INSTALL GUIDE FOR HQPLAYER EMBEDDED

(FOR DEBIAN AND UBUNTU CONFIGURATION)

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Contents

1. Scope

The scope of this guide is to provide information on how to install Signalyst HQPlayer Linux Desktop and Embedded on either Debian Stretch or Ubuntu Bionic Linux distribution. Once the software is installed you should be able to leverage HQPlayer Embedded as UPnP renderer and use Roon, JRiver or Minimserver with BubbleUPnP as control point to stream music to a USB DAC attached directly to the system running HQPlayer Desktop/Embedded or to a USB DAC attached to Network Audio Adapter system either running Windows or Linux or MacOSX as operating system.

This guide also has steps listed on how to install Network Audio Adapter under Debian or Ubuntu. Keep in mind that there is potential for you to lose support for native higher DSD rates if using NAA on a Linux system, especially if the USB controller is based around Amanero hardware (T+A Dac 8 and Lampizator are some that are known to not support higher DSD rates because of the Amanero firmware which supports native Linux)

The guide is written with assumption that the only operating system installed on the HQPlayer system is either Debian or Ubuntu, so please ensure that you either use a brand-new disk or have a good backup of the existing system in case you want to restore the previous hard drive content. The process of backup and restore is left up to you.

Use of the steps listed in the guide is at your own risk and the author is not liable for any kind of loss or damage.

2. Pre-requisite for HQPlayer Desktop and Embedded

Before getting started with the installation there are couple of things that are required and some decisions to be made for a smooth installation.

1. Debian Stretch Netinstall ISO or Ubuntu Bionic Server Install
2. 4GB or higher USB thumb drive
3. Rufus – application to write ISO to thumb drive
4. Wired Ethernet Connection for HQPlayer system
5. Putty or MobaXTerm – SSH Client for managing the system remotely. MobaXTerm includes support for X-Windows so you can SSH into the server and start HQPlayer Desktop and it will be displayed on your system running MobaXTerm.
6. Decision on UEFI v/s normal bios boot
7. Windows Computer to run Rufus on
8. Optional - Static IP Address (makes it easier to run system head less and manage remotely)

3. Prepare USB Thumb Drive

To install either Debian or Ubuntu to the internal hard drive we need to write the ISO image to the USB thumb drive using Rufus.

1. Download Debian Stretch Netinstall or Ubuntu Bionic Server
2. Download Rufus
3. Plug USB drive into your Windows Computer

4. Start Rufus as Administrator
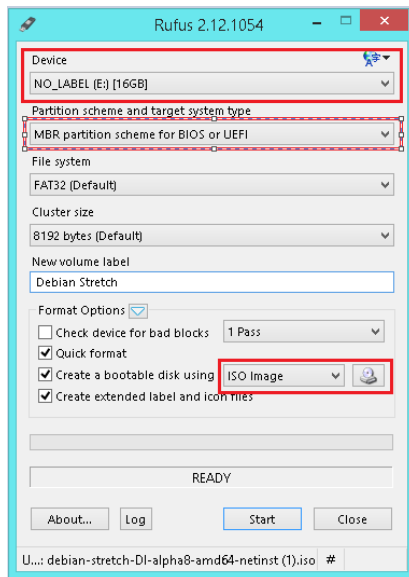
- a. Select correct drive letter for inserted thumb drive
- b. Partition scheme and target system type – If your system requires UEFI, change it to "GPT Partition scheme with UEFI using the drop-down arrow
- c. Create a bootable disk using ISO image – select the image that was downloaded earlier
- d. Click Start
5. Once the image has been written successfully exit out of Rufus and eject the thumb drive

4. Debian or Ubuntu Install Process

Once the USB thumb drive is prepared it is time to install your choice of the operating system on the internal hard drive. The install process for Debian v/s Ubuntu is slightly different so make sure to utilize appropriate install prompts for the OS in question.

