Grimm *AUDIO*

MU1 manual

Please read this manual before operating the unit!

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1   Introduction

Thank you for purchasing the Grimm Audio MU1 media player. It is designed to be the most sophisticated and best sounding music player on the market and at the same time blend seamless in your daily music playing routine. Core of the MU1 technology is an fpga processor board of our own design that offers the highest quality oversampling and de-jittering possible. The amount of work and knowledge that went into this project can hardly be overestimated. All this effort resulted in an elegant box of minimalistic design that humbly steps out of the way for the music. We are very proud that we were allowed to develop this gem and wish you many pleasurable hours of listening.

The Grimm Audio Team
info@grimmaudio.com

2   Important Safety Instructions

Grimm Audio gaat er van uit dat u deze Engelstalige tekst volledig begrijpt. Als u hier moeite mee heeft dient u contact op te nemen met Grimm Audio. Op verzoek sturen wij u een vertaling toe.

Grimm Audio nimmt an, dass Sie diesen Englischen Text völlig verstehen. Wenn notwendig, nehmen Sie bitte Kontakt auf mit Grimm Audio. Auf Wünsch wird Ihnen eine Übersetzung zugeschickt.

Grimm Audio suppose que le lecteur comprend parfaitement le texte en Anglais ci-dessous. En cas de doute s.v.p. contacter Grimm Audio. Si necessaire, on pourra vous envoyer une traduction.

Grimm Audio da por supuesto que el texto en versión Inglesa no ofrece ninguna duda de interpretación y se entiende integramente. Si este no fuese su caso rogamos contacte con Grimm Audio quien, a petición, se encargaría de enviarle la correspondiente traducción.

Please follow these precautions when using this product:
1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Dangerous voltage is inside this apparatus. Opening is only allowed by qualified service personnel.
6. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
7. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
8. Unplug this apparatus during lightning storms or when unused for long periods of time.
9. Do not use this apparatus near water.
10. Do not use this apparatus outside.
11. Do not expose the apparatus to dripping or splashing. Do not place objects filled with liquids (flower vases, drink cans, coffee cups, etc) on the apparatus.
12. Clean only with a dry, soft, non-fluffy cloth. Do not spray any liquid cleaner onto the cabinet, as this may lead to dangerous shocks.
13. Install in accordance with the manufacturer's instructions.
14. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Avoid exposure to direct sunlight.
15. Use only attachments or accessories specified by the manufacturer.
16. This unit runs slightly warm when operated normally. Operate in a normal ventilated area.
17. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
18. WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

3   Installing

Unpacking and installation
Your MU1 was carefully packed at the factory and the packaging it came in was designed to protect it from the trials and tribulations of shipping. Keep the box and all packing materials, so that in the unlikely event that you need to return the MU1 for servicing, you can do so safely.

Placement
The MU1 does not produce strong RF fields nor is susceptible to them. You can position it near other digital gear such as computers and disk recorders without worry. In general it is a good idea to keep some distance between monitors (LCD and CRT) and audio cables because of risk of induced low level noise due to stray magnetic fields.

AC Power Hookup
The MU1 has a switch mode power supply that works with AC mains voltages from 90V to 240V +/- 10%. Make sure this complies with your local mains voltage. The MU1 is shipped with a proper mains cable. Grimm Audio cannot be held responsible for problems caused by using the MU1 with improper AC wiring or voltage. The MU1 has a power switch on the rear panel. Please use this switch to turn off the MU1 before unplugging the AC power hookup.

The MU1 relies on safety earth in the mains cable to guarantee your safety. It also needs this connection as low impedance path for mains leakage current to prevent hum or sound quality degradation in your system. For this reason, please connect all audio equipment in your system to a common mains outlet with safety earth connection. If you do not have safety earth available on the outlets in your listening room, please consult an electrician to have him add it.
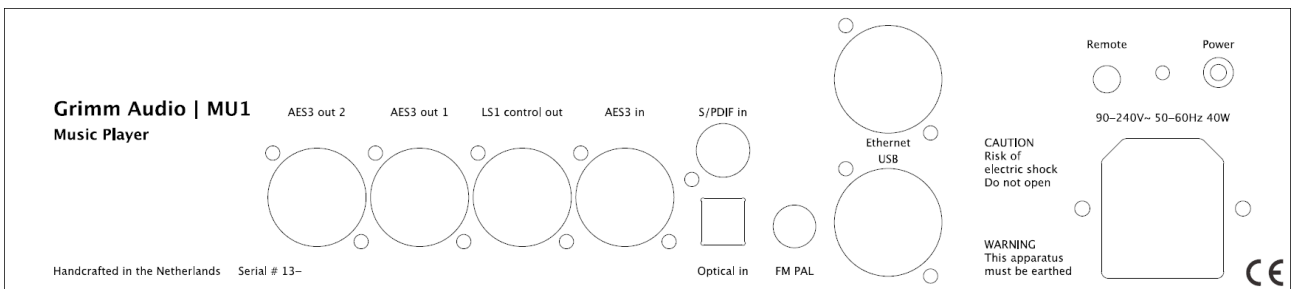
4   Signal connections

Front:

On the front you will find the MU1 activity LED in the 'i' of the Grimm logo. The display shows all user information.

Rear:

Digital output 2	Digital output 1	LS1 output	AES3 digital input	S/PDIF digital input	FM 75 Ohms cable input	Ethernet input	IR input	Mains switch
				Optical digital input		Dual USB input	Mains power connection	

Top:

On the top of the MU1 you find the main control knob. This is used for all user input of the MU1 via twisting and pressing.

5   Setup

Interface description

On the front

MU1 activity led. Shows the current activity of the MU1 system. Table 1 below shows the modi.

Off	MU1 is off or is updating.[1]
On	MU1 is on or booting[2]
Fading slowly	MU1 is in stand-by mode.

Table 1

[1] The system will only update when the user has manually activated the update. See chapter "Control".
[2] When the system is booting up the system will show an animation on the display.

The display shows information about the system depending on its state:
- System off: display is black, no information.
- System in stand-by: display is black, no information.
- System is booting up: boot animation is running, after booting the welcome picture is shown until the software is ready.
- System on: this state has different menus where information can be shown and settings can be adjusted. These settings are described in the chapter "Control".
- System shutting down: display is showing shutdown animation, with dimmed backlight. It goes to black when system is fully shut down.

On the rear

On the rear of the system various cable connections and the main power switch can be found. From right to left:

1. The mains power socket (standard IEC60320 model). In case your country has a EU, US or UK type wall outlet, our MU1 came with a fitting power cord. Otherwise, please consult your dealer.

2. The mains power switch. this is a small recessed switch. If the system is off and the power cord is connected, press the switch once using your finger nail to boot the system. If the system is on, press the switch once to shutdown the system.
*Hint: The power switch does not respond while the MU1 is updating.*

[To be implemented] 3. Mini jack input for infrared remote sensor. This will be implemented in a future software update.

4. Ethernet input. Connect your wired local network to the MU1 using this RJ45 connector. The cable type should be at least CAT5e to ensure that loss of network data packets is minimized. Please use high quality cables intended for use with computer systems and avoid cables with claimed special qualities for audio.

5. Dual USB input. These two general purpose USB3.0 connectors may be used for connecting an external USB drive (flash drive, SSD or HDD) for extending the disk space of the MU1 system. You may play music files from this drive. The MU1 supports the following filesystems: **FAT32, NTFS, EXT2 and EXT4**. When a USB device is plugged in, it will be automatically mounted in the system. Since USB drives are mounted in 'read only mode', it is not necessary to 'safely remove' the USB device from the system, the device is unmounted automatically.

