

CLASSE

Computer Audio Guide Part Two: Streaming via Ethernet

SETUP GUIDE FOR APPLE AND WINDOWS



ETHERNET

Part One of our Computer Audio Guide discussed computer audio and how to use the USB inputs of the CP-800. Part Two will focus on streaming audio using the Ethernet connection.

INTRODUCTION

The rear panel USB input of a CP-800 can give you state-of-the-art performance from a computer, but is subject to certain limitations in the physical setup. The USB interface requires that the computer be installed somewhat close to the preamp. The maximum recommended USB cable length is about 3m or 10ft, so it might be impractical for certain installations. Above fifteen feet USB data transmission becomes unreliable or simply might not work. For those who already have a computer or a NAS device located in another room, the Ethernet port allows streaming music files over far greater distances via the home network. In this set-up, the CP-800 is connected using a network cable, typically Cat 5, as described below. The router becomes the hub between computer(s) and/or NAS device(s) on the network and the renderer (CP-800). It is possible to run a network cable up to 100m (more than three hundred feet) between the router and the renderer. If it is not practical to run a network cable directly from the router, various wireless bridge and Ethernet over Powerline options are available and will be discussed later in this guide.

Even if you don't use the Ethernet connection for streaming music, you can benefit from what's called IP control. With the CP-800 connected to your network, preamp functions such as Volume, Source Selection, Tone Control, etc., can be fully controlled via Wi-Fi from an iOS device such as an iPad, iPad Mini, iPod touch or iPhone using the free Classé app available from the Apple App Store. In addition, as with the USB setup, you can use these devices to access your music libraries as well as transport functions such as play, pause, stop, etc., over your Wi-Fi network.

As in Part One, we will discuss separately Apple and Windows because of their different characteristics. For instance with Apple we will refer to the Ethernet connection as AirPlay and with Windows it will be DLNA.

TERMINOLOGY

ETHERNET

Computer networking technologies for LANs (Local Area Networks) enable networking of computers, appliances, personal devices, even hi-fi systems. Used for industrial, commercial or domestic applications, in this guide we use the term to refer to the physical cables and connectors associated with home networks. In a domestic system, Ethernet provides the physical connection to the main hub or router for connecting to the Internet and communications among different devices such as computers, appliances, etc. Although several standards exist, the connection is typically wired using network cables called Cat 5. For wireless connections to the network, we use the term Wi-Fi.



DLNA

Digital Living Network Alliance (DLNA) standards define the interoperability guidelines to enable sharing of digital media between multimedia devices. DLNA uses Universal Plug and Play (UPnP) for media management, discovery and control. Discovery identifies the type of device that DLNA supports (e.g. digital media server, renderer or player) and the mechanisms for accessing media over a network. The DLNA guidelines then apply a layer of restrictions over the types of media file format, encodings and resolutions that a device must support.

Apple is not a DLNA member. Apple uses its own proprietary Digital Audio Access Protocol (DAAP) instead of DLNA's UPnP protocols. It is possible to use DLNA with a Mac, however. The JRiver Media Center media player described later in this document is available in a version designed for the Mac OS.

DLNA relies on three software components: **media players, file servers and renderers.**

MEDIA PLAYER

This term is typically used to describe computer software for playing back multimedia files. While many media players can play both audio and video, others focus only on one media type or the other. Such players are known as either audio players or video players and often have a user interface tailored for the specific media type.

Media players often display icons known from physical devices such as tape recorders and CD players. Examples of these icons are Play, Pause, Stop and Skip. A media player will also display metadata such as Artist, Album, Genre, Song, etc. Although there are many others, in this document we will refer to specific media players such as iTunes for Apple and JRiver for Windows.

FILE SERVER

In computing, a file server is a computer attached to a network that has the purpose of providing a location for shared disk access (i.e. shared storage of computer files such as documents, sound files, photographs, movies, images, databases, etc.). Shared content can be accessed by the computers or workstations that are attached to the same network. For hi-fi applications, the file server can be your computer hard disk or a NAS device, equipped with software that allows it to serve files over the network.

MEDIA RENDERER

A media renderer is any device that can receive the music files from a file server and perform the digital-to-analog conversion for playback. The CP-800, when connected to a network, is a renderer. A/V receivers or DACs equipped with an Ethernet port and/or Wi-Fi



for streaming audio are also media renderers.

AIRPLAY

The Digital Audio Access Protocol (DAAP) is the proprietary protocol introduced by Apple in its iTunes software to share media across a local network. DAAP addresses the same problems for Apple as the UPnP AV standards address for members of the Digital Living Network Alliance (DLNA). The protocol used for AirPlay is DAAP. AirPlay is a proprietary protocol developed by Apple to allow wireless streaming of audio, video and photos, together with related metadata between devices. AirPlay is usually known as a wireless system but with the CP-800 a hard-wired connection is used instead because it provides a more reliable and higher speed connection than is typically available over Wi-Fi.



CAT 5

Short for Category 5, this is the most common type of network cable used for Ethernet connections. It is easy to find in hardware, office or electronic supply stores pre-terminated with plugs and at different lengths. Your local hi-fi retailer will most probably be able to sell you custom lengths and put the plugs on. In real world applications Cat 5 will work well up to distances of 100 meters (330 feet). The connectors used on Cat 5 cables for Ethernet are called RJ45.



ROUTER

The most familiar type of routers are home and small office routers that simply pass data, such as documents, web pages, email, videos and audio between the home computer(s), printers, media renderers (CP-800) and the Internet.



NAS

A Network Attached Storage (NAS) device is a particular type of computer, connected to a network, which provides only file-based data storage services to other devices on the network. Although it may technically be possible to run other software on a NAS unit, it is not designed to be a general purpose computer. For example, NAS units usually do not have a keyboard or display and are controlled and configured over the network, often using a browser. NAS systems contain one or more hard disks, often arranged into logical, redundant storage containers or RAID (Redundant Array of Independent Discs). In other words, a NAS is a computer-based hard drive system for providing storage and distribution of media files. The RAID system makes an exact copy of the files on two hard drives (or more) so if one hard drive fails (sooner or later!) your music and other files will not be lost. By replacing the failed hard drive with a new one, the surviving hard drive will copy its files onto the new

one, restoring the redundancy. With this system your music library always has a back-up copy—unless of course, in the very unlikely event that all of the hard drives would fail at the same time. This should be quite reassuring for most people to think that a redundant hard drive always makes a copy of the first hard drive, right? Wrong! Unfortunately, a NAS should not be considered a foolproof back-up for your music collection. If a virus ever infects your NAS it will infect equally every hard drive. A good strategy would be to buy an additional USB hard drive and use it as a back-up copy of your NAS. After you've taken the time to rip a complete collection of CDs you will not want to go back and do it again (the equivalent of going directly to jail without claiming the \$200 dollars it will cost for a USB hard drive!).