Debian Install
1. Plug the prepared Debian thumb drive into the HQPlayer Embedded System
2. Boot from USB thumb drive
3. Debian Install Options
    - a. Hostname – provide a name of your choice (default: Debian)
    - b. Root Password – enter password
    - c. Full Name for New User – HQP Embedded
    - d. Username for your account – hqpe
    - e. Set User Password
    - f. Select Time Zone: Select appropriate Time Zone for your region (for me it is Eastern)
    - g. Partition Disk
        - i. Guided – use entire disk (**This will wipe everything out, on the disk that you are installing so make sure that you are comfortable with the potential data loss before moving forward**)
        - ii. Manual – use this if you are dual booting your system (**Please search the net for tutorials on how to do this**)
    - h. Archive Mirror Country – United States (pick country closest to you)
    - i. Archive Mirror – pick mirror server closest to you.
    - j. HTTP Proxy – Leave it blank unless you need to connect to proxy server before getting access to Internet
    - k. Participate in the package usage survey – No

4

l. Choose Software to install – Make sure to have check mark only against SSH Server, standard system utilities option

m. Is the system clock set to UTC – No (unless it is set to UTC in Bios)

n. Restart system once it has completed the install process

o. Pull USB Out

Ubuntu Install

1. Plug the prepared Ubuntu thumb drive into the HQPlayer Embedded System
2. Boot from USB thumb drive
3. Debian Install Options
   a. Hostname – provide a name of your choice (default: Ubuntu)
   b. Full Name for New User – HQP Embedded
   c. Username for your account – hqpe
   d. Set User Password
   e. Encrypt your home directory - No
   f. Is this time zone correct? – Confirm correct time zone displayed, if the time zone is different select "No" and pick the correct one
   g. Partition Disk
      i. Guided – use entire disk (**This will wipe everything out, on the disk that you are installing so make sure that you are comfortable with the potential data loss before moving forward**)
      ii. Manual – use this if you are dual booting your system (**Please search the net for tutorials on how to do that**)
   h. HTTP Proxy – Leave it blank unless you need to connect to proxy server before getting access to Internet
   i. Update Options – "No automatic updates" (pick your preference on how to update)
   j. Choose Software to install – Make sure to have check mark only against standard system utilities and OpenSSH server option
   k. Install the Grub boot loader to the master boot record – "yes"
   l. Restart system once it has completed the install process
   m. Pull USB Out

5.   Debian Management

Once you have the Debian system booted, we need to install "sudo" package that is not install by default under Debian. Installing "sudo" package is more of a precaution to ensure that we do not use "root" account to manage the system going forward.

Logon as "root" and issue the following commands in the order listed:

```
apt-get install sudo

adduser hqpe sudo
```

6.   Update Debian / Ubuntu Packages

Ensure you are using to the latest version of default Debian / Ubuntu packages and optionally install the real time / low latency kernel package or install the custom kernel and headers that Jussi Laako @ Signalyst has published.

> *sudo apt-get -y update*
>
> *sudo apt-get -y dist-upgrade*
>
> *[Debian] sudo apt-get -y install linux-image-rt-amd64*
>
> *[Ubuntu] sudo apt-get -y install linux-image-lowlatency-lts-bionic*

7.   Assignment of Static IP Address (Optional)

Assigning a static IP address to the system running HQPlayer Embedded is optional but the ongoing management of the system remotely is easier.

Ubuntu Bionic has changed networking options and I have not spent enough time to come up with the commands to configure. You best bet is to assign static IP during installation.

To assign static IP address under Debian we will need to edit /etc/network/interfaces file.

> sudo nano /etc/network/interfaces

1.   Look for line that starts with "iface" and ends with "dhcp"
2.   Change "dhcp" to "static"
3.   Add three new lines
    a.   address static_ip (replace static_ip with actual ip address)
    b.   netmask mask (replace mask with netmask that your DHCP server is assigning)
    c.   gateway gw (replace gw with default gateway ip address)
4.   Exit nano (it will prompt you to save before exiting)
5.   Here are how my settings look like in /etc/network/interfaces

```
source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
allow-hotplug eno1
iface eno1 inet static
        address 10.19.67.42
        netmask 255.255.255.0
        gateway 10.19.67.1
```

6.   Reboot your system

8.   HQPlayer Embedded Installation

The commands below will install the prerequisite software needed to run HQPe.

