Operations Manual

Model 898A
8 Channel Active Balanced/Unbalanced Line Level Translator

Revision B (December 2008)

1. READ INSTRUCTIONS
All the safety and operating instructions of your Sonic Imagery Labs equipment should be read before power is applied to the equipment.
2. RETAIN OWNERS MANUAL
These safety and operating instructions should be retained for future reference.
3. HEED WARNINGS
All warnings on the equipment and in the operating instructions are important and should be followed.
4. FOLLOW INSTRUCTIONS
All operating instructions are important and should be followed.
5. HEAT
The equipment should be kept away from areas of high temperature, i.e., heater vents, radiators, stoves/ovens, fireplaces, etc.
6. VENTILATION
The equipment should be used in an area suitable for proper ventilation. Care should be taken not to impede airflow in and around chassis.
7. WATER AND MOISTURE
The equipment should not be used in or around water, such as a bathtub, sink, or swimming area. Also, the equipment should not be used in areas prone to flooding, such as a basement.
8. POWER SOURCES
The equipment should be connected only to a power source of the same voltage and frequency as that listed on the rear panel below the power entry module.
9. POWER CORD PROTECTION
Power cords should be arranged so they do not interfere with the movement of objects in the room: people, fan blades, utility carts, etc. Also, care should be taken that the power cord is not pinched or cut, and placed so it is not in danger of being cut or pinched, as in under a rug, around a tight corner, etc.
10. POWER CORD GROUNDING
The power cord is of a three wire grounded type, designed to reduce the risk of electric shock sustained from a live chassis. It is assumed to be of suitable length for most uses of this equipment. The use of extension cords and power strips is discouraged unless they are of suitable rating to deliver the required total current for safe operation of all connected equipment. Furthermore, extension cords or power strips must provide the same three wire grounded connection. It is important that the blades of the equipment's plug be able to fully insert into the mating receptacle. Never remove the round grounding pin on the plug in an attempt to mate a two wire ungrounded receptacle: use a grounding adapter with the grounding tab or wire suitably connected to earth ground.
11. NON USE PERIODS
During periods of extended non use, the power cord should be unplugged from the power source.
12. CLEANING
The equipment should be cleaned only as detailed in the operating instructions.
13. OBJECT AND LIQUID ENTRY
Care should be taken so that objects and/or liquids such as cleaning fluid or beverages, are not spilled into the enclosure or chassis of the equipment.
14. DAMAGE REQUIRING SERVICE
Sonic Imagery Labs equipment should be serviced by qualified service personnel when:
A. The power supply cord or plug has been damaged, or
B. Objects have fallen onto, or liquid has been spilled into the equipment or,
C. The equipment has been exposed to rain or,
D. The equipment does not appear to operate normally or exhibits a marked change in performance, or
E. The equipment has been dropped, or the chassis has been damaged.
15. SERVICING
The user should not attempt to service the equipment beyond that which is described in the operating instructions. All other service should be referred to qualified service personnel.
16. CARTS AND STANDS
The equipment should be used with carts or stands only of sufficient strength and stability for the use intended.
An equipment and cart combination should be moved with care. Sudden stops and starts, excessive force, and uneven surfaces may cause the equipment and cart combination to topple.

Introduction

Thank you for purchasing the Sonic Imagery Labs Model 898A 8 Channel Active Balanced/Unbalanced Line Level Translator. The Model 898A was designed for professional use in professional live audio and state of the art studio audio and broadcasting systems and its features include the following:

- **8 Channels of -10dBV to +4dBu Conversion**
- **8 Channels of +4dBu to -10dBV Conversion**
- **Ultra Precision Laser Trimmed Line Receivers**
- **Precision Laser Trimmed Balanced Line Drivers**
- **Ultra Low Total Harmonic Distortion and Noise**
- **DC to 200Khz Bandwidth (direct coupled)**
- **High Current Output Drive in both directions**
- **+25dBu Maximum Levels**
- **Ability to drive 300Ω Minimum Loads**
- **RCA & XLR Interface Connections**
- **Channel to Channel Crosstalk > -105dB**
- **Made in the USA**

Important

Before actually using the Sonic Imagery Labs Model 898A, read this manual thoroughly at least once, so you will know where to return when you need answers.

