



# **DA103 AND DMA103**

## **AUDIO DISTRIBUTION AMPLIFIER**

### **OPERATING AND MAINTENANCE MANUAL**



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## DESCRIPTION

Your **DA103** and **DMA103** Audio Distribution Amplifiers are inexpensive high performance amplifiers designed to split and isolate audio signal lines.

The **DA103** accepts a **line level input**, balanced or unbalanced audio at -20, -10 or +4dBu nominal level and provides a line level output at +4dBm nominal to balanced or unbalanced output lines. The DA103 input/output connectors are two piece solderless "Phoenix" types, individual for each input and output line.

The **DMA103** accepts a **microphone level input** signal and provides either line or microphone level outputs to drive balanced or unbalanced lines. Phantom microphone power is provided and all audio connections are made using XLR type connectors.

## CIRCUIT DETAILS

The **DA103** accepts a maximum line input level of +22dBu to high impedance (20Kohms) balanced instrumentation amplifier input (A1) and drives three servo balanced 600-ohm (minimum load) outputs (A3, A4, A5) up to +22dBm maximum. An internal input gain setting jumper plug optimizes the input stage gain, noise and headroom for nominal inputs at -20, -10 or +4dBu. The Master Gain Control (R14a) adjusts all outputs simultaneously to compensate for input signal changes while individual output trimmers accommodate differing nominal output level requirements from -10dBu to +8dBm. Up to 40dB maximum gain is available. The servo-balanced outputs automatically detect single-ended (one side grounded) loads; remove the drive signal from the grounded output and double the signal applied to the ungrounded output thus maintaining equal gain for both types of loading.

The **DMA103** boosts a microphone level input up to line level with up to 80dB gain. A low noise transformerless input stage (A1) allows internal DIPswitch (S1) selection of input gain from 10, 20, 40 or 60dB to optimally match low or high output microphones. A Master Gain Control is provided and individual front trimmers match differing output level requirements from -10 to +8dBm. Phantom microphone power at regulated +20.2 VDC from A10 is selected with an internal DIPswitch and is sufficient for most powered microphones. +48VDC phantom power is also available as a plug-in option (PH48-1); consult factory. Three servo-balanced output drivers drive balanced or one-side-grounded loads and individual jumper plug 54dB output attenuators (P1, P2, P3) provide -50dBm microphone level outputs if necessary.

The DA103 and DMA103 require 22 to 30VDC and are designed to share a common external 24VDC "Wall Wart" type power supply, included with each unit. A pair of loop-thru DC connectors on the rear of each module permits several units to be daisy-chained with P/N 20602-1 DC power loop-thru cables to a single power supply. The WA100-1 and WA100-2 (universal 90-264VAC, available at extra charge) are 400mA supplies. The DA103 and DMA103 both draw about 100mA at full output. Any combination, which adds up to less than the supply rating, can be powered by a single supply.

## **INSTALLATION**

### **UNPACKING**

Inspect the equipment. Shake it to see if anything is rattling around inside. If there is any visible damage to the unit or to the box it came in, contact the factory but do not return anything to ATI without prior authorization and shipping instructions. It may be necessary to have the shipping company inspect the unit and the box at your location. Count the pieces! Don't throw out the boxes and packing material until you are sure you have everything that is coming to you. NANOAMPS need either their own WA100 power supply or a DC cable, P/N 20602-1 to share the supply of another NANOAMP.

Rack and desk mounting hardware may be packed in with the unit even though ordered separately.

### **WIRING**

#### **AUDIO CONNECTIONS**

**DMA103** - balanced XLR type inputs and outputs are wired with pin 2 as HI and pin 3 as LOW. Pin 1 is the cable shield and ground connection.

**DA103** - line level audio connections are made to the Phoenix type two-piece connectors (Hi - Lo - Shield) using the rear label as a guide. Connectors separate with a straight pull toward the rear. Strip the wires cleanly without nicking, clamp them in the plug by tightening the screws and reinsert the plug into the receptacle.

Active balanced outputs and inputs require a reference ground connection to the source or receiving device for proper operation. This ground can be provided by the rack frame or a studio ground bus connection if the cable shield does not carry it through.

