

UC1 *The Grimm Audio UC1 is a high quality Mastering and Mixing Universal Converter offering very broad digital application functionality. This 'quick guide' covers the specific functionality for use in an Audiophile System.*



UC1 - HiFi DAC quick start guide

Please read this manual before operating the unit.

Grimm | **AUDIO**

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1. Introduction

The Grimm Audio UC1 is a high quality Mastering and Mixing Universal Converter offering very broad digital application functionality. **This manual, however, covers the specific functionality for use in an Audiophile System.**

Please read this manual before using the UC1 to understand its operation and make optimal use of its versatility as a high audiophile quality DAC / HPA / PRE.

Applications Overview

Let's have a look at how to use the various inputs and outputs in this context.

DAC - The Primary Function

USB Connection :

The "rear" USB input [Input 6] as well as the "front" USB input, aka the "i-put" are connected to your digital source, be this a Server, a Streamer or a Computer.

AES3 S/PDIF Connection :

Two rear AES3 inputs can be connected to a digital source that has AES output, be this a Server or a Streamer.

The AES3 input can also connect a **CD Transport** via an AES > Coax adapter cable. Note that some high end CD Transports offer Master/Slave clock connection, such as the C.E.C. TL2N. The UC1's superior clock output can in this case can act as the Master when connected to the clock input of the Transport. The UC1's clock quality equals that of Grimm Audio's CC1 and CC2 master clocks.

When the UC1 is used as a standalone audiophile DAC and / or a monitor controller, the clock settings need to be selected accordingly in the UC1's "F2" function menu.

PRE - Monitor Function

XLR Analog Loudspeaker Connection :

The UC1 offers 3 analog XLR outputs. One of these output pairs, preferably "Ana Out 3|4", can connect directly to a pair of active loudspeakers via their respective XLR inputs.

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A secondary loudspeaker system can be connected to a dedicated XLR output pair ["2nd Out"] that runs in parallel to the Headphone output situated on the front panel.

Digital RJ45 Loudspeaker Connection :

This dedicated connection connects directly to a pair of Grimm LS1 or PMC loudspeakers via their respective inputs.

In the menu you select to which Output the Loudspeaker system is connected. Although not typical in the HiFi Universe, please note that the UC1 offers several interesting Pro Audio monitor settings such as "Mono", "Side", and "Stereo Swap".

PRE - Gain & Control Functions

Gain / Volume / Mute / Polarity & Settings :

As the UC1 is a Pro Audio component, Gain - which can be increased or decreased via the volume dial knob - is expressed in positive or negative "dB deviation" from a reference loudness level nominally called "0dB". This level is by convention expressed in "db SPL". This level corresponds to an SPL of 79db in a small recording room.

To adjust the UC1 to the HiFi usage convention, reset the default -8dB setting under the P2 function to -18db which effectively equals an output level of 0VU. The DAC's output clips at +18db (5Vpp), so the gain would cover a range of -18dB > +18dB.

Please note that the **Volume and Mute** functions are available for all input / output signal paths, but in the absence of a basic remote, these need to be adjusted manually. News : A remote control 3.5 mm socket on the back panel is for future use and is not yet enabled.

This is not really an issue as in almost all cases the UC1 as a standalone DAC will be connected to modern HiFi amplifiers with "remote". "Mute" is selected in "F1".

The signal's **Polarity** can be inverted in "P2", but note that this function is only available for Headphone Out signals traversing the "Foldback Route", which, if used, needs to be activated in "F1".

Furthermore, the 'Foldback' function is limited to two output paths, notably to Headphone and 2nd Out .

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PRE - Headphone Function

6.35mm / 1/4" Jack Connection :

The UC1 offers a 6.3mm headphone output with gain control. The acoustic sensitivity of headphones on the market varies by as much as 30 dB. Consumer ear buds are more or less standardized on a sensitivity of approximately -14 dBu (~0.15V) for 100 dBA. Some professional 600 Ohm headphones however may need as much as 15 dBu (~4.4V) to reach 100 dBA. This example is of an HP with a sensitivity of 85dB/mw. The UC1 is targeted at the professional audio market and therefore offers enough gain to drive these types of demanding headphones. The majority of HiFi audio headphones are far less demanding and, as such, the UC1 will drive these with ease.

