



BAB TECHNOLOGIE GmbH

AUDIOMODULE

Documentation

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EN



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1 INTRODUCTION

Congratulations on your purchase of the new **AUDIOMODULE** and thank you for your confidence in our product. We are certain that you will enjoy every minute with your **AUDIOMODULE**. To get the best from your new device from the very start, we recommend that you read the operating instructions carefully.

In this way, you will familiarise yourself quickly and thoroughly with the **AUDIOMODULE**. In addition, the operating instructions offer you useful tips on installing and using your new device.

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Figure 1 AUDIOMODULE Speaker KNX/TP

Product name:	AUDIOMODULE Speaker KNX, AUDIOMODULE Line KNX
Function:	Audio streaming client/ server based on the Squeezebox Technology Optionally with KNX/TP connection
Design:	REG (series installation)
Article number:	10516 (KNX/TP Speaker) 10526 (KNX/TP Line)



1.1 OVERVIEW OF FUNCTIONS

The **AUDIOMODULE** enables you to set up a multi-room audio system. The **AUDIOMODULE**, in combination with e.g., the **EIBPORT** or **CUBEVISIONMODULE** provides the option of controlling the audio system by means of visualisations, KNX pushbuttons or touch displays. One **AUDIOMODULE** is used for each music zone.

The **AUDIOMODULE** is either connected to an existing hi-fi system or active loudspeaker (Line version) or the connected speakers are fed via the integrated amplifier (only Speaker version).

The **AUDIOMODULEs** unique feature is that it can be controlled directly via KNX (only KNX/TP) without additional hardware and comes with a Line In (audio input via phone connector).

1.2 AUDIOMODULE FUNCTIONAL PRINCIPLE

The **AUDIOMODULE** is based on the **Squeezebox (SQB) Technology**. This has a central **Server** (*Squeezebox Server* respectively *Logitech Media Server (LMS)*) to which several streaming **Clients** (*Squeezebox Client*) are connected.

The **AUDIOMODULE** not only has an integral SQB client, but also an integral SQB server. This means it can be operated in both modes: “client mode” and “server-client mode”.

a) **Client mode:**

In the client mode, the **AUDIOMODULE** acts as a streaming client and plays back music from a remote Server. The **AUDIOMODULE** receives the audio files in digital form via the network in data packets from the server and then converts these into an analogue music format so that they can be played back by the speakers.

b) **Server-client mode:**

In this mode the **AUDIOMODULE** acts simultaneously as a server and as a client. In other words, the internal client accesses the own internal server. so that the **AUDIOMODULE** can also be used in “Standalone” mode.

In this mode, the media files are connected directly to the **AUDIOMODULE** via storage media. The total maximum storage capacity is 32GB.

The specifics of how to control the **AUDIOMODULE** via KNX differ.

a) Controlled via the **EIBPORT** or the **CUBEVISIONMODULE** from BAB TECHNOLOGIE GmbH.

b) Or receive commands directly via the KNX bus (e.g. via KNX push button sensor, jobs or KNX visualisations).

* *The SqueezeBox Server (The software was originally developed from Slim Devices) is also known under the name Logitech Media Server (hereinafter referred to by the abbreviation “LMS”)*

2 AUDIOMODULE SPEAKER & AUDIOMODULE LINE

The **AUDIOMODULE** is available as two different types of devices.

- **AUDIOMODULE** Speaker KNX,
- **AUDIOMODULE** Line KNX

2.1 AUDIOMODULE SPEAKER KNX

As “**AUDIOMODULE** SPEAKER”, the **AUDIOMODULE** is connected direct to the speakers through integral amplifiers. The stereo audio output of the integrated amplifier produces 2x 20 W RMS at 4Ω.



Figure 2 AUDIOMODULE Speaker KNX



2.2 AUDIOMODULE LINE KNX

The “**AUDIOMODULE LINE**”, is connected via a line out output to an existing Hi-Fi system or active loudspeaker. This is an audio line-out (3.5mm stereo phone connector) of 2 V_{eff} at 10 k Ω .



Figure 3 AUDIOMODULE Line KNX/TP



2.3 SCOPE OF SUPPLY AND INTERFACES

The **AUDIOMODULE** is supplied in a white cardboard shipping box with the following contents:

- 1x **AUDIOMODULE**
- 1x 2-pole screw terminal for power supply
- 1x 2-pole screw terminal for KNX bus (only KNX variant)
- 1x 4-pole screw terminal for loudspeaker (only Speaker variant)

A power supply unit for the device is NOT included!

Apart from the connection for the power supply (**Speaker 24 V DC, Line 10-32 V DC**), the **AUDIOMODULE** offers the following ports:

- 1x KNX®: twisted pair via terminal (for Art. No. 10525 and 10515)
- 1x 3.5 mm phone connector for Line In (audio in)
- 1x 3.5 mm phone connector for Line In (audio out; only Line variant)
- 1x 4-pole screw terminal for 2 loudspeakers (loudspeaker out; only Speaker variant)

- 1x RJ 45: Ethernet 100 Mbit/s full duplex
- 4x USB ports

- Speaker variant: 2x speaker outputs, 2x20 W RMS at 4 Ω, Operating voltage 24 V DC
- Line variant: Audio line-out, 2 V_{eff} at 10 kΩ, Operating voltage 10-32 V DC

Factory settings at shipment

- **IP address** **192.168.1.226**
- **Username** **admin**
- **Password** **admin**
- Device Name AUDIOMODULE



3 INSTALLING THE AUDIOMODULE

3.1 AUDIOMODULE SPEAKER

The operating voltage for the AUDIOMODULE Speaker is 24 V DC.

The device shown here is the **AUDIOMODULE** Speaker. DIN rail mounting housing 4 units wide. Dimensions (width x height x depth): 72 x 90 x 63 mm

To make connection of the speakers and the power supply easier, the 4-pole screw terminals for the loudspeaker and the 2-pole screw terminal for the power supply (Figure 4 **AUDIOMODULE** Speaker KNX) are removable from the unit.

The **AUDIOMODULE** Version KNX has an additional 2-pole screw terminal for the KNX bus.

The power supply cables are now connected to the screw terminals (Figure 4 **AUDIOMODULE** Speaker KNX). Attention must be paid to the correct **polarity: (Left: Plus (+), Right: Minus (-)).**

In order to connect the speakers and hi-fi system correctly, attention must also be paid here to the correct **polarity** (Fig. 4): **(- Left + | - Right +)**

The KNX bus cable is attached to the smaller 2-pole screw terminal, as shown on the front panel (as shown below Figure 4 **AUDIOMODULE** Speaker KNX).

Pay attention to the correct polarity! **(Left: Black (-), Right: Red (+)).**

The screw terminals can now be reinserted into the **AUDIOMODULE**.

If desired, you can now connect an external audio source, such as TV, CD-, DVD-Player, with a 3.5 mm jack connector to the Line In input.

The **AUDIOMODULE** can now be snapped onto the DIN rail complying, according to EN 60715.

Important note: Before you disconnect the power supply, please shut down the AUDIOMODULE via its web interface first Configuration/System)!

AUDIOMODULE Speaker properties	
(1)	Line In (audio input, 3.5mm stereo phone connector)
(2)	Power supply via 24 V DC screw terminal
(3)	USB port
(4)	RJ45 socket for Ethernet LAN
(5)	2 x 20 W at 4 Ω - L + - R +
(6)	KNX bus connector (only KNX/TP version)



Figure 4 AUDIOMODULE Speaker KNX

The **AUDIOMODULE** has two DUO-LEDs, each of which has one green and one red LED. (“Power/Boot” and “Status”)

Explanation:

The green “Power/Boot” LED lights up as soon as the **AUDIOMODULE** is supplied with power. Two or three seconds after the power is connected, this LED changes to red and starts flashing. Once the boot-up process is complete, this LED changes back to green.

After the **AUDIOMODULE** has booted up, the status LED flashes continuously with two quick pulses followed by a short pause.

This flashing also indicates the load level on the **AUDIOMODULE**: the higher the frequency of the flashing LED, the greater the load on the **AUDIOMODULE**.

The **AUDIOMODULE** now requires **2 minutes** to boot up.



3.2 **AUDIOMODULE LINE**

The operating voltage of for the AUDIOMODULE Line is 10-32 V DC.

The device shown here is the **AUDIOMODULE** Line. DIN rail mounting housing 4 units wide. Dimensions (width x height x depth): 72 x 90 x 63 mm

To make connection of the speakers and the power supply easier, the screw terminals (see Figure 5 **AUDIOMODULE** Line KNX) are removable from the unit.

The **AUDIOMODULE** Version KNX has an additional 2-pole screw terminal for the KNX bus.

The power supply cables are now connected to the screw terminals (see Figure 5 **AUDIOMODULE** Line KNX). Attention must be paid to the correct **polarity: (Left: Plus (+), Right: Minus (-)).**

To connect active loudspeakers or hi-fi system used a 3,5mm jack plug and insert it into the "line-out" socket (see Figure 5 **AUDIOMODULE** Line KNX).

The KNX bus cable is attached to the smaller 2-pole screw terminal, as shown on the front panel (as shown below see Figure 5 **AUDIOMODULE** Line KNX).

Pay attention to the correct polarity! **(Left: Black (-), Right: Red (+)).**

The screw terminals can now be reinserted into the **AUDIOMODULE**.

If desired, you can now connect an external audio source, such as TV, CD-, DVD-Player, with a 3.5 mm jack plug to the "line in" socket (see Figure 5 **AUDIOMODULE** Line KNX).

The device can now be snapped onto the DIN rail complying, according to EN 60715.

NOTE for operation with the AUDIO AMP (item no. 10540) or active loudspeakers (built in power amp):

Set the AUDIO AMP, or your active speakers with built in amp, to a low volume setting initially, and the AUDIOMODULE to a high-volume level.

Gradually increase the volume level of the AUDIO AMP (or your active speakers) during the first playback if needed, and store its final volume level.

This prevents you from accidentally destroying your speakers by starting your first playback at maximum levels.

For active speakers, the procedure is the same as for the AUDIO AMP.

AUDIOMODULE Line properties	
(1)	Line In (audio input, 3.5mm stereo phone connector)
(2)	Power supply via 12-24 V DC screw terminal
(3)	USB port
(4)	RJ45 socket for Ethernet LAN
(5)	Line Out (audio output), 2 V _{rms} at 10 k Ω
(6)	KNX bus connector (only KNX/TP version)



Figure 5 AUDIOMODULE Line KNX

The **AUDIOMODULE** has two DUO-LEDs, each of which has one green and one red LED. (“Power/Boot” and “Status”)

Explanation:

The green “Power/Boot” LED lights up as soon as the **AUDIOMODULE** is supplied with power. Two or three seconds after the power is connected, this LED changes to red and starts flashing. Once the boot-up process is complete, this LED changes back to green.

After the **AUDIOMODULE** has booted up, the status LED flashes continuously with two quick pulses followed by a short pause.

This flashing also indicates the load level on the **AUDIOMODULE**: the higher the frequency of the flashing LED, the greater the load on the **AUDIOMODULE**.

The **AUDIOMODULE** now requires **2 minutes** to boot up.



4 COMMISSIONING

GENERAL

Environmental requirements

Operating voltage:	Line: 12- 32 V DC, Speaker: 24 V DC
Power input:	AUDIOMODULE Speaker: max. 72 W AUDIOMODULE Line: <=5 W
Environmental conditions:	compliant with EN 50090-2-2
Ambient temperature:	-5 to 35°C
Storage temperature:	-10 to +60°C
Relative humidity (no condensation):	5% - 80%

Connect device

Snap the device onto the DIN rail complying, according to EN 60715.

Power supply

When assembling the power supply, make sure that sufficient power is available. Connect the power supply in accordance with the labelling on the screw terminal.

Network

Connect the **AUDIOMODULE** with your network.

Audio input

Connect the **AUDIOMODULE** via the Line In input with the external source.

KNX bus

Connect the **AUDIOMODULE** via the KNX bus connector with the KNX bus.

ADDITIONAL NOTES FOR **AUDIOMODULE** SPEAKER

Connect device

- Connect the loudspeaker.

ADDITIONAL NOTE FOR **AUDIOMODULE** LINE

Connect device

- Connect the hi-fi system, the amplifier or active loudspeaker.

If the **AUDIOMODULE** has been correctly installed, as shown in chapter 3 - Installation, it can now be put into service by switching on the power supply. In order to configure the device as required, the following conditions must be met, see below:



4.1 LED-STATUS

The **AUDIOMODULE** has two DUO LEDs (Power/Boot and Status). Each DUO LED has a green and a red LED. The upper DUO LED shows the state of Power/Boot, and the lower DUO LED the state of the **AUDIOMODULE**.

POWER / BOOT LED

LED indicator	State
OFF	The device is not ready for use. There is no operating voltage.
GREEN	The device is ready for use.
BLINKING ORANGE	The device is booting.

STATUS-LED

LED indicator	Status
OFF	The device is booting.
BLINKING GREEN	The device has booted. The LED simulates a heartbeat. The blinking frequency increases with the device's usage.
BLINKING RED	Communication with the KNX bus.

Explanation:

The green LED of the Power/Boot DUO LED lights up as soon as the **AUDIOMODULE** is powered. Two to three seconds later, the red LED of the DUO LED begins to flash until the boot process is completed (this makes the Power/Boot DUO LED appear orange).

As soon as the boot process is complete, the Power/Boot LED stays green, while the Status LED flashes green (it simulates a heartbeat). The flashing frequency increases with the usage of the **AUDIOMODULE**.

The **AUDIOMODULE** requires about **2 minutes** starting.



4.2 ESTABLISHING CONNECTIONS

In order to configure the **AUDIOMODULE** (Speaker/Line) and to retrieve the web interface, a current browser and a network connection to the device are required. If the device is in the condition on delivery, it can be accessed at the above-mentioned IP address and the network settings must be adjusted to the address range, where necessary. To do this, please follow the instructions provided in chapter "Adjusting the network settings of your computer".

The **AUDIOMODULE** (Speaker/Line) has the standard IP address 192.168.1.226.

4.3 DISCOVERY TOOL

If you do not know the network settings of the device, the DiscoveryTool can help you to find out with which IP address the device is available. The "DiscoveryTool" software is platform-independent and can be run on any operating system. It can be found on the supplied CD or in the download section at www.bab-tec.de.

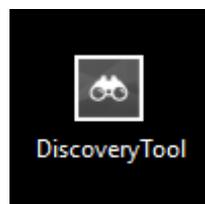


Figure 6 Discovery Tool icon

Double-click the program icon in order to start the software. All devices available in the network are shown in the program window with their respective device names and serial numbers. An **AUDIOMODULE** can be recognised by means of a serial number starting with "BT102...".

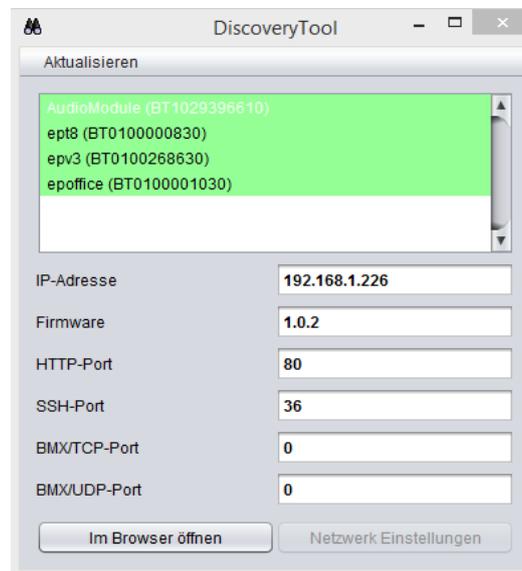


Figure 7 Discovery Tool Software

The colour marking of the devices shown in the DiscoveryTool has the following meaning:

- Grey = Information is being retrieved
- Green = Device is in the same network area as the PC
- Yellow = Device is NOT in the same network area as the PC

Mark the required device in the list. The device information available is displayed in the fields below. If the device is marked green, you can immediately call up the start page of the device by pressing the "Open in Browser" button. If the device is marked yellow, change the network settings of your PC correspondingly (see chapter below).

4.4 ADJUSTING THE NETWORK SETTINGS OF THE AUDIOMODULE

If the network prerequisites have been created, you can now access the configuration of the **AUDIOMODULE** in order to adjust the network settings to the local requirements there. To do this, please proceed as described below:

- Enter the IP address of the **AUDIOMODULE** in the address line of your browser (for factory settings: 192.168.1.226).

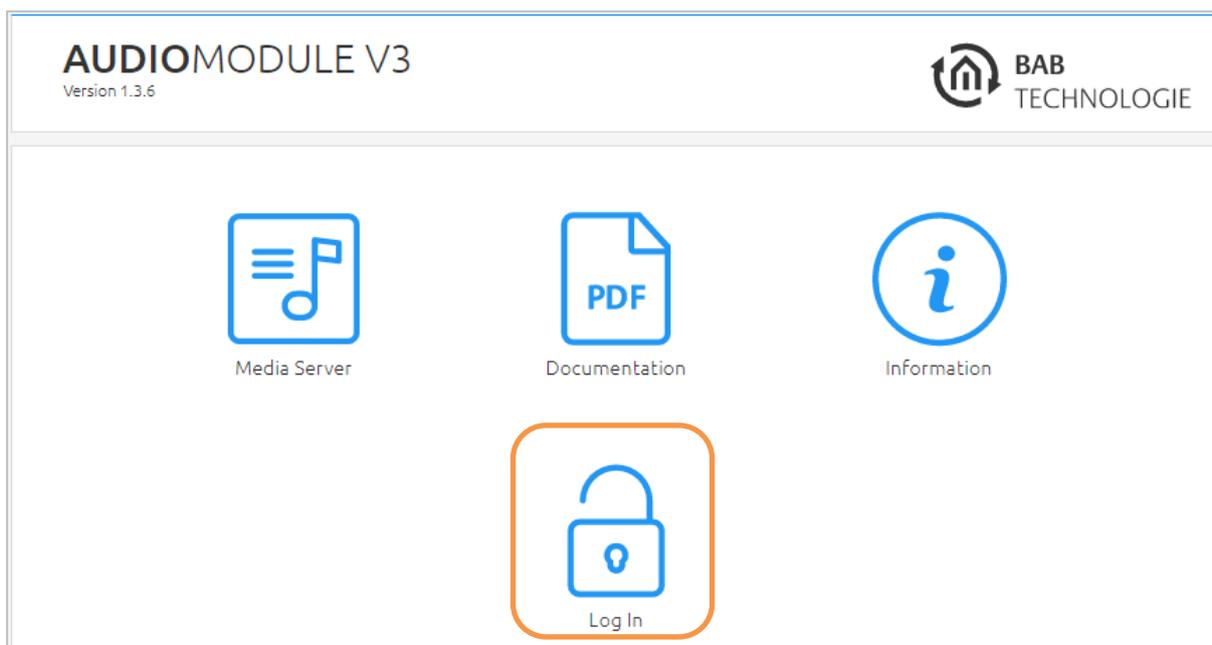


Figure 8 Login AUDIOMODULE Web interface

- The start page of the **AUDIOMODULE** opens up. Click "Log In" on the top right-hand corner of the screen (see figure above, orange circle).
- A login dialog appears. For factory settings, the login data is as follows:
Username: **admin**
Password: **admin**

Note: The password must be changed immediately when logging in for the first time. If the password is lost, the device cannot be reset!

