

LAVRY

Quintessence

Reference DAC and Digital Monitor Control



MODEL DA-N5

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Warning

The front panel of the Lavry Quintessence is plated with 24 karat gold, which is vulnerable to scratching and abrasion. When shipping this unit, protect the front panel with a non-abrasive cloth.

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Introduction

Congratulations on your purchase of the Lavry Quintessence DA-N5, reference DAC and digital monitor controller. This unit is a single stereo digital to analog converter, which comes equipped with dual stereo XLR analog outputs. The output designated **Main Out**, provides fixed, full scale level signals. The output designated **Monitor Out**, provides the same output signal as **Main Out**, attenuated by a user-controlled, high-precision volume setting.

The Quintessence has 3 digital audio input connectors, and may be switched between them with the press of a button. Each input has an independent volume setting for **Monitor Out**, allowing level matched AB comparisons. The unit provides quick and smooth transitions when switching between inputs or other functions

Layout

This section gives an overview of the controls and connectors of the Quintessence.

Rear Panel

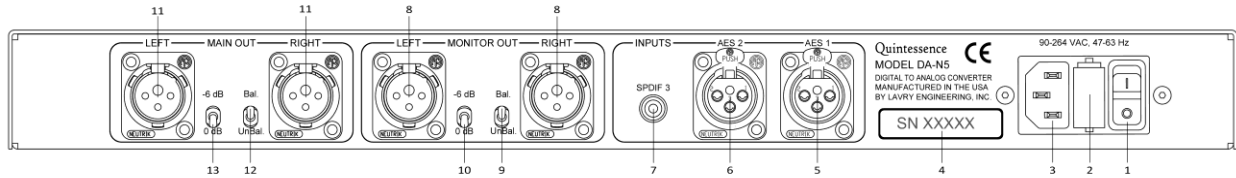


Figure 1- Rear Panel Layout

1. Power Switch	2. Fuse Drawer
3. AC Power Connector	4. Serial Number
5. Input 1	6. Input 2
7. Input 3	8. Monitor Output
9. Monitor Balanced/ Unbalanced Switch	10. Monitor Gain Range Switch
11. Main Output	12. Main Balanced/ Unbalanced Switch
13. Main Gain Range Switch	

POWER SWITCH

The power switch is a two position rocker switch.

FUSES

This unit uses two 1A 250V Slow-Blow 5mm x 20mm fuses. There are two small spring-loaded tabs located at the top and bottom of the fuse drawer that must be released to allow access to the fuses.

AC POWER CONNECTOR

The Quintessence power supply accepts AC power in the range of 90-264 Volts at 47-63 Hertz. The power supply adjusts automatically for proper operation with AC power within this voltage & frequency range.

The AC power connector features the Volex V-Lock system to minimize the possibility of the power cord becoming unintentionally disconnected. There is a small push button on the V-Lock power cord which must be depressed to release the cord from the receptacle. The power connector's IEC C14 receptacle can accept any standard IEC power cord with a C13 connector, as well as the V-Lock compatible power cord.

INPUT 1 & 2

These XLR connectors accept either AES or SPDIF format stereo digital audio signals. Standard adapters can be used to connect RCA coaxial SPDIF sources to these XLR inputs.

INPUT 3

This RCA connector accepts either AES or SPDIF format signals. A standard adapter can be used to connect XLR AES sources to this RCA input.

MAIN OUT

This pair of XLR connectors outputs a fixed level stereo signal. The maximum output level is 24dBu in balanced mode or 18dBu in unbalanced mode.

MONITOR OUT

This pair of XLR connectors replicates the **Main Out** signals with user adjustable attenuation, controlled via the front panel Volume control.