The Headphone output circuit runs through the Foldback route of UC1. As such, the Mute and Polarity Inversion functions are available. HP output volume can be controlled via the dial knob directly next to the output jack. Switching between HP and Loudspeaker monitoring can be done by briefly depressing the main dial at the far right of the front panel.

PRE - Analog In

XLR Connection :

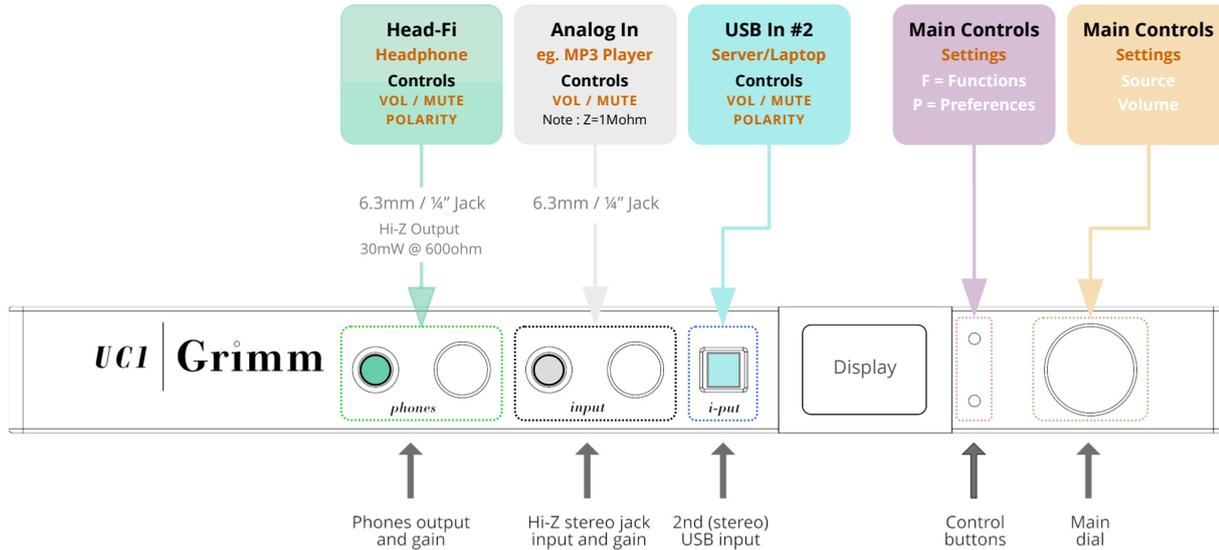
This input was intended for recording analog signals for mixing / mastering purposes. It does not serve as a typical analog input to which first gain is applied before being "passed-through" to the UC1's analog outputs.

In effect, any Analog signal input would be converted by the A/D chip circuit to digital ... and then reconverted back to analog by the D/A chip circuit.

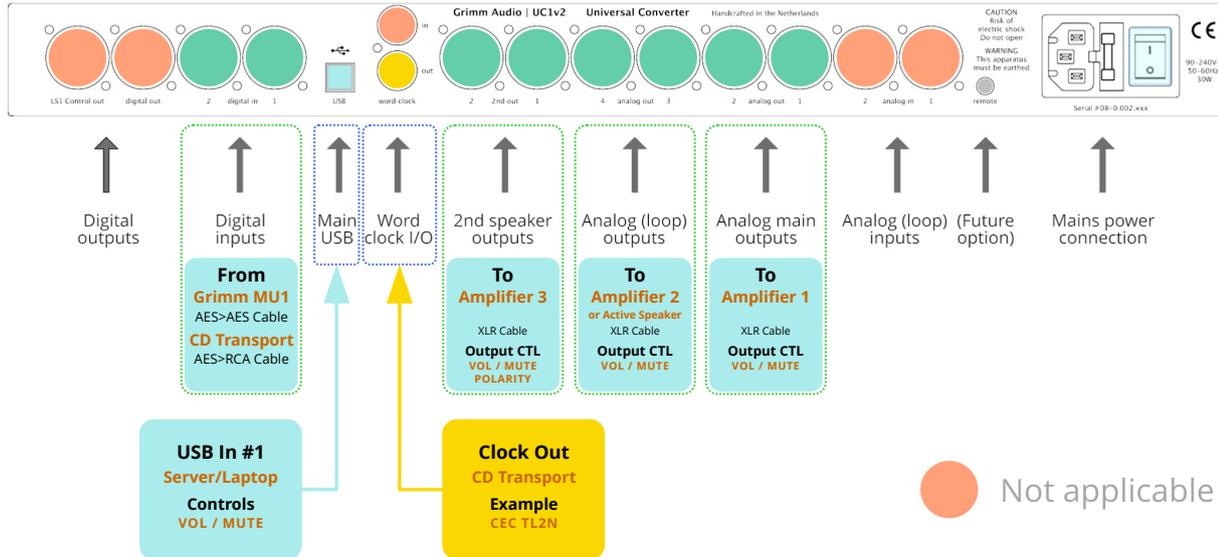
This may be useful only if the UC1 is connected to a pair of active loudspeakers, and where it is not connected to a Preamplifier > Amplifier > Loudspeaker system chain.