The mounted folder can be found through the Roon storage settings. Go to the Roon *Settings →Storage* and press the button "*+ Add Folder".*
The USB disk should appear in the menu on the left as "usbdisk-XXXX-XXXX". Where XXXX-XXXX is the device ID. If you don't see it here, go to the root directory "/" and open "mnt". Here you will find "usbdisk-XXXX-XXXX". Select this folder to add it.
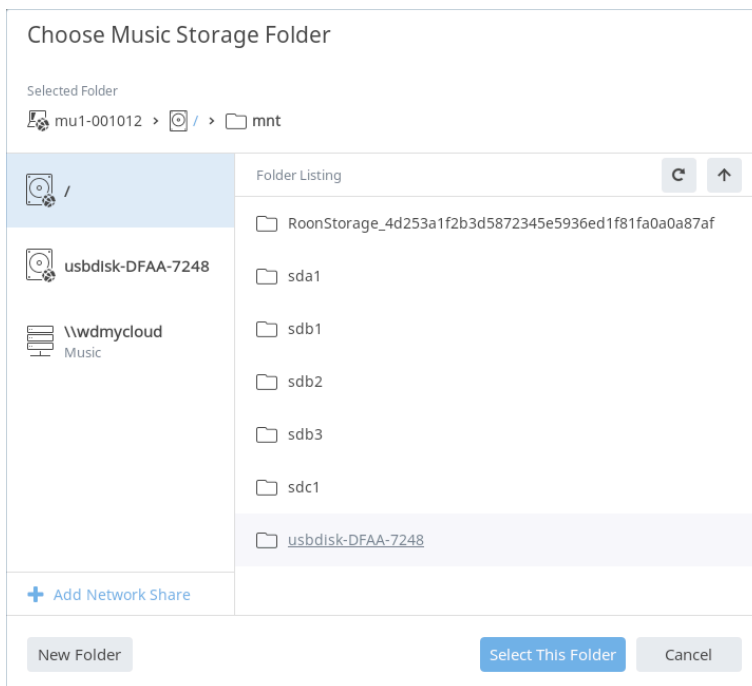
[To be implemented] 6. Analog FM input. Will be added in a future software update.

7. Digital audio Inputs. The MU1 has three digital inputs on the back. These sources can be selected with the main control dial. Read chapter "Control" for instructions about how to do this. The selected source is routed via the fpga for oversampling and de-jittering and benefits from MU1's high performance rendering.

  a) S/PDIF digital input: orange RCA connector, digital input for S/PDIF sources.
  b) Optical digital input: black Toslink connector, digital input for S/PDIF sources.
  c) AES3 digital input: XLR connector, digital input for AES3 sources.

8. Digital audio outputs. There are three digital outputs. These can be configured as stereo outputs that carry the same audio data or as six individual outputs for surround playback *(to be implemented)*. From right to left:

  a) LS1 output: a proprietary connection to the LS1 playback system, carrying both audio data and control data. The cable for this connection is supplied with the LS1 system. Connect this cable to the "Control in" input of the LS1.

  Warning: Do not connect a network cable to this connection! Although a normal RJ45 connector fits, this output may only be used for LS1 control connection. Grimm Audio is not liable for damage to a local network system as a result of incorrect wiring by the user.

  b) Digital output 1: transformer balanced XLR3 digital output for use in a surround LS1 system or connection to a 3rd party DAC.

  c) Digital output 2: transformer balanced XLR3 digital output for use in a surround LS1 system or connection to a 3rd party DAC. This output has a high-quality digital volume control for 3rd party DAC's.

On the top
On top of the MU1 you will find the large main control dial. This knob can be turned left and right and can be pressed. Depending on the state of the system and the current menu selection this knob has different purposes.

The system will boot to the *Music View*. The use of the main control in this state is:
  • Volume up (turn right)
  • Volume down (turn left)
  • Pause/mute (short press)
  • Enter menu (long press)
  • Press and turn selects the input.
A short press is shorter than 2 seconds, a long press is longer than 2 seconds. How to enter and leave menus is described in the "Control" chapter.

6   Roon Labs setup

Grimm Audio selected Roon Labs for the user interface and audio engine for file and stream playback on the MU1 (an alternative UI and engine will be added later). In our opinion Roon offers the best High-End user experience to date, a real must have. Both Roon Core and Roon End Point are pre-installed, so no other computer is needed. Please mark that Roon Labs is a paid subscription so you need to enter your account details via the Roon app. Roon Lab supports Tidal and Qobuz lossless music streaming services. These are separately paid subscriptions. You need to enter your account details of these services via the Roon interface.

Operating the Roon system in the MU1 is identical to that of any other Roon equipped system. First you need to install the Roon remote control software for a tablet or smart phone to get access to the Roon Core server in the MU1. Please visit the app store of your OS manufacturer, or use this link: https://roonlabs.com/downloads.html. For general operational guide lines of the user interface, we refer you to the Roon Labs documentation: https://roonlabs.com/support.html. The MU1 can perform all processes that Roon offers, but we recommend to use the MU1 fpga oversampling and downsampling algorithms in stead of the Roon offerings, and use Roon just for audio playback. Roon is a capable multi room system. If you like you can use the Roon Core in the MU1 to stream music to other Roon End Points in your network (for instance a system in the kitchen). Please note that the oversampling and de-jittering qualities of the fpga in the MU1 can only be enjoyed with the digital audio outputs on the MU1.

The MU1 can play all file formats that Roon supports, such as wav and flac, and has native support of PCM formats up to 8x the base rate (8FS or "DXD") and of DSD formats up to DSD256. The fpga processor in the MU1 will upsample 1FS and 2FS sources to 4FS and downsample 8FS and DSD formats to 4FS.

Enabling track information on the MU1 display

To show the song that currently plays on the MU1 display, you need to enable the MU1 software to communicate with the Roon Labs software. This is facilitated by a 'Roon Extension'. Since Roon Extensions can only be enabled by the account owner of the Roon software, you need to perform this step yourself. Mark that the Roon Extension enabling function is not offered on the smart phone interface of Roon, only on tablets and the PC or Mac interface. So please connect a tablet, PC or Mac computer to the same network as the MU1 and install the 'Roon' (not 'Roon Server') software: https://roonlabs.com/downloads.html. Next, please follow the following steps:

- Switch on the MU1 for the first time
- Start Roon on the tablet or PC/Mac software, wait until the MU1 pops up as a device and select it.
- Log in with your Roon account.
- Go to the settings menu and select the tab 'Extensions'.
- Add the Grimm Audio extension to your MU1 by clicking the Enable button in the menu as shown below.
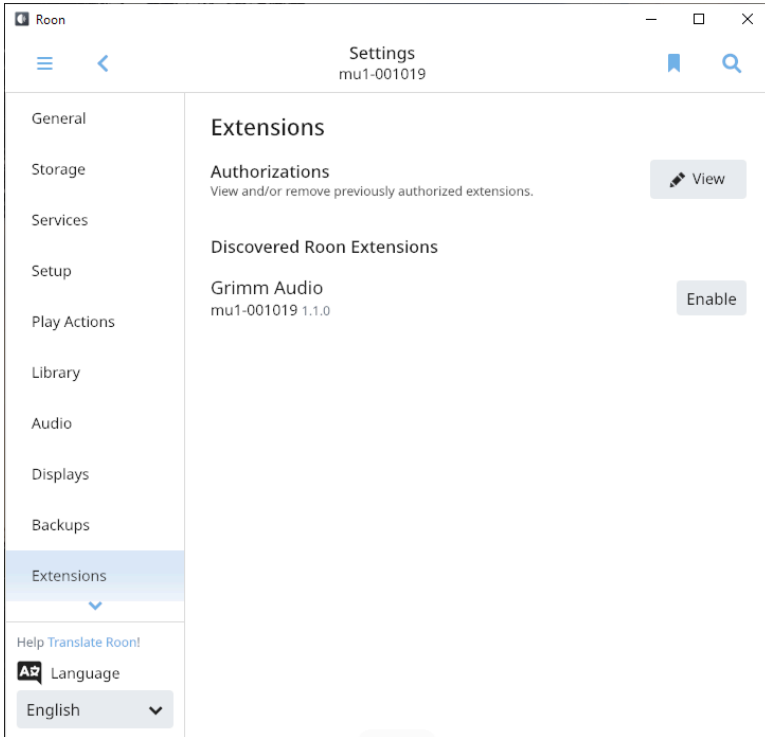
Volume control of the LS1 DSP and the fpga volume control of Digital output 2 should now work via both the Roon app and the MU1 main control. Additionally your will now see information about the currently playing track in the display and a progress bar of the running track.

Volume settings

We put in a safety limit on the volume control. Whenever you turn the MU1 main control or the Roon app volume fader quickly to the maximum position, the volume will jump back to the lowest level (the fader will stay at the max position though). This will protect your equipment when the controls are set to max by accident. If this happens to you, be careful to pause the music first before touching the fader, since it can still become loud when touching the fader.

As an alternative, we recommend to set a comfort limit for the Roon fader in the device setup so you cannot accidentally set the volume very loud by sliding the volume bar too far to the right. In case you do like to play louder than the limit, you can still press the + or – buttons in the Roon interface to increase or decrease the volume of the LS1 playback system. To set the comfort limit, please browse to the Audio tab of the Roon settings, tap the 'cog-wheel' configuration logo on the right of the GA MU1 device and select 'Device Setup', as shown in the picture below.

11
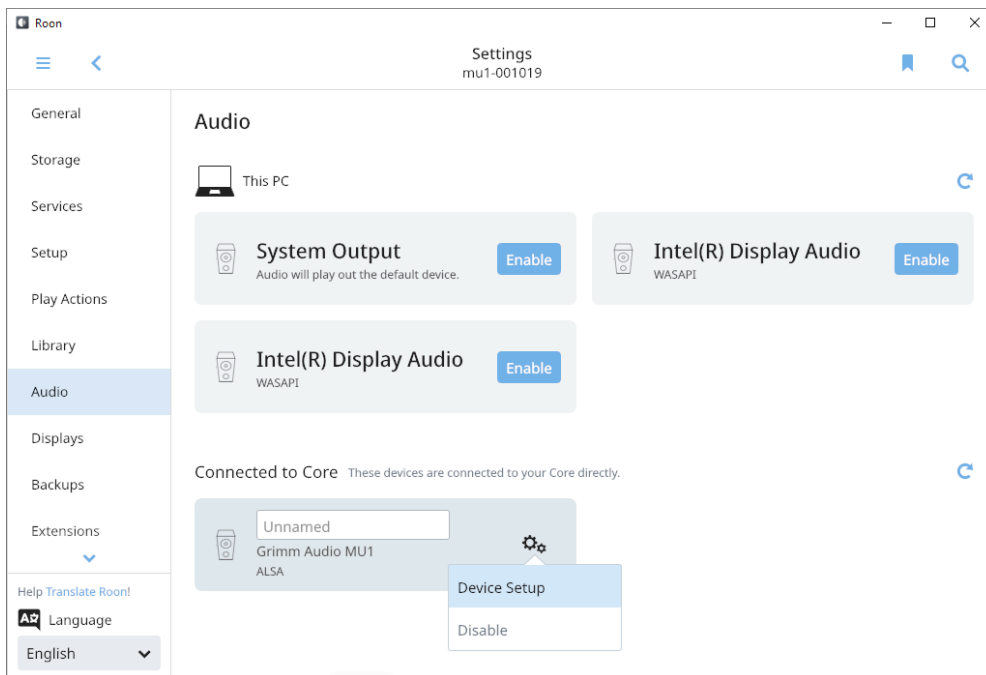
Here you select "Set volume limits" and set it to '64' which corresponds to an acceptable comfort level for most music. If your taste mainly covers softly recorded tracks, you may decide to set a higher level.

> **Warning! In the Device setup menu you can also change the volume settings type of Roon. You should always keep the "Volume Control" set to "Device volume".** Switching to "DSP Volume" or "Fixed Volume" **will** give problems with volume control, that can jump to maximum (we added a safety brake for that, but still). If you accidentally changed the settings you can get out of this state by pressing the "Load Defaults" button in 'Device Setup'. This will restore the system to the normal state. More information can be found here: https://kb.roonlabs.com/Audio_Setup_Basics in chapter Volume Control Mode. This page states about the volume settings: "It's there to solve problems - if you don't have problems, you don't need it!"

DSD playback setting

While you are in the Device Setup page, please set the "DSD playback strategy" to "Native" if it is not already. The MU1 fpga processor has a superior quality DSD downsampler and we recommend to use this feature to play DSD files to the LS1 system or other PCM DAC's. You may also open the "advanced" part of this window and check whether the max sample rate (DSD) is set to "up to DSD256" and the max sample rate (PCM) is set to "up to 384kHz".
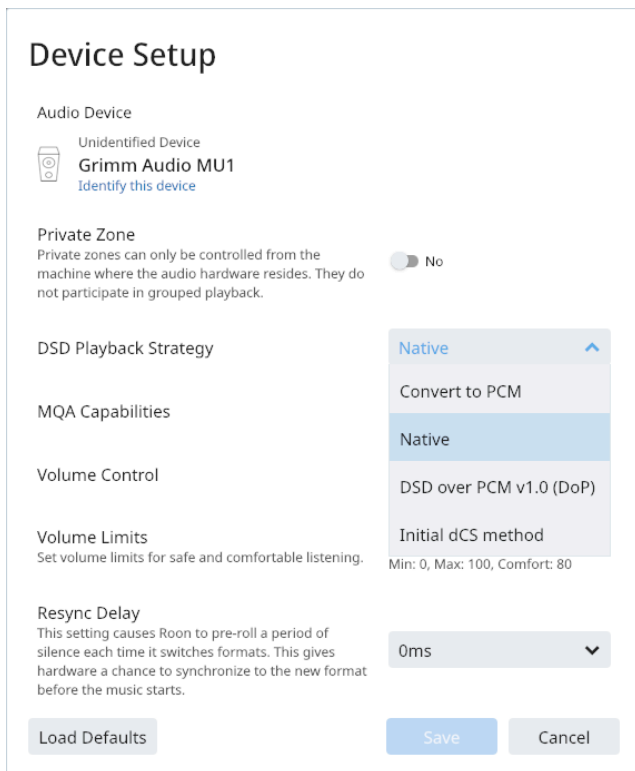
Background analysis speed