General Description

The Sonic Imagery Labs, Model 898A is a high performance professional grade tool used to convert unbalanced -10dBV consumer line level audio signals to balanced +4 dBu professional levels - and vice versa. The only product available that provides 8 channels each direction, simultaneously.

Unbalanced lines typically should be kept as short as possible to prevent the undesirable effects of microphonics, hum and noise pickup. The Model 898A allows the conversion to and from balanced lines that can be run up to 500 feet without the loss of audio quality.

Signal to noise and common mode rejection performance are perfectly preserved by using the 898A, since it incorporates precision laser trimmed components that are fully specified for high performance audio applications and have outstanding AC characteristics, including ultra low harmonic distortion (0.0005% at 1KHz), the ability to drive capacitive lines and remain stable, and high slew rate (15V/uS).

The Sonic Imagery Labs Model 898A's one rack space package and performance provides the answer to the most demanding applications requiring precision level conversion and input / output line balancing and unbalancing.

Initial Set-Up

During unpacking, be careful not to damage the 898A. Save the carton and packing material. You may need them to transport your 898A sometime in the future. In addition to the 898A the package should contain the rack mounting screw kit.

After unpacking, check the units for any evidence of damage due to rough handling during transport. Contact your dealer or factory representative if you have any questions.

Installation Site

The 898A may be used in most areas, but to maintain top performance and prolong operating life, observe the following environmental limitations:

1.) Nominal temperature should be 5 to 35 degrees Centigrade (41 to 95 degrees Fahrenheit)
2.) Relative humidity should be 30 to 65% (non-condensing).
3.) Strong magnetic fields should not exist nearby. Conversely, this unit should not be installed near other equipment that is sensitive to magnetic fields.

Rack Mounting

The 898A can be mounted in a standard 19" EIA rack. Use the supplied 10-32x 3/4 mount screws.

Chassis Grounding

The rear surface of the rack mounting ears are unplated for chassis grounding purposes. Good electrical practice dictates earth grounding the Model 898A. If the ground integrity of the rack is in doubt, run a wire from the rack to a known good earth ground.

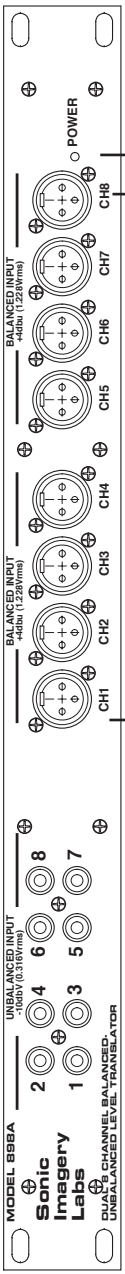
Power Options

The Model 898A is powered by 117Vac nominal line voltage and is supplied with a 6 foot IEC removable universal line cord. If ordering for Asian or European use, the unit will be configured for use with 220/240V line voltages and the user replaceable fuse will be substituted with the appropriate value for the new line voltage.

Wiring Interface

The Model 898A's balanced +4 dBu inputs and outputs conform to the IEC 268-12 XLR wiring standard of pin 2(+) and pin 3 (-). On the XLR male input, an option located on the PCB allows the user to tie pin 1 to audio ground. It is normally shipped open or floating. The unbalanced -10 dBV inputs and outputs are gold plated RCA phono type connectors.

The Model 898A is capable of driving large signals into 600Ω loads over long cables. Low impedance shielded audio cables such as the standard Belden 8451 or 9452 (or similar) are recommended, especially in applications where long cable lengths are required.



