LAVRY

AD-24-200



savitr

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CAUTION

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

For safety, users should not attempt to service or repair the unit unless given specific instructions to do so by Lavry Support staff-members (Users will be advised to power off, and unplug the unit before removing the top-cover and to replace the top cover before plugging and powering on the unit).

Do not let the unit suffer sudden impact. The structure of the unit is enforced with machined steel parts, but with a sudden impact it is possible to damage electronic connections on the circuit boards. Secure the unit firmly into place in your 19 inch rack, or place the unit on a level surface.

To secure the unit into a 19 inch rack, it may be necessary to remove the 4 rubber feet adhered to the bottom surface. They can be removed without the use of any tools which could leave scratches on the metal surface. If the feet have been removed, and the unit is moved to a level surface, then the user is advised to first secure 4 new adhesive rubber feet to the bottom surface of the unit.

If the unit is on a level surface, it should be buffered from that surface with the 4 rubber feet which are adhered to the bottom surface of a new unit. The rubber feet will prevent the bottom surface of the unit from abrading or being abraded by that surface, and the unit from sliding around.

If you suspect that the unit is malfunctioning, please refer to the Trouble Shooting Section.

INTRODUCTION

Congratulations on your purchase of the Lavry Savitr AD-24-200 ultra-precision analog to digital converter. Unit features include adjustable GAIN, External Clock Search & Lock, LOW-LATENCY mode, MX mode, output format (AES/SPDIF) selection, and SOFT SATURATION.

The AUXILARY module offers an additional digital audio output with independent settings for format and clock mode.

This unit is contained within a standard 19 inch rack-mountable steel frame. All electrical communication and connection is made via the rear panel. The power switch, and 4 other switches are located on the rear panel; none of these switches should be needed during standard operation.

All regular user control is done via the front panel's button switches.

REAR PANEL



1. AC Power section

A. Power Inlet

This unit is powered via a standard IEC C13/C14 power cord.

B. Fuse Tray

This fuse tray contains 2 fuses. Be sure to unplug the IEC power cord before accessing the Fuse Tray. If the unit will not power on, and there is no problem with the supply of power, then one or both of the fuses may have blown. (Please refer to Appendix A – Changing Fuses)

C. Power Switch

This switch controls the power inlet. The symbols on the switch are standard "line and circle" power symbols.

- UP position : ON
- DOWN position : OFF

2. ANALOG INPUT section

A. LEFT Input connector

B. RIGHT Input connector

These 2 locking female XLRs accept analog audio signals.
The internal GAIN range: 0 dB to 7 dB

- Full-scale balanced input range: 17-24 dBu
- Full-scale unbalanced input range: 17-20 dBu

3. MAIN EXT SYNC INPUT section

This section allows the user the option to synchronize the digital audio of the unit to an external clock source (32-200 kHz).

A. WORD CLOCK INPUT connector

This BNC input is internally terminated by 75Ω.

B. SOURCE toggle switch

- UP position: The unit can sync to the AES signal on the XLR.
- DOWN position: The unit can sync to the WORD CLOCK signal on the BNC.

C. AES INPUT connector

This locking female XLR enables lock to a digital audio signal.

4. MAIN OUTPUT section

A. WORD CLOCK OUTPUT connector

This BNC outputs a clock source signal.

B. OUTPUT FORMAT switch

- UP position : OUTPUT FORMAT = AES
- DOWN position : OUTPUT FORMAT = SPIDF

C. Digital Audio Output connector

This locking male XLR is the main digital audio output.

5. AUX DIGITAL OUTPUT section

A. SYNC INPUT switch

- UP position: SYNC INPUT is set to WORD CLOCK.
- DOWN position: SYNC INPUT is set to AES.

B. SYNC INPUT connector

This BNC input is internally terminated by 75Ω.

C. OUTPUT FORMAT switch

- UP position: the output signal is AES formatted.
- DOWN position: the output signal will be SPDIF formatted.

D. Digital Audio Output connector

This locking male XLR outputs a digital audio signal.

FRONT PANEL (START-UP SEQUENCE)



The front panel layout consists of the METER, and USER CONTROLS.

1. METER

The meter displays audio peak levels.

2. USER CONTROL groups

User controls consist of switches, LED indicators (lamps) and trim pots.

STARTUP sequence

During calibration, the METER runs a visual sweep from left to right, illuminating one pair of lamps at a time. The unit loads all settings saved before the previous shutdown.

When the STARTUP sequence has completed, the unit enters OPERATION mode.

FRONT PANEL (OPERATION MODE)



1. Enable lamp

EDIT mode: ON
OPERATION mode: OFF

2. Enable switch

A sustained press of this switch enters EDIT mode. The ENABLE lamp will turn ON when this change occurs.

3. M switch

This switch cycles through the illumination settings of the METER lamps.

4. S switch

This switch cycles through the illumination settings of the USER CONTROL groups.

5. Peak Refresh switch

This switch clears the peak-hold function for the METER. This function can be enabled via an internal DIP switch.



FRONT PANEL (EDIT MODE)



In EDIT mode, the user-controls are divided into 6 distinct sections, labeled MAIN, AUX, SOFT SAT, SPECIAL, GAIN, and EDIT.

All User-Control lamps will display one of 4 states:

- OFF
- ON
- SELECT (ON): SELECTED for change to ON state (long flash)
- SELECT (OFF): SELECTED to change to OFF state (short flash).

Conversion continues uninterrupted in EDIT mode. Operation will only change to new settings after the SET switch is pressed. This will be followed by a brief mute of the output.

1. EDIT control section

Enable switch

To switch between OPERATION and EDIT mode, press and hold this switch until the ENABLE lamp changes. The unit will automatically exit to OPERATION mode after a short idle time.