In the Library page of the Settings menu Roon offers several options for the 'Background Audio Analysis Speed'. We recommend to set this to "Throttled" and not to one of the "Fast" options. This makes sure most of the processing power of the CPU is dedicated to audio playback. You may also set it to "Off", Roon will then calculate the waveform of a new file on the fly when it is played.
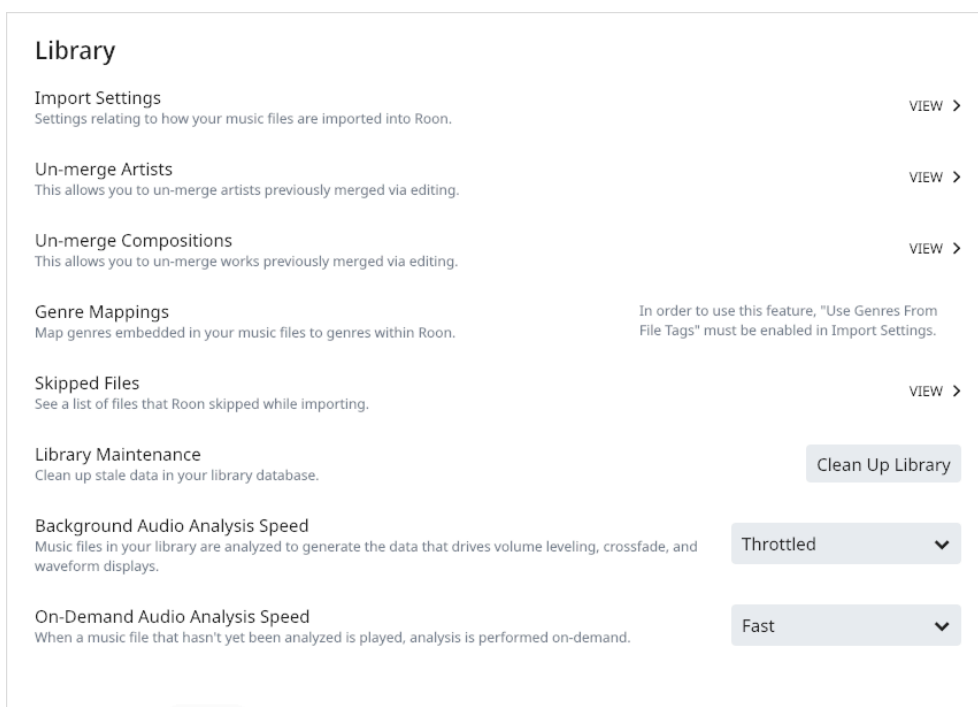
Updates of Roon software

Roon Labs offers frequent updates to both the Roon Core app in the MU1 and the Roon Remote app in your tablet or smart phone. Updates on your phone/tablet are usually installed automatically. If a Roon Core update is available the Roon Remote app will inform you about that. You are permitted to start a Roon Core update process in the MU1 from the Roon Remote phone/tablet app, but we do not take any responsibility for the impact of problems that may occur. Of course we will in that case offer support to help you solve the problem, where possible.

Known issues with Roon on the MU1

#1 Hampered playback when analysing a large catalog.
When you add a folder with lots of albums, Roon will analyse the files, download artwork etc. It will also do an analysis of the audio data to store waveforms that are shown in the user interface and to store the average loudness of the track for loudness normalization use. During the initial setup, Roon's labor can cause the system to be less responsive. Although it should be possible, we recommend to not use the system for music playback while Roon runs this analysis for the first time on a large set of albums. If you let it run overnight, it is usually finished the next day.

When you add a few albums only, playback is not hampered and this will not affect the playback. Nevertheless we recommend to use the "Throttled" mode for the analysis to keep the CPU load low. This can be selected in the Roon settings, see chapter "Background analysis speed". Consult the Roon manual for more information.

#2 Soft glitches in DSD album playback.
Please mark that when playing albums in DSD format, the end and start of the files are not reproduced 100% gapless by design, which means that a very soft glitch can be heard at the start of a new track. This glitch is in the master files and cannot be solved in the MU1 or Roon software. Also, a short moment after playback of a DSD file has stopped, Roon will switch to a 'silent' PCM stream and this also causes a soft glitch.

#3 Adding the root system folder to Roon.
When adding the root directory or "/" in the storage settings of Roon, problems may occur. Roon tries to index the OS filesystem making it slow and in some cases might even make Roon crash. Instead of adding the root directory, please add the proper music folders as explained in the next chapter.

Internal disk

The MU1 optionally has an internal disk for music files. Adding music to the folders of this drive is done via the network, how to do this is described below for Windows and Mac-OS.

First of all, open the help page of the MU1 menu (see chapter "Control") and note the hostname and IP-address.
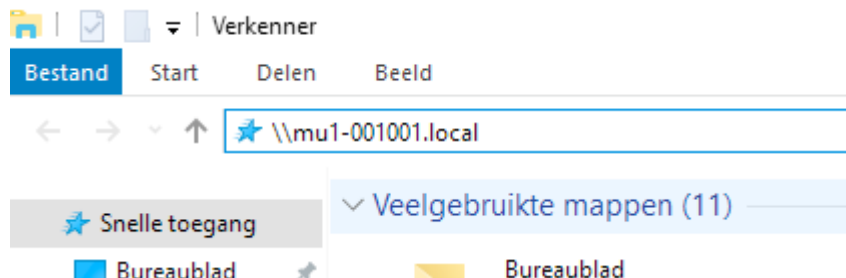
Windows users:
Note: Not all Windows computers can use the hostname for finding an internal disk in the network. This is because "mDNS" is not natively supported by Windows. However, on many Windows

computers software has been installed that added support for this protocol and therefore we advice to first try to use the hostname and if this doesn't work, use the IP address.

1. Open the File Explorer (this is done by opening a random folder).
2. Enter ' \\"*hostname*" ' in the address bar as shown in the image below.

*Note: If you do not have "mDNS" this doesn't work. Use the ip-address: ' \\"ip-address" '*

3. The internal disk is now shown in the File Explorer. You can now add, delete and move music to the MU1 internal disk from your Windows computer.

Tip: Make a shortcut to this folder so you can easily find it instead of typing in the hostname.

Mac users:
The shared folder can be found in the Finder, in the left hand column under "Shared".
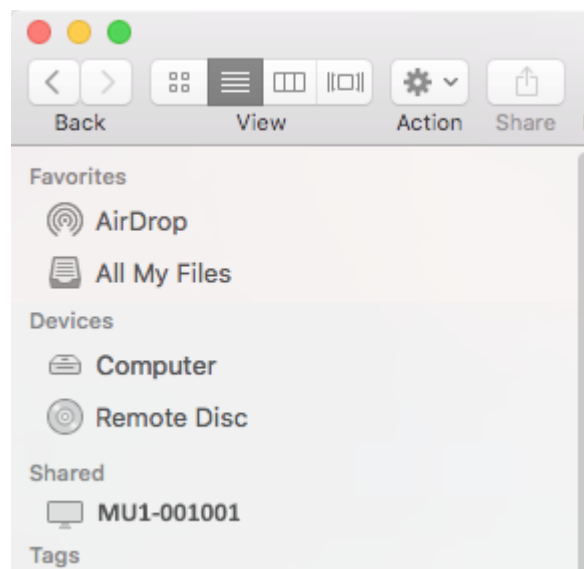
After selecting this folder, you can add, delete and move music here from your Mac. Please mind to 'eject' the mounted folder before disconnecting from the network (for instance with a laptop).

If the MU1 does not show up in the Shared section, press ⌘ - K to open the Connect to Server window. Enter the *hostname* and press Connect. The hostname of your MU1 is indicated on the second page of the MU1 menu, see **Menu View** in chapter 7 of this manual. Connect as "guest" to the Music share folder. In the unlikely event that connecting to the *hostname* does not work, please enter the IP address of your MU1, which is found on the same menu page of the MU1.