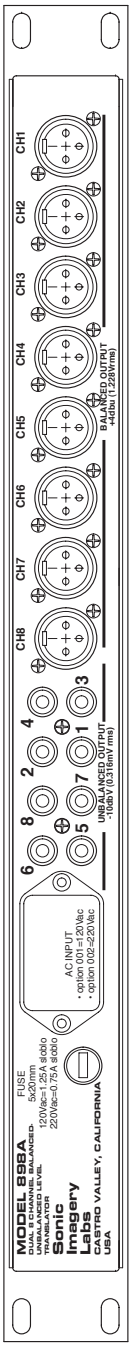
Front Panel Connections

Power indicator: When illuminated, indicates that the unit is operational.

XLR-3-31 Balanced inputs. +4dBu to -10dBV balanced to unbalanced line direction. This input can be driven from cables as long as 500 feet. Belden type 8451 or 9452 or similar shielded cable is recommended

RCA Phono type unbalanced inputs. -10dBV to +4dBu single ended line to balanced line direction. It is important to keep this cable as short as possible to minimize unwanted pickup of noise and hum.

Rear Panel Connections



XLR-3-32 Balanced outputs. -10dBV to +4dBu unbalanced to balanced line direction. This output can be drive cables as long as 500 feet. Belden type 8451 or 9452 or similar shielded cable is recommended

RCA Phono type unbalanced outputs. +4dBu to -10dBV balanced to unbalanced line direction. It is important to keep this cable as short as possible to minimize unwanted pickup of noise and hum.

Power cord connection and power switch. The unit is preconditioned for the country of operation. Voltage conversion is not possible on models sold in the US, Canada, U.K. or Europe. Contact the factory if your units operating voltage is incorrect.

User replaceable fuse. 5x20mm type. Always replace with the same rating as indicated on rear panel.

Driving Impedances

The balanced output has the ability to drive 32 volts peak to peak (24dBu) into a 600Ω load across 500 feet of cable without loss of audio quality (See Figure 1). The unbalanced drive has the same capability but remember for noise immunity cable runs should be limited to 10 feet or less.

Also, unlike transformer based line level translator products, the Sonic Imagery Labs Model 898A can provide up to 60mA of drive current in both the balanced and unbalanced directions

Balanced +4 dBu Input Characteristics

The balanced +4 dBu input signal is conditioned by precision laser trimmed differential line receivers, that feature ultra low distortion and noise performance (0.0004% (see figure 2)) as well as better than 90 dB common mode noise rejection (CMR). The source impedances connected to the balanced input must be nearly equal to assure good common mode noise rejection. A 5Ω mismatch in source impedance will degrade the CMR to approximately 77 dB (RTO). If the source has a known mismatch, an additional resistor in series with the opposite input can be added to preserve good CMR.

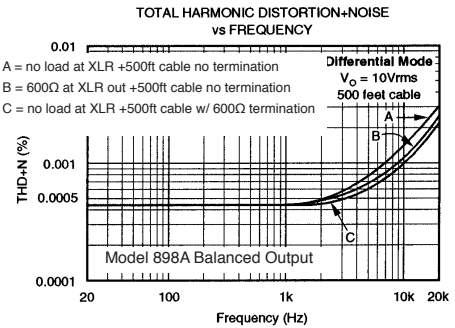


Figure 1. -10 dBv unbalanced input to +4 dBu balanced output.

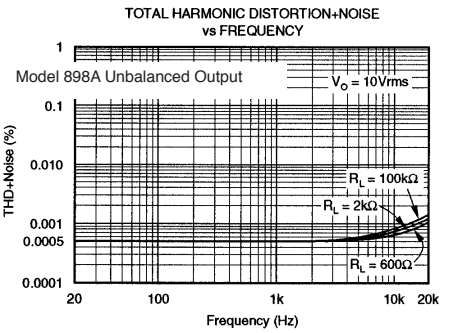


Figure 2. +4 dBu balanced input to -10 dBv unbalanced output.