In extremis, It would be imaginable that if one wanted to connect a Turntable with a dedicated Line stage with integrated Phono to this analog input via RCA > XLR cable adapters, one could in fact do so. The SQ output post A/ D/A conversion would be "acceptable". This would also apply to the connection of a Reel-to-Reel tape machine.

2 A. Signal Connections - Front Panel



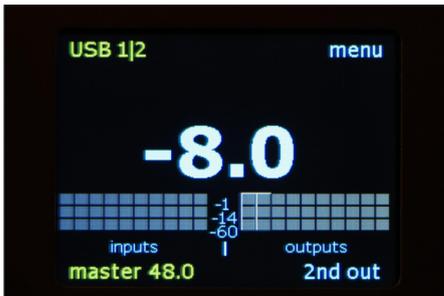
2 B. Signal Connections - Back Panel



Buttons and display

Most functions of the UC1 are adjusted via the main dial and the two control buttons on its left side. Additionally there are knobs for the phones output gain and the jack input gain.

The main dial can be turned and pushed. In normal operation, turning changes the gain of all monitor paths (main, 2nd and phones) and pushing mutes the speakers while engaging the headphones output on the front. When press-holding the main dial, the current monitor source (indicated top left of the display) starts



Main screen, USB 1/2 selected

blinking. Keep pressing the main dial while turning it to change the monitor source. All inputs and outputs can be selected. Their name is shown in the display and their channels are highlighted in the meter. When releasing the dial the indicated source stays selected. Alternatively, release the dial when the blinking starts. Then turn to select a source and press to confirm.

The large number in the display indicates the current monitor gain level in dB's. The monitor outputs offer 8 dB of clean gain above '0' on the display. In other words: a full scale signal will only reach full scale on a monitor output if the monitor gain is set to +8 dB. This may seem odd, but the idea is that the '0' indication of the display is your reference playback level to which you always return after a louder or softer playback. This is common practice in mastering. The '0' level is usually aligned with an SPL of 79dBC when playing a SMPTE reference noise signal on a single channel. The Grimm LS1 is factory aligned to that, you may adjust the gain of your 3rd party amplifier to achieve the same result - or to select another acoustic SPL that suits you as reference playback level. In case you feel the need to

(Continued)

adjust the '0' level of the UC1, you can change it in menu P2 (see chapter 6. Menus).

Note that the monitor gain can be set to display values up to +18, which means that there is 10 dB of positive gain available in the UC1 to audition very soft noises. Note that any signal above -10 dBFS will in that case clip – please use this extra gain with caution!

The volume control is in 0.5 dB steps above -17 dB and 1 dB below it. If you have a Grimm Audio LS1 or PMC digitally controlled loudspeaker connected to the proprietary cat 5 output on the back, the volume control



Main screen, Digital 1/2 selected, in phones mode

takes place in the DSP of the loudspeaker. In all other cases the volume control is in the DSP of the UC1. At volume setting '+8' the data to the digital output and build-in DACs is put through transparently. At other levels the digital gain control is properly dithered at 24 bits.

Optionally, volume control of the main out can be disabled in the menu. In that case the indicated monitor gain only applies to the 2nd out and phones.

The knob to the right of the phones jack can be used to align the headphones' acoustic level with that of your main monitor system. The idea is to switch between speakers and phones (removing your headphones when listening to the speakers) and adjust this control until speakers and phones sound equally loud to you. From then on just use the main dial for changing your monitor gain and leave the phones control at its calibrated level.