Note: On the internal disk you will find a directory lost+found, you can ignore or delete this folder.

Tip: After mounting you can make a backup of the music that is stored on the MU1 internal drive via your Windows or Mac computer by using your favourite backup application.

How to add the internal disk to Roon

To add the internal disk to the Roon catalog, first remove any memory stick or USB drive that you connected to a USB receptor on the back of the MU1. Next open the Storage settings in Roon and click on "Add folder". The internal disk should show up in the menu on the left as "HEAP". Select this folder to add the disk to Roon as music folder.

If the disk does not appear as HEAP you must add it manually. Please note that the procedure for this is dependent on the serial number of your MU1. For serial numbers starting with 13.0.001.xxx the label is **sda1**. For serial numbers starting with 13.0.002.xxx the label is **sdb1**.

Click on "Add folder" and go to the root directory "/", open "*mnt*" and choose "*sdx1*" (the name of the internal SSD drive, depending on the serial number). Your music folders are on sda1 or sdb1 and will now be added.

Tip: Roon will automatically append music that you later add to your music folder.
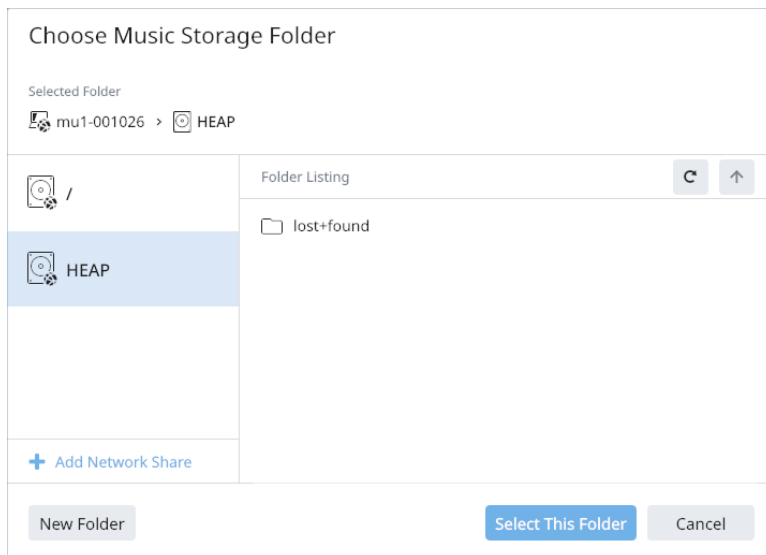
Select the HEAP drive if it is available.
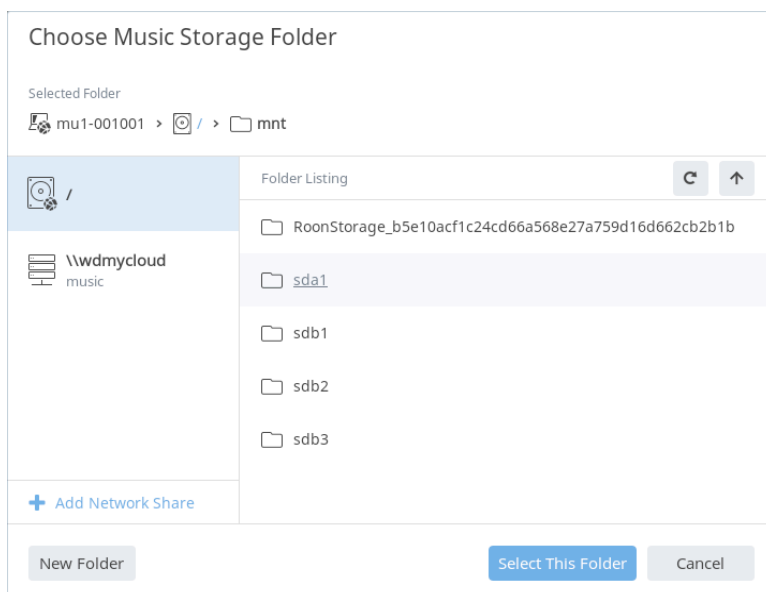
Select sda1 or sdb1 (depending on serial number, see above) in "/mnt/" if the HEAP drive is not available.

Roon database access

In case you encounter a problem with the Roon software and consult with Roon Support, they may ask you to view, copy, rename or reset your Roon database. The database folder contains all settings, log files and database items. The MU1 mounts this folder in the network under the share name "roondata", and it is password protected to prevent accidentally resetting the database. The credentials are as following:

Username: mu1-user

Password: mu1-pass

How to mount this internal disk in your PC or Mac is explained in the chapter **Internal disk** above.

7   Control

This chapter describes the user menus and settings of the MU1.
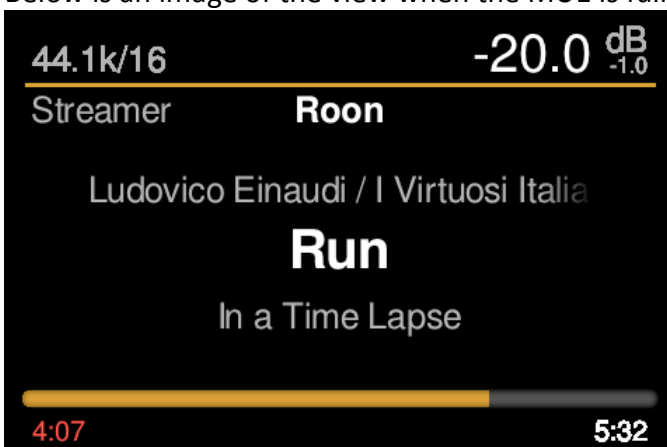
Music View

Function of the main control knob:
- Turn left for lowering volume.
- Turn right for increasing the volume.
- Short press pauses or starts playback.
- Long press enters the settings menu.
- Press and turn selects the input.

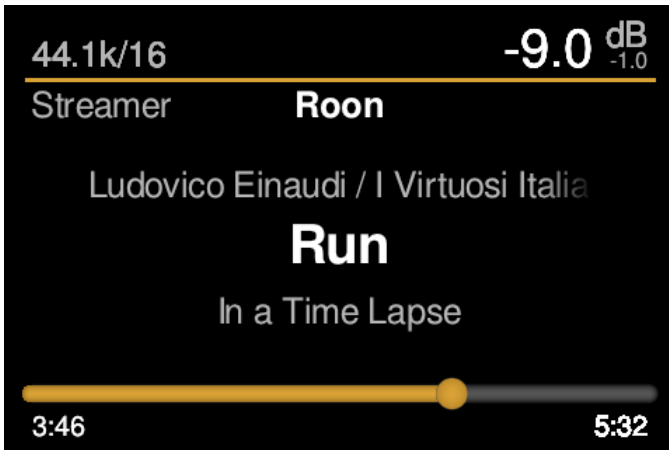*A short press is shorter than 2 seconds, a long press is longer than 2 seconds.*

For your information, in the Help page of the Menu (page 2) the pictograms for these actions are described:
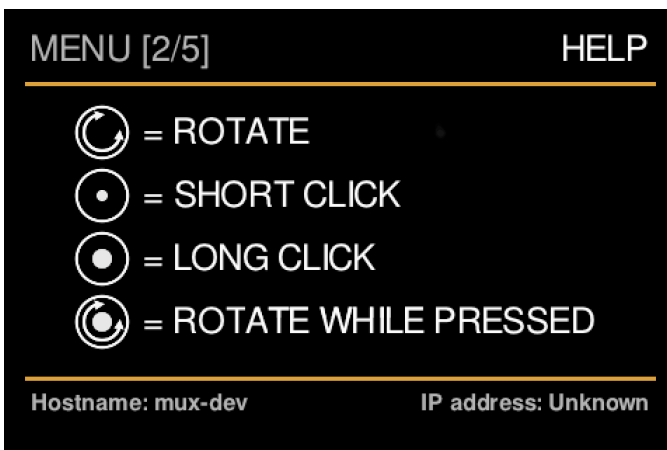
Below is an image of the view when the MU1 is fully booted, with playback paused.