Unbalanced -10 dBV Input Characteristics

The unbalanced -10dBV input circuitry also features excellent audio characteristics. THD+Noise is below 0.0005% throughout most of the audio band (see figure 3). The unbalanced input impedance is fixed at 10KΩ to match the drive characteristics of consumer equipment. Cable runs should be limited to 10 feet or less at this input.

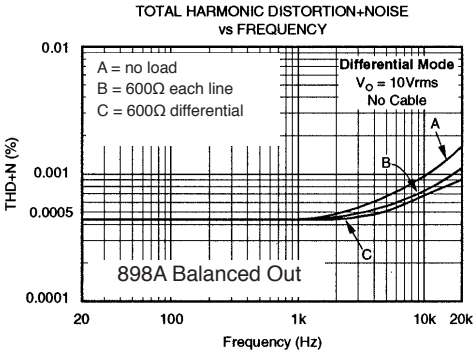
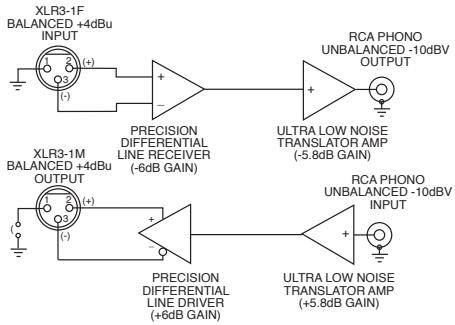


Figure 3. -10 dBv unbalanced input to +4 dBu balanced output.

Block Diagram

Figure 4 is a simplified block diagram of the 898A. It should be noted that the audio path is DC coupled from input to output. No interstage capacitors are used in the design that might disturb the integrity of the audio component being passed. This feature allows the 898A to act like a "straight wire". Hence the units bandwidth extends to DC.

Figure 4. Block Diagram



DC Offset Error

If the equipment connected to the 898A exhibits a large amount of DC offset, due to a leaking or failed output coupling capacitor, this DC error will be passed thorough to the next piece of equipment in the audio chain. If the offset error is quite large, the precision translator amplifiers in the 898A will asymmetrically clip the audio content. When this occurs, the result will be excessive distortion, and the offending equipment driving the 898A should be repaired or replaced.

Ordering Information

part no. = Model 898A-xxx-zzz

- For 120Vac operation, add 001 in place of XXX in part number
- For 220-240Vac operation, add 002 in place of XXX in part number
- Balanced +4dBu input termination open, leave ZZZ blank in part number
- Balanced +4dBu input termination 600 ohms, add 003 in place of ZZZ in part number
- Balanced +4dBu input termination 2K ohms, add 004 in place of ZZZ in part number

Specifications

-10 dBV to +4 dBu (RCA to XLR3-1)
Unbalanced to Balanced Direction

- Nominal input reference level
  -10 dbV(0.316Vrms)
- Nom. input ref. level channel to channel accuracy
  +/-1%
- Bandwidth
  DC-175Khz +0 -0.2dB
  175kHz-250Khz +0 -1dB
  375Khz -3dB
- THD+Noise@1Khz, Rload 600Ω
  Vo=10Vrms 0.0005%
- Noise Floor, 20Khz BW, RTO
  -98dBu
- Headroom, THD+Noise<1%, RTO
  +26.5dBu
- Output DC Offset, 600Ω Rload
  +/-50mV typical
- Input Impedance
  10KΩ
- Output Impedance
  50Ω

Miscellaneous

- Unit Size
  1.75" Height x 19.0" Wide x 3.5" deep
- Weight
  4 pounds (3 Kg)