In the bottom left corner of the display the clock status of the UC1 is indicated. The clock source can be set manually. Please refer to the menu chapter for instructions.

4. Menu

The UC1 has many functions, preferences and system setup items that can be controlled from the menu. To enter the menu, press the top button with 'menu' next to it on the display. You will see a screen with 6 tabs, labeled F1 and F2 for Functions, P1, P2 and P3 for Preferences and S1 for System info. We walk you through all these settings in the pages below. To move to the next tab, press the top button 'next tab'. To exit the menu, press the bottom button 'exit'. Note that the exit button is disabled when an option is selected and its arrow is blinking. Turn the main dial to select a function, press to change it, then turn to browse the options and press again to confirm your choice.

F1 menu

Whenever you enter the menu, the F1 page will be available first. This page gives access to monitor functions that are often used.

- Monitor source. You can select all inputs and outputs here by pressing the main dial briefly (the arrow starts blinking) and then turning the dial. When you reach the last source, the order wraps and the first source appears again. To confirm a choice, press the dial again (the arrow stops blinking). This item does the same as press-hold the main button and then turn. The result is immediately visible in the left top corner of the display, and the selected source becomes audible.

Grimm LS1 customers, please note that the UC1 cannot select the analog and digital inputs of the LS1 as a source. In case you need to access these, please use the

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```

Dig In 1|2  -8.0  next tab
| F1 | F2 | P1 | P2 | P3 | S1 |
> monitor source: Dig In 1|2
special: stereo
foldback: off
mute: L | off | R
master 48.0  exit
  
```

F1 menu.

LS1 PC Remote software with the UC1. It is not possible to combine the UC1 with the LS1r hardware controller and LS1i USB interface. The UC1 replaces these.

- Special. After a press of the dial the choices are stereo / mono / side / swap. Note that mono = L+R and side = L-R (they are also known as 'M' and 'S'). "Swap" flips the left and right channels. At the end of the dial the order wraps back to stereo again. This makes it possible to AB Compare stereo & mono, mono & side and swap & stereo. If you confirm a choice by pressing the dial once more, the arrow stops blinking. If you then exit to the main screen the function is shown in the screen (except for 'stereo', which is the normal state).

- Foldback. When in the main screen - as a quick access feature - a single press of the bottom button turns off and on foldback (in case a foldback source was selected in the menu).
- Mute. To mute the loudspeakers from the main screen you just press the main dial. This turns off the selected speakers and turns on the phones at the same time: it toggles between speakers and phones.

F2 menu

• Clock. This setting is only available when the back USB is not connected to a computer (normally the USB host controls the UC1 clock). It allows you to choose all sample rates from 44.1 to 192 kHz in master mode, or to slave to word clock, digital in 1 or digital in 2.

```

Dig In 1|2  -8.0  next tab
| F1 | F2 | P1 | P2 | P3 | S1 |
clock: master 48.0
> autoswitch clock: yes
  2nd out: off
  compare mode: off

master 48.0  exit

```

F2 menu.

• Autoswitch clock. This setting influences the UC1 behavior when in slave mode. When 'yes' the UC1 clock rate will follow any change of the selected clock source. When 'no', the UC1 will maintain the clock rate that it found when first slaving to the selected clock source. If the source then switches sample rate, the clock indication on the display will turn red and start flashing to indicate it lost lock. The 'no' mode is helpful when you are running a project with a specified sample rate and it should keep running at that rate, even when by accident the source that you sync to changes sample rate.

• 2nd out. This flips the monitor path to the 2nd speaker output XLR's on the back (main and phones are muted).

• Compare mode. This mode is used when comparing two sources at equal loudness, for instance when evaluating the impact of a compressor/limiter in the analog loop. Usually the external processor will have changed the signal's loudness and when flipping between the two sources, this loudness jump hampers a proper quality judgement. In compare mode the volume setting is memorized for every source

(Continued)

individually instead of global. So if you listen to the first source, adjust the volume to taste, then switch to the second source and adjust that volume to a similar level, flipping between the two sources can be done at equal loudness. To indicate that compare mode is engaged, the volume number turns green.

P1 menu

The P1 menu is the first of three Preference menus. These are settings that are usually only changed to tailor the UC1 to your system setup.