A NAS is also completely agnostic in terms of music related technology. It will simply store any music file format at any resolution and for this reason you can pretty much consider a NAS device future proof.

Like a computer, your NAS needs an Operating System to work. A NAS usually works on a Linux Operating System (included). So, like on a computer, we now have hard drives and an OS. We only need one more thing: media server software. Usually, when you buy a NAS, the media server software is already included and installed; if not you can download a free media server like **Twonky Media**, which is used by many NAS companies and works well.

Twonky Media server is NOT a media player (like iTunes or JRiver), it is a UPnP server only. Setting up your NAS and media server is done with your computer using a web browser, such as Windows Internet Explorer or Apple's Safari. The instructions provided with a NAS will usually make the installation easy and straightforward. You could imagine a NAS as a jukebox serving your hi-fi system.

A little note of caution: as previously mentioned, a NAS is agnostic but the media server software is not. For instance many media servers do not process AIFF files (proprietary to Apple). Before you buy a NAS and its associated media server software, you should check which file formats are supported to make sure it will meet your needs.

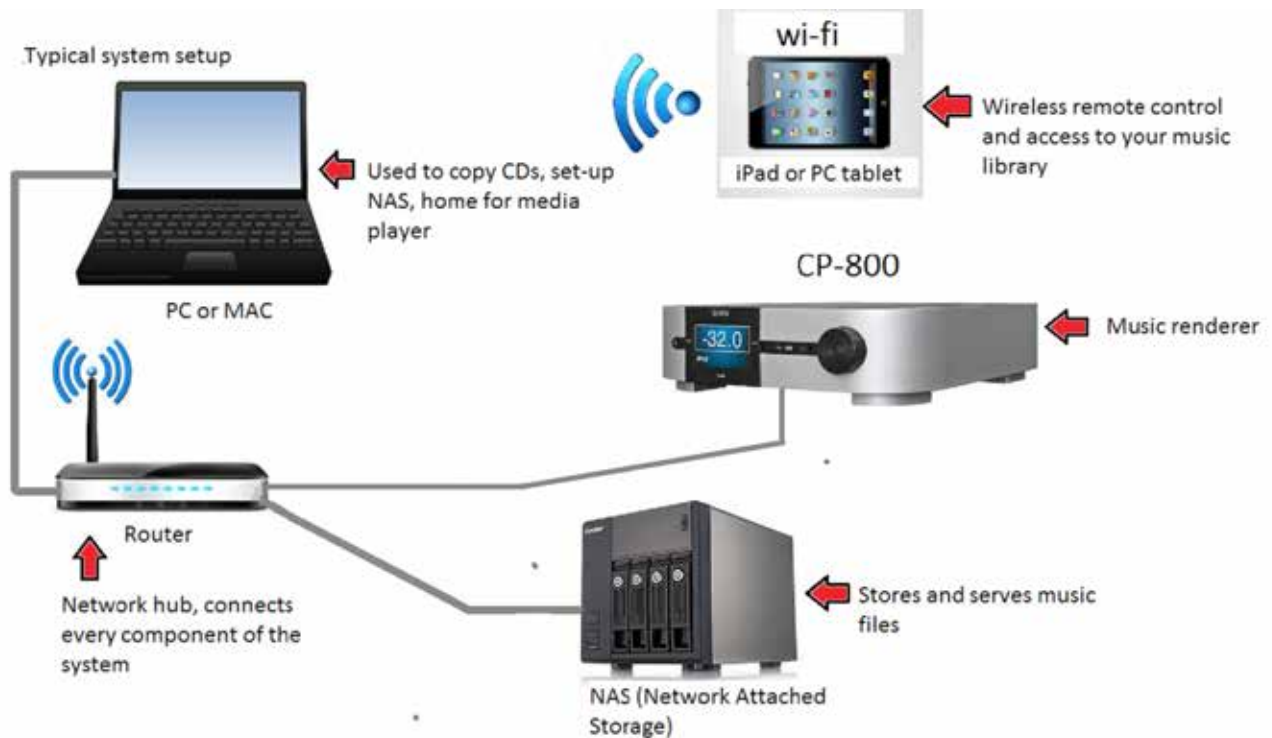
Popular NAS devices for domestic applications are QNAP, Synology, LaCie, Seagate and Western Digital.

For those who have just purchased or updated to Windows 8, there is a web site describing how to set-up a media server in Windows 8:

Click here:

<http://topnettricks.com/windows-8-dlna-media-server/>

Below is a typical network setup. The router is the hub where all Cat 5 cable connections and wireless Wi-Fi transit. Another system, for starters maybe, would be to remove the NAS and use only the computer's hard drive to store music files.



CLASSÉ APP

Go to the Apple App Store and type "Classe audio" in the search engine to access and download the free Classé app.

[App Store](#) > [Music](#) > [Classe Audio](#)

The Classé application will work on any iPad/iPhone/iPod touch. (An **Android** version of the app is currently under development for Google Nexus, Samsung and other PC Tablets.)



Once your Classé app is downloaded onto your iOS device, simply touch the Classé icon to start the app.

The Classé app will give you wireless control of typical remote control functions such as volume, source selection, tone control, play, pause, skip, etc. as well as information such as sampling rate and file format of what's being played and even network performance (speed).



Above: Three example screenshots of the Classé app.

WIRED VS. WIRELESS

The CP-800 uses a wired Ethernet connection because it provides a more reliable and higher speed connection than is typically available over Wi-Fi. If it is impractical or impossible to run Cat 5 cables to your hi-fi system, other alternatives exist. You could for instance use a wireless bridge like an **Apple Airport Express** to receive the files being transmitted wirelessly from your router. Simply connect an Ethernet cable between your CP-800 and the Airport Express.

Even if your CP-800 is directly connected to your router with an Ethernet cable, your iOS device still needs to be connected to your router via Wi-Fi in order to use the Classé App and to conveniently access your music files. If the router is far from your listening room the Wi-Fi signal could be weak. The Airport Express, or any wi-fi extender will give you a strong local wireless connection.

Another way to use Ethernet without a direct Cat 5 connection is with a **Powerline Ethernet adaptor**. These adaptors, such as those offered by Netgear and others, actually give you a **wired connection!** They connect into AC outlets and use the electrical wiring of your house to make the network connection. At first glance, for an audiophile, transmitting music through the electric cables of a house would sound like an abomination but it is not. With this system the files will be transmitted without noise or degradation. This system uses two adaptors. One connects with cat 5 to your router, the other to the CP-800.



Above: Various Powerline Ethernet Adaptors




APPLE AIRPLAY

AirPlay


APPLE AIRPLAY

The CP-800 is AirPlay-certified; it can render audio content from Apple iPhone, iPad or iPod touch iOS devices or from iTunes running on a Mac or PC.

To play content on the CP-800:

1. Connect your device to the same network as the CP-800.
2. Open iTunes or the Music app on your iPhone, iPad or iPod touch.
3. Locate and tap the AirPlay icon  and select the CP-800 from the menu (if attempting to AirPlay video content from Safari or Videos, begin playback first). Note that for newer versions of iOS firmware, the Control Center shown below is accessed by swiping up from any screen.
4. Press play.