Note: Logging in only works if the browser is authorised to save cookies!



After the log in, you can access the four following menus:

- MEDIA SERVER
- SOURCE MANAGMENT
- CONFIGURATION
- INFORMATION
- LOG OUT

In order to change the IP address of the **AUDIOMODULE**, please click "CONFIGURATION" (see orange circle, figure below).

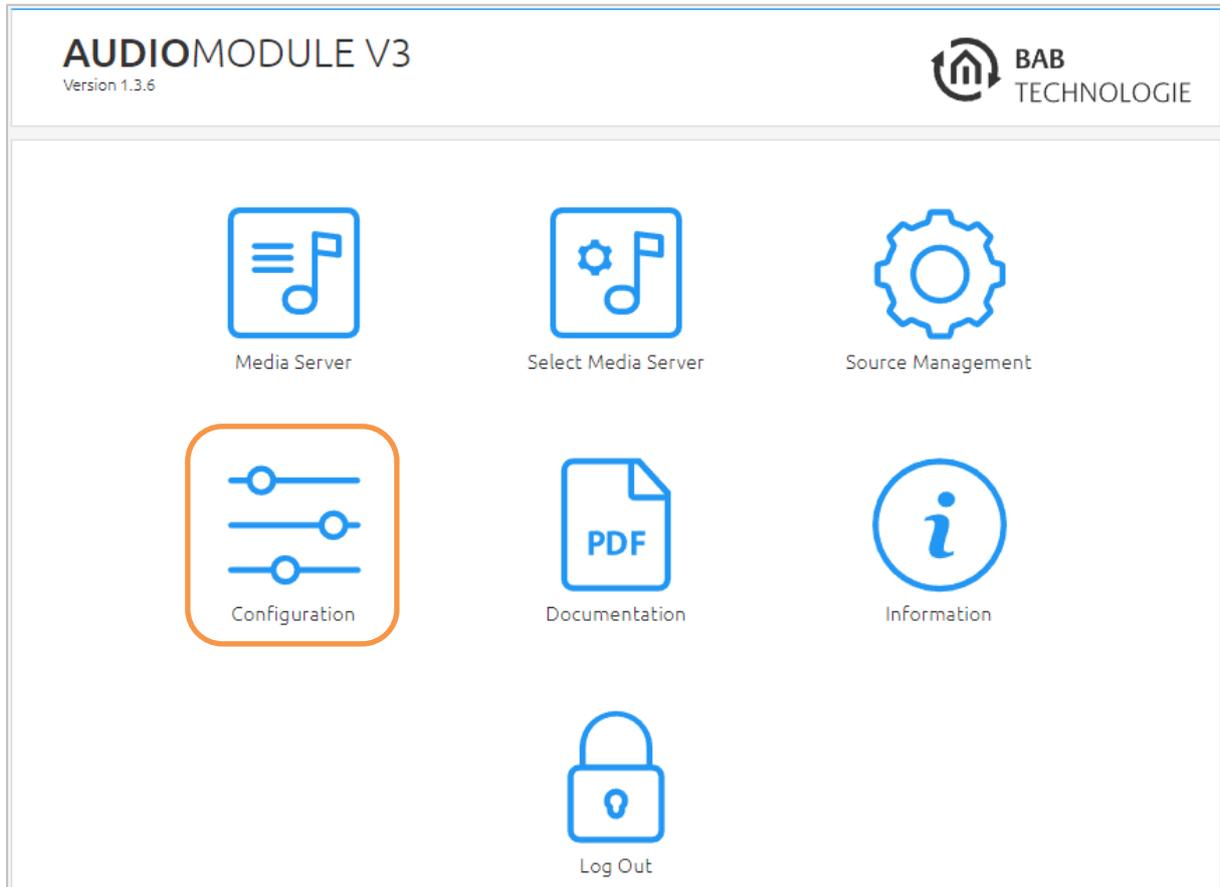


Figure 9 Web interface - open configuration

The configuration menu opens up. You can make the following settings in the "Network" menu item:

DHCP:

If the DHCP is activated, the device will automatically load the network settings. A DHCP server must be available in the local network.

IP address / subnet mask / gateway:

If DHCP is not activated, you must adapt the typical network parameters to the existing network.

DNS server:

DNS stands for Domain Name System. The DNS server converts an Internet address, e.g. www.bab-tec.de/ into an IP address 85.214.89.170 and vice versa.

NTP server:

Configure an NTP server so that the device can synchronize its internal clock. NTP server list: e.g. <http://www.pool.ntp.org/zone/europe>

AUDIOMODULE V3
Version 1.3.6

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> Start > Configuration

Save Configuration

General

Network >

KNX

User Administration

Remote Servicing

Backup / Restore

System

Network

DHCP

IP Address 192.168.1.226

Netmask 255.255.255.0

Gateway 192.168.1.1

DNS Server

DNS Server #1 192.168.1.1

DNS Server #2

DNS Server #3

NTP Server

NTP Server #1 0.de.pool.ntp.org

NTP Server #2 2.2.2.2

NTP Server #3

Save Configuration

DHCP activate-/deactivate

Figure 10 Network configuration

Change the IP address settings as required. In order to save the settings made, click "Save Configuration". The server in the device is restarted; the browser automatically connects to the new IP address if possible.

You must now log out, then give your PC the old IP address (chapter 4.2) and log in again at the **AUDIOMODULE** Web interface.

Note: Please bear in mind that you might have to reset the IP address of your computer to the initial value in order to be able to access the AUDIOMODULE after the change has been made.

Special feature when activating DHCP

If you have activated DHCP for the **AUDIOMODULE** according to the steps mentioned above, please use the DiscoveryTool as described in chapter "DiscoveryTool" in order to find out the current IP address configuration of the **AUDIOMODULE**.

General operating information can be found in chapter 6.



4.4.1 ADJUSTING THE NETWORK SETTINGS OF YOUR COMPUTER

In order to adjust the network settings of your computer and establish a connection to the device, please proceed as described below:

- Open the IP address settings (e.g. Windows 10):
- Click on
Windows icon -> "Settings" -> "Network & Internet" -> "Network and Sharing Centre"
- Select Connections: Ethernet

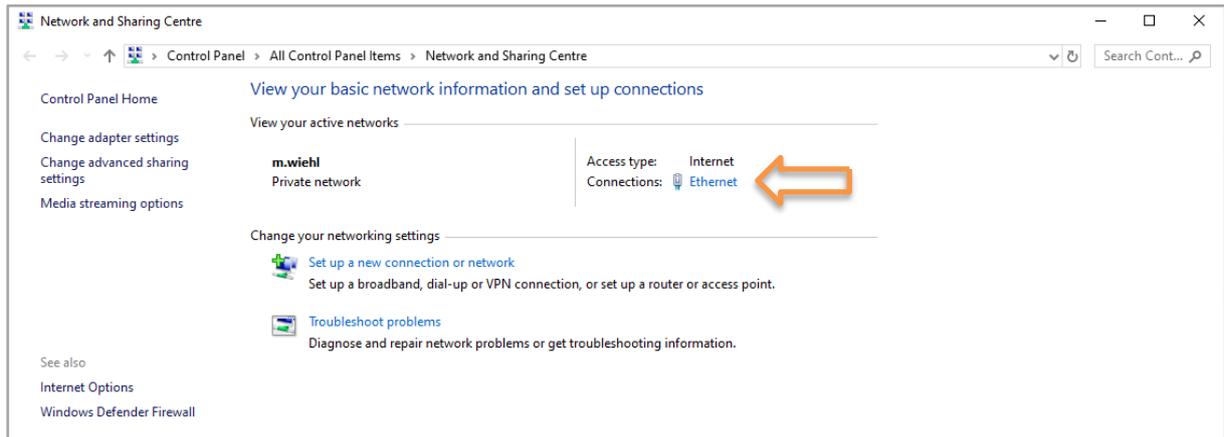


Figure 11 Network and Sharing Centre

- Next, click on Properties.

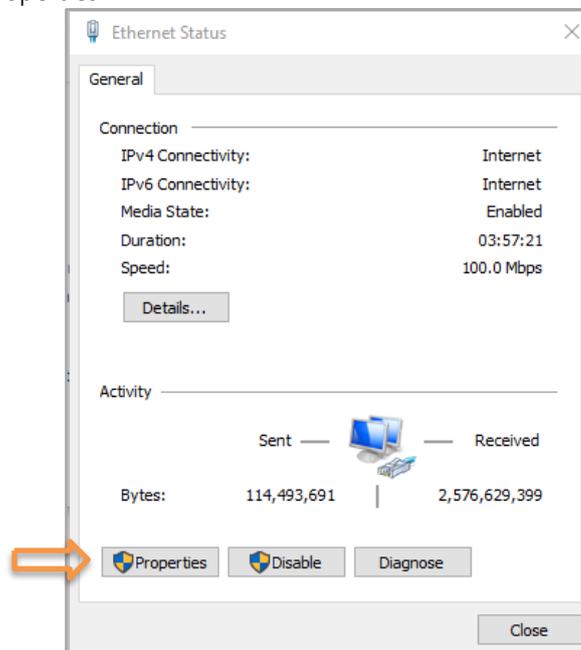


Figure 12 Network properties

- Select "Internet protocol Version 4 (TCP/IPv4)" and click "Properties" again:

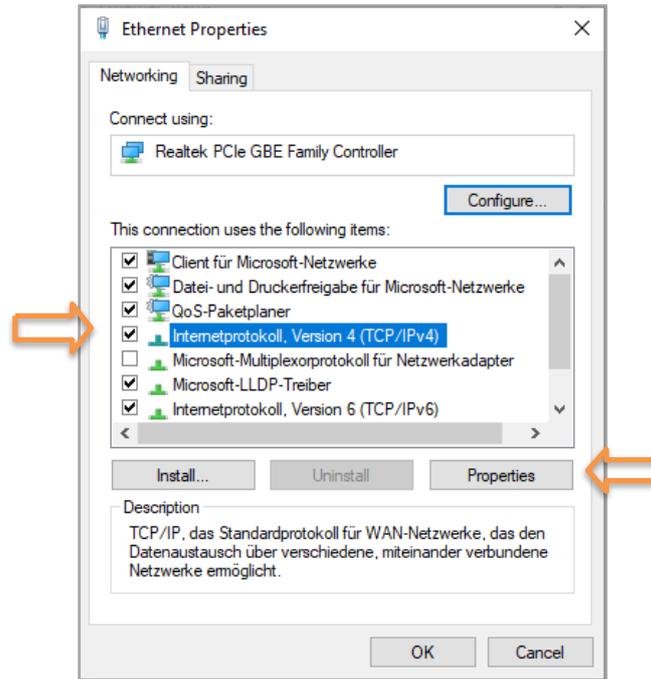


Figure 13 Properties of the network interface

- Now note down the current IP address settings or take a screenshot in order to ensure that you can reset the IP address setting following the configuration of the **AUDIOMODULE**.
- Now change the IP address settings (IP address and subnet mask) as required:

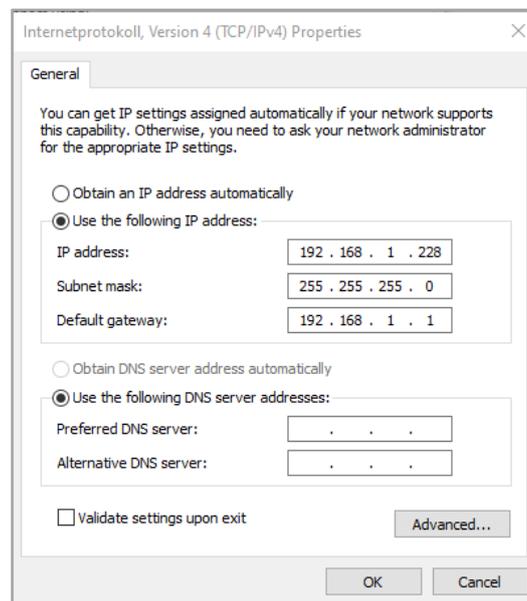


Figure 14 Internet protocol, Properties

Example of a valid configuration for the factory settings of the **AUDIOMODULE**:

- Free IP address: 192.168.1.228
- Subnet mask: 255.255.255.0
- Now confirm your input with "OK".
- Close all windows until the "Windows Network and Sharing Center Settings" window is shown.



Thus, you have adjusted the network settings of your PC to those of the **AUDIOMODULE**. The web interface of the **AUDIOMODULE** can be accessed by means of the browser. Restore the original network settings of your PC by following the steps described above as soon as you have configured the **AUDIOMODULE** correspondingly.



4.5 CONNECTING AUDIOMODULES TO THE SERVER

AUDIOMODULE can be operated with two different operating modes.

- a) Each **AUDIOMODULE** connects to its own server.
- b) All **AUDIOMODULE** connect to a central server.

The two operating modes are explained under the chapter "Client and server-client operating mode".

4.5.1 SETUP MULTIROOM SYSTEM

To set up a Multi Room system with the **AUDIOMODULE** and an external Logitech Media Server (LMS), proceed as follows:

- 1) Install the Logitech Media Server (LMS) on a computer.
- 2) Start up the first **AUDIOMODULE**.
- 3) In the configuration of the **AUDIOMODULE** under the "General" section, assign a unique "Device Name". This name is also used as the name for the audio zone in the server.
- 4) The names of the **AUDIOMODULE** must not have any special characters or spaces.
- 5) Connect the **AUDIOMODULE** to the previously installed server.

- 6) Continue with the other **AUDIOMODULE** according to this principle.

Once all **AUDIOMODULE** are connected to the server, the next step is to configure the controller.

4.6 CONTROL OF THE AUDIOMODULE

For the **AUDIOMODULE** KNX, with own KNX bus connection, the audio control functions are configured under the menu item "**Source Management**" (gearwheel symbol, see Figure next page).

This menu item contains also the default settings such as standard audio source, volume or equaliser profile.

The detailed description can be found in the chapter "Source Cotnrol".



5 CLIENT AND SERVER-CLIENT OPERATING MODE

There are two different ways to operate the **AUDIOMODULE**.

As "client mode", use with an external server (LMS) or as "server-client mode" (Standalone), the **AUDIOMODULE** operate with the internal server (LMS).

5.1 SERVER-CLIENT MODE: COMMISSIONING THE AUDIOMODULE WITH AN INTERNAL SERVER

In this case the **AUDIOMODULE** functions simultaneously as server, LMS and client. In other words, the internal client accesses the internal server so that the device can also be used in "Standalone" mode. In this mode, however, there are restrictions.

5.1.1 ASSIGN SERVER

You will now see the start window in which you can select one of three menu options:

- MEDIA SERVER
- CONFIGURATION
- INFORMATION



Figure 15 Logitech Media Server selection

To assign a server to the **AUDIOMODULE**, select the menu option “SELECT MEDIA SERVER”. This opens the window shown below:

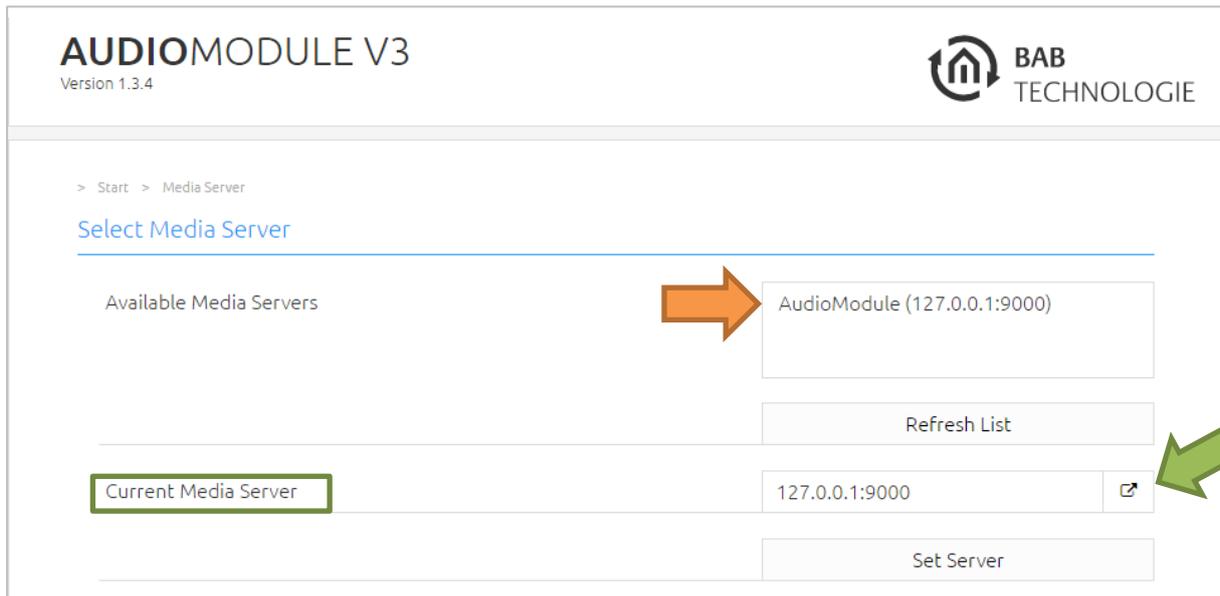


Figure 16 Select server for AUDIOMODULE

The currently available servers are displayed with their names and IP addresses. Click on “Refresh List” to update the list with all the latest available servers.