```

Dig In 1|2   -8.0   next tab
| F1 | F2 | P1 | P2 | P3 | S1 |
> main out: Ana Out 1|2
  max in Analog 1|2: 18 dBu
  main out volume: on
  pc control (midi/volume): on

master 48.0   exit

```

P1 menu.

- Main out. Here you select your main monitor output. There are three options: LS1 / PMC on cat5, Dig out 1 | 2 and Ana out 1 | 2. The selected output will receive volume control and monitors the audio from the monitored sources. Their playback will be interrupted when another monitor source is chosen.

- Max in Analog 1 | 2. This preference let's you choose between 18 dBu or 24 dBu as maximum modulation (0 dBFS) input voltage. The default is 18 dBu (all UC1 outputs have a maximum modulation at 18 dBu). In case a vintage device is used into your analog input, and that you like to drive to maximum swing, you can change this setting to 24 dBu.

- Main out volume. By default it is turned on. Some people prefer to use an external analog volume control in stead of the internal digital one. They can disable the main out volume control here. Volume control of 2nd out and headphones will still work.

- PC control (midi/volume). Not Applicable to this application.

P2 menu

- Monitor mode. In 'normal' mode the three monitor outputs (main, 2nd speaker and phones) alternate. Only one is active at a time. In 'split' mode the 2nd speaker and phones paths are decoupled from the monitor system and become an independent path for USB 9&10, without any digital volume control. The 2nd out and phones channels carry the same signal and are always on. The rightmost channels in the meter display now show the USB 9&10 levels in stead of the monitor output levels.
- Soft key. Here the function of the bottom button in the main screen can be selected. You can choose between: *2nd out* (switch to 2nd speaker output); *special* (enable the selected 'special' function from menu F1, like mono or side); *dim 20 dB* (attenuate the output by 20 dB); *compare mode* (enable the compare mode of menu F2); *fast 0 dB* (set the volume level to the current reference level).
- Phones phase. This flips the polarity of the headphones output. Since there is no official standard for the relationship between the electrical signal polarity and the acoustical pressure polarity of headphones, a positive going electric pulse can result in a pressure increase on some brands' headphones and a pressure decrease on others. The UC1 polarity switch can be used to achieve a positive polarity with your microphone / headphones combination so that an increase in pressure in front of your microphone will result in an increase in pressure inside your headphones.

(Continued)

```

Dig In 1|2  -8.0  next tab
| F1 | F2 | P1 | P2 | P3 | S1 |
> monitor mode: normal
  soft key: 2nd out
  phones phase: normal
  ref level: -8.0dB

master 48.0  exit

```

P2 menu.

Since headphones always show some leakage from environmental sounds, selecting the right polarity will improve the coherence of the leaked acoustic sound.

- Ref level. When this line is selected, a press on the main dial stores the current volume level as the '0 dB' reference playback level. The default setting is -8 dB, which means that the UC1 monitor output has 8 dB of gain available above the reference setting. If you need more or less 'excess gain', you may change it here.

P3 menu

- Display brightness. This function controls the brightness of the display from 1 to 10.
- Display auto dim. If auto dim is turned on the display will turn off a few seconds after a control is used.
- Main screen meters. This enables or disables the presence of a simple 3-stage meter on the main screen.

```

Dig In 1|2  -8.0  next tab
| F1 | F2 | P1 | P2 | P3 | S1 |
> display brightness: 5
  display auto dim: off
  main screen meters: on

master 48.0  exit

```

P3 menu.

S1 menu

This menu shows the hardware and firmware versions of your UC1. It also shows if the UC1 is booted in LS1 mode or PMC mode.

```

Dig In 1|2  -8.0  next tab
| F1 | F2 | P1 | P2 | P3 | S1 |
  about: Grimm Audio UC1
  hardware version: 2.0
  firmware version: 1.1.3
  speaker type: LS1