> *sudo apt-get -y install libglib2.0-0 libflac8 libasound2 libasound2-data libgomp1 rygel alsa-utils*
>
> *wget* http://www.sonarnerd.net/src/stretch/libgmpris_2.2.1.2_amd64.deb
>
> *sudo dpkg -i libgmpris_2.2.1-4_amd64.deb*

Check the subdirectory for appropriate HQPlayer Embedded (Debian Stretch or Ubuntu Bionic) site to download the latest version. If a newer version is available and if you would like to install the newer version, just replace "hqplayerd_4.6.1-21_amd64.deb" with the newer version's filename.

> *[Debian] wget* **https://www.signalyst.eu/bins/hqplayerd/stretch/hqplayerd_4.6.1-21_amd64.deb**
>
> *[Ubuntu] wget* **https://www.signalyst.eu/bins/hqplayerd/bionic/hqplayerd_4.6.1-21_amd64.deb**
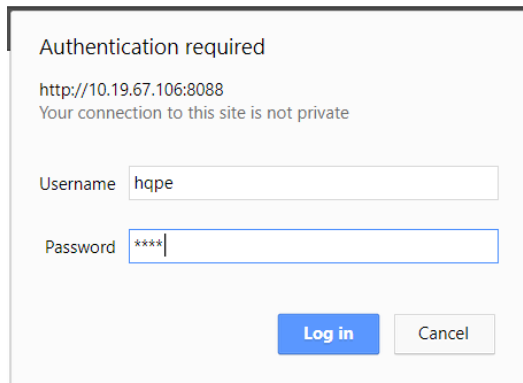>
> *sudo dpkg -i hqplayerd_4.6.1-21_amd64.deb*

9. HQPlayer Embedded

Configuration

Starting with version 4.0alpha20 or so Jussi @ Signalyst has included configuration option as part of the HQPlayer Embedded (HQPe) solution and you no longer need either the Desktop HQPlayer Setup or edit the configuration files manually to make the changes. The web configuration option now allows you to set all the settings like the Desktop version using browser connection. Just make sure that you have stopped playback before making any changes.

> *# set web configuration username and password*
>
> *hqplayerd -u <username> <password> (replace username and password with what your choices)*

Once you have configured the username and password you can start a web browser and use http://ip_address:8088/config to start the configuration process. Enter the username and password that was set earlier when prompted

Authentication required

http://10.19.67.106:8088
Your connection to this site is not private

Username	hqpe
Password	****

Log in   Cancel

On the configuration screen there are couple of settings that are critical for successful usage of HQPe.

Signalyst HQPlayer 4 Embedded

Generic

Scope:	Title	Backend	Output mode	Fixed volume (dBFS)	Startup volume (dBFS)	Channels	Options	Log file
● System ○ User	HQPlayer	ALSA ▼	Auto ▼		-3	2	☐ Auto rate family	☐ enabled /tmp/hqplayerd.log

DSD sources

☑ Direct SDM   ☐ Gain +6 dB

Integrator	Conversion
IIR ▼	poly-short-lin ▼
	Noise filter
	standard ▼

PCM settings

Filter	Dither	Sample rate	Rate limit
poly-sinc-lp ▼	TPDF ▼	Auto ▼	768000 ▼

SDM settings

Oversampling	Modulator	Bit rate	Rate limit
poly-sinc-lp-2s ▼	ASDM7 ▼	Auto ▼	24576000 ▼

ALSA backend

Device	Channel offset	DAC bits	Buffer time	
Current ▼	0	0 (0 = default)	0 ms (0 = default)	☐ DoP

Network Audio backend

Device	DAC bits	Buffer time		
Current ▼	0 (0 = default)	0 ms (0 = default)	☐ DoP	☐ IPv6