To change the server, select the external server you require from the list of “Available Media Servers” and click on “Apply Server”.

The local server can be easily recognised by the IP address **127.0.0.1** (localhost).

“Current Media Server”: This shows which server is currently being used.

The **AUDIOMODULE** is now linked with the required external server.

Note:

If the server that the AUDIOMODULE should access is changed during operation, the Logitech Media Server must be closed and then opened again.

As the IP address of the LMS also changes when the server is changed, it would otherwise not be possible to play back the audio files.

General operating information can be found in chapter 6.



5.2 CLIENT MODE: COMMISSIONING AS AUDIOMODULE WITH EXTERNAL SERVER

In the client mode, the **AUDIOMODULE** acts as a streaming client and plays back music from a remote Logitech Media Server (LMS).

Requirements:

- A PC with JAVA version 1.5 or higher
- A current browser (e.g., Firefox, Chrome, Safari etc.)
- **EIBPORT**
- Network and network cable
- Media server, xPL hub + ExPL plugin
- Power supply
- Speaker or hi-fi system, depending on **AUDIOMODULE**

In order to use the LMS, you need the xPL hub and ExPL plugin.

5.2.1 LOGITECH MEDIA SERVER (XPL HUB + EXPL PLUGIN)

The xPL hub can be downloaded free of charge from the xPL homepage:

<http://xplmonkey.com/xplhub.html>

and the ExPL plugin can be requested by emailing info@bab-tec.de.

By installing these files, you can ensure that your PC meets the requirements for control using the **EIBPORT**.

5.2.2 ASSIGN EXTERNAL SERVER

To assign a server to the **AUDIOMODULE**, log in again on the Web interface. In the main menu, select the “MEDIA SERVER” option. This opens the window shown below:

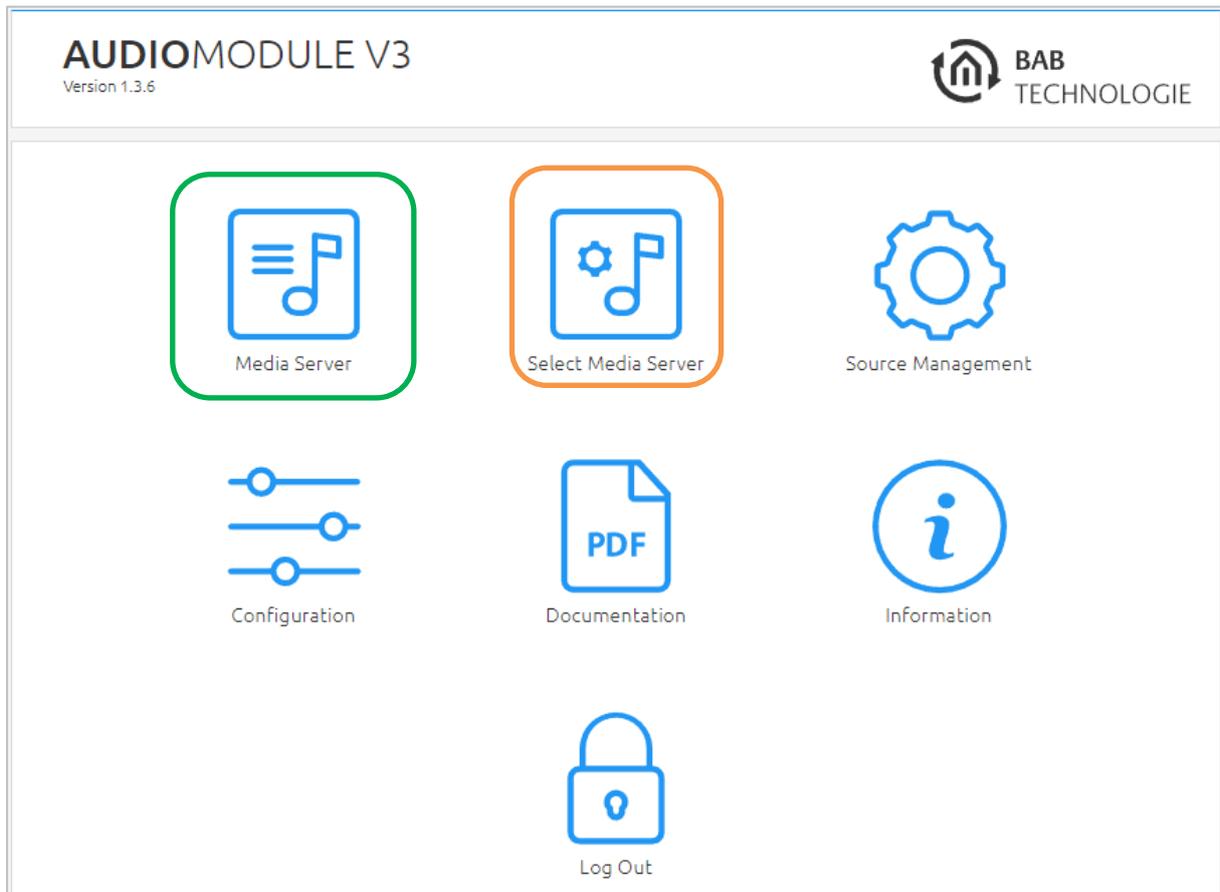


Figure 17 Logitech Media Server selection

Click on “Select Media Server” will open another window in which the server for this **AUDIOMODULE** can be selected (orange encircled).

Click on “Media Server” will open the web interface of the Media Server (green encircled).

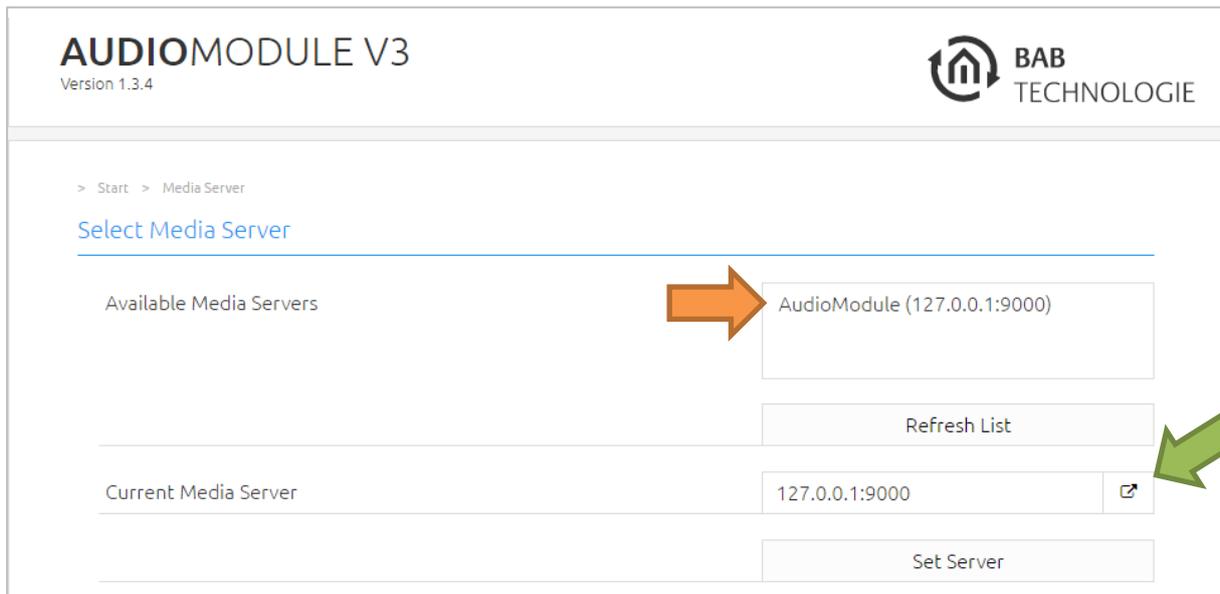


Figure 18 Select Logitech Media Server

The currently available servers in the local network are displayed (orange arrow) with their names and IP addresses.

Click on “Refresh List” to update the list with all the latest available servers.

In order to change the server, select the desired server from the "Available media servers" and click on "Apply."

“Current Media Server”: This shows which server is currently being used.

The **AUDIOMODULE** is now linked with the required external server.

Access the media server via the green arrow.

Note:

If the server that the AUDIOMODULE should access is changed during operation, the Logitech Media Server must be closed and then opened again.

As the IP address of the LMS also changes when the server is changed, it would otherwise not be possible to play back the audio files.

**6****SOURCE COTNROL**

Here you will find the default settings for the standard source, automatic source switching, equaliser, standard volumes and energy saving function.



6.1 CONTROL AUDIOMODULE

The **AUDIOMODULE** Speaker KNX and **AUDIOMODULE** Line KNX have a KNX bus connector and can be connected directly to the KNX bus.

Source Control **AUDIOMODULE** V3 KNX

AUDIOMODULE V3

Version 1.3.6

> Start > Source Management

☰ Generate GAs

✓ Save Configuration

Source Control **AUDIOMODULE** V3 KNX

Source - Preset	Media Server ▼
Enable Automatic Source Selection by default	<input checked="" type="checkbox"/>
Automatic Source Selection - Default Fallback Source	Line-In ▼
Automatic Source Selection - Silence Tolerance (Timeout in Seconds)	5
Equalizer	Without Optimisation ▼
Equalizer (EIS14)	2/1/1 >
Equalizer - Callback (EIS14)	2/1/2 >
Default Volume - Line-In	50
Default Volume - Media Server	50
Energy Saving Mode - Timeout (Minutes)	0

Source – Preset. This source will be selected by default after start-up the **AUDIOMODULE**. This setting will be overridden if “automatic source selection” is active.

Enable Automatic Source Selection by default. Pre-set for the “automatic source selection” function.

Note: It is possible that the **AUDIOMODULE** may also switch to the Line In when an audio cable is connected without an attached source (open end).

Automatic Source Selection - Default Fallback Source. If the automatic source selection is active, this source will be the default source after start-up.

Automatic Source Selection - Silence Tolerance (Timeout in Seconds). The time for which the **AUDIOMODULE** will wait before switching back to the default source when it does not receive an audio signal.

Assures that pauses in or between songs do not causes a source switch.



Equalizer. The **AUDIOMODULE** has 10 different in-build audio profiles to adjust the audio output that can be set using this pull-down menu. The chosen audio profile will be loaded into the Digital Sound Processor (DSP) and activated once you press "Save Configuration".

The profile for the digital sound processor can also be selected here. The selected profile will be activated after saving the configuration,

The following audio profiles are available:

- (1) Without Optimisation
- (2) Bass Boost
- (3) Stereo Widening
- (4) Flat
- (5) Party
- (6) Pop
- (7) Rock
- (8) House
- (9) Speech
- (10) Mono

Equalizer (EIS14). The different audio profiles can also be activated directly via a KNX group address and a value. For this purpose, the value of the desired audio profile has to be sent to the specified KNX group address. The associated values are listed in brackets in the description of the configuration field **Equalizer**.

NOTE: If a KNX group address is configured, the DSP profile cannot be changed manually via the web interface (see pull down menu "Equalizer").

Equalizer – Callback (EIS14). Report the active DSP profile as EIS14 value.

Default Volume

- **Line-In.** The volume which is used at start-up of the **AUDIOMODULE** for the source Line-In. This value can be overwritten via a KNX telegram. A later change of this configuration, however, will overwrite the KNX given value.
- **Media Server.** The volume which is used at start-up of the **AUDIOMODULE** for the source Media Server. The value can be overwritten via a KNX telegram. A later change of this configuration, however, will overwrite the KNX given value.

Note 1 Standard volume: If the volumes (default volume Line-In and Media Server) change via the corresponding KNX group address, these settings will be overwritten.

Note 2 Standard volume: Changing these parameters in this configuration menu, and saving the configuration, will override any previous changes made via KNX.

Energy Saving Mode - Timeout (Minutes). It applies only to the **AUDIOMODULE** Speaker model. The time for which the **AUDIOMODULE** will wait before going into stand-by when it does not receive a signal.

Notice: The value "0" (zero) disables this feature.



Group Addresses for Dynamic Configuration.

Group Addresses for Dynamic Configuration		
Standby (EIS1)	2/1/4	>
Standby - Callback (EIS1)	2/1/5	>
Source Select (EIS1)	2/1/6	>
Source Select - Callback (EIS1)	2/1/7	>
Source Information (EIS15)	2/1/8	>
Source - Name - Media Server	Medienserver	
Source - Name - Line-In	Line-In	
Enable Automatic Source Selection (EIS1)	2/1/9	>
Enable Automatic Source Selection - Callback (EIS1)	2/1/10	>
Default Source (EIS1)	2/1/11	>
Default Source - Callback (EIS1)	2/1/12	>

Standby (EIS1). Switches the integrated amplifier of the **AUDIOMODULE** Speaker on and off. Function of trigger values:

- 0 Power off
- 1 Power on

Standby – Callback (EIS1). Report whether the **AUDIOMODULE** is in standby mode (telegram value 1).

Source Select (EIS1). With this KNX group address you can switch manually between the sources “Media Server” and “Line-In” via the KNX bus. The manually switching between the sources, will be disabled the automatic source selection. The following KNX telegram values are assigned to the sources

- 0 for the Media Server
- 1 for the Line-In input

Source Information (EIS15). The given name of the current selected source is sent as EIS15 text values on this KNX group address. The names of the sources are awarded in the following two text fields.

Source - Name - Media Server. The text that is sent when the Media Server is selected.

Source - Name - Line-In. The text that is sent when the Line-In is selected.



Enable Automatic Source Selection (EIS1). The source can automatically be selected depending on the input signal and standard source. The following KNX telegram values are assigned to the function

- 0 Input signals will not cause an automatic switch of the source
- 1 The source will be selected automatically based on input and default source.

Note: It is possible that the **AUDIOMODULE** may also switch to the Line In (because of disturbing noise) when an audio cable is connected without an attached source (open end).

Default Source (EIS1). It concerns the default source for automatic source selection. If no signal is detected on the non-standard source, this source will be selected. The following KNX telegram values are assigned to the function

- 0 For Media Server
- 1 For the Line-In Input



Group Addresses for Volume Control.

Group Addresses for Volume Control		
Volume Absolute (EIS6)	2/1/13	>
Volume Absolute - Callback (EIS6)	2/1/14	>
Volume Dimmer With Step Length Information (EIS2)	2/1/15	>
Volume dimmer (EIS2)	2/1/16	>
Volume +/- (EIS1)	2/1/17	>
Volume +/- Step Length (%)	5	
Volume Minimum	1	
Volume Minimum - Group Address (EIS6)	2/1/18	>
Volume Minimum - Group Address - Callback (EIS6)	2/1/19	>
Volume Maximum	100	
Volume Maximum - Group Address (EIS6)	2/1/20	>
Volume Maximum - Group Address - Callback (EIS6)	2/1/21	>
Mute (EIS1)	2/1/22	>
Mute - Callback (EIS1)	2/1/23	>

Volume Absolute (EIS6). Control volume with absolute KNX telegram values. The volume for the currently inactive source remains unchanged. Only the currently active source will be adjusted.

Volume Absolute – Callback (EIS6). Feedback of the current absolute volume; there are stored volumes for both sources. Only the currently active source will be sent.

Volume Dimmer With Step Length Information (EIS2). Set volume relative with step length. It is dimming only the volume of the current active audio source. The volume of the inactive source will not change.

Volume dimmer (EIS2). Change the volume with the dimming function (via start and stop dimming command principle). It changes only the volume of the current active source. The volume of the inactive source will not change.

Volume +/- (EIS1). This KNX group address adjusts the volume stepwise with the configured step width. The size of each step can be configured as well with the next configuration field. The following KNX telegram values are assigned to the function

- 0 Decrease the volume with the configured step width
- 1 Increase the volume with the configured step width



Volume +/- Step Length (%). Step width of the step to change the volume stepwise.

Volume Minimum. The preconfigured minimum of selectable value for the volume level.

Volume Minimum - Group Address (EIS6). The preconfigured value for the minimum volume can be overridden by an EIS6 telegram with this KNX group address.

Volume Minimum - Group Address – Callback (EIS6). Report the minimum permitted volume level.

Volume Maximum. The preconfigured maximum of selectable value for the volume level.

Volume Maximum - Group Address (EIS6). The preconfigured value for the maximum volume can be overridden by an EIS6 telegram with this KNX group address.

Volume Maximum - Group Address – Callback (EIS6). Report the maximum permitted volume level.

Note: If the maximum or minimum volume changes via KNX group address the **AUDIOMODULE** will store this new value even after a restart.

Mute (EIS1). Mute the sound. The function mute will not forget the previous volume. The playback (if the media server is active) will be not interrupted in this case.

Mute – Callback (EIS1). Report whether the **AUDIOMODULE** is muted (telegram value 1) or unmuted (telegram value 0).



Group Addresses for Playback Control

Group Addresses for Playback Control		
Play/Pause (EIS1)	2/1/24	>
Play/Pause - Callback (EIS1)	2/1/25	>
Current Title Seek - Dimming (EIS2)	2/1/26	>
Current Title Seek - +/- (EIS1)	2/1/27	>
Current Title Seek - Step length	5	
Media Server - Title +/- (EIS1)	2/1/28	>
Media Server - Playlist +/- (EIS1)	2/1/29	>

Play/Pause (EIS1). This KNX group address manages the Play Pause function. The following KNX telegram values are assigned to the function

- 0 For pause
- 1 For play

Play/Pause – Callback (EIS1). Status feedback of the Play/Pause function; Play mode (value 1); Pause mode (0). It is only sent when the **AUDIOMODULE** is in media server mode.

Current Title Seek - Dimming (EIS2). EIS2 object (with the start and stop "dimming" principle) for a seek in configurable steps of seconds.

Current Title Seek - +/- (EIS1). EIS 1 object for the search function within the current track in steps. The increment of the search is determined in the next configuration field. The following telegram values are assigned to the function

- 0 step backward
- 1 step forward

Current Title Seek - Step length. Length of seek for every step-in seconds.

Media Server - Title +/- (EIS1). On the Media Server it is possible within the active playlist to jump to the previous or next title. The following telegram values are assigned to the function

- 0 Previous title
- 1 Next title

Media Server - Playlist +/- (EIS1). On the Media Server it is possible to change the active playlist. The following telegram values are assigned to the function. The playlists skip function is a loop, i.e. calling "previous playlist" when the first playlist is playing will open the last playlist, and vice versa.