## GROUNDING

Operation in high RF broadcast environments requires special attention to grounding and shielding. The chassis **must** be grounded directly to a good, low impedance studio ground system. Input and output connections must be properly shielded and free of ground loops. It may even be necessary to add shielding to the DC input leads to avoid RF pickup.

## POWER DISTRIBUTION

Multiple NANOAMPS sharing a single wall-wart power supply should be looped through each other using the DC interconnects cables P/N 20602-1. Hum and noise performance of the units can be degraded by poor DC ground connections between units sharing a common supply. Use of the recommended rack and desk mounting kits will assure a good ground connection between units by firmly strapping their chassis together. **CAUTION!** The outer shell of the DC interconnect cables is positive relative to the chassis. Do not allow a DC cable plugged into a powered unit to hang loose where it can short against the chassis or rack frame.

## SETUP

Before mounting your product in a rack, remove the top cover (4 upper side screws) and set the DA103 preamp gain jumper to match the nominal input line level. For the DMA103, set the preamp gain with the DIP rocker switch to the highest level that does not cause input circuit clipping. Higher output mics will require lower gains (20-30dB) while low output mics will require higher gain settings (40-60dB). Also set phantom power ON or OFF as needed and select line (+4dBm) or mic level (-50dBm) outputs with jumper plugs P1, P2 or P3.

## MOUNTING

NANOAMP units may be rack mounted one, two, or three across in a standard EIA 19" rack and will require only 1-3/4" of vertical space. Rack mount kit P/N 21075-501 mounts one, two or three units. When rack mounting fewer than three units, you may wish to tidy up your installation with our 1/3 RU Filler Panels, P/N 21097-501.

Single desk mounting kits consist of a pair of angled base plates that mount under the lower front and rear cover screws of a single unit to raise and to tilt it for easy use. In addition, one or more sets of vertical stacking plates, mounting to the upper front and rear cover screws of the bottom unit, allow multiple units to be stacked. Several units can be desk mounted side-by-side and even stacked side-by-side using horizontal joiner kits together with mounting base and stacker kits. P/N 20617-501 is the angled base kit. P/N 20617-502 is the base plus one stacker kit (two high). P/N 20617-503 is the base plus two stackers (three high). P/N 20617-504 is the 2-unit stacker kit by itself.

## **OPTIONS**

### **230VAC OPERATION**

The WA100-2 power supply accepts 90-264VAC at 47-63Hz and is supplied with interchangeable AC input connectors for worldwide use.

### **BATTERY OPERATION**

Alkaline battery packs (BBU100-1), 24VDC gel cell rechargeable battery packs (PPA-1) and a DC converter (DCA100-1) to operate from 12V belt pack, NP-1 or auto batteries.

### **48VDC PHANTOM POWER (DMA103 only)**

A DC converter P/N PH48-1 can boost the phantom power up to +48VDC.

## **MAINTENANCE**

There is no routine maintenance required for your NANOAMP. If you have a problem, check panel LED indicators to assure that the units have DC power, eliminate by substitution input and output cables, connectors, downstream devices, DC interconnect cables and Wall Wart power supplies. If you are still experiencing a problem, call us and ask for technical support.

## **POWER SUPPLY LEVELS**

The recommended loaded DC input voltage range is 22VDC minimum to 32VDC maximum over the full range of AC line voltage tolerances. The audio circuits will continue to work with reduced headroom below 22VDC but the phantom microphone power will drop out of regulation.

## **OPERATING POINTS**

An internal reference voltage equal to 1/2 the supply voltage is generated. All audio stage IC inputs and outputs should show a DC level equal to this voltage when measured with a high impedance meter. Audio inputs and outputs are capacitor coupled and ground referenced.