When playing the progress bar has a position indicator dot:

In Music View, the display offers the following information:
- Sample rate and format[1]
- Current user set volume in dB
- Mismatch volume in dB[2]
- Streamer service[3]
- Artist
- Song title
- Album name
- Progress bar
- Current time stamp
- Track length

[1] This is the indicated file or stream information by Roon. The output of the MU1 may run at a higher sample rate because of the optional upsampling in the fpga of the MU1.

[2] The mismatch shows the difference between the user set volume and the actual volume, for instance when loudness normalization *(to be implemented)* affects the file volume. It also indicates a -10 dB attenuation when previewing a source.

[3] At the moment only Roon is supported.
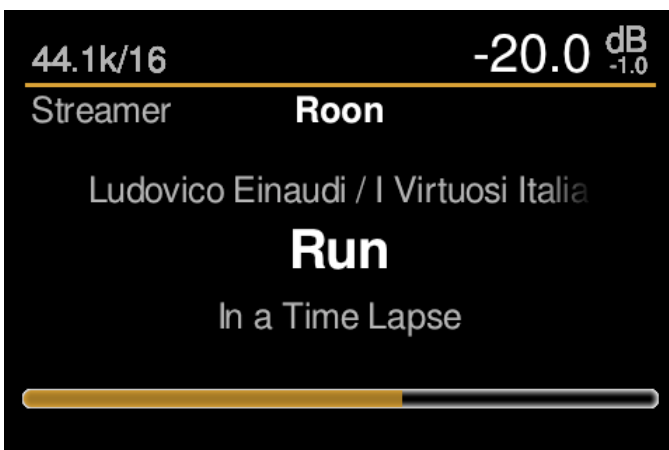
When turning the MU1 main control knob, the volume changes and the track progress bar at the bottom is temporarily replaced by a bar that indicates the current volume setting. The MU1 will send volume control data to the DSP of the LS1 via its proprietary cat5 cable. For 3rd party DACs the

fpga chip performs a volume attenuation at high precision. To use this feature, connect your DAC to the Digital 2 output. If you prefer to control the volume downstream after your DAC, connect your DAC to the Digital 1 output, that keeps the audio data at maximum volume.

The user set volume indication in the top right corner has a max level of +23.5 dB, which corresponds to "100" of the volume slider in the Roon app. You would normally never reach this level, it should only be used for music with very low average loudness. Your normal level will be around 0 dB or even lower. For LS1 users, this 0 dB level is adjusted to the traditional reference playback level in mastering studios and levels above +8 dB will add positive gain in the LS1 DSP. For users who connected a 3rd party DAC to the Digital 2 output we decided to not offer positive gain, which means the maximum volume is reached at +8 dB on the MU1 display, or "64" in the Roon app. All steps above "64" on the Roon slider will still give you no gain compared to the original level of the source. This means the FPGA offers 64 steps of 1 dB, which to our opinion is enough for all applications.

Source selection
By pressing and then rotating the main knob you enter the source selection menu. Here you can select sources. To leave this menu just release the main knob when the desired input is selected.

There are 3 source categories and each has one or more inputs. The list below shows each category and their available inputs:
- LS1:
  - LS1 Analogue
  - LS1 Digital 1
- Streamer:
  - Roon
- Digital in:
  - AES-XLR
  - AES-RCA
  - Toslink
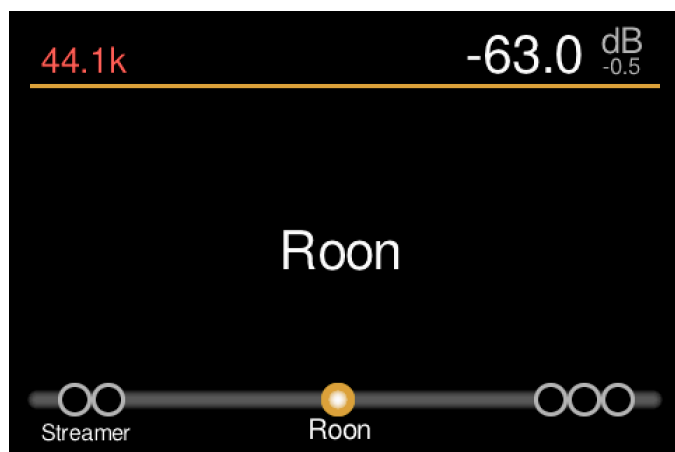
By turning the main knob (while holding it down) the different sources are selected.
If you 'hover' over a certain input this input will be selected in preview mode after 1 second, this means that you can listen to the selected source (at 10dB lower volume than the current setting) to check if this input is what you like to listen to. When releasing the main knob the selected input is confirmed and the volume returns to the normal setting.

Note: The Toslink input is a 'LS1 low-latency' input. This is the recommended input for TV audio since lower latency offers better synchronisation with the video. This feature only applies to the LS1 playback system, the LS1's standard phase linear crossover has a 40ms latency. Please refer to the LS1 manual for more information about its low latency mode.

Note: When you select an LS1 or Digital In source the MU1 will automatically pause Roon. Mark that it is possible to then start Roon playback in the Roon App. This is not an intended use case, so please mind the following: if you selected an LS1 input, Roon playback will become audible on Digital out 1 and 2. In case you connected a DAC to one of these outputs you will hear music but the track information is not shown on the display. If you selected a Digital In source, Roon will not play properly since the fpga board does not request audio data from the internal PC in this mode. As a result Roon gets confused and jumps to the next track in the playlist at irregular pace. There will be no damage done to the system but we recommend to only start Roon playback in the app when Roon is selected as a source.

Menu View
By pressing and holding the main control knob for 2 seconds or longer, the MU1 display enters the 'Menu View' mode.

*Settings menu[1/5]:* **Standby**
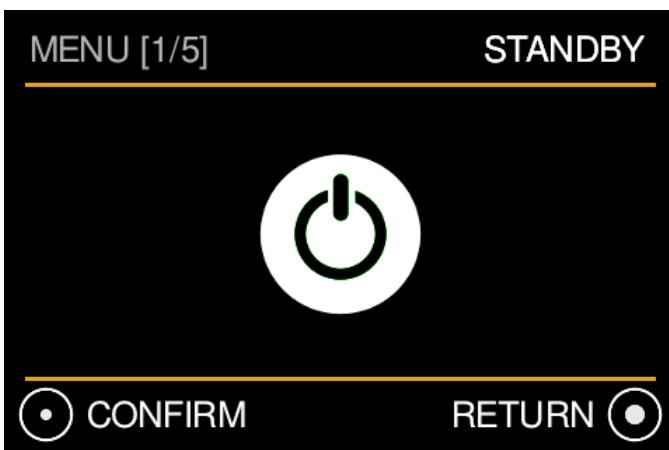
In this menu you can put the MU1 in standby mode.