- 0 Previous playlist
- 1 Next playlist

Media Server Title Information's.

Media Server Title Informations

Text View (EIS15)	<input type="text" value="2/1/29"/>	>
Text View - Events - Show for Seconds	<input type="text" value="5"/>	
Album (EIS15)	<input type="text" value="2/1/30"/>	>
Artist (EIS15)	<input type="text" value="2/1/31"/>	>
Title (EIS15)	<input type="text" value="2/1/32"/>	>
Playlist (EIS15)	<input type="text" value="2/1/33"/>	>

Text View (EIS15). Suitable for KNX switch sensors with text displays. On this KNX group address, the **AUDIOMODULE** will send a variety of information. By default, it will display current track information. However, if an action, such as change volume, change playlist, start, stop or mute, is triggered the current track information will be interrupted and the current action will be shown. The duration of this action display is set in the next configuration field.

Text View - Events - Show for Seconds. The duration for the triggered action that will be displayed on the Text View. After this time the current title information will be displayed again.

Album (EIS15). The name of the current album will be sent to this KNX group address.

Artist (EIS15). The name of the current artist will be sent to this KNX group address.

Title (EIS15). The name of the current title will be sent to this KNX group address.

Playlist (EIS15). The name of the current playlist will be sent to this KNX group address.



Playlist – Selection.

Playlist - Selection		
Playlist - Display Row 1 (EIS15)	2/1/34	>
Playlist - Display Row 2 (EIS15)	2/1/35	>
Playlist - Display Row 3 (EIS15)	2/1/36	>
Playlist - Display Row 4 (EIS15)	2/1/37	>
Scroll Playlists (EIS1)	2/1/38	>
Playlist selection (EIS14)	2/1/39	>

These communication objects have been implemented to create a set of four EIS15 texts listing available playlists. One use case is a dynamic playlist selection via visualisation. Scrolling the playlists, if there are more than four, is done with an additional EIS1 object („Scroll Playlists (EIS1) “). Starting a playlist is realized with an EIS14 object.

Playlist - Display 1 (EIS15). First playlist entry.

Playlist - Display 2 (EIS15). Second playlist entry.

Playlist - Display 3 (EIS15). Third playlist entry.

Playlist - Display 4 (EIS15). Fourth playlist entry.

Scroll Playlists (EIS1). Via this group addresses the next or previous four playlists will be requested. Consequently, those four playlist names will be sent on the four display KNX addresses. The following telegram values are assigned to the function

- 0 requests the names of the previous four playlists to be sent to the display KNX addresses (Playlist - Display 1 ... Playlist - Display 4)
- 1 request the names of the next four playlists to be sent to the display KNX addresses (Playlist - Display 1 ... Playlist - Display 4)

Playlist selection (EIS14). Via this group address and its value, one of the currently displayed four playlists will be started. The following telegram values are assigned to the function

- 1 for the playlist displayed on Playlist - Display 1
- 2 for the playlist displayed on Playlist - Display 2
- 3 for the playlist displayed on Playlist - Display 3
- 4 for the playlist displayed on Playlist - Display 4

Direct Playlist Selection.

Direct Playlist Selection

Playlist Selection (EIS14) 2/1/30 >

Assign Playlist

1: Faithless - Outrospective (2001)

Add Copy Edit Delete

✓ Save Configuration

Playlist (EIS14). Via this KNX group address, playlists can be started through assigned values. In the next configuration parameter, the playlists can be assigned to values.

Assign Playlist. In this list, the playlists are linked with corresponding values. Add create a new entry. Copy, Edit and Delete are also available for processing the entries.

Two pieces of information are required for a new entry:

- The Playlist and
- The (trigger-) Value.

The following figure shows the configuration of a new entry. The play list is selected by using a pull-down menu.

Corresponding Integer (0-255) in the next configuration field is the assigned trigger value to start the selected play list.

Assign Playlist

Desired Playlist Faithless - Outrospective (2001) ▾

Corresponding Integer (0-255) 1

Notification List

Cancel OK

Notification List. . If this option is activated, the playlist will be temporarily inserted into the current playlist. This means that after the playlist is finished, the previous state will be restored. For example, previously played internet radio station will be reloaded again, and if another playlist had been playing, it will be resumed at the point of interruption



7 CONFIGURATION

This chapter describes the configurations for both the **AUDIOMODULE** Speaker and the **AUDIOMODULE** Line.

7.1 SAVING THE CONFIGURATION

As soon as you have applied changes, such as on the name and the IP address of the **AUDIOMODULE** and want to save them, click on the button "**Save configuration**".

7.2 GENERAL

Click on "Configuration" to make changes to the general settings.

The screenshot shows the configuration interface for AUDIOMODULE V3, Version 1.3.9. The page title is "AUDIOMODULE V3" and the logo for BAB TECHNOLOGIE is in the top right. The breadcrumb navigation is "> Start > Configuration". A "Save Configuration" button with a checkmark is visible in the top right. On the left, there is a sidebar menu with options: General (selected), Network, KNX, User Administration, Remote Servicing, Backup / Restore, and System. The main content area is titled "General" and contains three configuration fields: "Device Name" with the value "AUDIOMODULE1", "Location" with a dropdown menu showing "Europe/Berlin", and "System Time" with the value "17.02.2022 10:04". A second "Save Configuration" button with a checkmark is located at the bottom right of the configuration area.

Figure 19: General configurations

Device name: Here, you can assign an individual device name for your **APPMODULE**. This name is then displayed in the "Discovery Tool" and BAB STARTER.

Location: Edit the installation site so that the correct time zone can be set.

System time: The current system time of the device is shown. Clicking the button synchronises the system time of the device with that of the local PC. To synchronise the system time automatically, please use the NTP service. See "[Network](#)".

Note: The system time must be correct for the software to run properly. Please make sure that the system time is always correct. If synchronisation with NTP is not possible, correct the system time manually.

7.3 NETWORK

- DHCP:** If DHCP is active, the device automatically obtains the network settings. A DHCP server must be available in the local network.
- IP address / network mask / gateway:** If DHCP is not active, the network settings must be carried out statically. In case of doubt, contact your network administrator as to which settings are to be carried out. Please note that an IP address may never be assigned twice!
- DNS server:** DNS is the abbreviation for Domain Name System. The DNS server converts Internet addresses, for example "www.bab-tec.de" into the IP address "85.214.89.170" and vice versa. Without a valid DNS entry, NTP-, weather- and UPnP-service do not work.
- NTP server:** NTP is a free service for synchronising the system time of Internet-compatible devices. If time synchronisation is not possible, please correct the system time manually. See "[General](#)".
NTP server list: e.g. <http://www.pool.ntp.org/zone/europe>

The screenshot shows the configuration page for AUDIOMODULE V3 (Version 1.3.9) by BAB TECHNOLOGIE. The page is titled "Netzwerk" (Network) and includes a "Konfiguration speichern" (Save configuration) button with a checkmark. The settings are organized into three sections: DHCP, DNS Server, and NTP Server.

Netzwerk	
DHCP <input type="checkbox"/>	
IP-Adresse	192.168.1.226
Netzwerkmaske	255.255.255.0
Gateway	192.168.1.1

DNS Server	
DNS Server #1	192.168.1.1
DNS Server #2	1.1.1.1
DNS Server #3	

NTP Server	
NTP Server #1	0.de.pool.ntp.org
NTP Server #2	1.de.pool.ntp.org
NTP Server #3	2.de.pool.ntp.org

At the bottom of the NTP Server section, there is another "Konfiguration speichern" (Save configuration) button with a checkmark.



7.4 KNX

The KNX-specific settings of the **AUDIOMODULE** are made in the "KNX" menu. The KNX settings are available for the **AUDIOMODULE** KNX (10516 and 10526).

AUDIOMODULE V3
Version 1.3.6

> Start > Configuration

Save Configuration

General

Network

KNX >

User Administration

Remote Servicing

Backup / Restore

System

KNX Interface

Physical Address	<input type="text" value="4.7.10"/>
KNXnet/IP Tunneling Address	<input type="text" value="4.7.18;4.7.19"/>
KNXnet/IP Routing	<input type="checkbox"/>
KNXnet/IP Tunneling	<input type="checkbox"/>

Test KNX Interface

KNX Address	<input type="text" value="1/0/1"/>
Switch a KNX Address	<input type="button" value="Toggle"/>
Read Address State	<input type="button" value="Request Status"/>

Save Configuration

Physical address:

Here, you can determine the physical address to be used by the **AUDIOMODULE** in the KNX network. Please make sure that the physical address corresponds to the installation site and does not occur twice.

KNXnet/IP Tunnelling address:

This address is used by the internal KNXnet/IP server for a KNXnet/IP tunnelling connection established to the device (using the **AUDIOMODULE** as a programming interface). Please note that this address must not be the same as the physical address (see above) and that it must not be used by any other participant in the line either.

KNXnet/IP Routing:

Activates KNXnet/IP routing for the coupling of lines and areas via IP. It can only be activated, if the physical address corresponds to that of a line or area coupler. KNXnet/IP routing is based on multicast and all participants send a **multicast group 224.0.23.12**. Since multicast packages are usually not transferred by routers, "routing" only works within a subnet.

KNXnet/IP Tunnelling:

Activates the KNXnet/IP tunnelling access to the device. This connection can be used to program KNX devices or to exchange data. The **AUDIOMODULE** is the server. The above-mentioned address is used as the physical address for the connection. For each address, only one connection can be established at any one time. On the TCP/IP layer, the connection is made by means of unicast to UDP port 3671.

TEST KNX INTERFACE

KNX Address	Enter the desired Group address here
Switch a KNX Address	With this Button you can toggle a telegram on the desired group address
Read Address State	By clicking "Request Status" the group address state of the desired group address is requested and is shown in Pop-up window

7.5 USER ADMINISTRATION

In order to edit the user or add new users, you must click on "User Administration" under the menu option "Configuration".

In User Administration you can then ADD, EDIT or DELETE USERS. (Orange circle)

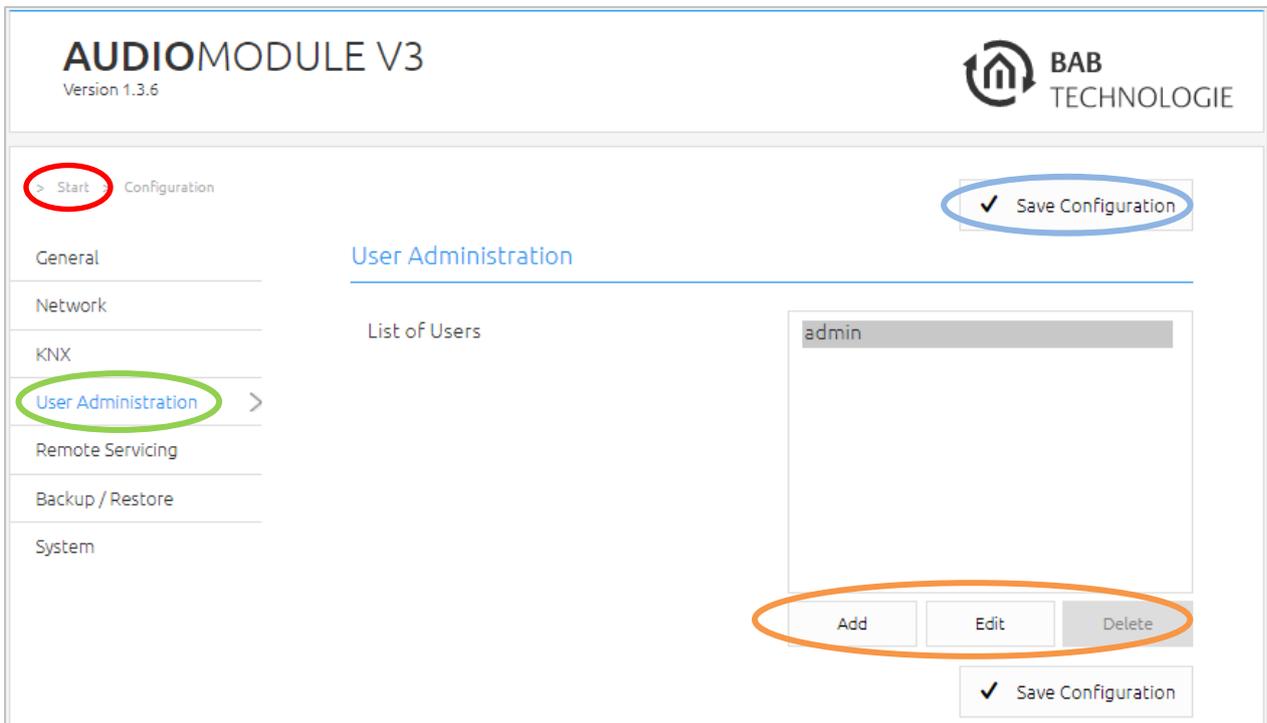


Figure 20 User administration



7.6 ENABLE THE REMOTE SERVICING ID

Requirements: The AUDIOMODULE needs to have an Internet connection. Port forwarding is not necessary.

The screenshot shows the configuration page for AUDIOMODULE V3 (Version 1.3.6). The left sidebar contains a menu with options: General, Network, KNX, User Administration, Remote Servicing (selected), Backup / Restore, and System. The main content area is titled 'Remote Servicing' and includes a 'Save Configuration' button with a checkmark. Below this, there is a 'Deactivate in' field set to '2h' and an 'Activate Remote Servicing Access' button.

- Choose the duration for which the remote support connection shall be available at “Deactivate in” and activate the access by clicking on “Activate Remote Servicing Access”.
- After a short moment the Remote Support ID and the end date will be displayed.

The screenshot shows the configuration page for AUDIOMODULE V3 (Version 1.3.6) after activation. The left sidebar is the same as in the previous screenshot. The main content area is titled 'Remote Servicing' and includes a 'Save Configuration' button with a checkmark. Below this, there are three rows of information: 'Remote Servicing Access activated' with the value '09.11.2017 13:14:22', 'Remote Servicing Access ends' with the value '09.11.2017 15:14:22', and 'Remote Servicing Access ID' with the value 'U2FsdGVkX18asFkyZ7yODEphXmhZctaxh'. There are also two buttons: 'Copy Remote Servicing Access ID' and 'Deactivate Remote Servicing Access'.

- Copy the Remote Servicing Access ID (click on “Copy Remote Servicing Access ID” to copy the ID to the clipboard) into an email and send it to info@bab-tec.de.

Note: at any time, the access can be closed by “Deactivate Remote Servicing Access”.

7.7 BACKUP / RESTORE

Once configurations have been made, such as IP addresses or device names, these settings can be saved. To do this, call up the menu "Save settings".

The configuration data of the **AUDIOMODULE** should be backed up at regular intervals in order to ensure that the current configuration status can be restored at any time.

AUDIOMODULE V3
Version 1.3.9

BAB TECHNOLOGIE

> Start > Configuration ✓ Save Configuration

General | Network | KNX | User Administration | Remote Servicing | **Backup / Restore** > | System

Backup Settings

Modules	Configuration	<input checked="" type="checkbox"/>
	States & History	<input type="checkbox"/>
Comment	<input type="text" value="Backup Firmware Update"/>	
<input type="button" value="Create a Backup"/>		

Restore Settings

Select Backup File

backup_20220217_1100.am.bkp

Modules	Configuration	<input checked="" type="checkbox"/>
	States & History	<input type="checkbox"/>
Backup creation date	<input type="text" value="17.02.2022 11:00"/>	
Firmware Version	<input type="text" value="1.3.9"/>	
Comment	<input type="text" value="Backup Firmware update"/>	
<input type="button" value="Restore"/>		

Figure 21: Backup / Restore



CREATING A BACKUP

Select the checkboxes under “Modules” to set which configuration data is to be backed up.

- *Configuration:* All configuration data except for app configuration data.

Note: The network settings are not backed up; these are separate from the backup data.

- *Statuses & logging:* The address status table and logging table are backed up. This is important, as it ensures that the status information can also be restored. Otherwise, status information will be established on the basis of the current telegram communication.

Comments regarding the backup can be added in the “Comments” field.

- Click on “Create backup” to launch the backup process.
- The backup file is generated by the system and provided automatically for download using the browser download dialogue.

RESTORING A BACKUP

- Select an **APPMODULE** backup file using the “Select backup file” button. The files have the extensions “*.am.bkp”.
- Information for the selected file is displayed in the “Backup created on”, “Firmware version” and “Comments” fields.
- The “Modules” field shows which modules are available in the selected backup file. You can also use the checkboxes to select which modules are to be restored.
- *Configuration:* All configuration data except for the app configuration data.

Note: The network settings are not part of the backup file.

- *Statuses & logging:* The address status table and logging table are restored.

7.8 FIRMWARE UPDATE

All **AUDIOMODULE** firmware versions 1.3.0 and above can be updated. The firmware update is free of charge. You will find the latest firmware files on the BAB Homepage. Download the latest firmware for the **AUDIOMODULE** as follows:

http://www.bab-tec.de/index.php/download_en.html

1. Under “Configuration” – “System”, select **AUDIOMODULE**
2. Now, in the “Firmware Update” window click “Browse” to select the downloaded firmware file on your hard disk.