Apply

Main Input Configuration Backup Restore About Authentication Key

1. Generic
    a. Scope: System v/s User. If "System" is selected all configuration information is stored in /etc/hqplayer/hqplayerd.xml file, while "User" configuration information is stored in /home/username/.hqplayer/hqplayerd.xml. By default, HQPe firsts checks "User" directory before checking "System" location. Recommendation is to use "System" directory for all configuration files.
    b. Backend: ALSA/Network. If you DAC is connected to the system running HQPe select "ALSA" and if you are using NAA select "Network"
    c. Output Mode: Auto/PCM/SDM, select appropriate setting for you DAC or listening preference.
    d. Options: Auto rate family, check box as appropriate to your preference.
    e. Log file: Check the "enabled" box and set the file directory and location as appropriate. The default location is stored on volatile directory and the file will be lost if the system is rebooted. Recommendation is to leave the file location to default. If you need to troubleshoot you can reboot your system which will start a fresh copy making it easier to share with Jussi @ Signalyst.
2. DSD Sources
    a. Check "Direct SDM" if you would like to play DSD without any stream manipulation – up sampling to higher DSD or convolution.
3. PCM Settings
    a. Filter: Your preference
    b. Dither: Your preference
    c. Sample Rate: Your preference based on your DAC
    d. Rate limit: Your preference based on the highest resolution supported by your DAC
4. SDM Settings
    a. Oversampling: Your preference
    b. Modulator: Your preference
    c. Bit Rate: Your preference based on your DAC
    d. Rate limit: Your preference based on the highest resolution supported by your DAC
5. ALSA Backend (if DAC connected locally)

> a. Device: Select appropriate DAC connected locally
> b. DoP: Enable if DAC requires the setting
6. Network Audio Backend
> a. Device: Select NAA and DAC setting
> b. DoP: Enable if DAC requires the setting
7. Click on "Apply" to save the configuration
8.

Requesting License File

To request a license for HQPe you will need the "fingerprint" of your PC. To find the fingerprint select "About" at the bottom of the web page. On the next screen you will see version of HQPe installed, Fingerprint and License info. On a brand-new install allows you to use HQPe for 30 minutes at a time in trial mode.

Fingerprint
BaCHzZqnGzU4nE2KlryTTg==

1. Send the "Fingerprint" information to Jussi @ Signalyst and he will send you a license file back.
2. Once the license file is received logon to the HQPe web configuration site and select "Key" from the bottom of the page.

Upload license key file

| Scope: ⦿ System ◯ User | Choose File No file chosen | Upload |

Main Input Configuration Backup Restore About Authentication Key

> a. Select User
> b. Click on Choose File and select the license file provided
> c. Click on Upload

Main Web Page

The main web page of the HQPe is the status page where you can view information on the song that is currently playing. The page also allows you to try different "Mode", "Filter", "Dither", "Samplerate" for PCM and "Mode", "Oversampling", "Modulator" and "Samplerate" for SDM. Using the "Main" web page allows you to try various settings before making those changes and saving it under configuration settings.

Configuration for MiniDSP USBStreamer with Chromecast Audio

1. Run "aplay -L" command and look for entry "hw:CARD=USBStreamer,Dev=0"
2. Stop HQPe if running by issuing "systemctl stop hqplayerd.service"
3. Edit hqplayerd.xml file that you are using and add another entry under "Input" tag. Below is the entry that I added for my setup right before the existing input entry that Miska already provided in the configuration file.
   <input channel_offset="0" channels="2" device="hw:CARD=USBStreamer,DEV=0" format="pcm" name="USBStreamer @44.1k" period_time="0" samplerate="44100"/>
   <input channel_offset="0" channels="2" device="hw:CARD=M20,DEV=0" format="pcm" name="Input @44.1k" period_time="0" samplerate="44100"/>
4. Start HQPe issuing "systemctl start hqplayerd.service". Please do not forget to add "sudo" before "systemctl" if you are logged in with normal user privilege or are under Ubuntu.
5. Connect to HQPe web interface and select "Input" option
6. From the drop option select USBStreamer @44.1k or the name that you used in the config file.

Something to keep in mind when switching back and forth between normal UPnP/HQPControl Protocol (Roon) and USBStreamer as input. Switching from UPnP/Roon connectivity to USBStreamer requires you to manually make the change under the web interface but switching back to UPnP/Roon is automatic.

10. Start HQPlayer Embedded During System Restart

When the embedded package is installed, there is a system startup file hqplayerd.service installed under /lib/systemd/system directory. The newer HQPe code already has the support built in for UPnP/DLNA server so all you need to do is start the services or reboot the system which will automatically start the service.

sudo systemctl start hqplayerd.service

11. JRiver as Controller

One of the major advantages of leveraging JRiver as Controller is the interface and various remote controls to stream music to HQPlayer Embedded. Using the two solutions together you get a better interface and remote control along with one of the best music conversion engines out there.