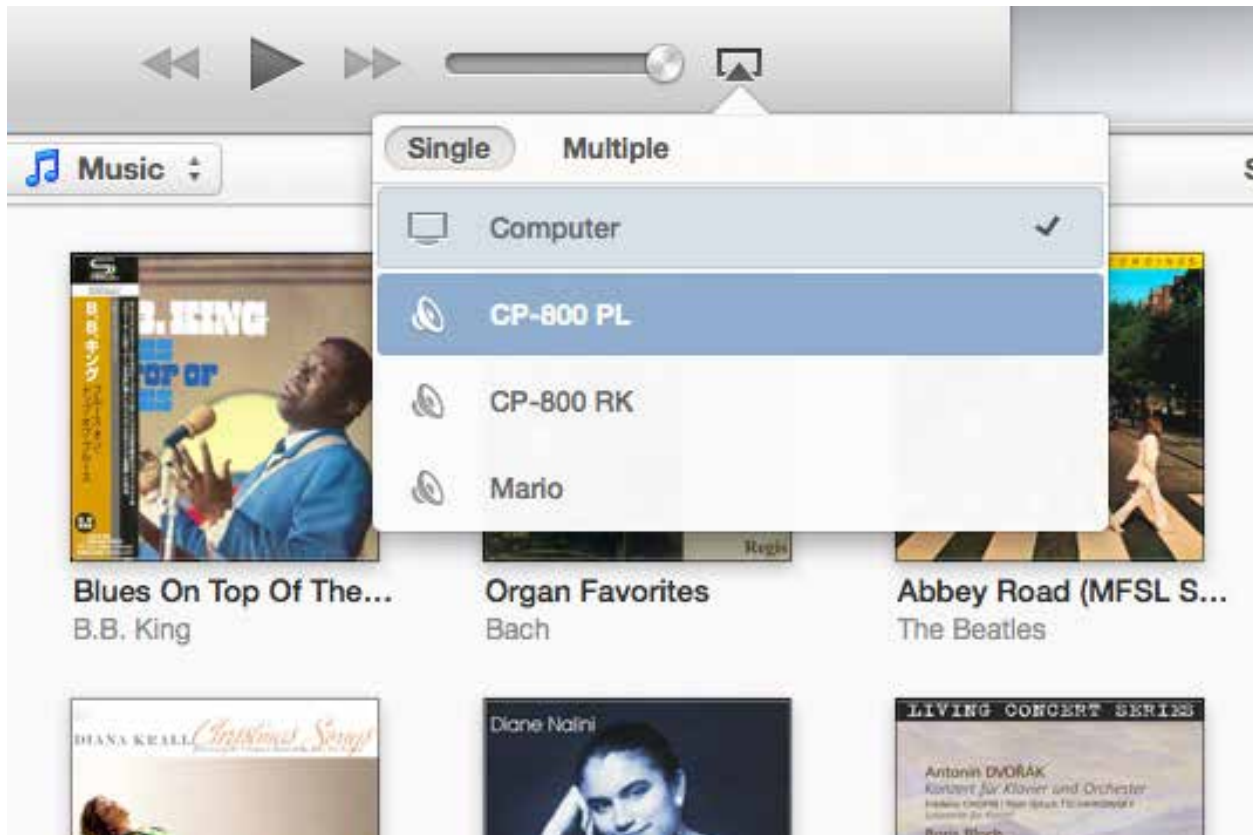
 AirPlay icon on an iPhone

When you play content over AirPlay the CP-800 will automatically select the Network source; in fact, the system will go ON automatically if it is in standby. If your CP-800 has multiple sources that select the Network input, the system will select the most recently used source.

The CP-800 home page shows stream status including the clock status (sampling frequency) and file format (ALAC for AirPlay). File formats such as FLAC, WAV, AIFF and others may be shown when streaming with DLNA sources).

The CP-800 supports the Apple AirPlay protocol for streaming audio through a network using wired (Ethernet) or wireless (Wi-Fi) connections, or a combination of the two. AirPlay lets you stream audio from your Wi-Fi network-connected iPad, iPhone or iPod touch, or using iTunes, streaming from a network-connected Mac or PC. Working within the Apple ecosystem, iTunes supports a wide range of file formats and data rates, but AirPlay will convert them, if necessary, to ALAC with a sampling rate of 44.1 kHz. To use AirPlay, make sure a source button on the CP-800 has been enabled to use the Network connection.

Note: When your Ethernet connection is active, the green and amber lights on the Ethernet connector will be illuminated (located on the back panel of the CP-800 on the Ethernet input) and the CP-800 Network Setup page will show the status: "Connected." If no connection is present, the front panel display will show the words "Not Connected" when the Network source is selected and also appear highlighted in red when viewing the Network Setup page.



Open iTunes on your network-connected Mac or PC and look for the AirPlay icon. Click on the icon to see the list of AirPlay capable “speakers” available on your network. Select your CP-800 from this list. Choose the music you want to hear and click play. The Network source will be automatically selected and music will begin playing through your system. It’s that simple. The volume control in iTunes can be used to adjust the playback level of the CP-800. When first connected, you may find the iTunes volume set to zero, so turn it up and enjoy.

The CP-800 display will show the status of the audio stream, so when using AirPlay, it will show the sampling frequency of the signal as well as its format (ALAC is the format AirPlay streams use). You may adjust the volume in iTunes or if using Apple’s free Remote app, change volume and choose and manage music files in iTunes from your

iOS device (iPad, iPhone, iPod touch). Volume changes happen within the CP-800, which uses a high-quality analog volume control to avoid the loss of resolution associated with digital domain attenuation. If you press pause or stop, the display will indicate AirPlay - Stopped.

Using an iOS device for AirPlay works the same way. Choose the Music app icon, tap the AirPlay icon (newer devices may require you to swipe up on the screen to access the Control Center where the AirPlay icon is located), select the CP-800 from the list of AirPlay speakers, choose your music and play. Volume is likewise adjusted in the CP-800 by using the volume control on the device.

In iTunes, the AirPlay icon lets you select your renderer in the dropdown menu. If required, multiple renderers can be used on the same network.



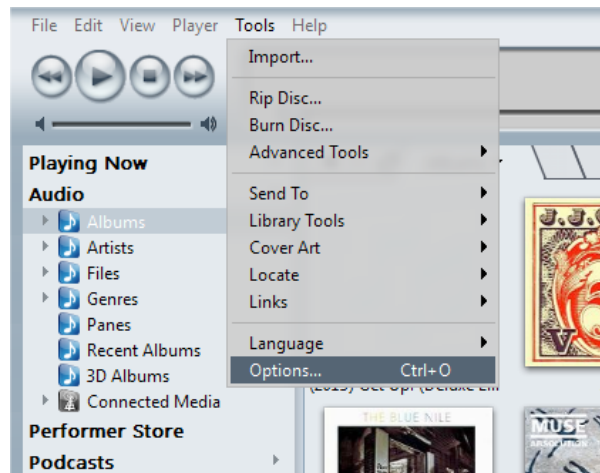
JRiver (Media Center) has a lot to offer. In addition to being a *media player*, JRiver can also be used as a *media server*. This means it can be activated for DLNA and can be used in two different manners.