- Turn right to go to the second menu.
- A short press ('confirm') will put the MU1 in standby mode. To get the MU1 back in normal mode you can simply press or rotate the main control knob again.
- With a long press you will exit the menu and go back to the *Music View*.

When in standby the power consumption decreases and the screen is turned off after a short animation. The internal electronics are mostly shut down, but some of it still functions. If you like to completely turn off the system, switch off the device with the main power button on the rear of the device. **Always turn off the system before unplugging the power cord to prevent damage to your MU1 computer system!**
Hint: The white LED on the front indicates if the device is in stand-by (LED 'breathes') or if the MU1 is shut down (LED off).

Settings menu[2/5]: **Help**
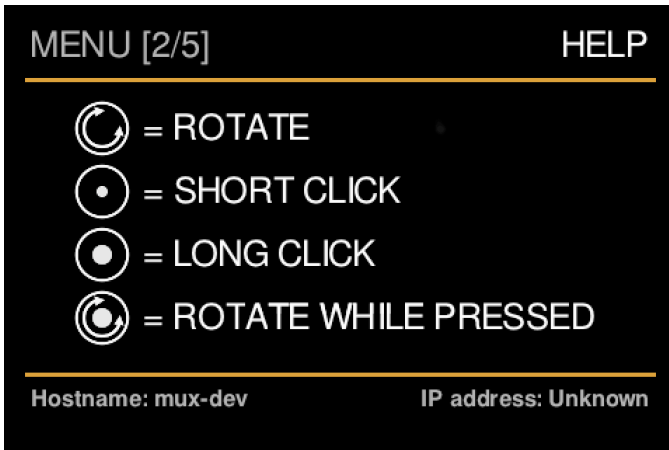
This menu explains the pictograms that are used in the MU1 for operating the main knob. At the bottom the network information is shown. When the IP address is unknown, there is no network connection and the MU1 cannot be found by the Roon control app in your tablet or smart phone.

- Turn left to go to the first menu, turn right to go to the third menu.
- With a long press you will exit the menu and go back to the *Music View*.

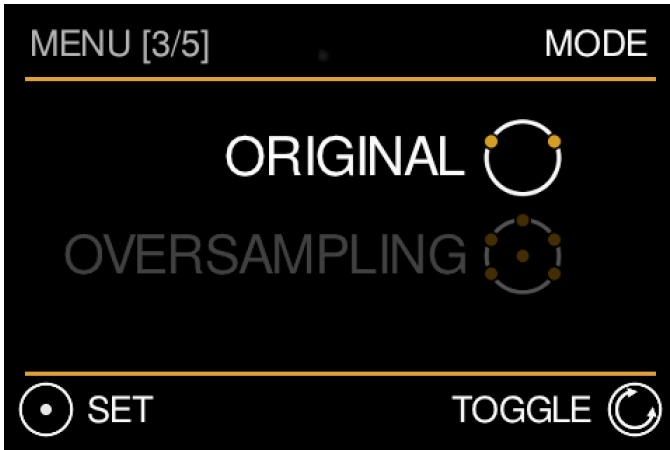*Settings menu[3/5]:* **Playback Settings**
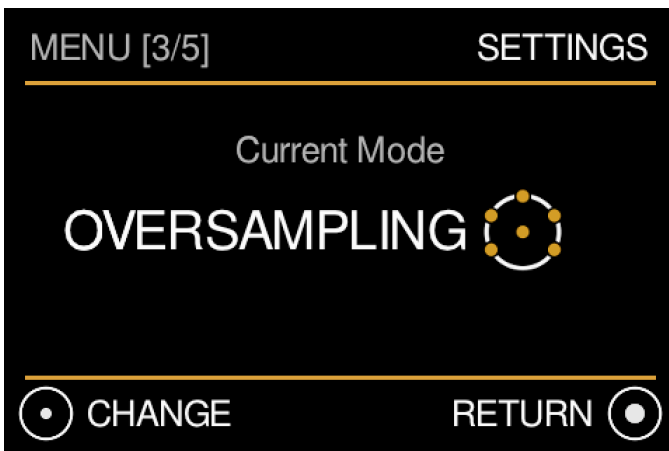
In this menu you can change some playback settings of the MU1.

- Turn left to go to the second menu, turn right to go to the fourth menu.
- To change the playback setting, short press the main control knob.
- This setting is saved in the MU1.
- With a long press you will exit the menu and go back to the *Music View*.

After a short press the following choice appears:

MENU [3/5]   MODE

ORIGINAL

OVERSAMPLING

SET   TOGGLE

- Turn left to change playback to Original PCM.

MENU [3/5]   MODE

ORIGINAL

OVERSAMPLING

SET   TOGGLE

- To confirm the selection of the 'Original PCM' setting, short press the main control knob.
- Turn right to select fpga Oversampling on 1fs and 2 fs sources again.

MENU [3/5]   SETTINGS

Current Mode

ORIGINAL
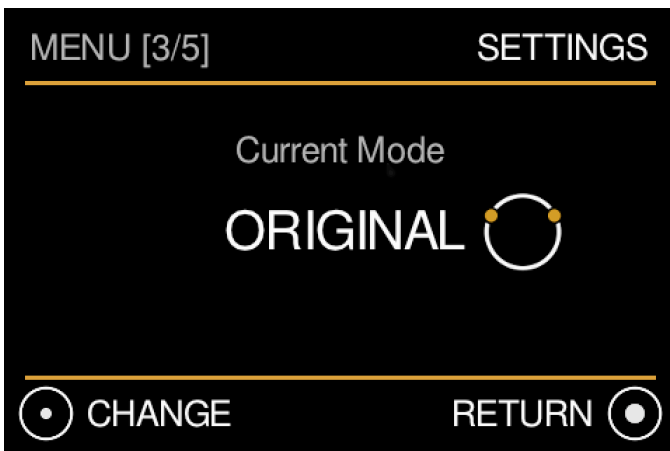
CHANGE   RETURN

After the mode change is confirmed, the display returns to the settings menu.

- Turn left to go to the second menu, turn right to go to the fourth menu.

- To change the playback setting again, short press the main control knob.
- With a long press you will exit the menu and go back to the *Music View*.

Settings menu[4/5]: **Software Version and Update**

```
MENU [4/5]      SOFTWARE VERSION

   Up to date

   Software:       1.1.0




 (•) UPDATE          RETURN  (●)
```
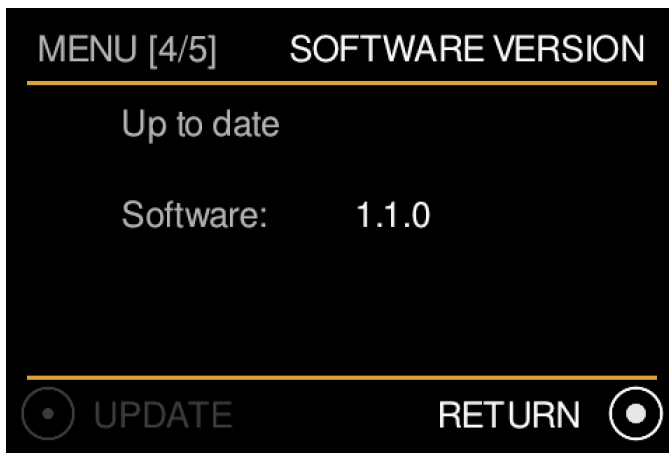
In this menu you can view the current software version and start an update. The MU1 automatically checks for an update every hour, from the moment the unit is turned on. If your software is up to date this is indicated in the display and the bottom left icon stays greyed out.