BALANCED/ UNBALANCED SWITCHES

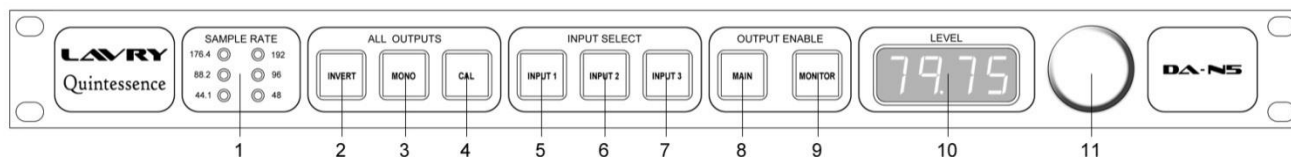
Each of the output pairs has its own switch for balanced or unbalanced settings. When set to the unbalanced position, pin 2 of the XLR output is hot and pin 3 is grounded.

GAIN RANGE SWITCHES

Each of the output pairs has its own gain Range switch. The gain range lowers the signal level by 6dB in either balanced or unbalanced operation.

Front Panel

The Lavry Quintessence front panel has a simple user interface which consists of 6 LEDs, 8 illuminated



pushbuttons, a 4 digit segmented numerical LED display, and one rotary knob with a built-in pushbutton switch. A pushbutton which is illuminated in green indicates an enabled setting. A pushbutton illuminated in blue indicates a setting which is disabled.

Figure 2- Front Panel Layout

1. Sample Rate Indicator LEDs	2. Invert On/Off
3. Mono On/Off	4. Calibration
5. Input 1 Select	6. Input 2 Select
7. Input 3 Select	8. Main Output Enable
9. Monitor Output Enable	10. Level Display
11. Rotary Knob & Pushbutton	

SAMPLE RATE INDICATOR LEDs

When the unit is locked to a digital audio input signal, one of these six LEDs will be illuminated, indicating the sample rate. The Quintessence can accommodate sample rates of 44.1, 48, 88.2, 96, 176.4, and 192 kHz.

When the unit is not receiving a valid digital audio input signal, the LEDs will strobe in a repeated pattern.

INVERT ON/OFF

This button toggles polarity inversion of all outputs on and off. This affects both the left and right channels of the **Main Out** and **Monitor Out** signals.

When the invert mode is off, the signal on Pin 2 is in the normal polarity. When the invert is on, the signal on Pin 2 is inverted. In balanced mode, Pin 3 is the opposite polarity of Pin 2. In unbalanced mode, Pin 3 is grounded.

MONO ON/OFF

This button toggles the signal output to mono when on, and to stereo when off. This affects both the **Main Out** and **Monitor Out** signals. Loudness differences between mono and stereo modes vary depending on the degree of stereo separation of the music.

The Lavry Quintessence switches smoothly between Normal and Invert, between Mono and Stereo, and between Inputs 1, Input 2, and Input 3; preventing high energy pops or clicks, from entering the output signal.

CALIBRATION

When in calibration mode, the **Rotary Knob** provides fine adjustment to both **Main Out** and **Monitor Out**. The adjustment range is -0.70 dB to +0.70 dB in 0.1 dB increments. While in this mode, the **Numeric Display** indicates the calibration setting.

Calibration is useful to compensate for minor level differences caused by differences in the input impedances and input signal range tolerances of driven equipment.

INPUT SELECT BUTTONS (INPUT 1, INPUT 2, INPUT 3)

This group of buttons selects which of the 3 digital stereo inputs is received by the DA converter circuitry. Each input selection retains an independent Volume setting.

MAIN OUTPUT ENABLE

This button enables or mutes the signals to the **Main Out** connectors. When in mute, the output is hardware grounded.

MONITOR OUTPUT ENABLE

This button enables or mutes the signals to the **Monitor Out** connectors. When in mute, the output is hardware grounded.

The Output Enable buttons are a fast means to mute the outputs in case of a corrupted input signal.

LEVEL DISPLAY

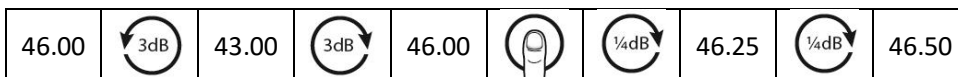
This 4 digit numeric display indicates the Volume level of the **Monitor Out** signals. The minimum level is "00.00" at which the signal is muted. The maximum level is "80.00", which is full scale.