1. JRiver can be used as a media player to access the files stored on the hard disk of your computer and also as a media server that will distribute your files over Ethernet to your media renderer, the CP-800.
2. JRiver can also be used as a media server to access the files stored on your NAS and distribute them to your renderer via Ethernet.

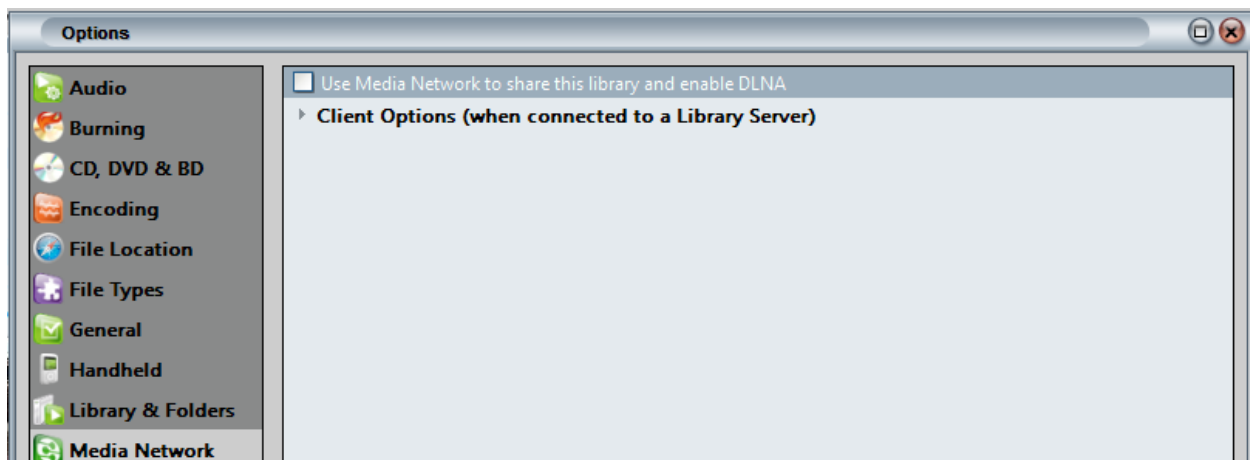
In both cases the DLNA function must be activated. This is easily done from JRiver's toolbar by just clicking a few boxes.



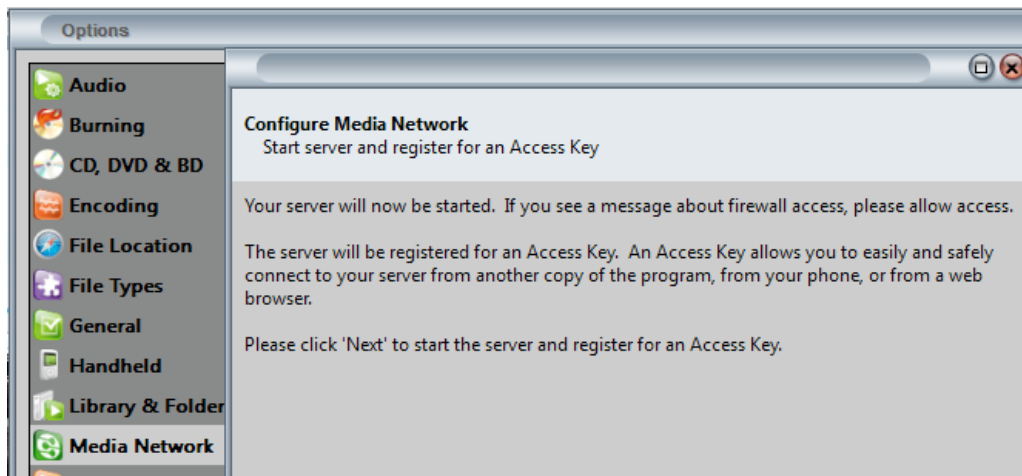
First open JRiver > toolbar > Tools > Options



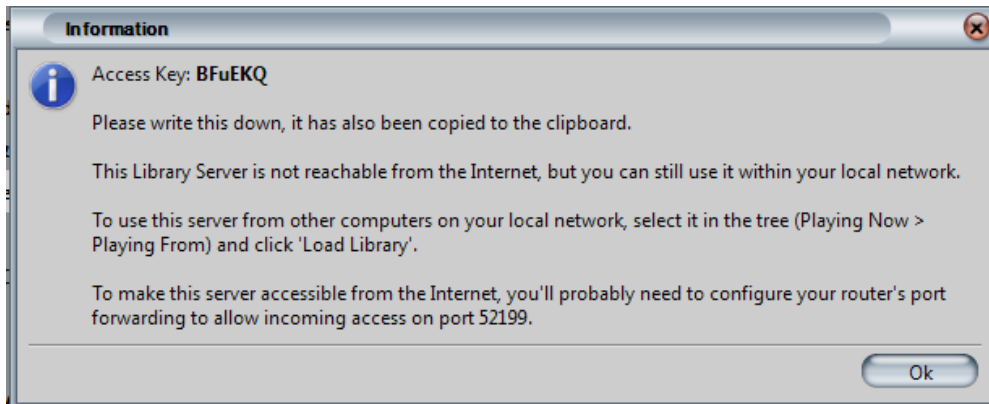
In the new window select > Media Network (it has the DLNA logo on the left).
Click the box on the first line: “Use Media Network to share this library and enable DLNA”.



