connection relatively vulnerable. Depending on the network adapter, the MC range is often not routed at all in the network, especially when using wireless adapters. A number of local packet filters (such as firewall programs) see this form of communication as an attack on the system and thus filter it. Most better-quality firewall programs initially reject these broadcasts, but can be set up to permit unrestricted communication by entering the NOXON as a so-called trusted host.

The Windows firewall, for example, offers exceptions for a variety of protocols and technologies, and the default option "Universal Plug and Play" in the advanced settings allows unrestricted traffic for UPnP services.

If this option is not available, disable local packet filtering for the NOXON's IP address. In this case it's of course advisable to assign a fixed IP address to the NOXON to ensure that the rule does not need to be edited continually. You should also perform a check to determine whether Multicast communication is even possible. A variety of scenarios are conceivable here depending on the network adapter, especially in the case of Windows-based ad hoc wireless networks. You should also determine whether communication with the NOXON is possible at the most basic level by pinging it.

- Open the configuration of the NOXON, select Status and scroll to the IP Address item. If "being configured" is displayed here, then the device has not yet found a connection to the DHCP server, or a DHCP server is not available. In this case, check your network configuration before proceeding.

- Now, ping the NOXON from the computer running the music server. Open the command prompt (Start > Run > and enter "CMD") and enter "ping 192.168.1.157", using the actual IP address of your NOXON, of course. If you receive replies to your ping (the time in milliseconds until the reply was received will be displayed), then basic communication is possible. If that is not the case ("host unreachable"), then carefully check your communication—especially with regard to encryption and IP addresses.

In summary, use the following checklist:

✓ **Is the music server running correctly?**

Are all of the configuration files correct and does the server appear in the Processes list (CTRL + SHIFT+ ESC)? If it is not listed, check your server-side configuration.

✓ **Is there a conflict with your filter or firewall rules?**

The firewall can be disabled completely as an extreme measure when running Windows, or its functionality should not be extended to cover the NOXON. Disabling it briefly for the test can be useful when hunting down the problem.

✓ **Is any form of communication with the NOXON possible?**

A ping to the NOXON's IP address as described above will clarify this question. If the NOXON doesn't respond to your ping, it certainly won't be able to communicate via UPnP. If you are not successful here, then you have a different network problem which can range from a typo in the encryption key to massive configuration errors.

✓ **Does the network adapter support broadcasts in the MC range?**

A number of wireless network adapters do not support MC broadcasts while in ad hoc mode. That, however, prevents a fundamental part of the connection establishment. Please contact the vendor of your network adapter for more information.

3. The connection fails after several minutes

This points toward one of the small peculiarities of the UPnP standard. The useful communication begins on one of 1024 ports and changes regularly during operation. Not all firewall applications recognize this knocking on various doors as a continuous connection. Depending on its configuration, the firewall may decide not to ask the unknown visitor in.

Depending on the firewall application, the following actions will solve the problem:

- Specifying the NOXON (with a static IP) as a so-called trusted host, i.e. a device whose communication is guaranteed not to be malicious.

- Allow the server to communicate with the NOXON on ports 1024-65535.

- Activate an exception for "UPnP Framework" in the Windows XP firewall, or set other firewalls to allow UPnP communication.

C - FAQ – Other questions and solutions

The current FAQ (Frequently Asked Questions) for initial problem-solving can be found on the Internet at http://www.terratec.de/support

The NOXON finds my access point, but not my computer.

- Please ensure that a UPnP server is installed on your system and that this is enabled. Depending on the distance and software, it may take several seconds before your selection is listed in the NOXON.

- You may have MAC address filtering enabled in your router. If so, enter the MAC address of the NOXON in your router configuration. The address can be found on the bottom of the NOXON.

- Your router may be configured to use fixed IPs. If so, enter an IP address in both the NOXON and your router.

My access point (SSID) is not listed.

- The NOXON can only find your access point if it is within range. Reduce the distance to the access point and try again.

- Depending on the configuration of your router, your SSID may be hidden. If so, you must enter the SSID in the NOXON configuration menu manually.

My NOXON sees several unknown access points.

If multiple access points are within range—those of your neighbors, for example—the NOXON will list them. Select your own access point and continue with the installation.

My NOXON indicates that my network is encrypted.

Your network uses WEP encryption as protection against intruders. Enter your WEP key in the NOXON so that your network will recognize it as a user.

Where can I find my WEP key?

If you set the network up, you will have specified it yourself. Otherwise, contact your network administrator.

I can't receive radio streams, or the update fails.

- Your network may be using a proxy server that you have not entered in the configuration of your NOXON.

- You cannot connect to the Internet. Your router must be configured so that you can establish a connection to the Internet.

- If you are using the NOXON with an ad hoc connection, your local computer must be connected to the Internet and must have Internet connection sharing enabled.

I'm playing a music file, but I can't hear anything.