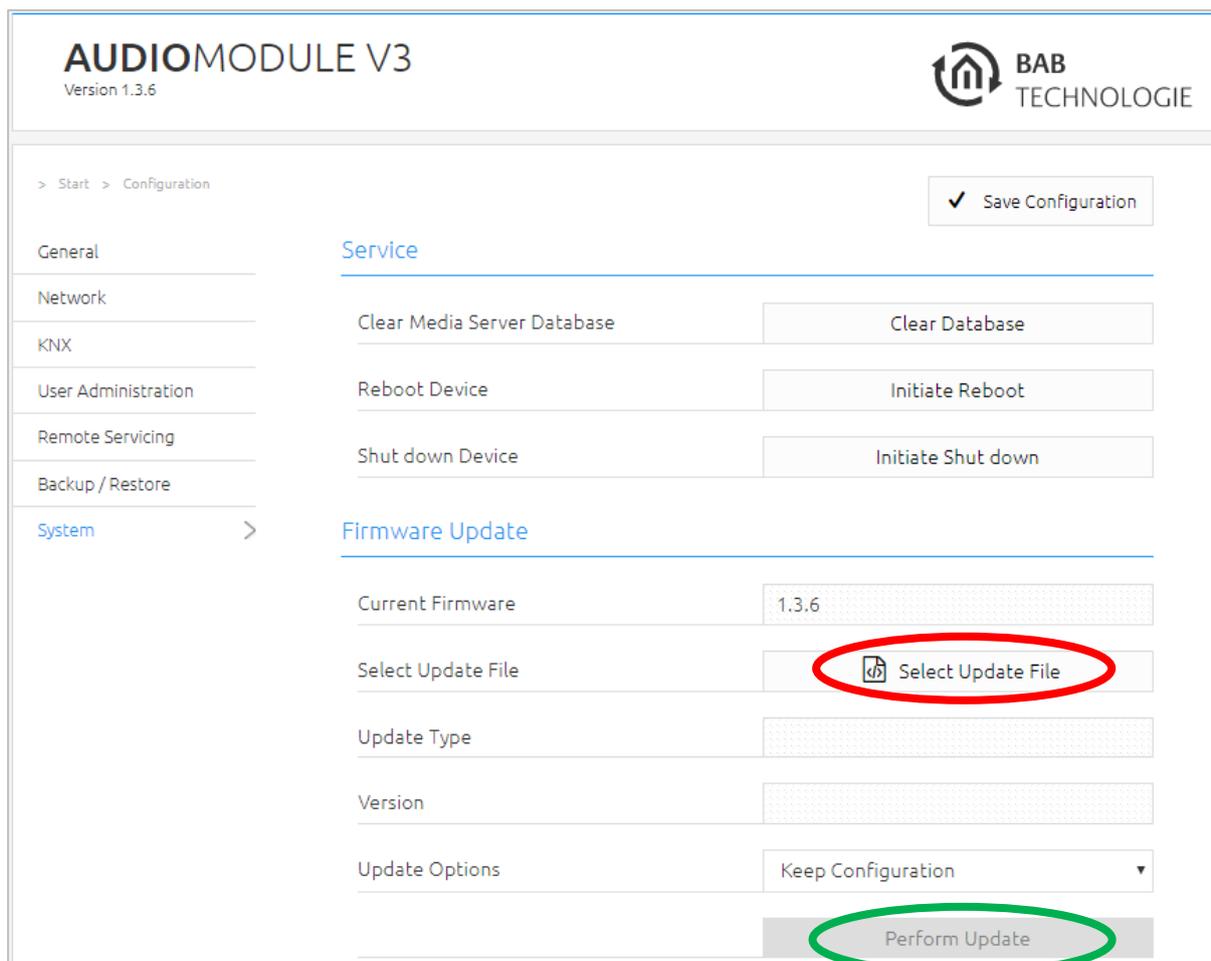


Figure 22 Firmware update menu

3. “Keep Network Settings” is to retain the **AUDIOMODULE** IP address setting after the update. Alternatively, you can select the option "Keep configuration" or "Reset configuration".

NOTE: In any case, please make a backup for secure.

4. Click on “Perform Update”



7.9 EXITING THE CONFIGURATION MENU

To leave the configuration menu and return to the main menu, click on the header (product name; Figure 23) or use the “back-button” of the web browser (orange circled Figure 23).

7.10 SIGN OUT

To sign out from the Web interface, click on the “Log Out” button (blue circled Figure 23).

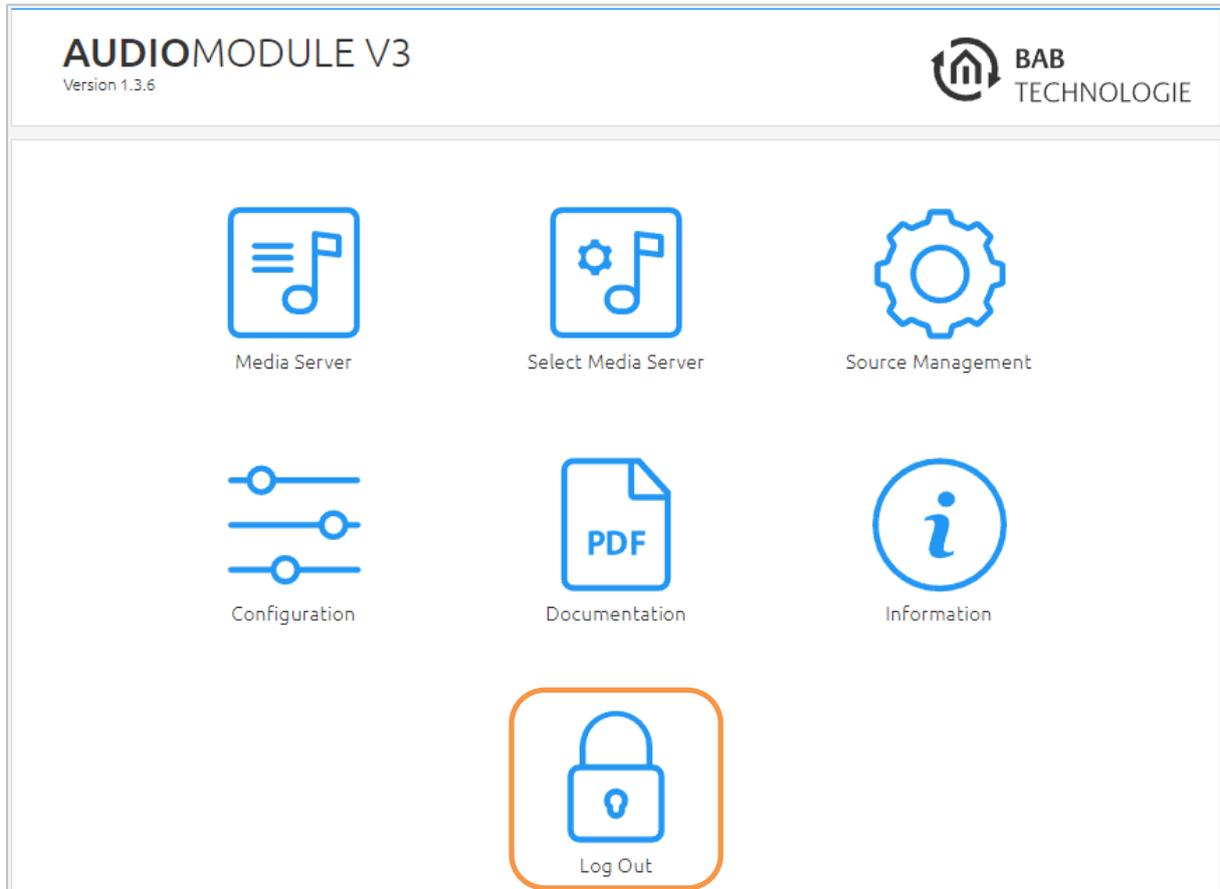


Figure 23 Header of the web interface

7.11 INFORMATION

Here you will find all the information you require on your **AUDIOMODULE**. Please retain this information in case you need to call for support.

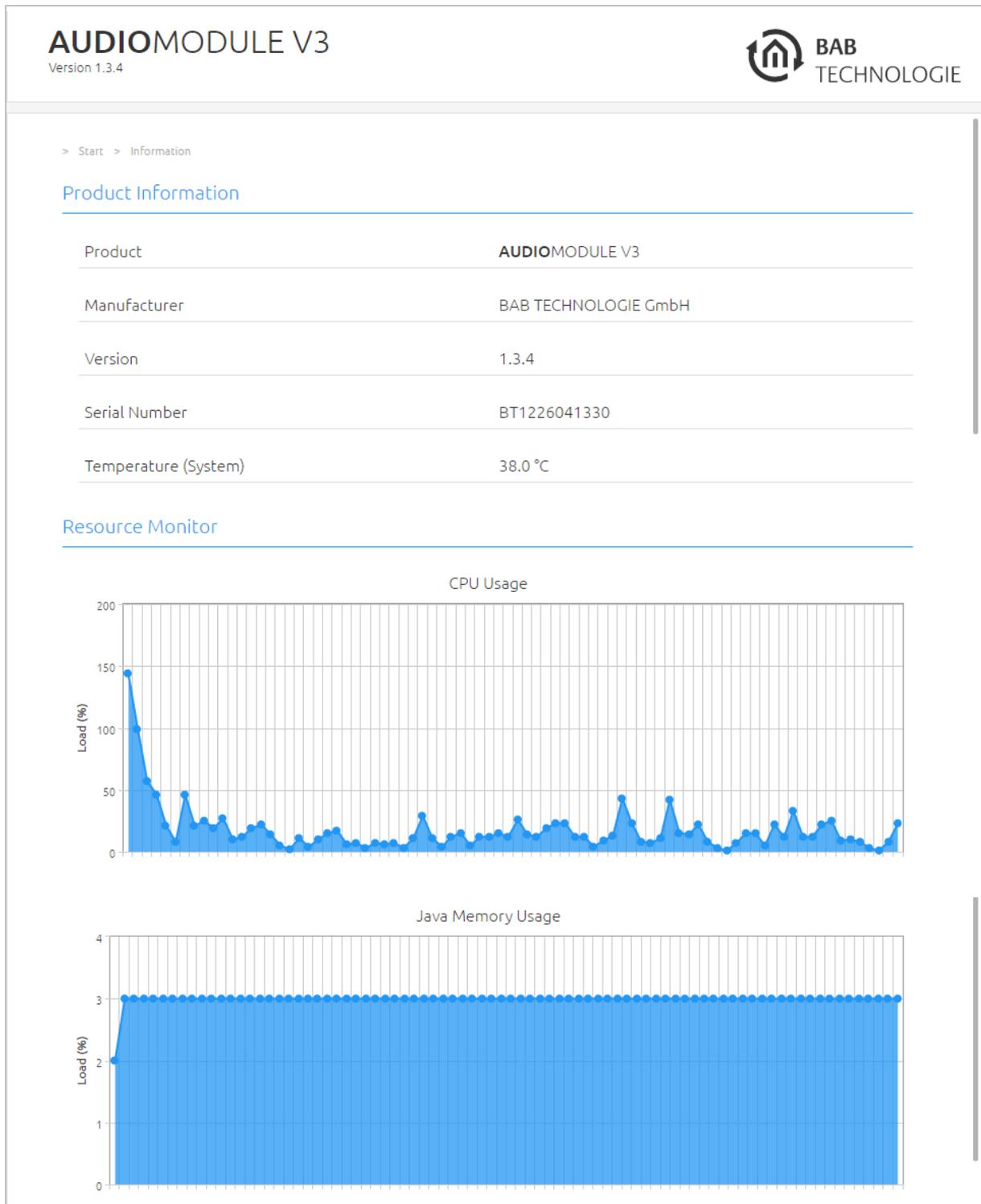


Figure 24 Information about the AUDIOMODULE

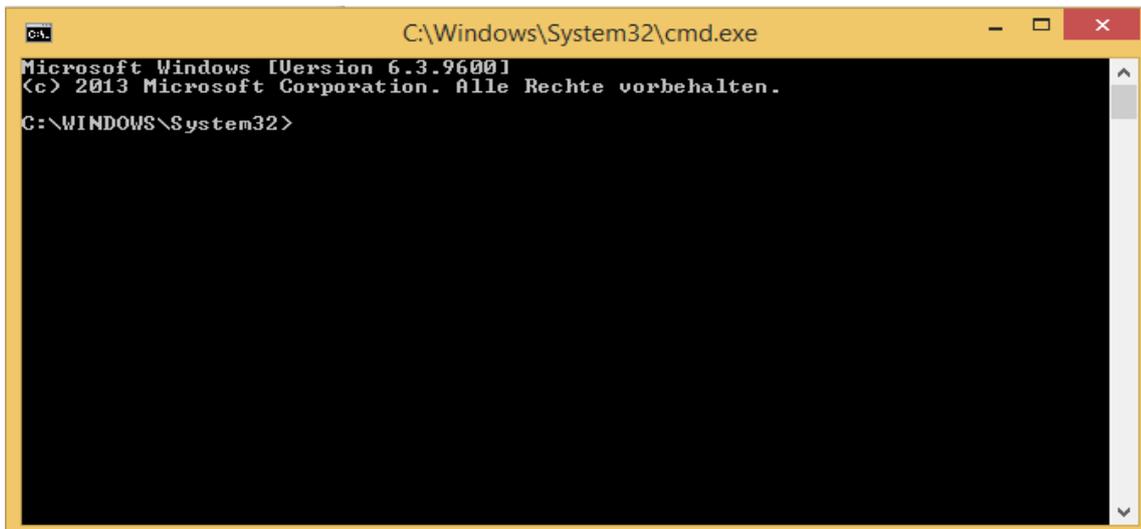


8 TROUBLESHOOTING

If the **AUDIOMODULE** does not connect itself, you can check the two IP addresses in the console (manually or using the Discovery Tool, Fig. 12).

To check now whether your computer and your **AUDIOMODULE** are in the same IP circle, click on the Start button and enter “cmd” in the search field.

A console window now appears:



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. Alle Rechte vorbehalten.
C:\WINDOWS\System32>
```

Figure 25 CMD

To check which IP address your **AUDIOMODULE** has, enter “ping audiomodule.local”.

And to check the IP address of your computer, enter “ipconfig”.

**9****APPENDIX**

9.1 CHANGING THE AUDIOMODULE NAME

The “Device Name” is used for unique identification of the **AUDIOMODULE**. This means that the **AUDIOMODULE** will not only be accessible in the browser under “Devicename.local”, but will also bear this name as an SQB Client in the LMS.

There is a possibility of changing the device name of the **AUDIOMODULE** and of the LMS in one process. In other words, it is not necessary to make changes in two different places!

To change the “Device Name”, proceed as follows:

1. Open the Web interface of the **AUDIOMODULE**
2. Change the device name of the **AUDIOMODULE** under the “Configuration” menu option
3. The player’s name of the LMS will adapt itself automatically.

Note: You should now make no further changes to the name in the AUDIOMODULE or the LMS, as otherwise you will have two different names for one AUDIOMODULE.



9.2 LOGITECH MEDIA SERVER

The Logitech Media Server (LMS) offers you easy and uncomplicated operation. You can save your audio files centrally on a single server and access them with every **AUDIOMODULE**.

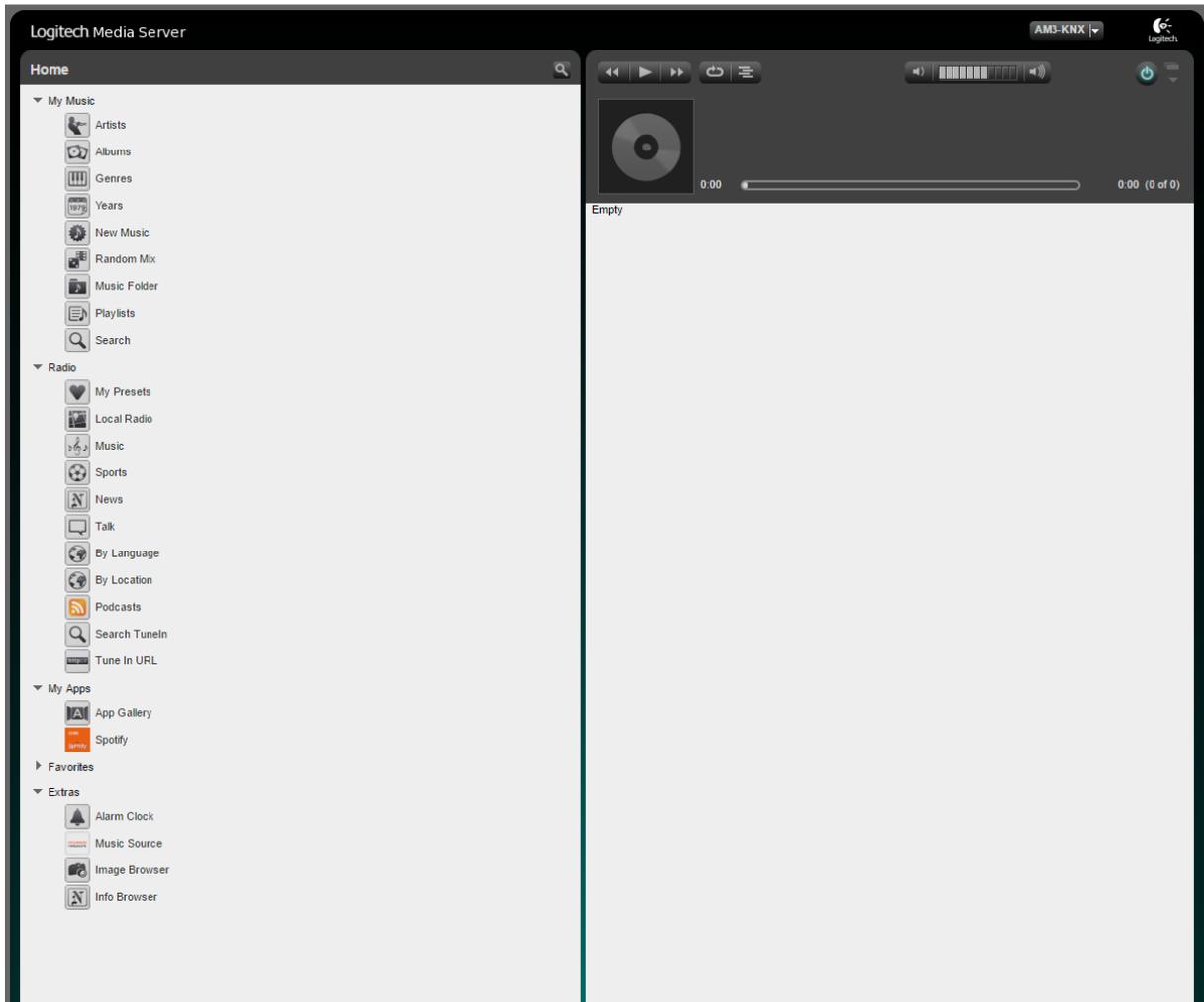


Figure 26 Logitech Media Server Web interface

The audio files are managed centrally here by the LMS. In the main menu you can perform a series of settings as shown in Fig. 46. Not only playlists can be created, but also extras such as setting alarms, or naming favourites.

Further information on the Logitech Media Server can be found at:

http://wiki.slimdevices.com/index.php/Main_Page



9.3 ACCESS THE MEDIA SERVER

To open the web interface of the Media Server, click on the button “Media Server” in the main menu of the **AUDIOMODULE** (green encircled on the previous page).

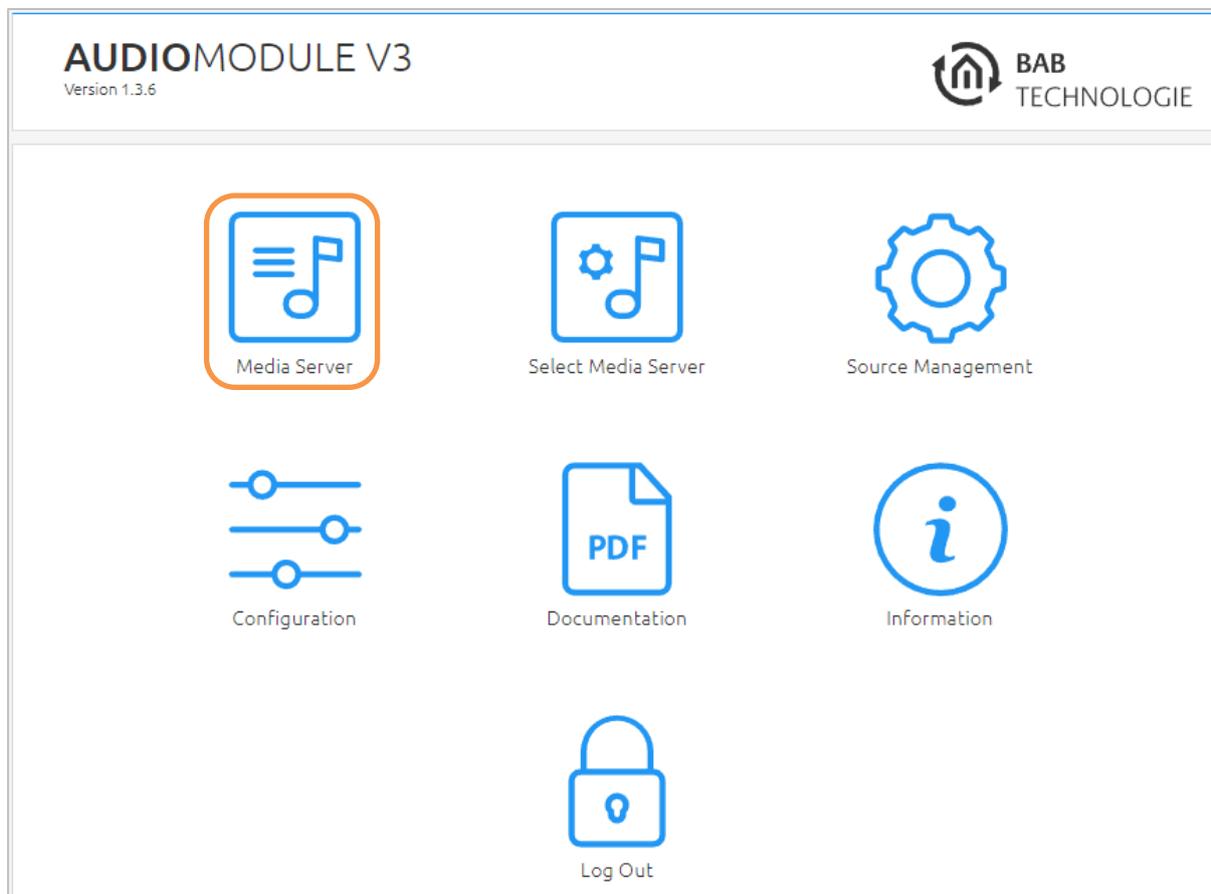
The media server can also be accessed via the **AUDIOMODULE** login page (without a login).

Alternatively, the Media Server can also be accessed via the page “Select Media Server” (see green arrow).



9.4 SETTING UP PLAYLISTS

NOTE: The location of the playlist may not be changed!



In order to set up playlists, open the menu of the Logitech Media Server (LMS). Do this by clicking on the button “Media Server” (see orange arrow).

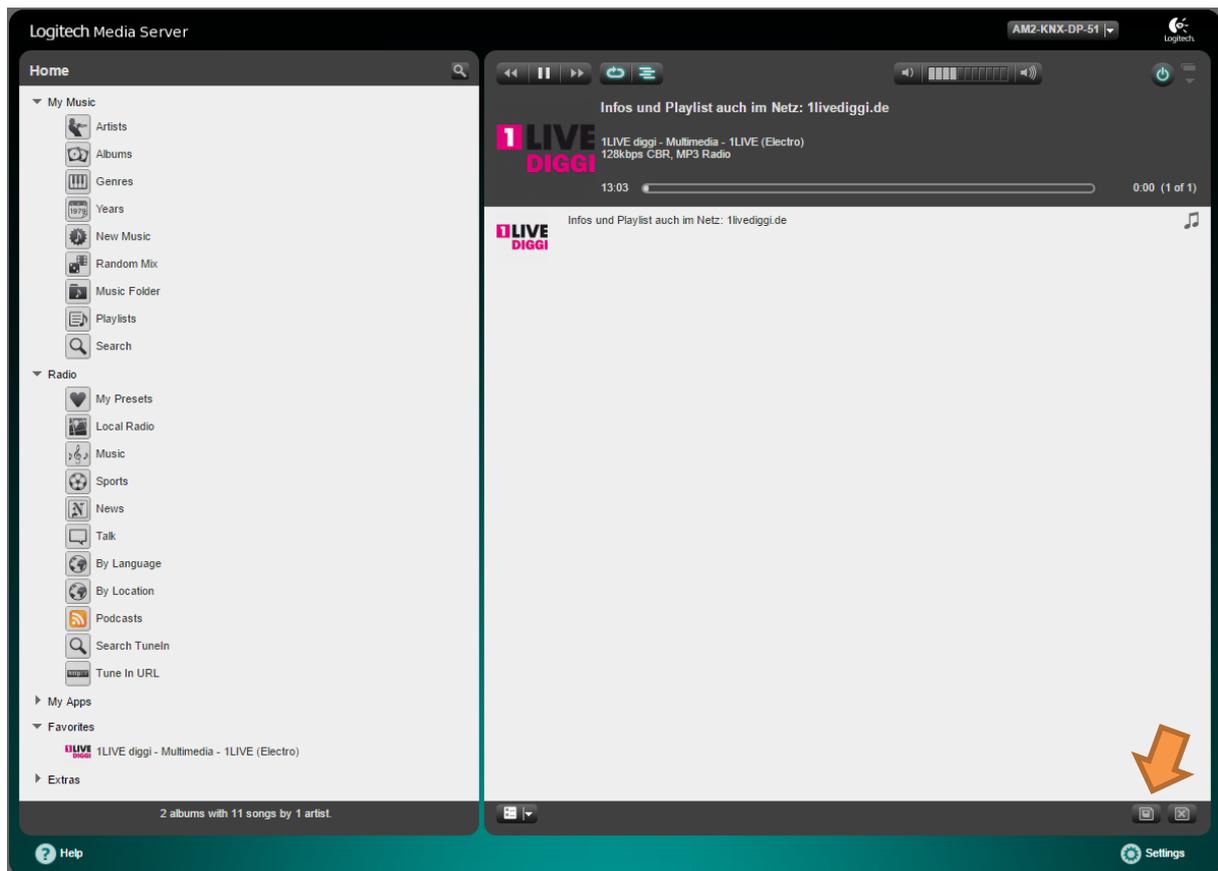
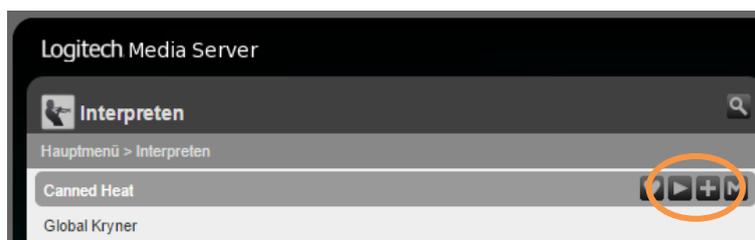


Figure 27 Logitech Media Server main menu

In the main menu you will find all the music files, sorted by artist, album and musical style. These can add to the current playlist (start directly play with the Play symbol or append to the current play list with the plus symbol). After choose the content for the playlist you want to create, click on SAVE (orange arrow) to safe the current playlist.



You can find further information on the LMS at: http://wiki.slimdevices.com/index.php/Main_Page



9.5 IMPLEMENT CURRENT COVER IN THE VISUALISATION

The visualisation element (e.g., the **EIBPORT** or **CUBEVISIONMODULE**) “Image” has the possibility to “show external images”. In this way the cover of the current audio track can show on a visualisation. If the cover image exists, the **EIBPORT** or **CUBEVISIONMODULE** can be found under the following URL:

`http://<server>:<port>/music/current/cover.jpg? player=<playerid>`

The player ID is the assigned name of the **AUDIOMODULE**.

Example:

Assuming the **AUDIOMODULE** is configured as follows:

- the IP address is 192.168.1.226
- the port of the Logitech Media Server is **9000** (standard)
- and the name of the **AUDIOMODULE** is **living room**

Then the URL to the cover of the current audio track is:

`http://192.168.1.226:9000/music/current/cover.jpg?player=livingroom`

9.6 CONNECTING THE USB STICK

One or two USB sticks can be directly connected to the **AUDIOMODULE**.

This offers even greater flexibility. Before you insert the USB stick, however, you must follow a couple of instructions:

- The USB stick must be formatted as NTFS or FAT32 (Windows) or ext2 or ext3 (MacOS, Linux).
- Under no circumstances may the USB interface be extended with a USB hub.
- We recommend that you do not use more than two USB sticks with a capacity of 16 GB each.
- As soon as a USB stick is connected, the Logitech Media Server requires several minutes to scan it. The duration of the scanning process depends not only on whether you have connected one or two USB sticks, but also on the storage capacity of the individual USB stick, what format the audio files have (wav or mp3) and how many playlists are stored on the stick. A cover has a crucial influence on this duration. If each audio file in each folder has its own cover, this will prolong the scanning process significantly. If there are two USB sticks with a capacity of 16 GB each, the scanning process will take 20 minutes on average.
- **The storage location for the playlist shall not be modified!**
- As soon as a USB stick has been removed the audio files can no longer be played and must be rescanned the next time the stick is connected.

To ascertain how far the scanning process has progressed, click on “Settings” in the LMS (Fig. 26, circled in yellow).

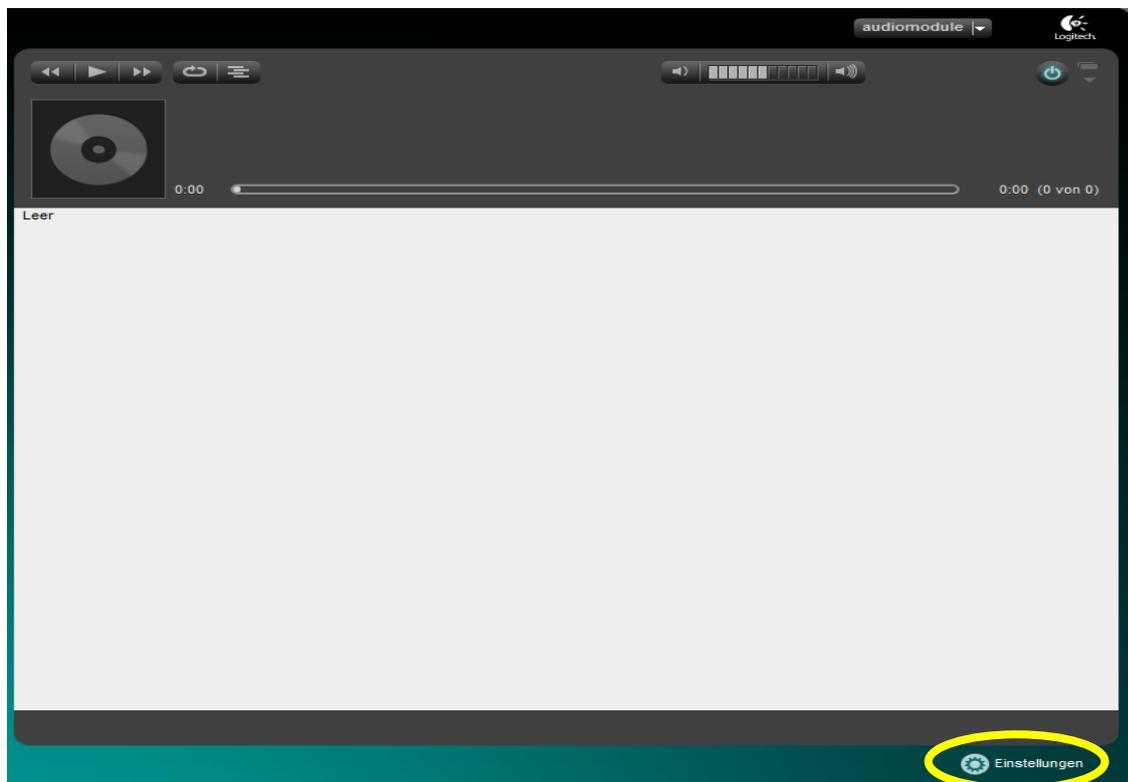


Figure 28 Open Logitech Media Server settings



9.7 UPNP CONTROL

If the **AUDIOMODULE** is operated in the server-client mode, the **AUDIOMODULE** can be used completely independently as a “Standalone” device. By means of the Logitech Media Server which is started on the **AUDIOMODULE**, the **AUDIOMODULE** is simultaneously a “UPnP-renderer” and “UPnP-server”.