master 48.0  exit

```

S1 menu.

5. Source Routing Examples

Suggested Routing & Settings - Source Specific

This section covers suggested routing and settings for 4 Digital Source options - 3 server / streamers, and a CD Transport. A brief description of each is shown below, and is illustrated by a diagram on pages 18-21.

A. Routing USB1 | Server/Streamer - Rear Panel

Figure 2a on page 18 shows the routing diagram of the UC1 for the USB1 input connection on the rear panel.

The selected output shown is Ana 3|4 which bypasses all functions and controls. To allow all functions and controls, select output Ana 1|2 (aka Main) or "2nd Out".

C. Routing Grimm MU1 Server/Streamer

Figure 2c on page 20 shows the routing diagram of the UC1 for the Grimm MU1 connected to AES3 Dig 1/2.

The selected output shown is "2nd Out", and all controls and functions are enabled. If "Phones" and "polarity" are not desired, select output Ana 1|2.

B. Routing USB I-put | Server/Streamer - Front Panel

Figure 2b on page 19 shows the routing diagram of the UC1 for the USB "I-put" connection on the front panel.

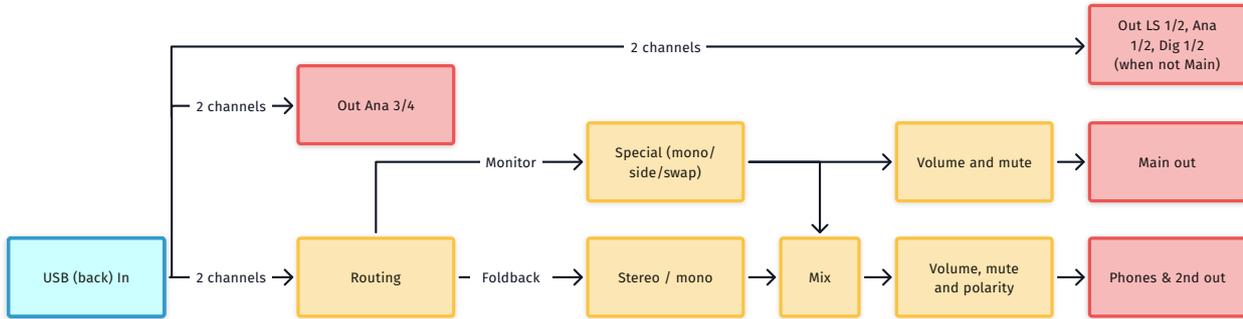
The selected output shown is "2nd Out", and all controls and functions are enabled. If "Phones" and "polarity" are not desired, select output Ana 1|2.

D. Routing CD Transport

Figure 2d on page 21 shows the routing diagram of the UC1 for a CD Transport connected to AES3 Dig 2/2,

The selected output shown is "2nd Out", and all controls and functions are enabled. If "Phones" and "polarity" are not desired, select output Ana 1|2.

A. Routing USB 1 | Back



USB 1 | F1 settings

USB 1	-12.0	next tab
F1	F2	P1 P2 P3 S1
> monitor source :		USB 1
special :	stereo	mono
foldback :	on	off
mute :	on	off
master	44.1	exit

USB 1 | F2 settings

USB 1	-12.0	next tab
F1	F2	P1 P2 P3 S1
clock master 44.1		
autoswitch clock :	yes	no
2nd out :	on	off
compare mode :	on	off
master	44.1	exit

Settings

- Using the main VOL / Source Dial, select the USB1 input under F1.
- Via the two setting buttons, scroll through and select the F1, F2, functions and the P1 and P2 Preferences as shown.
- The P2 "reference level" can preferably be between -8 and -18 ... e.g. -12
- The Clock master setting for this source's playback will automatically set itself to the source clock when "autoswitch clock" under F2 is set to "yes".