Either the NOXON is muted, or the volume is so low that you can't hear anything. Turn up the volume and/or press the Mute button. Ensure that the connected stereo or speaker system is powered up. In the case of DRM content, the digital output is disabled for legal reasons.

The radio stream is interrupted suddenly.

You may have a throughput problem with your Internet connection. Sometimes the problem is also with the station itself. Switch to a different station and try again. Also see the solutions in Appendix B.

Playback stops abruptly.

This may be due to a communication problem. It can be the result of radio interference, being out of range, or problems with your server or router. Reboot your system and try again. Also see the solutions in Appendix B.

My computer/NOXON has found an unknown ad hoc network.

An additional ad hoc network is in operation in your vicinity. Should you have problems with your configuration, please ensure that the option to automatically connect with non-preferred networks is disabled in the network settings. Disable and re-enable your network connection.

My computer cannot be found when switching from ad hoc to network mode (or back).

Restart the music server and your NOXON. Your computer will then be recognized again.

How can I make subsequent changes to my configurations?

Press the network button 🖳 on your remote control to open the configuration menu, in which you can modify a wide range of settings.

How should I proceed with a manual IP configuration?

Press the "Network" button to open the configuration menu. Launch the wizard, select "Next" and select your access point as usual. The "Static IP address" option must be selected in the IP settings. In the next step, enter the IP address. Finish the setup with the proxy settings as usual and apply them.

Can I check all of my settings?

Yes, by selecting "Status" in the configuration menu. The full range of information and settings related to your current configuration is displayed here.

I would like to set up another profile for a different location. Is that possible?

Yes, the "Profile selection" item is located in the configuration menu. You can create three personal profiles here that will be stored in the NOXON and which can be selected whenever you need them.

What's the maximum range?

Outdoors, the range is around 300 m. Walls and furniture reduce the range significantly indoors. The weather and barometric pressure is a further factor. The alignment of the antenna of your access point or network adapter is also important. Taking all of these factors into account, a range of 30-100 m should be possible indoors.

Which file types does the NOXON support?

The NOXON plays MP3 and WMA files (with DRM10). It also supports M3U and PLS playlists and most ASX streams (please check our website from time to time for updates which may expand support for individual formats!).

Is the data communication truly secure? Does the NOXON represent a security risk for my network?

If your network is WPA-encrypted, data communication between it and the router will be just as secure as with any other client. The NOXON therefore does not represent a potential point of attack for hackers.

Is it possible to read or view other data on my hard drive?

No, the NOXON can only access data shared by the UPnP server. This is the sole route the NOXON can use for accessing your files, so nothing else on your computer will be visible or transferred.

Which communication standards does the NOXON support?

NOXON supports IEEE 802.11b networks at 11 Mbps as well as IEEE 802.11g at 54 Mbps.

What are the NOXON's power requirements?

The iRadio requires an operating voltage of +12V DC at 1000mA—which corresponds to the included power adapter.

Is wireless data communication a health hazard?

Due to its very low power levels, WLAN data communication is less critical than the radiation from cell-phones. As it does with cellphone radiation, however, the density of the radiation and the nature of the room also play a role in this respect.

D - Technical glossary

Access point (AP) — An access point is a network component that WLAN clients (terminal devices) connect to in order to exchange data with the Internet or other clients. It is identified via its SSID. The NOXON can connect with an AP in order to obtain files from computers in the local network or audio streams from the Internet.

Ad hoc network — Ad hoc network (ad hoc: Latin, literally "for this purpose") refers to a wireless network topology between two or more mobile devices without a fixed infrastructure. An access point is not required. The NOXON can also be used in ad hoc mode. You merely need a local computer with a WLAN adapter and your NOXON.

DHCP — The abbreviation for Dynamic Host Configuration Protocol. This protocol permits IP addresses and configuration parameters to be allocated to computers dynamically. DHCP permits the integration of additional network components without configuration. The NOXON configuration wizard supports DHCP, so no further configuration parameters need to be specified.

IEEE 802.11b/ IEEE 802.11g — Industry standards for wireless networks issued by the Institute of Electrical and Electronics Engineers. The b standard refers to a maximum bandwidth of 11 Mbps, whereas g supports 54 Mbps. Our NOXON supports both IEEE 802.11b and IEEE 802.11g networks.

IP (IP address) — (Internet Protocol) refers to a common communication protocol for computer networks. Each client has its own IP address consisting of four groups of digits separated by dots (e.g. 127.80.1.34). IP addresses are allocated automatically when using DHCP. The IP address can also be entered manually if the NOXON is not configured via DHCP.

LAN — A LAN (Local Area Network) is a computer network in a limited geographical area (in general a cable-based network).

MAC address — (Media Access Control address) is the hardware address that serves as a unique identifier for every hardware component in a network. The MAC address is fixed and can not be modified. As the NOXON is a network component, it also has a fixed MAC address. It can be found on the bottom of the device.

Peer-to-peer connection (P2P) — This describes communication among devices of an equal rank. All partners have the same status and identical functions. In an ad hoc network, the NOXON and your local PC represent a P2P connection.