In this way, the **AUDIOMODULE** can easily be controlled by means of a UPnP application, e.g. from a smartphone.

UPnP means “Universal Plug and Play”, a term that can be subdivided into three categories in relation to A/V controllers: Server, renderer and control point.

1. Server: Provides audio and video data. In this case, it can also be the mobile phone.
2. The renderer replays audio and video files, but the **AUDIOMODULE** only replays audio files and not video files.
3. The control point: this controls the **AUDIOMODULE**, for example with a UPnP-compatible smartphone or tablet.

Through apps, e.g., "BubbleUPnP" for Android or e.g. "imediashare" for iOS, you can make your smartphone or tablet UPnP Control Point-capable.



9.8 INTEGRATING MUSIC VIA NETWORK SHARING (UPNP)

The **AUDIOMODULE** can also access music from the network. This is done via UPnP. Shared music can be provided by a PC or NAS drive.

The following steps are necessary to access music over the network (Here an example with a Synology Disk Station NAS drive):

1. Activate the UPnP function on the NAS drive.
The figure below shows how the UPnP function on a Synology DiskStation will be activated (circled in red).
A software package for this function is needed. In this example, the "Media Server from Synology" (green circle) will be used. You will find the Media Server under "Package Center" (yellow circled)

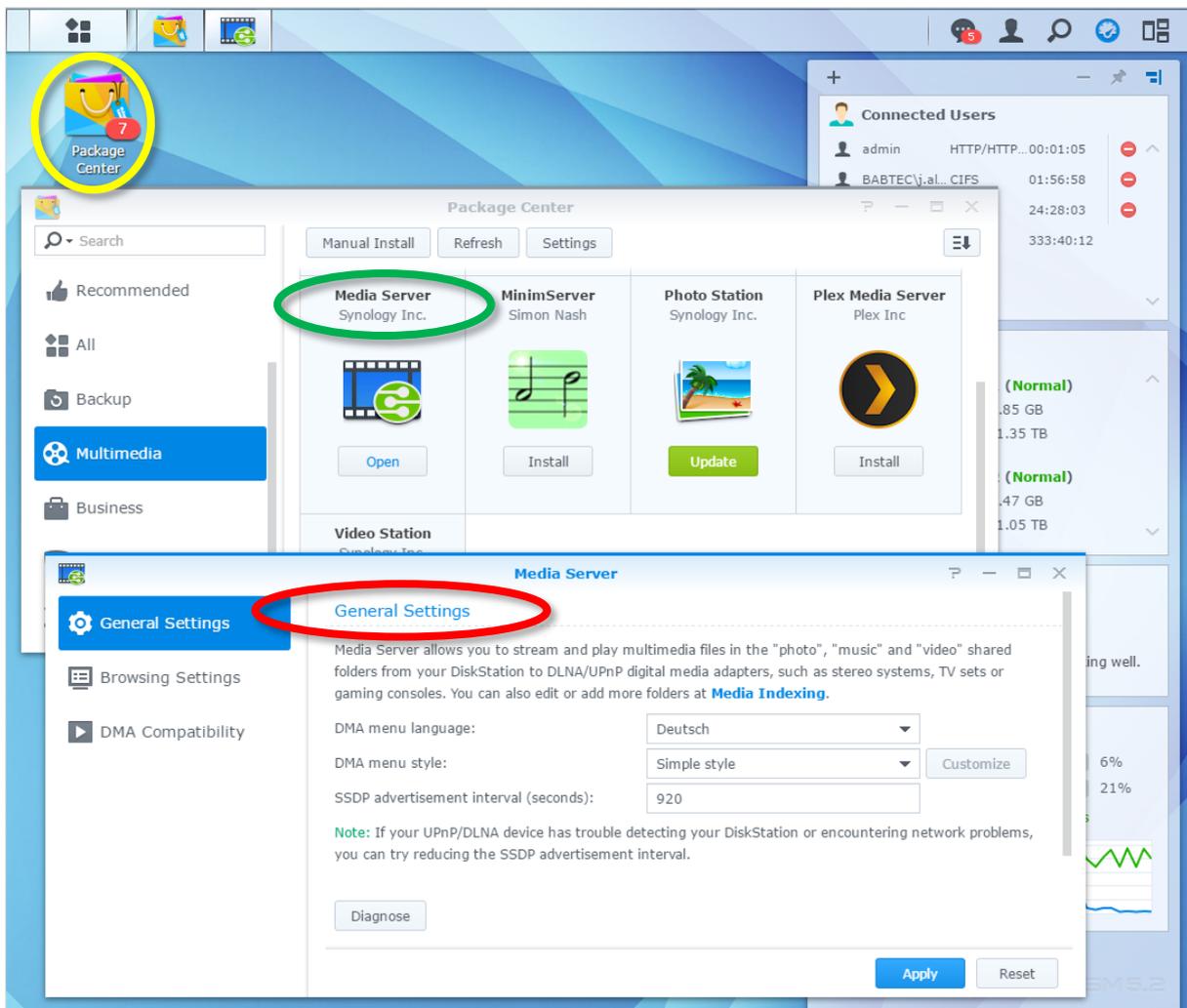


Figure 30 DiskStation Package Center – (UPnP) Media Server

2. Activate the UPnP function on the **AUDIOMODULE**.
The "UPnP / DLNA" plugin is required to access music via UPnP. Activate the plugin under the tab "Plugins" (orange arrow).

The screenshot shows the Logitech Media Server configuration interface. The 'Plugins' tab is selected and highlighted with a yellow circle. Below the navigation tabs, a message states: 'Logitech Media Server muss neu gestartet werden, damit die Änderungen in Kraft treten.' Below this, a section titled 'Aktive Plugins' contains a table of installed plugins. An orange arrow points to the 'UPnP/DLNA Media Interface (v1.0)' plugin in the table.

Aktive...	Name:	Beschreibung	Autor	
<input checked="" type="checkbox"/>	Anwendungsgalerie (v1.0)	Anwendungsgalerie	Logitech	
<input checked="" type="checkbox"/>	Befehlszeilenchnittstelle (CLI) (v1.0)	Mithilfe des Befehlszeilen-Plugin kann die Squeezebox-Software über eine TCP/IP-Verbindung ferngesteuert werden (z.B. über ein Automatisierungssystem eines anderen Herstellers wie AMX oder Creston).	Logitech	Einstellungen
<input checked="" type="checkbox"/>	Eigene Anwendungen (v1.0)	Eigene Anwendungen	Logitech	
<input checked="" type="checkbox"/>	Extension Downloader (v1.0)	Mit dem Erweiterungs-Downloader werden optionale Funktionen für Logitech Media Server automatisch heruntergeladen und installiert.	Logitech	Einstellungen
<input checked="" type="checkbox"/>	Favoriten (v1.0)	Favoriten speichern und bearbeiten	Logitech	Einstellungen
<input checked="" type="checkbox"/>	Generischer OPML-Browser (v1.0)	Generischer OPML-Browser	Logitech	
<input checked="" type="checkbox"/>	Info-Browser (v1.0)	Liest Informationen aus Internetquellen und zeigt Sie auf der Fernbedienung, dem Server oder dem Player an. Im Abschnitt 'Einstellungen' finden Sie Hinweise zu zusätzlichen Informationsquellen.	Logitech	Einstellungen
<input checked="" type="checkbox"/>	Line-In (v1.0)	Line-In für Boom	Logitech	
<input checked="" type="checkbox"/>	MOG (v1.0)	MOG	Logitech	
<input checked="" type="checkbox"/>	Musiksammlung erneut durchsuchen (v1.0)	Automatisches Durchsuchen der Musiksammlung	Logitech	Einstellungen
<input checked="" type="checkbox"/>	mysqueezebox.com-Service Handler (v1.0)	Wechseln Sie zu mysqueezebox.com für eine Auswahl an Diensten, die nicht von Logitech Media Server unterstützt werden.	Logitech	
<input checked="" type="checkbox"/>	Orange Liveradio (v1.0)	Orange Liveradio	Logitech	
<input checked="" type="checkbox"/>	Pandora (v3.0)	Pandora	Logitech	
<input checked="" type="checkbox"/>	Radio (v1.0)	Internetradio-Verzeichnisse	Logitech	
<input checked="" type="checkbox"/>	Rhapsody (v1.0)	Rhapsody	Logitech	
<input checked="" type="checkbox"/>	SiriusXM Internet Radio (v1.0)	SiriusXM Internet Radio	Logitech	
<input checked="" type="checkbox"/>	Slacker (v1.0)	Slacker	Logitech	
<input checked="" type="checkbox"/>	Sounds & Effekte (v1.0)	Sounds & Effekte	Logitech	
<input checked="" type="checkbox"/>	Spotify (v1.0)	Offizielles Spotify-Plugin. Nutzen Sie Spotify über Ihr Squeezebox Radio oder Ihre Squeezebox Touch.	Logitech	
<input checked="" type="checkbox"/>	Titel-Scanner (v2.0)	Player-Schnittstelle zum Springen an zufällige Positionen im aktuellen Titel	Kevin Deane-Freeman	
<input checked="" type="checkbox"/>	TuneIn Radio (v2.0)	TuneIn Radio - Lokale Internetradiosender	Logitech	
<input checked="" type="checkbox"/>	UPnP/DLNA Media Interface (v1.0)	Fügt einen UPnP/DLNA AV MediaServer und MediaRenderer hinzu und ermöglicht so den Zugriff anderer Geräte auf das lokale Netzwerk.	Andy Grundman	
<input checked="" type="checkbox"/>	Wiedergabeliste speichern (v1.0)	Wiedergabelisten über das Player-Interface abspeichern	Logitech	
<input checked="" type="checkbox"/>	WIMP (v1.2)	WIMP	Logitech	
<input checked="" type="checkbox"/>	Zufallsmix (v1.0)	Zufällige Wiedergabe ihrer Musiksammlung	Logitech	

Figure 31 Logitech Media Server configuration – activate UPnP plugin



3. Enable the UPnP client function on the **AUDIOMODULE**.
If the UPnP plugin is activated, the UPnP client function must be enabled as a last step. The UPnP client can be enabled under the "advanced settings" in the category "Network" (orange arrows).

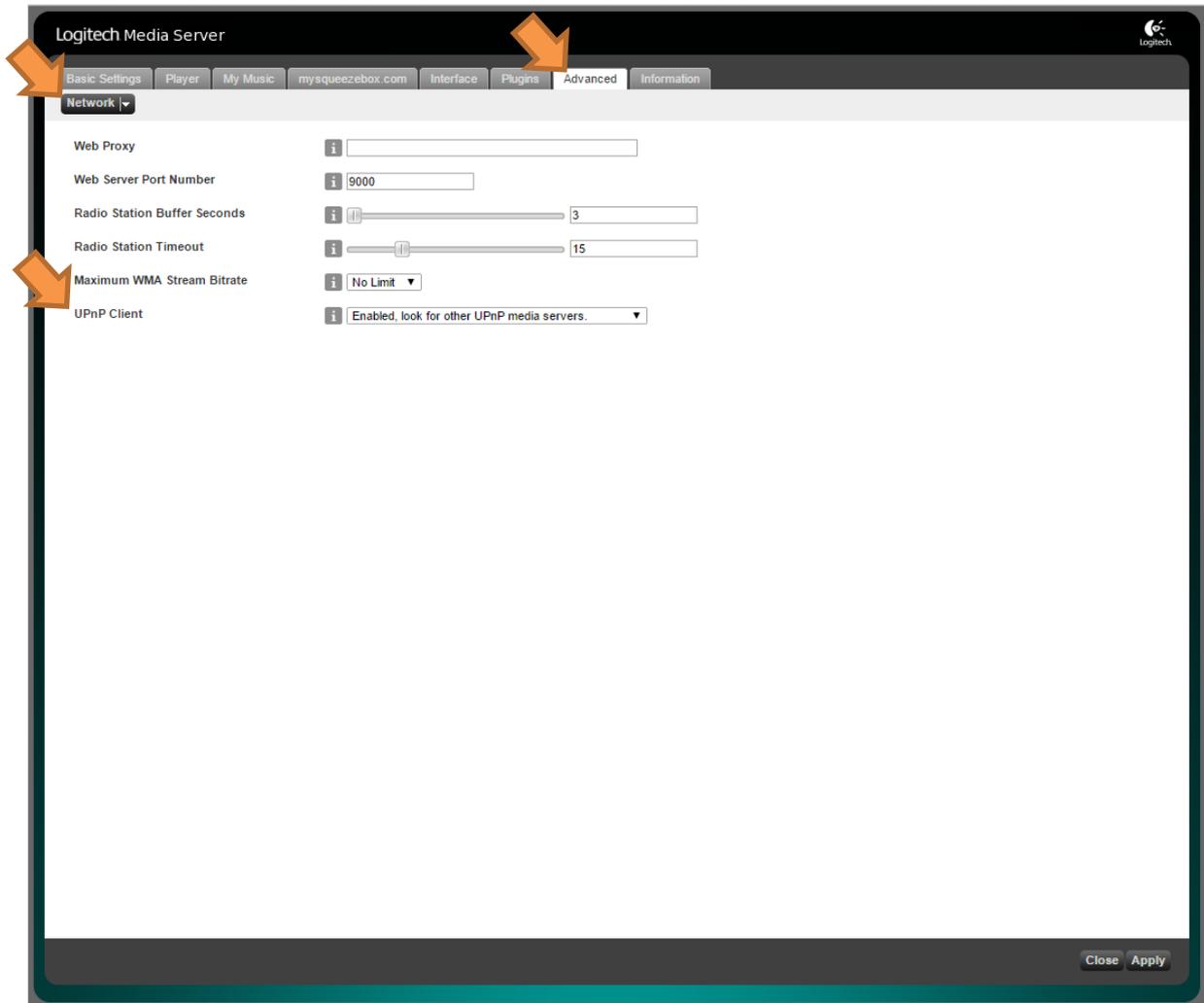


Figure 32 Logitech Media Server advanced configuration – enable UPnP Client