USB 1 | P1 settings

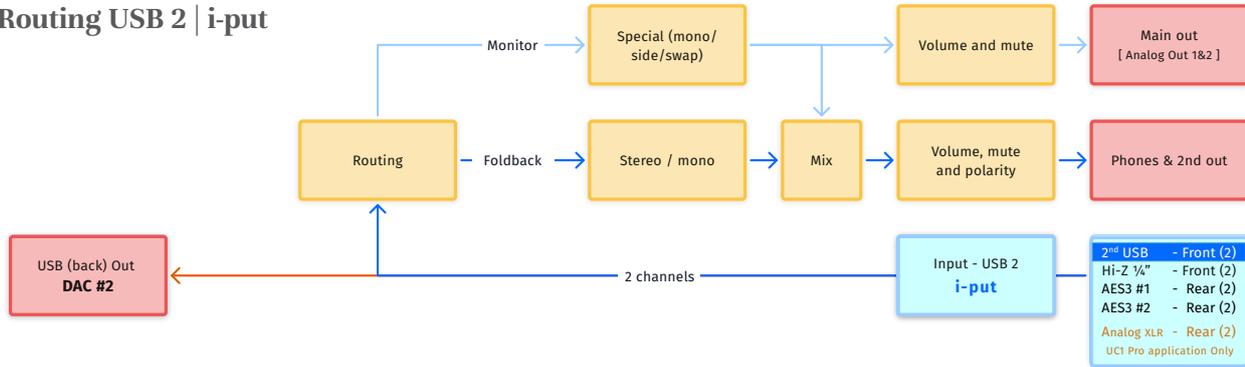
USB 1	-12.0	next tab
F1	F2	P1 P2 P3 S1
> main out :		Ana Out 3/4 2 nd Out 1/2
max In Analog 1/2 : 18 dBu		
main out volume :	on	off
compare mode :	on	off
master	44.1	exit

USB 1 | P2 settings

USB 1	-12.0	next tab
F1	F2	P1 P2 P3 S1
> monitor mode :		normal
softkey :	2 nd Out	
phones phase :	normal	inverted
ref level :	0dB	-12.0dB
master	44.1	exit

Figure 2a UC1- HiFi internal routing.

B. Routing USB 2 | i-put



i-put USB | F1 settings

i-put USB		-12.0	next tab			
F1	F2	P1	P2	P3	S1	
> monitor source :		i-put USB				
special :		stereo mono				
foldback :		on off				
mute :		on off				
master 44.1		exit				

i-put USB | F2 settings

i-put USB		-12.0	next tab			
F1	F2	P1	P2	P3	S1	
clock master 44.1						
autoswitch clock :		yes no				
2nd out :		on off				
compare mode :		on off				
master 44.1		exit				

Settings

- Using the main VOL / Source Dial, select the "I-Put USB" input under F1.
- Via the two setting buttons, scroll through and select the F1, F2, functions and the P1 and P2 Preferences as shown.
- The P2 "reference level" can preferably be between -8 and -18 ... e.g. -12
- The Clock master setting for this source's playback will automatically set itself to the source clock when "autoswitch clock" under F2 is set to "yes".

i-put USB | P1 settings

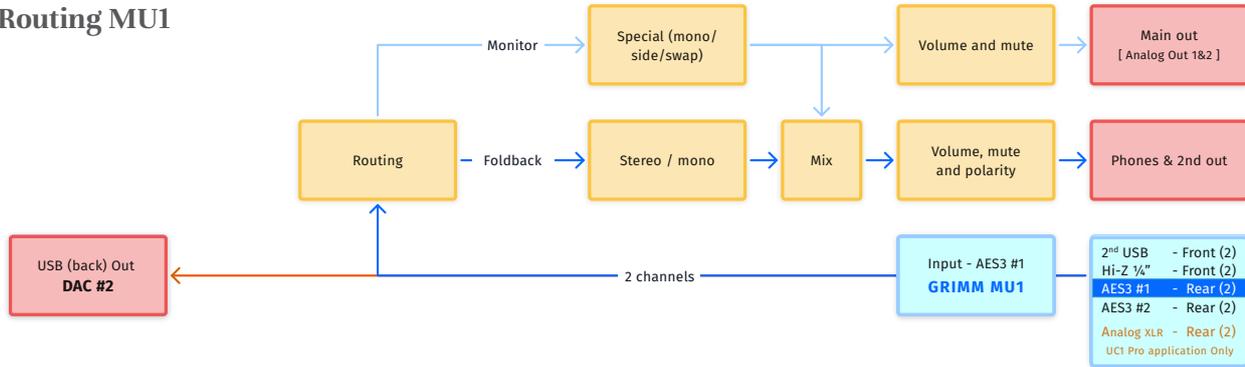
i-put USB		-12.0	next tab			
F1	F2	P1	P2	P3	S1	
> main out :		Ana Out 1 2		2nd Out 1 2		
max In Analog 1 2 : 18 dBu						
main out volume :		on off				
compare mode :		on off				
master 44.1		exit				

i-put USB | P2 settings

i-put USB		-12.0	next tab			
F1	F2	P1	P2	P3	S1	
> monitor mode :		normal				
softkey :		2nd Out				
phones phase :		normal inverted				
ref level :		0dB -12.0dB				
master 44.1		exit				

Figure 2b UC1- HiFi internal routing.

C. Routing MUI



Dig In 1|2 | F1 settings

Dig In 1 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
> monitor source :		Dig In 1 2			
special :		stereo mono			
foldback :		on off			
mute :		on off			
master 44.1		exit			

Dig In 1|2 | F2 settings

Dig In 1 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
clock master 44.1					
autoswitch clock :		yes no			
2nd out :		on off			
compare mode :		on off			
master 44.1		exit			

Settings

- Using the main VOL / Source Dial, select the Dig 1 |2 input under F1.