- Turn left to go to the third menu, turn right to go to the fifth menu.
- With a long press you will exit the menu and go back to the *Music View*.

The image below shows the case that there is an update available.

```
MENU [4/5]      SOFTWARE VERSION

   Update ready to start

   Software:       1.0.4




 (●) UPDATE          RETURN  (●)
```
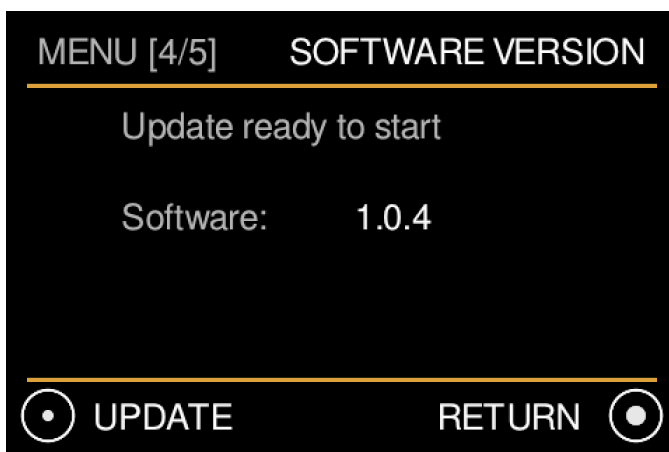
In case an update is available and downloaded the text "Update ready to start" is shown.
- Start the update with a short press and confirm after reading the warning message with another short press.

Please note: Depending on the type of update the install can take up to about 15 minutes. During this time you will not see information on the display, the power LED is off and the power button on the back is disabled. Please remain patient and do not unplug the device while updating since this causes the update to fail and the procedure has to start again when the device is powered up.

During the update process the internal PC will shut down and reboot at least once. When the update is complete the system will turn back on in normal mode and show the update status briefly.

Updates for third party software like Roon is not included in the MU1 software update, this is done separately via the Roon app.

Settings menu[5/5]: **Assistance**
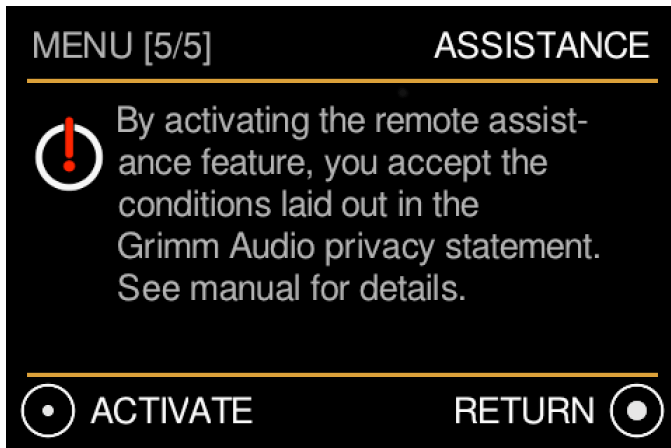
In this menu you can activate the assistance/support mode. It should only be activated when you have a reported problem with your MU1 and Grimm Audio support asked you to enter assistance mode. In this mode Grimm Audio engineers can get remote access to your device to help solve your problem.

- Activate the remote assistance mode with a short press on the main control knob, confirm by another short press. The MU1 will reboot in "support mode" and a continuous animation screen is shown on the display. To exit support mode, press the power button on the back of the MU1.
- With a long press you will exit the menu and go back to the *Music View*.

Privacy statement:
The support mode reboots the MU1 and establishes a secure connection to a Grimm Audio server. Through this secure connection we can log in to your device and read out logfiles and change settings. Grimm Audio will not copy information from your MU1 in any form without your consent. Grimm Audio will never share your data with any 3rd party.

8   Specifications

General:
- Maximum ambient temperature for operation: 50 °C.
- Fuse (worldwide): 200mA fast blow.
- Weight: 4.5 kg
- Dimensions: width x depth x height: 355 x 295 x 100mm or 14" x 11.6" x 3.9".
- Package dimensions: 536 x 392 x 219mm

Clock specifications:
- Internal intrinsic clock jitter <0.6 ps RMS (> 10 Hz).
- Can slave to 44.1kHz and 48kHz based digital sources at 1FS, 2FS and 4FS +/- 50ppm.
- The output will mute for 80 ms when changing between clock base rates.

Sample rate conversion with fpga processor:
- Oversampling of 1FS and 2FS files and streams to 4FS with "Pure Nyquist" decimation filter.
- Downsampling of DSD64, DSD128, DSD256 and DXD files and streams to 4FS with "Pure Nyquist" decimation filter.
- FPGA volume control on Digital 2 output: from 0 dB to -63 dB in 1 dB steps.
- Latency from digital in to digital out: 11ms at 48 kHz.

Power supply:
- Mains voltage range: 90 – 240V AC +/- 10% (50 and 60Hz)
- Power factor: > 0.98
- Power consumption: Normal use 17W, maximum 50W.

Internal computer properties:
- For serial numbers starting with 13.0.001.xxx: Intel i3-7100U 2.4GHz
- For serial numbers starting with 13.0.002.xxx: Intel i3-8109U 3.0GHz
- 2 cores, 4 threads, with Hyper-threading
- 4GB DDR4-2133 RAM 2400MHz
- 1000Mb/s Ethernet
- 2x USB 3.0 port
- Internal SSD for OS
- Optional internal SSD of 1, 2 or 4 TB for music data storage

Display specifications:
- Full colour TFT LCD
- 3.5 inch diagonal
- 480 x 320 pixels

9   Grimm Audio Limited Warranty

Grimm Audio BV ("Grimm Audio") warrants this product to be free of defects in material and workmanship for a period of two (2) years for parts and for a period of two (2) years for labor from the date of original purchase. This warranty is linked to the serial number of the device and can be transferred to second hand owners if they can show their purchase bill. The original owner can extend his limited warranty to a period of five (5) years for labor and parts if he sends the original warranty card that came with the unit to the Grimm Audio factory. The extended warranty is enforceable only by the original retail purchaser and cannot be transferred or assigned. The extended warranty does not apply to the built in computer and SSD drive parts of the MU1.

During the warranty period Grimm Audio shall, at its sole and absolute option, either repair or replace free of charge any product that proves to be defective on inspection by Grimm Audio or its authorized service representative. In all cases disputes concerning this warranty shall be resolved as prescribed by law. To obtain warranty service, the purchaser must first call or write Grimm Audio at the address and telephone number printed below to obtain instructions where to send the unit for service. All enquiries must be accompanied by a description of the problem. All authorized returns must be sent to Grimm Audio or an authorized Grimm Audio repair facility postage prepaid, insured and properly packaged. Proof of purchase must be presented in the form of a bill of sale or some other positive proof that the product is within the warranty period. Grimm Audio reserves the right to update any unit returned for repair. Grimm Audio reserves the right to change or improve design of the product at any time without prior notice.

This warranty does not cover claims for damage due to abuse, neglect, alteration or attempted repair by unauthorized personnel, and is limited to failures arising during normal use that are due to defects in material or workmanship in the product.

In no event will Grimm Audio be liable for incidental, consequential, indirect or other damages resulting from the breach of any express or implied warranty, including, among other things, damage to property, damage based on inconvenience or on loss of use of the product, and, to the extent permitted by law, damages for personal injury.

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