Enable lamp

- EDIT mode: ON
- OPERATION mode: OFF

Set switch

This switch executes all displayed SELECTIONS. If SET is not pressed before exiting to OPERATION mode, then all changes will not be executed, and the display will revert.

2. MAIN and

3. AUX control sections

These two sections control clock sources. The control method of each section is identical.

MAIN or AUX switch

A momentary press cycles through available sample rate options when in INTERNAL clock mode.
A sustained press cycles through clock modes (INTERNAL, NARROW, WIDE LOCK).

EXT lamp

- OFF: INTERNAL clock mode.
- SELECT (OFF) (short flash): SELECTING INTERNAL clock mode.
- ON: EXTERNAL clock mode (NARROW or WIDE LOCK).
- SELECT (ON) (long flash): SELECTING EXTERNAL clock mode (NARROW or WIDE LOCK).

SAMPLE RATE lamps

There are 6 lamps labeled with numbers 44.1, 88.2, 96, 176.4, and 192. These refer to sample rates in kHz. Depending on clock mode, these lamps function differently.

INTERNAL clocking mode

- ON: displays the active clock rate.
- SELECT (ON) (long flash): displays which clock rate is SELECTED to be SET.

NARROW clocking mode

SEARCHING function (Narrow)

Displays a repeating pattern of single flashing lamps, until a clock signal among the 6 rates is found.

LOCKED (Narrow)

Lamp (ON): displays the locked rate.

WIDE LOCK clocking mode

SEARCHING function (WIDE)

Displays a repeating pattern of **paired** flashing lamps, until a clock signal between 32 and 200 kHz is found.

LOCKED (WIDE)

Paired lamps (ON) indicates the range of the locked frequency:

- 44.1 and 48 (ON) : 32-68kHz
- 88.2 and 96 (ON): 68-136kHz
- 176.4 and 192 (ON): 136-200kHz

4. SOFT SAT control section

SOFT SAT switch

This switch will SELECT a SOFT SATURATION level.

3 lamps

These lamps indicate and control application of 4 levels of SOFT SATURATION to the audio signal:

- OFF: No Saturation.
- ON: Displays level of SOFT SATURATION.
- SELECT (OFF) (short flash) ALL lamps: SELECT setting for NO SOFT SATURATION.
- SELECT (ON) (long flash): SELECT setting for SOFT SATURATION.

5. SPECIAL control section

Low Latency control

Switch

This switch SELECTS between BEST-QUALITY and LOW LATENCY modes.

Lamp

- OFF: BEST-QUALITY mode.
- SELECT (ON) (long flash): SELECT LOW LATENCY mode.
- ON: LOW LATENCY mode.
- SELECT (OFF) (short flash): SELECT BEST-QUALITY mode.

MX control

The MX transformation is a proprietary technology, reducing the perceived harsh distortions due to signal clipping (exceeding the allowed signal range).

Switch

This switch SELECTS between NEUTRAL and MX modes.

Lamp

- OFF: NEUTRAL mode.
- SELECT (ON) (long flash): SELECT MX mode.
- ON: MX mode.
- SELECT (OFF) (short flash): SELECT NEUTRAL mode.

6. GAIN control section

INPUT TRIM potentiometers

The L and R potentiometers control INPUT GAIN for the LEFT and RIGHT analog channels.

With a small, flat-head screw-driver: CLOCKWISE rotation INCREASES GAIN. These trim pots provide 0-12dB of GAIN. Adjustment will require many rotations.

FULL-SCALE signal for BALANCED inputs is 24dBu. The trim potentiometers provide up to 12dB of internal GAIN to accommodate weaker input signals.

FULL-SCALE signal for UNBALANCED inputs is 18dBu. The trim potentiometers provide up to 6dB of internal GAIN to accommodate weaker input signals.

TECHNICAL SPECIFICATIONS

THD+N (0 dB Internal Gain)

Analog Input Level	Source Frequency	Gain	20 kHz Bandwidth		40 kHz Bandwidth	
-1 dBFS	1 kHz	0 dB	-110 dBFS	0.00032 %FS	-107 dBFS	0.00045 %FS
-0.1 dBFS	20 Hz to 20 kHz	0 dB	-109 dBFS	0.00035 %FS	-103 dBFS	0.00071 %FS
-1 dBFS	20 Hz to 20 kHz	0 dB	-109 dBFS	0.00035 %FS	-106 dBFS	0.00050 %FS
-3 dBFS	20 Hz to 20 kHz	0 dB	-113 dBFS	0.00022 %FS	-110 dBFS	0.00032 %FS

THD+N (with Internal Gain)

6 dB of Internal Gain: Increases THD+N by less than 2dB of the values above.

Dynamic Range

Sample Rate	Bandwidth	Unweighted	A-Weighted
44.1 kHz	20 kHz	126 dBFS	128 dBFS
96 kHz	40 kHz	122 dBFS	128 dBFS
192 kHz	80 kHz	104 dBFS	128 dBFS

Channel Separation

- 1 kHz: 123dBFS
- 20-20 kHz: 108dBFS

Latency

	Main Output			AUX Output	
Conversion Rate	Best Quality	Low Latency	Auxiliary Rate	Best Quality	Low Latency
44.1 kHz	471 µs	153 µs	44.1 kHz	3.7 ms	3.5 ms
48 kHz	440 µs	150 µs	48 kHz	3.4 ms	3.4 ms
88.2 kHz	267 µs	109 µs	88.2 kHz	1.9 ms	1.7 ms
96 kHz	249 µs	103 µs	96 kHz	1.7 ms	1.6 ms
176.4 kHz	137 µs	89 µs	176.4 kHz	940 µs	890 µs
192 kHz	130 µs	86 µs	192 kHz	865 µs	820 µs

WARRANTY

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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