When the unit is in calibration mode, this 4 digit numeric display indicates the output calibration setting, which ranges from -0.70 dB to +0.70 dB in 0.1 dB increments.

ROTARY KNOB

The Rotary Knob has a built-in pushbutton switch. By pressing and releasing the knob, the volume adjustment toggles between 0.25 dB and 3 dB steps.

Example 1:



This knob can be used to adjust the **Monitor Output** Volume of the currently selected digital input. Rotating the knob clockwise increases the level, and rotating the knob counter-clockwise decreases the level.

When the unit is in calibration mode, this knob adjusts the output calibration setting in 0.1 dB increments.

Volume Control Behavior At Maximum Or Mute

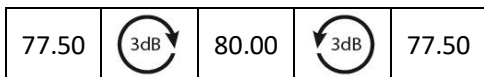
The COARSE MODE (3dB adjustment mode) of the Volume Control includes a feature which allows the user to easily return to the exact same level after having reached the MUTE or MAXIMUM VOLUME, without having to make additional 1/4dB adjustments in FINE MODE.

If the user makes an adjustment in FINE MODE, the increments will always be 1/4dB.

Rotating the knob very quickly into 00.00 or 80.00 and back may return the Volume to a slightly different level. To avoid this, please rotate the knob smoothly and at a natural speed.

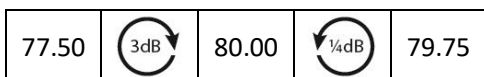
Example 2:

In COARSE MODE, starting at 77.50, rotate the knob clockwise. The Volume will change to 80.00, and additional clockwise rotations will do nothing. Rotate the knob counterclockwise, and the Volume will return to 77.50.

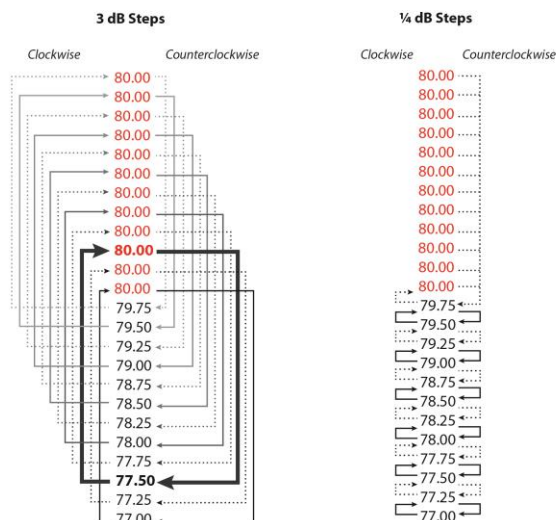


Example 3:

In COARSE MODE, starting at 77.50, rotate the knob clockwise. The Volume will change to 80.00, and additional clockwise rotations will do nothing. Press and release the knob to switch to FINE MODE. Rotate the knob counterclockwise. The Volume will change to 79.75.

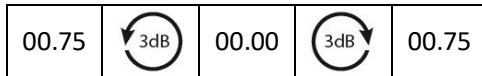


Upper Volume Control Range

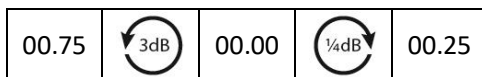


Example 4:

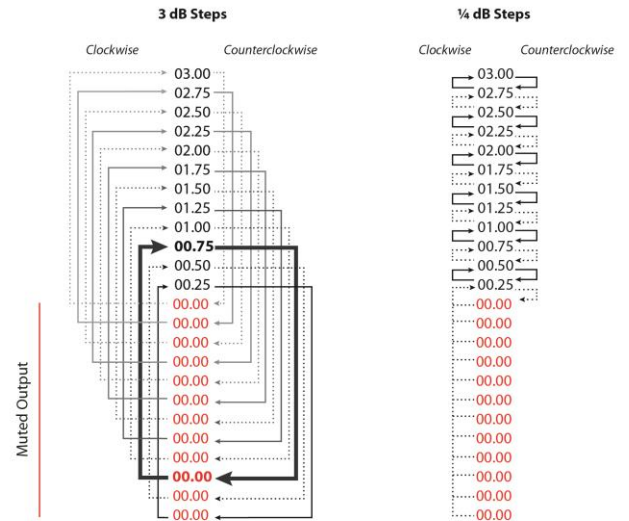
In COARSE MODE, starting at 00.75, rotate the knob counterclockwise. The Volume will change to 00.00, and additional counterclockwise rotations will do nothing. Rotate the knob clockwise, and the Volume will return to 00.75.

**Example 5:**

In COARSE MODE, starting at 00.75, rotate the knob counterclockwise. The Volume will change to 00.00, and additional counterclockwise rotations will do nothing. Press and release the knob to switch to FINE MODE. Rotate the knob clockwise. The Volume will change to 00.25.



Lower Volume Control Range



Front Panel Illumination

There are 3 groups of illuminated elements on the Front Panel: the 6 Sample Rate LEDs, the 8 Illuminated Pushbuttons, and the Level Display. Each of these 3 groups has an independent, user adjustable intensity setting.

To adjust the brightness of the **Sample Rate Illumination LEDs**, press and hold the **INVERT**, **MONO**, and **CAL** buttons simultaneously and rotate the knob.

To adjust the brightness of the **Illuminated Pushbuttons**, press and hold the **INPUT 1**, **INPUT 2**, and **INPUT 3** buttons simultaneously and rotate the knob.

To adjust the brightness of the **Level Display**, press and hold the **MAIN** and **MONITOR** buttons simultaneously and rotate the knob.

Passive Features

This section assumes that you have read the **Layout** section of the manual, and are familiar with the basic operation of the front panel controls as well as the input and output connections and switches.

System Memory

The unit retains all settings in non-volatile memory. When the unit is powered on, the last used settings are loaded from memory.

Mono and Invert

During switching between either Mono/Stereo or Polarity Invert On/Off, the volume ramps down and then ramps back up to prevent pops and cracks due to signal discontinuity.

Input Switching

This unit enables quick comparison of music before and after processing, with level matching accuracy up to 0.25 dB. Inputs signals may have different sample rates and word lengths. During input switching, the volume ramps down to mute while the unit stabilizes to the new signal; afterwhich, the volume ramps up to the new input level. This process is fast enough to compare music, but slow enough to prevent pops and clicks.

Before switching to an input with an unknown volume setting, it is advisable to first mute the monitor output. Then after switching inputs, proceed to lower the volume setting, unmute the monitor output, and raise the volume. This will prevent damage which may result when switching to a much higher volume.

The unit minimizes the audible impact of any undesirable noises that may occur when changing between settings by fading the volume down/up as necessary. This is useful to protect ears and speakers from damage.

Enabling and Muting Outputs

Muting the **Main Out** or **Monitor Out** begins with a volume fade out and ends by hardware shorting the output. On unmuting or unit power-up, this process is reversed.

Muting or unmuting **Monitor Out** will have no effect on **Main Out**. When muting or unmuting **Main Out** a moment of silence will be heard on **Monitor Out**.

Specifications

Performance

- **Distortion:** 0.0005% at – 3dBFS, 1kHz; 0.0009% at -3 dBFS, 20 Hz- 20 kHz
- **Noise:** -110 dBFS un-weighted
- **Flatness Response:** 0.05 dB
- **Channel Separation:** 107 dB (20 Hz – 20 kHz)
- **Mute:** -125 dB (Volume = 0)
- **Sample Rate:** 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
- **Stereo Level Matching (Left to Right):** 0.04 dB
- **Main to Monitor Level Matching:** 0.04 dB (Monitor Setting at Maximum Value)
- **Crosstalk:** -127 dB at 1kHz, -112 dB at 20Hz – 20 kHz
- **Click & Pop Protection on Switching:** fast fade out, fade in (front panel switches)