## SPECIFICATIONS:

<b>GAIN</b>	DA103: 40, 30, 16dB maximum. DMA103: 80, 60, 40, 30dB maximum
<b>NOMINAL LEVELS</b>	DA103: +4dBu in, +4dBm out at -4dB preamp gain DMA103: -50dBu in, +4dBm out at 40dB preamp gain
<b>PEAK LEVELS</b>	DA103: +22dBu in, +22dBm out to 600 ohm balanced DMA103: -20dBu in, +22dBm out to 600 ohm balanced
<b>NOISE 20kHz B.W.</b>	DA103: EIN -85dBu at unity gain DMA103: EIN -124dBm at 54dB gain
<b>HARMONIC DIST.</b>	.02% Max at Peak Levels, .01% max. at Nominal Levels, 20Hz to 20 kHz
<b>FREQUENCY RESP.</b>	-0.25dB, 20 to 20,000Hz
<b>CROSSTALK</b>	70dB minimum at 10kHz
<b>INPUT IMPEDANCE</b>	Balanced, 20kohm bridging
<b>OUTPUT IMPEDANCE</b>	Balanced, 40 ohms maximum
<b>PHANTOM POWER</b>	DMA103 only, 20.2VDC regulated, <b>PH48-1</b> 48VDC phantom power accessory available
<b>DIMENSIONS in. (cm)</b>	1.75" (4.45) H x 5.6" (14.2) W x 5.75" (14.6) D
<b>NET WEIGHT</b>	1.25 lb. (.57kg)
<b>SHIPPING WEIGHT</b>	3 lb. (1.4kg)
<b>CONNECTORS:</b>	DA103: Two-piece, screw clamp, Phoenix type DMA103: XLR
<b>POWER:</b>	24VDC @0.1A nominal, 22Vmin. to 30Vmax, loop thru cylindrical connectors, 2.0mm ID, sleeve is positive

## ACCESSORIES:

All units include a 24VDC power supply. DA and DMA units can share a single supply using DA loop thru cable (P/N 20602-1). Do not exceed rated supply current.

- WA100-1** Wall mount power supply (UL), 24VDC @ .4 amp, 115 VAC/60 Hz (included as standard)
- WA100-2** Wall mount power supply for international use, interchangeable AC connectors, 24VDC at .4A out, 90-264VAC, 47-63Hz, 16VA input, optional at extra cost
- BBU100-1** Battery Pack unit, houses four 9V alkaline batteries (batteries not included), 6 to 8 hour life
- PPA-1 (-2)** Rechargeable 24VDC gel-cell battery pack with charger for 115VAC (230VAC), 10 to 12 hours typical operation
- DCA100-1** DC-to-DC converter powers several units from 12VDC mobile and belt pack batteries. Supplies 24VDC @ .2amp maximum.
- 20602-1** DC power cable loop-thru assembly for looping the DC power

## DESK MOUNT KITS:

- 20617-501** Angled Desk Mount Base  
**20617-502** Angled Desk Mount Base and One Stacker  
**20617-503** Angled Desk Mount Base and Two Stackers  
**20617-504** Stacker (2 units high)

## RACK MOUNT SYSTEM:

- 21075-501** Mounts up to three units in one rack  
**21097-501** 1/3 RU Filler Panel

## FIELD ACCESSORIES:

**PROK-1** Side protection plates with slide mounts for quick-change battery packs

**ABAG-1** Carry case with strap for unit plus power pack (includes PROK-1)

## One Year Limited Warranty

ATI warrants this product to be free from defects in materials and workmanship to its original owner for a period of one year from date of purchase. ATI will repair or replace such product or part thereof, which upon inspection by ATI, is found to be defective in materials or workmanship.

The Proper Return Authorization Number must be obtained from ATI in advance of return. Contact ATI at 856-626-3480 or email [sales@atiaudio.com](mailto:sales@atiaudio.com) to receive the number and instructions for return of your unit.

A written statement providing the name, address, daytime telephone number and email address of the original owner, together with receipt from the original purchase, and a brief description of any claimed defects, must accompany all returns. Parts or product for which replacement is made shall become the property of ATI.

The customer shall be responsible for costs of transportation and insurance to the factory of ATI, and shall be required to prepay such costs.

ATI shall use reasonable efforts to repair or replace any product covered by this limited warranty within thirty days of receipt. In the event repair or replacement shall require more than thirty days, ATI shall notify the customer accordingly. ATI reserves the right to replace any product that has been discontinued from its product line with a new product of comparable value and function.

This warranty shall be void in the event a covered product has been damaged, or failure is caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, or lightning, power fluctuations and other incidental or environmental conditions. Further, product malfunction or deterioration due to normal wear is not covered by this warranty.

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Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

ATI reserves the right to modify or discontinue, without prior notice to you, any model or style product.

If warranty problems arise, or if you need assistance in using your product contact us.