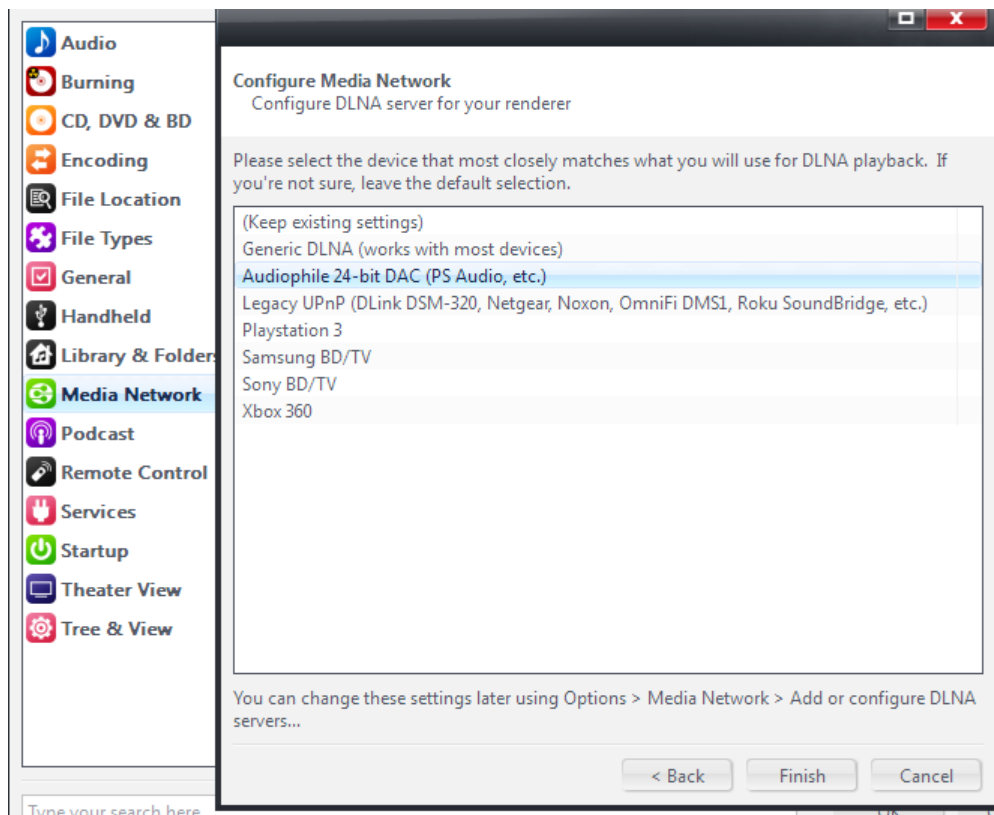
A new Dialog box will appear, click Next. This time JRiver is ready to set-up the server function. If a message about your Firewall appears, simply give JRiver the required permission to access it. Click next again.



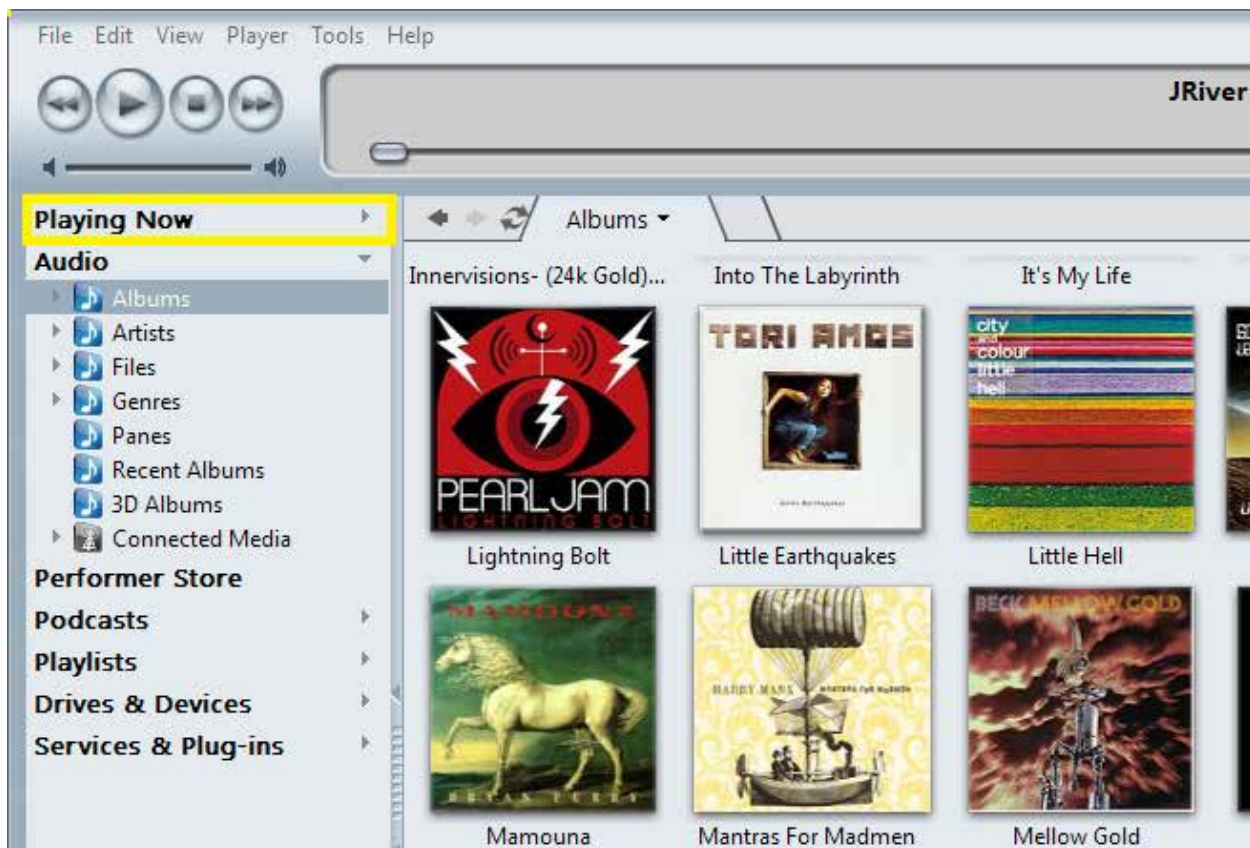
The next step will give you an access key that will be needed to connect additional devices to your network. (An iPad for example) Write down your Access Key and read the instructions. Then click OK.



In the new box, click to highlight "Audiophile 24-bit DAC". Then click on Finish.