Digital Inputs

- **2 XLR:** transformer isolated
- **1 RCA:** transformer isolated

Analog Outputs

- **Main Stereo Output:** 24 dBuFS into 600 Ohms
- **Monitor Out:** 24dBuFS into 600 Ohms maximum
- **Monitor Level:** Digitally controlled analog attenuation (3 dB or 0.25 dB steps)
- **Monitor Attenuation:** up to 79.75 dB + Mute

Calibration

- **Calibration Range:** ± 0.7 dB
- **Calibration Steps:** 0.1 dB
- **Calibration Step Accuracy:** ± 0.002 dB

AC Power

- This unit automatically adjusts to AC power input within the range of 90-264VAC, 47-63 Hertz. No change of settings is necessary.
- **Fuses:** 1.25A 250V Slow 5mm x 20mm

Physical

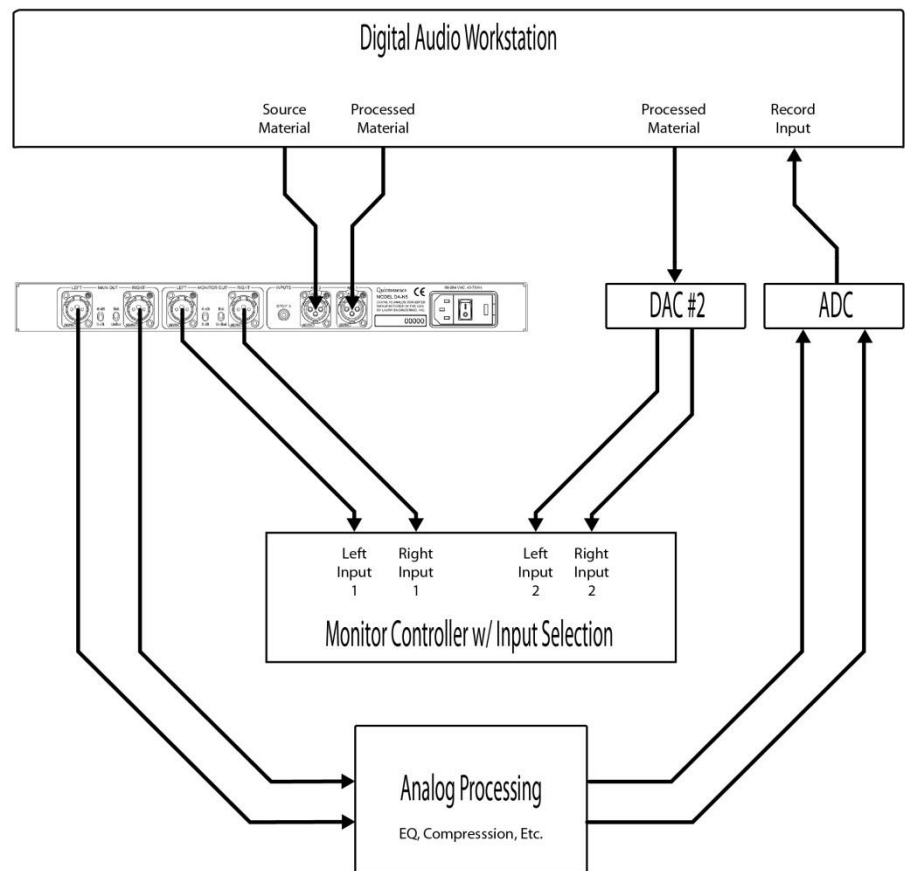
- **Dimensions:** 19"W x 1.75"H x 10.75" D (front panel to rear panel connectors; front panel knob adds 5/8")
- **Weight:** Unit ~8.85 lbs
- **Shipping weight:** ~10 lbs

Example Connection Diagrams:

The Lavry Quintessence has a unique digital monitor function that can allow precise comparisons of two or three digital sources. However, it cannot take the place of two DA converters in systems with analog processing. The Quintessence can be used for the comparison of pre and post processing signals when configured in one of the following manners. Each of these configurations requires the DAW to have multiple AES/SPDIF outputs.