- Via the two setting buttons, scroll through and select the F1, F2, functions and the P1 and P2 Preferences as shown.
- The P2 “reference level” can preferably be between -8 and -18 ... e.g. -12
- The Clock master setting for this source's playback will automatically set itself to the source clock when “autoswitch clock” under F2 is set to “yes”.

Dig In 1|2 | P1 settings

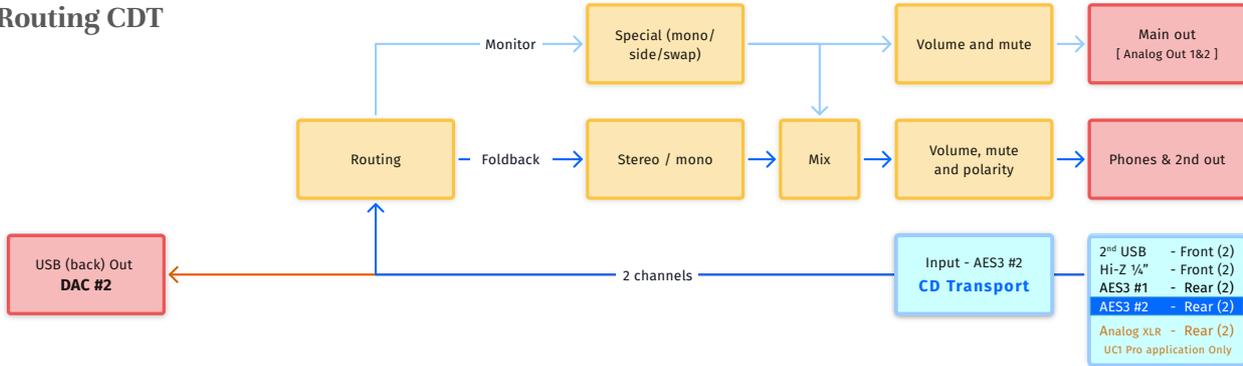
Dig In 1 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
> main out :		Ana Out 1 2 2 nd Out 1 2			
max In Analog 1 2 : 18 dBu					
main out volume :		on off			
compare mode :		on off			
master 44.1		exit			

Dig In 1|2 | P2 settings

Dig In 1 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
> monitor mode :		normal			
softkey :		2 nd Out			
phones phase :		normal inverted			
ref level :		0dB -12.0dB			
master 44.1		exit			

Figure 2c UC1- HiFi internal routing.

D. Routing CDT



Dig In 2|2 | F1 settings

Dig In 2 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
> monitor source :		Dig In 2 2			
special :		stereo mono			
foldback :		on off			
mute :		on off			
master 44.1		exit			

Dig In 2|2 | F2 settings

Dig In 2 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
clock master 44.1					
autoswitch clock :		yes no			
2nd out :		on off			
compare mode :		on off			
master 44.1		exit			

Settings

- Using the main VOL / Source Dial, select the Dig 2|2 input under F1.
- Via the two setting buttons, scroll through and select the F1, F2, functions and the P1 and P2 Preferences as shown.
- The P2 "reference level" can preferably be between -8 and -18 ... e.g. -12
- The Clock master setting for this source's playback will automatically set itself to the source clock when "autoswitch clock" under F2 is set to "yes".

Dig In 2|2 | P1 settings

Dig In 2 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
> main out :		Ana Out 1 2 2 nd Out 1 2			
max In Analog 1 2 : 18 dBu					
main out volume :		on off			
compare mode :		on off			
master 44.1		exit			

Dig In 2|2 | P2 settings

Dig In 2 2		-12.0	next tab		
F1	F2	P1	P2	P3	S1
> monitor mode :		normal			
softkey :		2 nd Out			
phones phase :		normal inverted			
ref level :		0dB -12.0dB			
master 44.1		exit			

Figure 2d UC1- HiFi internal routing.

UC1 | Grimm



Grimm Audio BV
The Netherlands
+31 40 213 1562
info@grimmaudio.com

www.grimmaudio.com