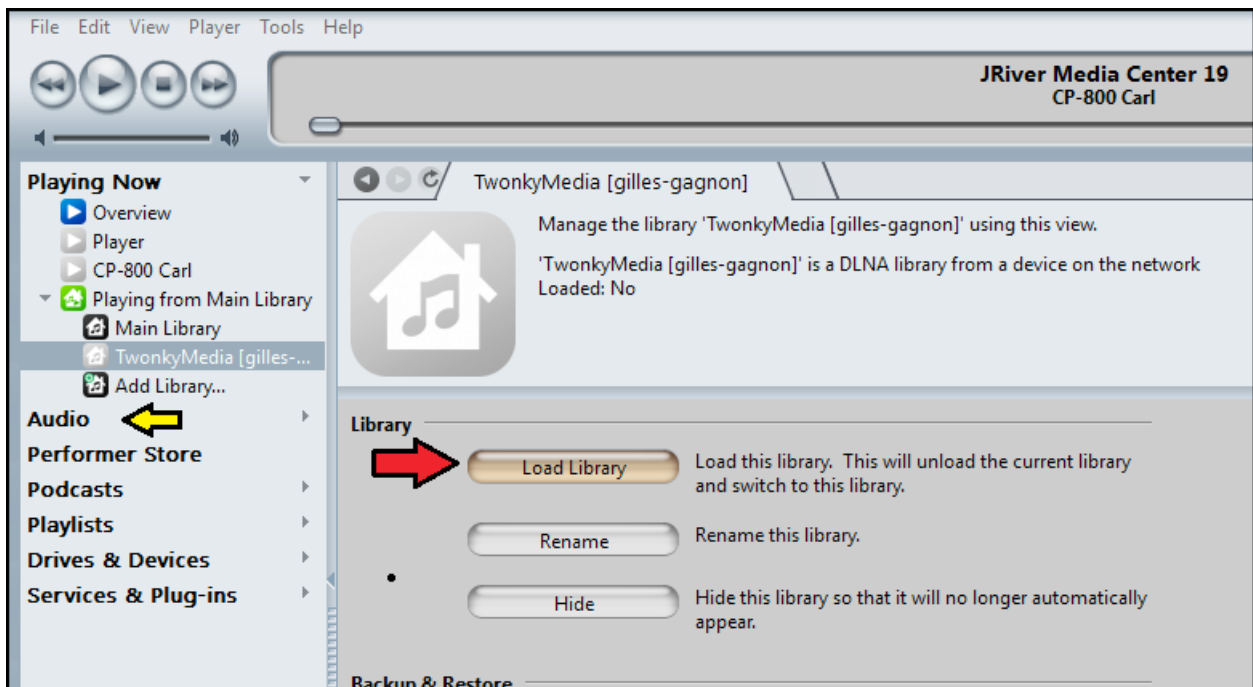
You will now be back on your JRiver usual desktop. In the upper left corner if you click on *Playing Now* you will see the CP-800 appear in the drop-down menu. You can now click on the CP-800 to connect it to your network. All set!



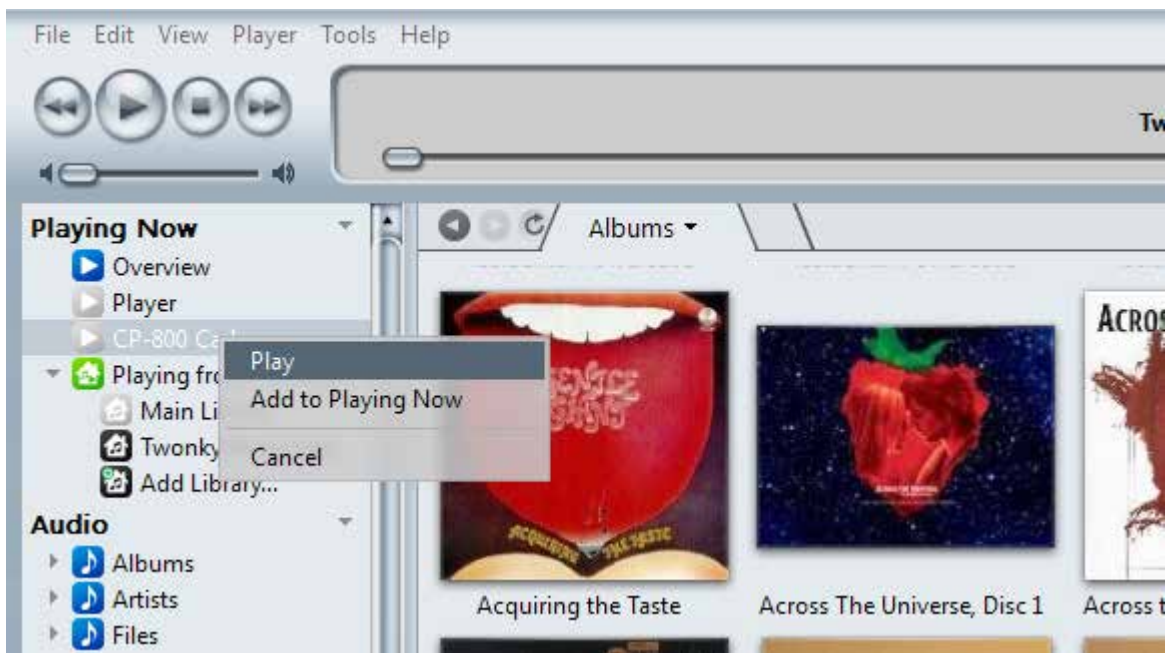
You can now control playback of music from your computer or even better, a tablet or smartphone using the appropriate app like JRemote (Windows) or My River (Mac) for iOS devices and My Music or Gizmo for Android, as described in the first section of this manual.

MANAGING LIBRARIES AND RENDERERS

The *Playing Now* drop down menu will display both your renderer and your NAS. If you want to import the metadata from the library located on your NAS: click on your NAS (here it says Twonky Media), then click on the *Load Library* button. (Red Arrow) If you then click on the Audio (Yellow Arrow) the library located on your NAS will now be visible from your JRiver desktop.



You can now drag and drop any CD or song into your CP-800 and play it now or later.



ADDITIONAL INFO

JRiver is a very sophisticated software program and if you browse through the different options and menus you will find several features that are available for both JRiver and your CP-800. For instance, in JRiver's AUDIO menu you will find an option to activate the DSP features. This menu will give you access to Parametric EQ, Bass Management, etc.

While these options could be useful for someone using an A/V receiver, an integrated amplifier or a preamp without these features, we recommend letting the CP-800 DSP and DACs do the work. This way you always have quick access to the CP-800 and can take full advantage of its high level of performance. It will also be more user friendly since you will not have to stop playback on JRiver in order to implement any changes.

A computerless system!



Using a NAS your system could be very simple, having only four elements: a NAS to store and serve your music files, a router to distribute them, your CP-800 used as the media renderer and a tablet used as a media player and remote control. Above is the schematic of such a system.

In a conventional system when a computer is used, your iPad or tablet is used as a remote control and the media player is located in your computer. In the system above the media player is located in the tablet so your tablet now performs two functions: media player AND remote control. Via Wi-Fi your tablet will access the library located in your NAS and will also control its media server. In this system a computer is no longer needed unless you would want to copy more CDs and access the Internet to get the associated metadata. Such systems often have a computer such as a laptop, join the network temporarily for these functions, but it may be off or absent from the network during listening sessions.

In order to install a media player in your tablet you need to get the required software.

APPLE

For Apple devices you can get *PlugPlayer* or *MediaConnect* from the Apple App Store. PlugPlayer and MediaConnect are both simple ways to use your existing UPnP software and devices from your iPad, iPhone or iPod touch. Using players such as these, you can stream music from your iOS device to the CP-800 without having a computer or a NAS on the network.



ANDROID

For apps for Android devices such as Google Nexus or Samsung Galaxy tablets you will have to go to the Google Play Store.