Mastering/Analog Insert processing 1:

This configuration uses the Quintessence as the source DA converter for analog processing. It is necessary to record the processed signal to use the monitoring feature of the Quintessence to compare the preprocessed (*flat*) source to the post processed (*EQ'd*) file. A second DA converter may be used prior to and during recording to monitor the processed signal.



Once recording is complete, it is necessary to mute the recording inputs in order to prevent the potential

for feedback when the input of the Quintessence is changed to the post processing signal. In this setup, **Main Out** would feed the analog processing, and **Monitor Out** would feed a monitor controller. Source selection on the monitor controller would be used to select the Quintessence or the separate monitor DA converter. During setup and recording, the monitor DA would be selected to listen to the processed signal. Once the file is recorded, the monitoring features of the Quintessence could be used to make precise comparison of the original and processed files playing from the DAW, and possibly a third source such as a CD player.

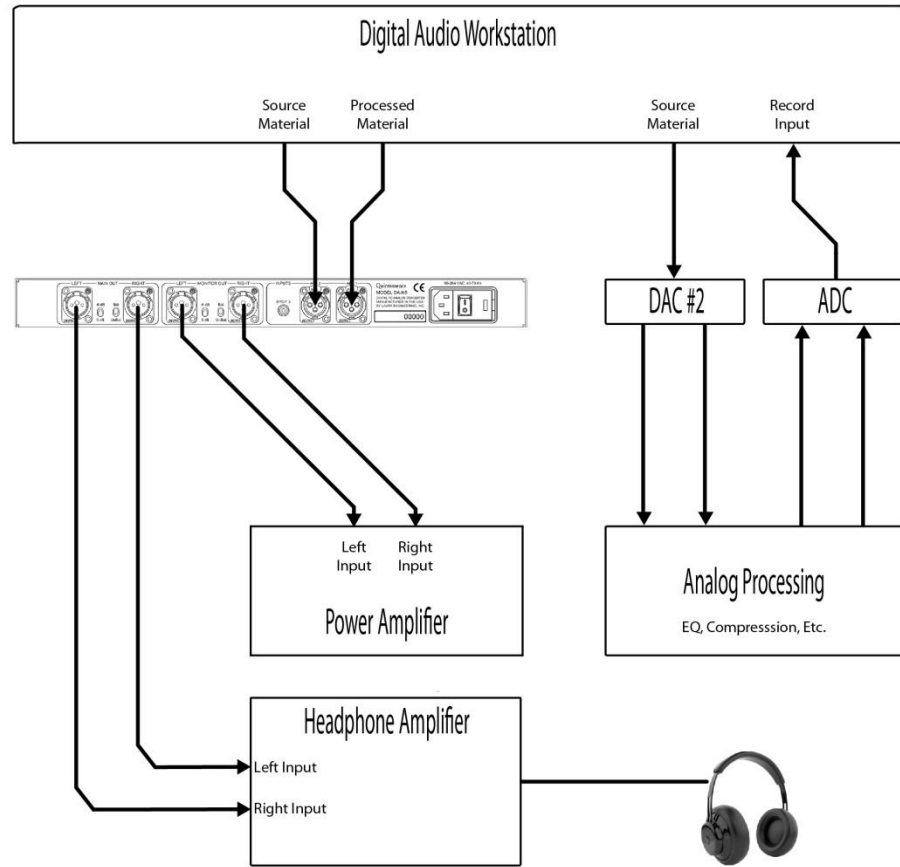
Mastering/Analog Insert processing 2:

This configuration uses the Quintessence as the monitor DA converter, and a second DA is used as the source for analog processing. The monitoring feature of the Quintessence can be used at any time to compare pre and post processing signals to each other, or to a third source such as a CD player.