Before JRiver can be used to control HQPlayer Embedded sharing of library and enable DLNA services. The other configuration that also needs to configure is the DLNA Servers.

1. Start JRiver
2. Select Tools → Options from the Menu
3. Select Audio and under Bitstreaming select DSD
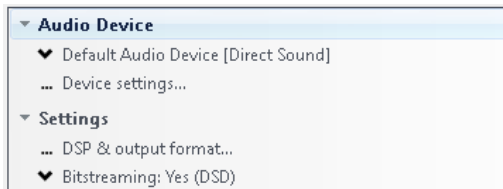
4. Select Media Network and enable "Use Media Network to share this library and enable DLNA"
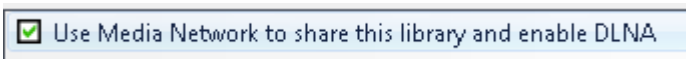
5. Once you check the box for Media Network you will now see Access Key: (6-digit alphanumeric key), which you can use to control JRiver using any of the remotes available like JRemote and eos (Android only)
6. Select "Add or Configure DLNA servers" and change Audio Mode to "Original" and Format to "PCM L24 No Header"
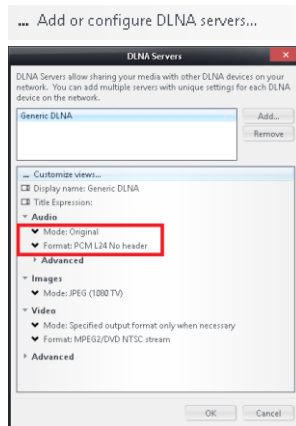
Once the above configuration is completed you are now ready to start streaming to HQPlayer Embedded. Under JRiver Playing Now you should see "hqpe:SignalystHQPlayer4" as option. Select that as the zone and start playing music.
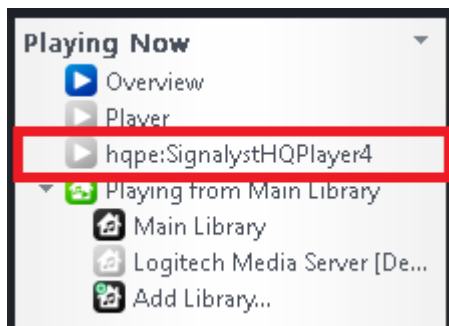
APPENDIX

1. HQPlayer NAA

HQPlayer NAA allows you to have your beefy potentially noisy system be located outside of the listening room and a small low powered system connected to the DAC in the listening room. The NAA software allows you to stream your music from HQPlayer to NAA. To configure NAA you need to follow the steps to install the OS as documented.

```
sudo apt-get install libasound2 libasound2-data libasound2-plugins alsa-utils
[Debian] wget https://www.signalyst.eu/bins/naa/linux/stretch/networkaudiod_3.5.4-38_amd64.deb
[Ubuntu] wget https://www.signalyst.eu/bins/naa/linux/xenial/networkaudiod_3.5.4-38_amd64.deb
[Debian/Ubuntu] sudo dpkg -I networkaudiod_3.5.2-36_amd64.deb
sudo reboot
```

2. HQPlayer Desktop

The HQPlayer Desktop installation is not needed to run HQPe but installation and configuration information is provided in case folks want to install HQP Desktop. Follow the steps listed for OS installation earlier in the document.

> *sudo apt-get -y install menu libasound2 libasound2-data libflac8 libgomp1 libogg0 libqt5script5 libqt5sql5 qml-module-qtquick-controls qml-module-qtquick-layouts qml-module-qtquick-window2 qml-module-qtquick2 acpid*
>
> *sudo apt-get -y install xserver-xorg libfontenc1 libxaw7 libxfont1 libxkbfile1 libxmu6 libxpm4 libxt6 x11-xkb-utils xfonts-base xfonts-encodings xfonts-utils xserver-common*
>
> *sudo apt-get -y install xinit*
>
> *sudo apt-get -y install openbox*
>
> wget **https://www.signalyst.com/bins/hqplayer_3.25.1-81_amd64.deb**
>
> sudo dpkg -i hqplayer_3.25.1-81_amd64.deb