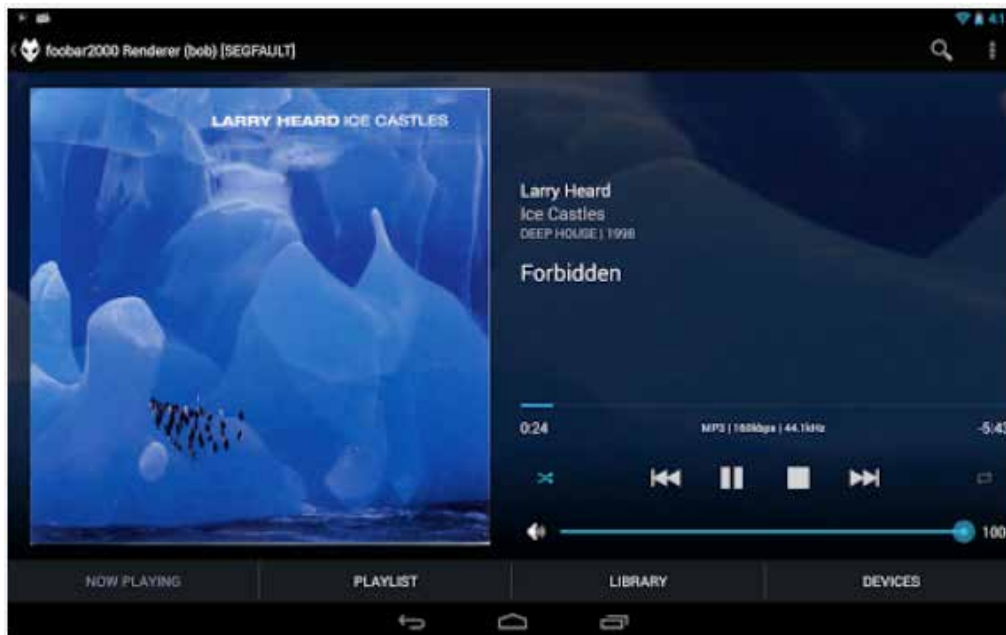
1. Type: *Google Play* in your web browser
2. Once in the Google Play store select Apps



In the next window type: bubble upnp in the search engine, press enter.



You will now have reached the download page for *Bubble UPnP*. You can choose the basic free version of Bubble UPnP to try on your system. If it works to your satisfaction you can then buy the full featured version for \$4.87. The full version is warmly recommended! Enjoy!



EVEN MORE SIMPLE? YES.

It is possible to get an even higher level of simplicity in a computerless system. It would be a system that really never uses a computer. How? Some NAS drives have built-in CD rippers to copy your CDs and get the metadata from the internet. The RipNAS is an example.



CONCLUSION

We hope this guide will be useful to get you started with steaming audio to your Classé system. It is admittedly far from covering in depth a subject which is vast and evolving at a rapid pace. This guide will however provide you with enough information to understand the basic terminology and architecture to setup an AirPlay or DLNA based system highlighting the exceptional technical and musical prowess of your CP-800.

Your Classé retailer should be able to take in charge the installation and set-up of your Ethernet based Classé system and once set up, your Classé system will provide you with many years of pure musical pleasure. This guide is aimed at those who are curious to find out how an Ethernet system works or even those who are more of the D.I.Y. type. Before you roll-up your sleeves and proceed to install your system, please take the time to read this guide carefully. We also recommend to those who are not computer savvy Ethernet experts but wish to learn more, to read more.

There are several web sites dedicated to computer audio. Some of them are well done and cover all the basics for starters and even for experts. They also have forums where you can share ideas and ask questions. Here are two good web sites:

Computer Audiophile:

Click here:

<http://www.computeraudiophile.com/>

The well-tempered computer:

Click here:

<http://www.thewelltemperedcomputer.com/>

When you open JRiver there is a tab on the main page called "Support" clicking on it will give you access to a wealth of information.

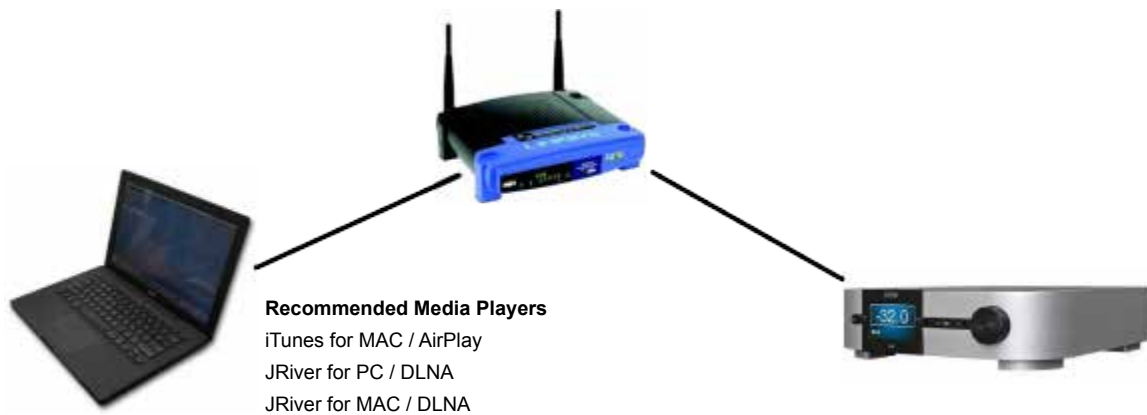
iTunes also has tutorials and user guides accessible from the tollbar > Help.

Thanks again for your purchase of Classé!



DLNA & AirPlay Network Systems Examples

EXAMPLE #1



Example #1 is the simplest DLNA/AirPlay setup possible. The three components used are from left to right, a laptop, a router, a CP-800. The laptop will host the DLNA/AirPlay music server as well as the Media Player. Recommended players are JRiver for PC/MAC and iTunes for MAC.

In this system, the player/library software such as JRiver and iTunes will stream to the CP-800 through the router. Take note that your music files will be stored on the laptop. In this case, backups are recommended to avoid loss of files due to hard disk failures. Depending on the system and software configuration used, AirPlay will provide ALAC 44.1kHz/16-bits and DLNA will go as high as WAV 192kHz/24-bits.

EXAMPLE #2



NAS drive

RipNAS is an example of a NAS drive that will provide a plug and play experience providing you with embedded applications such as a DLNA library, AirPlay support and many more applications. Additionally, ripping CDs, creating and maintaining your music library will be possible.