This also makes it possible to feed a monitor system directly from **Monitor Out**, without a separate monitor controller. The front panel Volume control of the

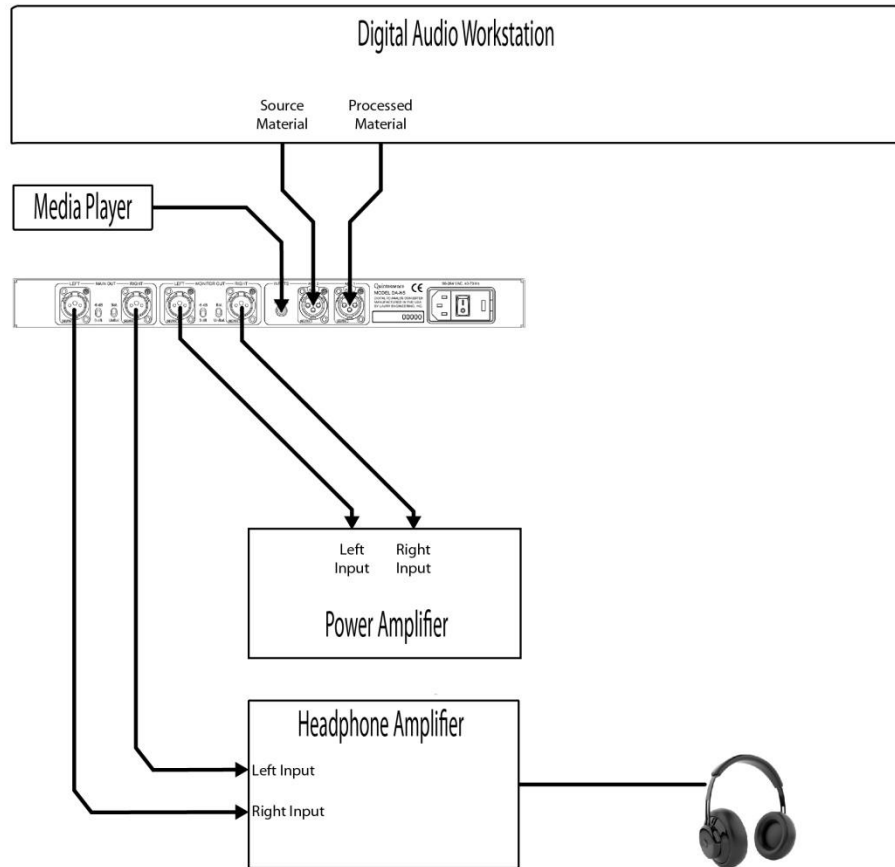
Quintessence would be used to control the listening level, and the output enable would serve as a Monitor Cut control.

Main Out could optionally be used to feed a headphone amplifier or a 2nd monitor path.



Mastering with Digital processing or mixing:

This example configuration uses the Quintessence to easily switch between inputs in order to compare the original, and modified version of an audio file. The ability to adjust channel Volume independently, enables comparing music at equal Volume. This setup may also be used for live comparisons during digital processing. In either case, the 3rd input of the unit could alternatively be unused, or connected to another DAW output instead of to an external media player.



Limited Warranty – Lavry Quintessence

Subject to the conditions set forth below, for one year after the original purchase date of the product, Lavry Engineering will repair the product free of charge in the United States in the event of a defect in materials or workmanship.

Lavry Engineering may exchange new or rebuilt parts for defective parts. Please call the factory for an RMA number prior to shipment. No product will be accepted for warranty service without a pre-issued RMA number.

This warranty is extended only to an original purchaser of the product from Lavry Engineering, or an authorized reseller of Lavry Engineering. Products that are purchased from unauthorized resellers do not have any warranty coverage. A valid purchase receipt or other valid proof of purchase will be required before warranty service is provided. This warranty only covers failures due to defects in materials or workmanship and does not cover damages which occur in shipment or failures resulting from accident, misuse, line power surges, mishandling, maintenance, alterations and modifications of the product, or service by an unauthorized service center or personnel. Lavry Engineering reserves the right to deny warranty service to products that have been used in rental, service bureau, or similar businesses.

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