After the **AUDIOMODULE** has been rebooted, a new entry with the name of the computer (in this example, the name of the DiskStation will be shown) will appear in the "My Music" folder. This entry provides the UPnP shared music (orange arrow), sorted by album, artist, genre, ...

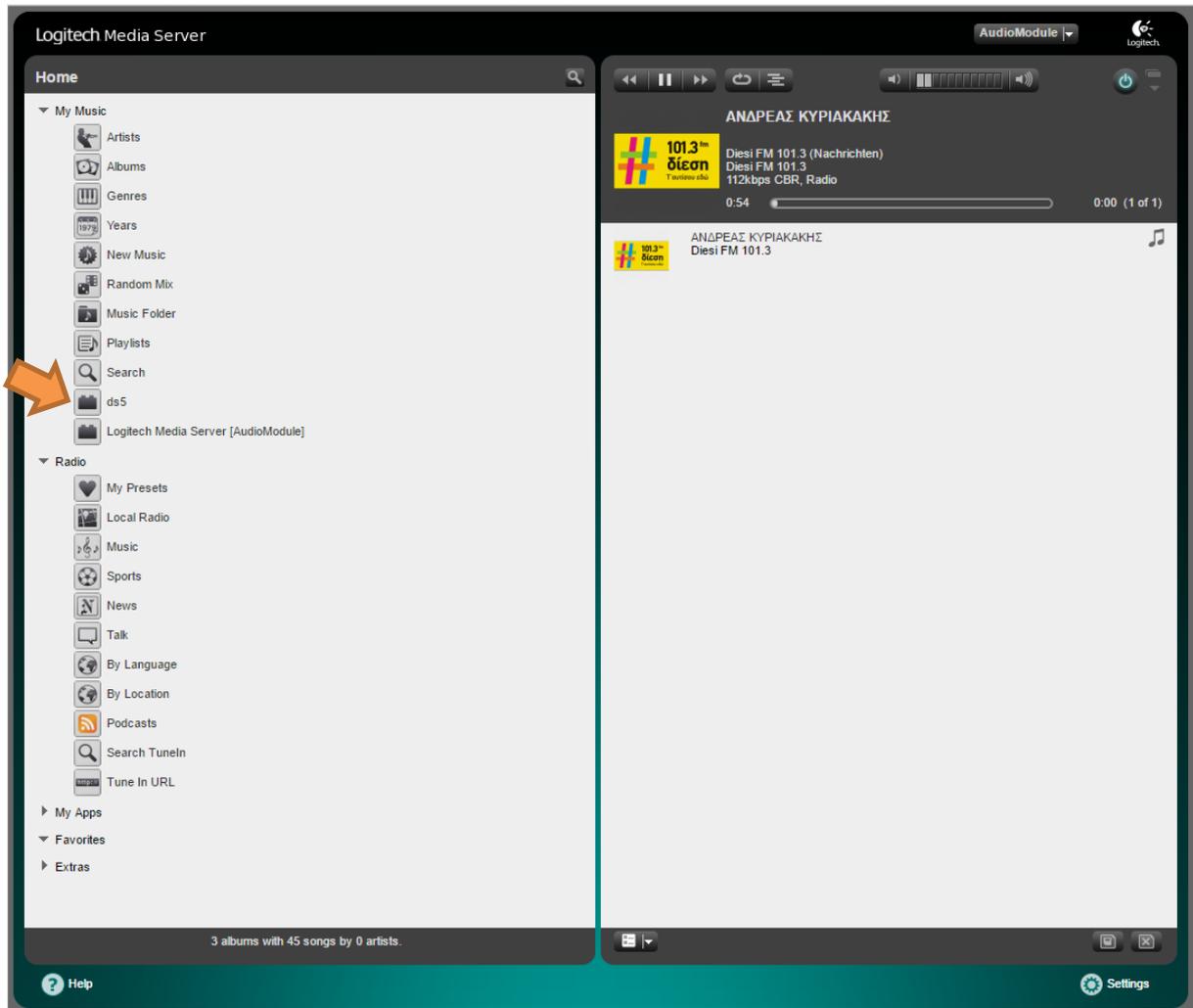


Figure 33 UPnP music content under "My Music"



9.9 EXAMPLE: ACCESS TO SPOTIFY® CONTENT

3rd party plug-ins add functionality and services to the Logitech® Media Server. For example, one of this 3rd-party plug-ins provides access to the contents of Spotify®. In order to access Spotify® music content, the 3rd party plug-in “Spotty” must be installed and some settings made.¹

Please proceed as follows:

1. Click on Settings (Figure 27 red circle).

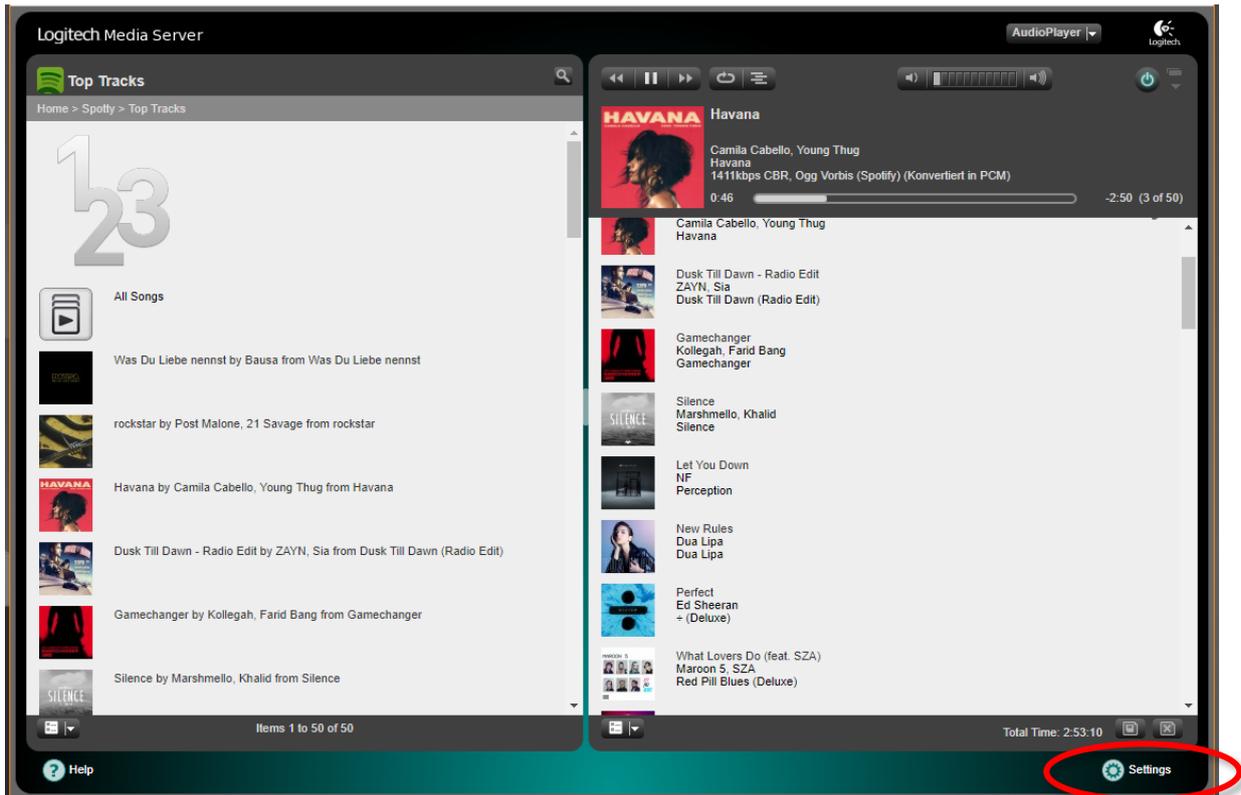


Figure 34 Logitech Media Server Player main menu (right side)

¹Third-party extensions (3rd Party Plug-Ins) are not part of the AUDIOMODULE's functionality. BAB TECHNOLOGIE has no control over the availability and functionality of third-party extensions and Logitech® Media Server.

The example was described considering the following software status: AUDIOMODULE with the firmware version 1.3.6.

Access to the contents of Spotify® may require a fee-based account.

- Now go to the tab “Plugins” (Figure 28 yellow circle) in the LMS settings menu.

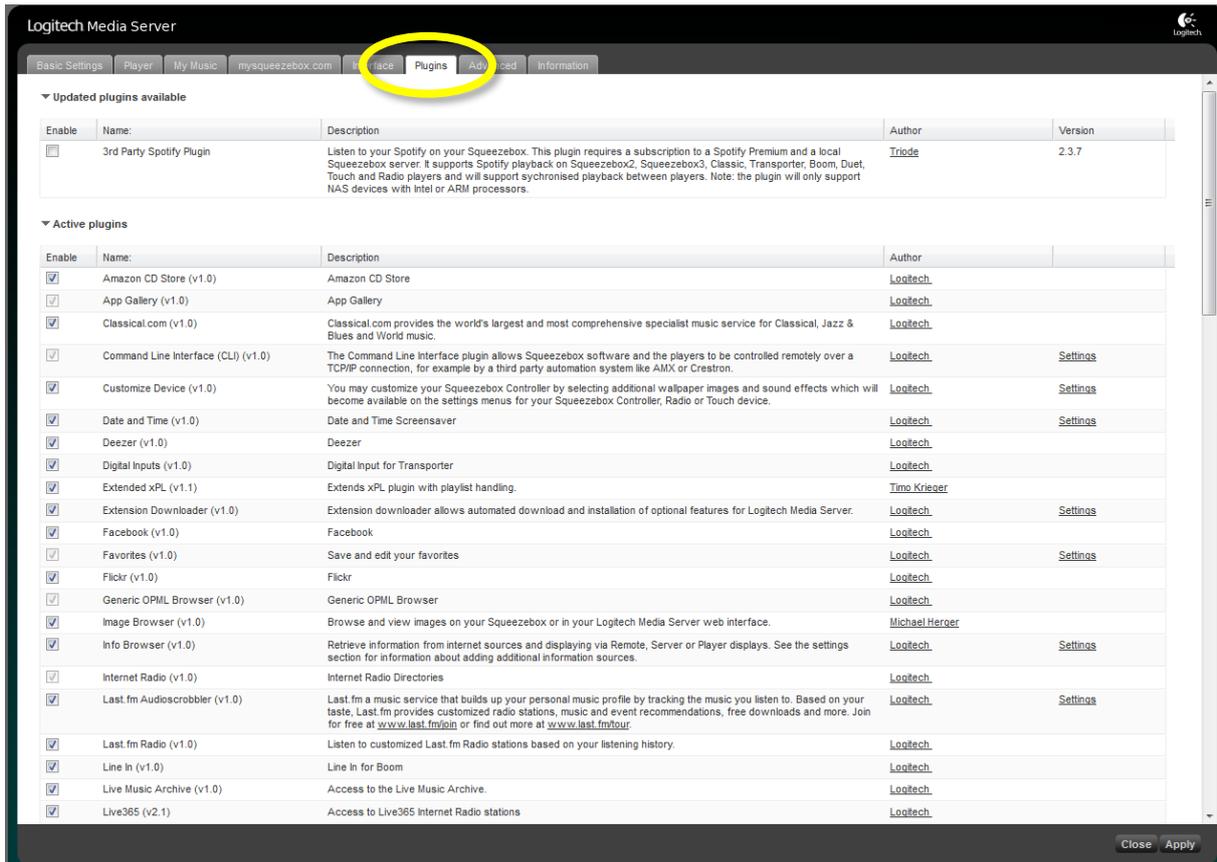


Figure 35 Configuration menu tab “Plugins”

- Now, enable the Spotty plugin. After the plugin have been activated, it is necessary to restart the Media Server.
After the restart, click on "Settings" (Figure 36 circled in red) to adjust the Spotty settings.

<input checked="" type="checkbox"/>	Song Scanner (v2.0)	Player interface for jumping to arbitrary positions within the currently playing song (Squeezebox Classic, Squeezebox Boom, Transporter only)	Kevin Deane-Freeman Logitech	
<input checked="" type="checkbox"/>	Spotty (v1.9.6)	Spotty Spotify for Squeezebox	Michael Herger	Settings
<input checked="" type="checkbox"/>	TIDAL (v1.2)	TIDAL - High Fidelity Music Streaming	Logitech	

Figure 36 Enter Spotify Plugin configuration



4. Now you have to enter your Spotify username and password (Figure 30).

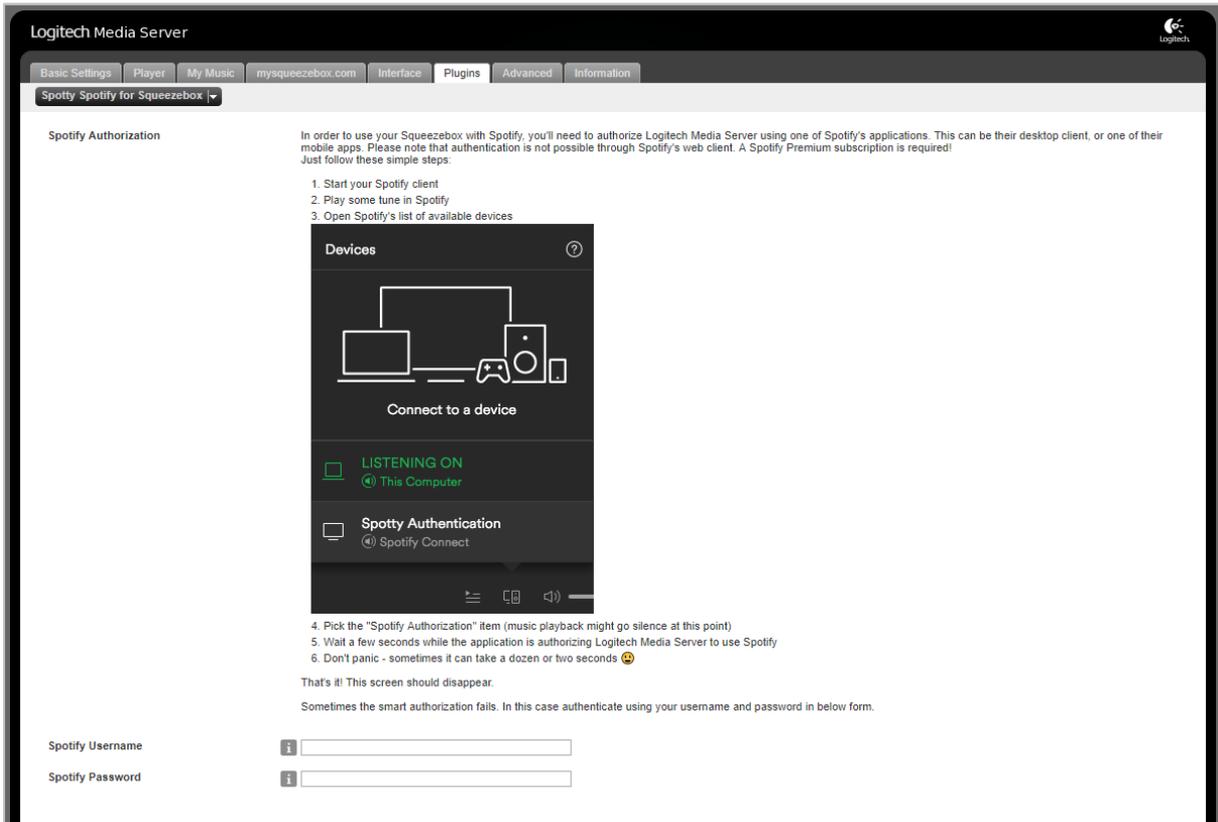
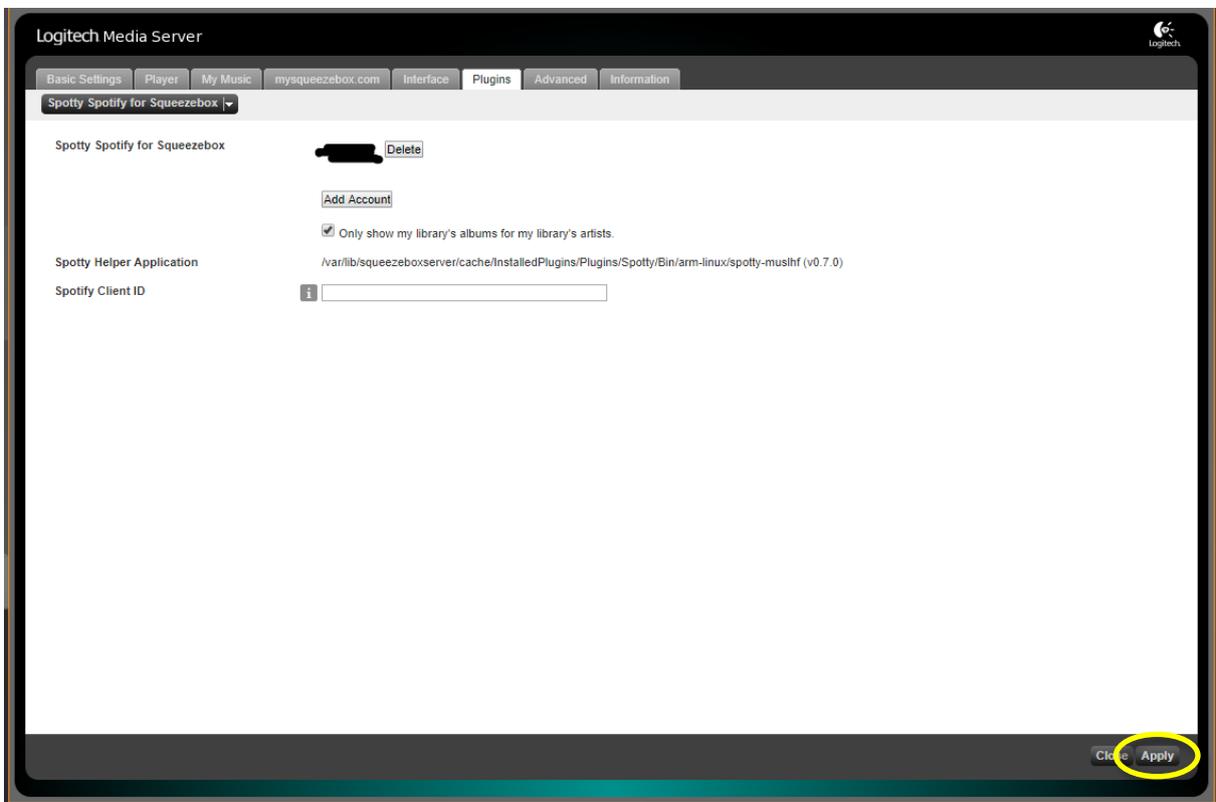


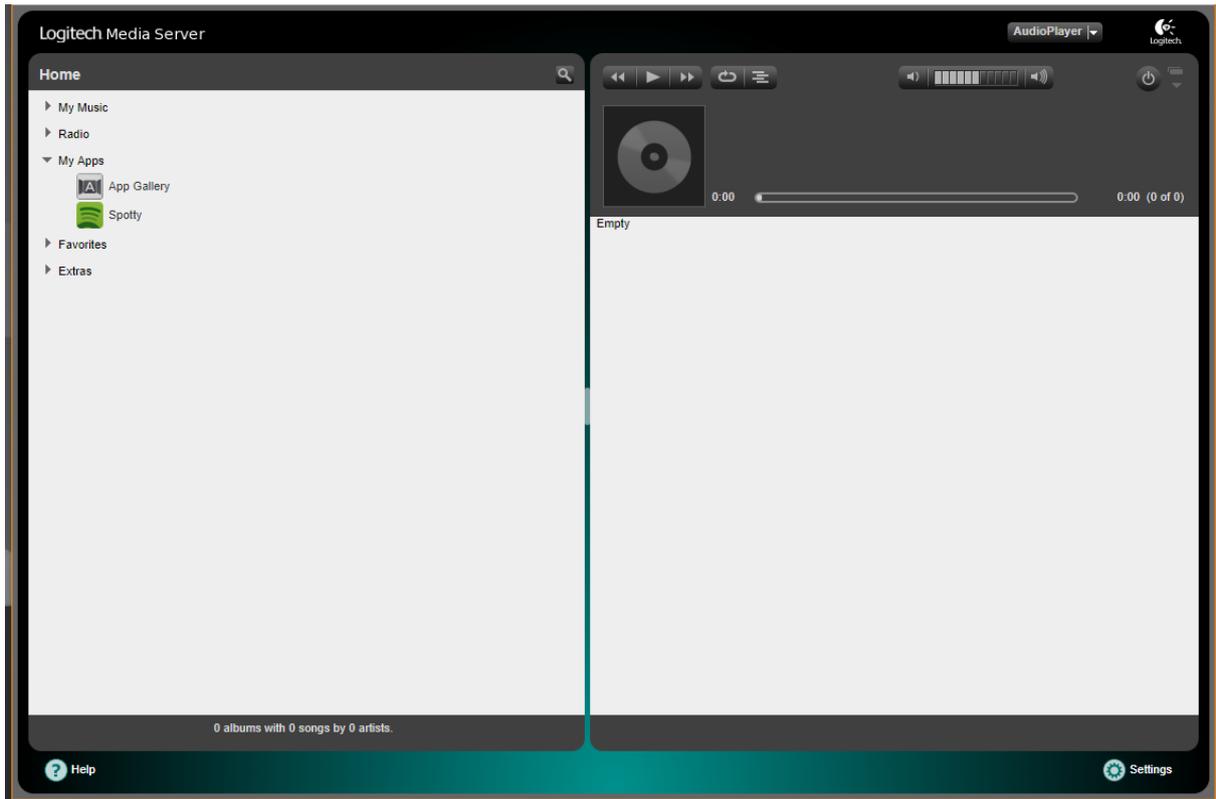
Figure 37 Spotify Settings

Finally, click the Apply button in the bottom right corner (yellow circle Figure 30).





Upon successful plugin installation and (Spotify Account) login, you can access the Spotify music library via the Media Server main menu under the category "My Apps".





9.10 SUPPORTED MEDIAFORMATS

Der Logitech Media Server is a DLNA-/UPnP-Media server for Audio. It supports the audio formats:

- MP3
(MPEG Audio Layer III; file extension: .mp3),
- FLACC
(Free Lossless Audio Codec; file extension: .flac),
- WAV
(Windows Media Audio; file extension: .wma),
- AIFF
(Audio Interchange File Format; file extension: .aiff),
- WMA / WMA PRO
(Windows Media Audio; file extension: .wma),
- Ogg Vorbis
(Vorbis; file extension: .ogg),
- HE-AACv2
(High Efficiency - Advanced Audio Coding; file extension: .aac, .3gp, .mp4, .m4a, .m4p),
- Apple Lossless
(Apple Lossless Audio Codec (ALAC); file extension: .m4a, .mp4)

MP3, WAV, WMA, WMA PRO and FLAC audio files has been checked in different quality grades:

MP3 (nach Sample Rate sortiert)

BITRATE		SAMPLE RATE	BITRATE		SAMPLE RATE
60kB/s	CBR	8.0 kHz	128kB/s	CBR	44.1 kHz
			158kB/s	VBR	44.1 kHz
59kB/s	CBR	11.025 kHz	148kB/s	VBR	44.1 kHz
			192kB/s	CBR	44.1 kHz
59kB/s	CBR	12.0 kHz	192kB/s	CBR	44.1 kHz
			192kB/s	CBR	44.1 kHz
123kB/s	CBR	16.0 kHz	192kB/s	CBR	44.1 kHz
			256kB/s	CBR	44.1 kHz
120kB/s	CBR	22.05 kHz	256kB/s	CBR	44.1 kHz
			279kB/s	VBR	44.1 kHz
118kB/s	CBR	24.0 kHz	281kB/s	VBR	44.1 kHz
			320kB/s	CBR	44.1 kHz
			320kB/s	CBR	44.1 kHz
96kB/s	CBR	32.0 kHz	320kB/s	CBR	44.1 kHz
96kB/s	VBR	32.0 kHz	320kB/s	CBR	44.1 kHz
96kB/s	CBR	32.0 kHz	320kB/s	CBR	44.1 kHz
104kB/s	VBR	32.0 kHz	320kB/s	CBR	44.1 kHz
118kB/s	CBR	32.0 kHz	320kB/s	CBR	44.1 kHz
320kB/s	VBR	32.0 kHz	320kB/s	VBR	44.1 kHz
			125kB/s	CBR	48.0 kHz
			320kB/s	VBR	48.0 kHz

FLAC

BITRATE	SAMPLE RATE	SAMPLE SIZE
389kB/s VBR	44.1 kHz	16 Bit
491kB/s VBR	44.1 kHz	16 Bit
480kB/s VBR	44.1 kHz	16 Bit
2178kB/s VBR	96.0 kHz	24 Bit
2605kB/s VBR	96.0 kHz	24 Bit
2255kB/s VBR	96.0 kHz	24 Bit
4477kB/s VBR	192.0 kHz	24 Bit
5547kB/s VBR	192.0 kHz	24 Bit
4680kB/s VBR	192.0 kHz	24 Bit

WAV

BITRATE	SAMPLE RATE	SAMPLE SIZE
1411kB/s CBR	44.1 kHz	16 Bit

WMA

BITRATE	SAMPLE RATE	SAMPLE SIZE
64kB/s CBR	44.1 kHz	16 Bit
80kB/s CBR	44.1 kHz	16 Bit
96kB/s CBR	44.1 kHz	16 Bit
128kB/s CBR	44.1 kHz	16 Bit
160kB/s CBR	44.1 kHz	16 Bit
192kb/s (215kb/s) VBR	44.1 kHz	16 Bit

WMA PRO

BITRATE	SAMPLE RATE	SAMPLE SIZE
128kB/s (151kB/s) VBR	44.1 kHz	24 Bit
192kb/s (213kb/s) VBR	44.1 kHz	24 Bit
256kb/s (269kb/s) VBR	44.1 kHz	24 Bit

9.11 SAMPLE RATE

Sampling Frequency	System Clock Freq					
	64 f _s	128 f _s	192 f _s	256 f _s	384 f _s	512 f _s
8 kHz	– ⁽¹⁾	1.0240 ⁽²⁾	1.5360 ⁽²⁾	2.0480	3.0720	4.0960
16 kHz	– ⁽¹⁾	2.0480 ⁽²⁾	3.0720 ⁽²⁾	4.0960	6.1440	8.1920
32 kHz	– ⁽¹⁾	4.0960 ⁽²⁾	6.1440 ⁽²⁾	8.1920	12.2880	16.3840
44.1 kHz	– ⁽¹⁾	5.6488 ⁽²⁾	8.4672 ⁽²⁾	11.2896	16.9344	22.5792
48 kHz	– ⁽¹⁾	6.1440 ⁽²⁾	9.2160 ⁽²⁾	12.2880	18.4320	24.5760
88.2 kHz	– ⁽¹⁾	11.2896 ⁽²⁾	16.9344	22.5792	33.8688	45.1584
96 kHz	– ⁽¹⁾	12.2880 ⁽²⁾	18.4320	24.5760	36.8640	49.1520
176.4 kHz	– ⁽¹⁾	22.5792	33.8688	45.1584	– ⁽¹⁾	– ⁽¹⁾
192 kHz	– ⁽¹⁾	24.5760	36.8640	49.1520	– ⁽¹⁾	– ⁽¹⁾
384 kHz	24.5760	49.1520	– ⁽¹⁾	– ⁽¹⁾	– ⁽¹⁾	– ⁽¹⁾

(1) This system clock rate is not supported for the given sampling frequency.

(2) This system clock rate is supported by PLL mode.

Figure 38 Samplerate