+4 dBu to -10 dBV (XLR3-1 to RCA)
Balanced to Unbalanced Direction

- Nominal input reference level
  +4 dBu (1.228Vrms)
- Nom. input ref. level channel to channel accuracy
  +/-1%
- Bandwidth
  DC-20Khz +0- 0.2dB
  20kHz-40Khz +0-1dB
  75Khz -3dB
- Common Mode Rejection, Vcm+/-46.5V, Rs 0Ω better than 90dB
- THD+Noise@1Khz, Rload 600Ω
  Vo=10Vrms 0.0005%
- Noise Floor, 20Khz BW, RTO
  -106dBu
- Headroom, THD+Noise<1%, RTO
  +24dBu
- Output DC Offset, 10KΩ Rload
  +/-2mV typical
- Input Impedance
  24KΩ differential
  18KΩ common mode
  600Ω user insertable
- Output Impedance
  100Ω

Service Information

Sonic Imagery Labs will service any of its products, no matter when it was manufactured or what condition it is in. However, no goods will be accepted without a Return Authorization number. If we don't know its coming we wont be prepared to make necessary repairs, so we wont accept it.

BEFORE SENDING ANYTHING TO SONIC IMAGERY LABS, CALL FOR A RETURN AUTHORIZATION NUMBER. JUST ASK, WE'LL GLADLY GIVE YOU ONE!
CALL (510)728-1146 WEEKDAYS,
9 A.M. TO 4 P.M. PACIFIC TIME.

In-Warranty Repairs

The Sonic Imagery Labs 898A is covered by a limited warranty for a period of three (3) years from the manufacturing date located on the serial number tag. The serial tag is located on the rear panel of the unit. The limited warranty statement supplied with your unit spells out all the legal details, and the generalities that follow are not intended to modify that statement.

TO HAVE YOUR UNIT FIXED:

1. Call for a Return Authorization number.
2. Pack the unit in its original packing materials.
3. Put the Return Authorization number on the outside of the box.
4. Ship it to Sonic Imagery Labs freight prepaid.

Just do those 4 things, and repairs made in warranty will cost you only the one way freight fee. We will prepay the return freight.

However, if you send it to us in some kind of flimsy non-Sonic Imagery Labs packaging, we'll have to charge you for proper shipping materials. We won't return the unit in anything but the original Sonic Imagery Labs packaging. Finally, if the problem turns out to be operator inflicted, you'll have to pay for both parts and labor. In the event there is a charge, we will still pay for return freight, but all other charges will be Cash On Delivery

Limited Warranty

The Sonic Imagery Labs Model 898A is designed and manufactured for use in professional and state of the art studio audio systems. Sonic Imagery Labs warrants that the Model 898A manufactured by Sonic Imagery Labs, when properly installed, used and maintained in accordance with instructions contained in the operators manual, will perform according to the specifications set forth in the operators manual.

Sonic Imagery Labs expressly warrants that the 898A will be free from defects in material and workmanship for three (3) years from the date of manufacture. Sonic Imagery Labs' obligations under this warranty will be limited to repairing and replacing, at Sonic Imagery Labs' option, the part or parts of the 898A which prove defective in material or workmanship within three (3) years from the date of manufacture, provided that the purchaser gives Sonic Imagery Labs prompt notice of any defect or failure and satisfactory proof thereof.

Products may be returned by the purchaser only after a Return Authorization number (RA) has been obtained from Sonic Imagery Labs and the purchaser will prepay all freight charges to return any products to the Sonic Imagery Labs factory.

Sonic Imagery Labs, may at its option, require proof of the original date of purchase. Products repaired under warranty will be returned freight prepaid via United Parcel Service by Sonic Imagery Labs, to any location within the United States.

Outside the United States, products will be returned freight collect. Sonic Imagery Labs warrants to the original purchaser of any Sonic Imagery Labs equipment, that the product is in working condition, according to its specifications at the time of shipment, for a period of three (3) years from the date of original manufacture.

Should the equipment malfunction during the warranty period, Sonic Imagery Labs will at its discretion repair or replace the equipment upon receipt with an equivalent. Any replaced parts become property of Sonic Imagery Labs.

This warranty does not apply to the software component of the product or a product which has been damaged due to accident, misuse, abuse, improper installation, usage not in accordance with product specifications and instructions, natural or personal disaster, or unauthorized alterations, repairs or modifications.

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