Proxy server — Some networks—especially large corporate ones—use proxy servers to minimize the data volume requested continuously or by multiple users. They act as a kind of buffer between the Internet and the users in the local network. A proxy stores static Web content so that it does not need to be downloaded again the next time the page is requested. If you have a proxy server in your system, enter its settings in the NOXON to prevent any complications.

Router — A router is a piece of communication hardware that ensures that data packets sent through a network arrive at the correct destination computer (client). In many cases, routers interconnect networks such as LANs and WLANs. The NOXON is also a client that receives data packets in this manner.

SSID (ESSID) — The Service Set Identifier (SSID) or network name is the identifier for IEEE 802.11-based wireless networks. Every wireless LAN has a configurable SSID or ESSID (Extended Service Set IDentifier) as a unique network ID. In other words, it is the network's name. The NOXON recognizes all found networks automatically and also supports the manual entry of SSIDs.

UPnP — This abbreviation stands for Universal Plug and Play, which is based on a number of standardized network protocols and is designed to provide cross-vendor control of devices (stereos, printers, routers, household systems) via IP-based networks. The NOXON is a UPnP device capable of receiving files from a suitable application.

WEP encryption — WEP (Wired Equivalent Privacy) describes a type of encryption for WLANs. Naturally, NOXON can also receive and interpret WEP-encrypted data.

WPA encryption — Like WEP, WPA is an encryption and authentication standard. WPA was developed to eliminate the fundamental weaknesses of WEP encryption. WPA can thus be seen as the secure successor to WEP.

WiFi — A certificate for WLAN products that comply with IEEE802.11 standards and are compatible with other products. The NOXON also fulfills the technical standards of the WiFi consortium.

WLAN — Also Wireless LAN or Wireless Local Area Network. The NOXON connects to your network via WLAN. It receives data via the local wireless network, processes them and plays it in the form of audio files.

E - Service at TerraTec

"Rien ne va plus—Nothing's working" can happen to the best systems. If this happens to you, the TerraTec team is happy to offer its service and support.

Hotline and Internet

In case of a serious problem—where you can neither solve the problem on your own nor with the guided help found in this manual, nor with the help of your dealer—please contact us directly.

If possible, try our Internet support system first: under **www.terratec.de/support** you will always find current answers to frequently asked questions (FAQ) and the latest drivers.

If these options do not provide the necessary help, please contact our phone helpline or contact us online at **http://supportde.terratec.net/kontakt.php**.

In addition, it would be helpful to our technicians if you are at your computer during the phone call so that you can carry out our tips and tricks directly. Please do not forget to write down the name of the respective support technician if you contact our Support Team. You will need this name if a defect is present and your device needs to be mailed to us.

Broken?!

Before you send your device back, be sure to contact us! Make a note of the name of your support contact and follow these simple instructions:

- Please fill out the service request form provided with your card clearly and completely. The more clearly and detailed you describe the problem, the faster we will be able to help. Cards sent in without a description of the problem cannot be processed and will be returned to you at your expense.

- Be sure to include a copy of your purchase receipt (not the original) with the package. If we do not receive a copy of a receipt, we will assume that the warranty for the product has expired and will bill you for the repair.

- Please use a sufficiently strong and padded mailing package. We recommend using the original package. Remember that the card is a sensitive electronic component.

- Be sure to include enough postage—we will cover for the postage for the return to you.

;-)

General terms and conditions of service

1. General

By purchasing and receiving the goods, you accept our general terms and conditions of service.

2. Proof of guarantee

We will require a copy of the purchase receipt or delivery slip as proof of warranty. If you do not supply proof of warranty, we will charge for repairing the goods.

3. Description of problem

Shipments that do not include a description of the fault or an insufficient description ('defective' or 'for repair' is insufficient) will be returned for a processing fee, because this makes repair more difficult and could have been avoided.

4. Invalid returns

In the event of an unfounded complaint (no fault could be detected, probable operating error), we will return the goods and a processing fee will be charged.

5. Packaging

If possible, please use the original packaging for return shipment. Any warranty claim will be jeopardized by improper packaging. The warranty will not apply to damage caused by improper packaging.

6. Foreign manufactured products

Devices that are not manufactured or distributed by TerraTec Electronic GmbH will be returned and a processing fee will be charged.

7. Repairs liable to your expense

Repairs out of the warranty period are liable to your expense.

8. Transportation costs

The dispatcher pays all costs associated with shipping and insurance for the goods for repair to TerraTec Electronic GmbH. If the goods are covered by warranty, TerraTec Electronic GmbH will pay the shipping costs for returning repaired goods. COD shipments will not be accepted for organizational reasons.

9. Final regulation

TerraTec Electronic GmbH reserves the right to change or supplement the general terms and conditions of service at any time.

Otherwise the General Terms and Conditions of Business of TerraTec Electronic GmbH are considered to be accepted.