Recommended apps

PlugPlayer for iOS device (DLNA)
Bubble UPnP for Android (DLNA)
MediaConnect for iOS device (AirPlay/DLNA)

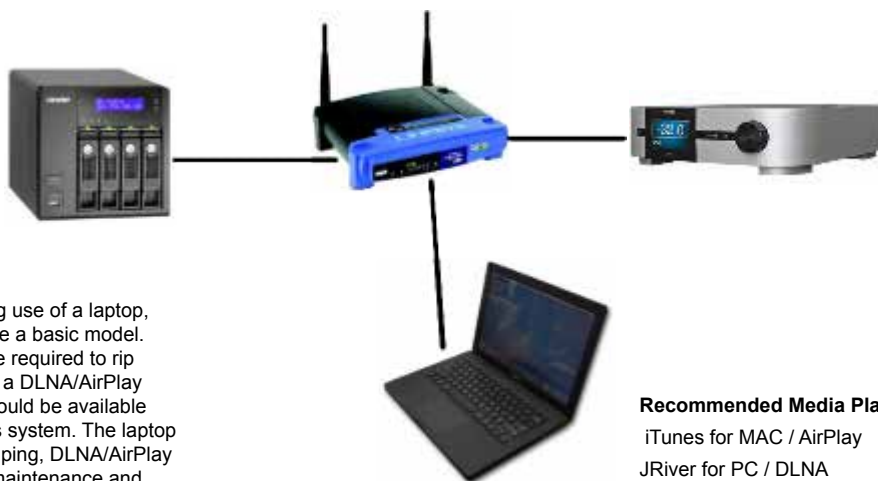
Example #2 is an intermediate DLNA/AirPlay setup. The four components used are from left to right, a NAS drive with embedded DLNA/AirPlay server library, a router, the CP-800, and an iOS device or Android device. Tested applications such as PlugPlayer and Bubble UPnP are a good start for you to familiarize yourself with this type of setup. Many applications exist, it will be a question of choice and convenience.

In this system, the portable device will act as a player. It will command streaming audio through the use of the DLNA/AirPlay library which is running on the NAS. The streaming audio will be sent through the router to the

CP-800 which is the renderer. Depending on the system used, whether AirPlay or DLNA, AirPlay will provide ALAC 44.1kHz/16-bits and DLNA will go as high as WAV 192kHz/24-bits. It is to be noted that a laptop or other computer will be required at the initial stage of this system to configure the router and NAS drive. Upon completion, the computer may be removed and a portable device could be used to access the music.

Depending on your portable device and the application installed, playback of audio may require that your device stays on or remains in sleep mode. If not, audio playback will stop.

EXAMPLE #3



NAS drive

Since we are making use of a laptop, the NAS drive can be a basic model. No CD tray would be required to rip CDs and most likely a DLNA/AirPlay library application would be available but is optional in this system. The laptop would provide for ripping, DLNA/AirPlay library and system maintenance and configuration.

Recommended Media Players

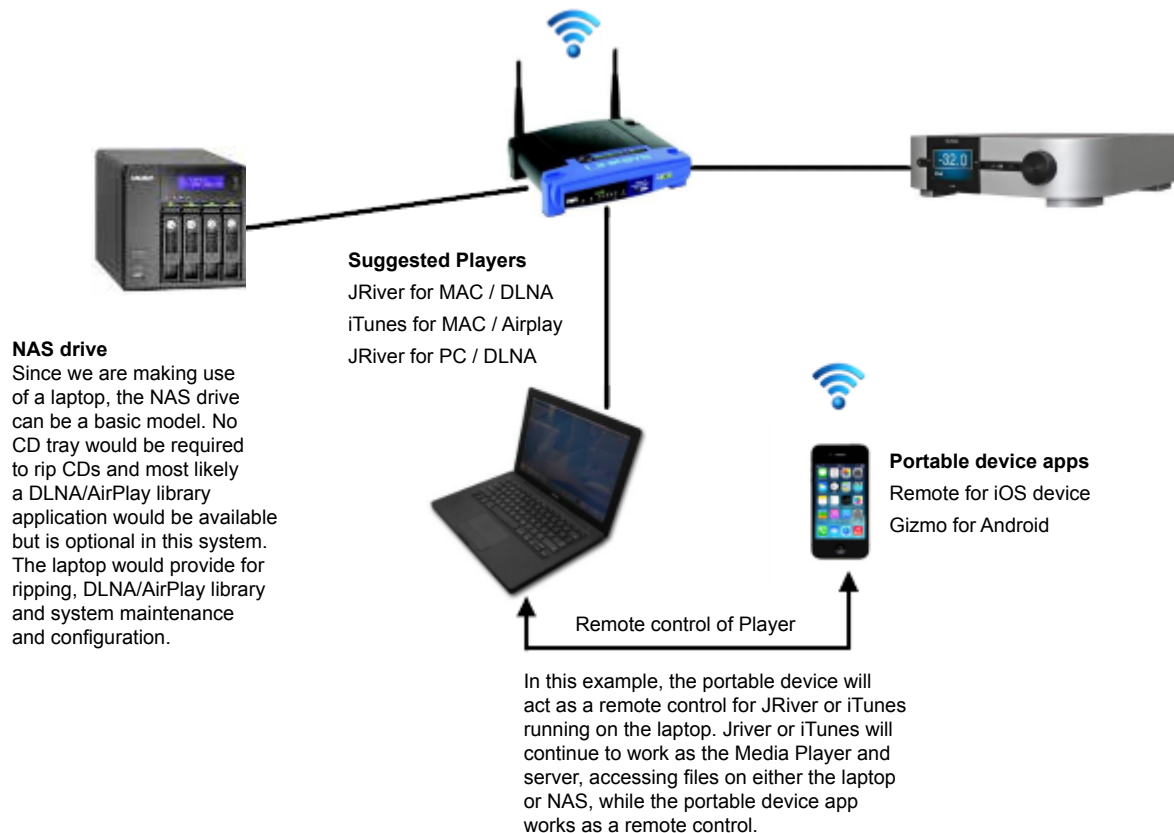
iTunes for MAC / AirPlay
JRiver for PC / DLNA
JRiver for MAC / DLNA

Example #3 is a more complex DLNA/AirPlay setup. The four components used are from left to right, a NAS drive, a router, the CP-800 and a laptop which will be used to provide the DLNA/AirPlay library through the use of Media Players such as JRiver and iTunes. The laptop will also serve to rip CD disks as well as maintain and configure the router, the NAS and the music library content on the NAS.

The laptop in this system will act as the main control console to navigate and play music from the NAS drive. Making use of a portable device will be possible and is covered in example #4.

In this system, the player/library software such as JRiver and iTunes will take command of the NAS to stream towards the CP-800 through the router. Depending on the system and software configuration used, AirPlay will provide ALAC 44.1kHz/16-bits and DLNA will go as high as WAV 192kHz/24-bits.

EXAMPLE #4



Example #4 is a more sophisticated DLNA/AirPlay setup. The five components used are a NAS drive, a router, the CP-800, a laptop and a portable device. The laptop will serve to rip CDs as well as maintain and configure the router but most importantly provide the player by using either JRiver or iTunes. The player can also provide a server library in conjunction with music files stored on the NAS drive.

The laptop in this system will act as the main control console to navigate and play music from the NAS drive. A portable device can also be used as a remote control for the player running on the laptop. This could allow for an easier more convenient control of the player.

In this system, the player/library software such as JRiver and iTunes will take command of the NAS to stream music to the CP-800 through the router. Depending on the system and software configuration used, AirPlay will provide ALAC 44.1kHz/16-bits and DLNA will go as high as WAV 192kHz/24-bits.

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