



BI400, BU400B, & UB400B IHF-PRO INTERFACE AMPLIFIERS OPERATING AND MAINTENANCE MANUAL



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GENERAL

Consumer audio equipment can offer unique features, good performance and attractive pricing making it very desirable for professional use. Unfortunately, RF pickup, ground coupled cross talk, high frequency roll off, hum loops and distortion are often the results of the direct connection of low level unbalanced IHF outputs into the 600 ohm balanced systems used in studio or broadcast environments. Consumer and semi-professional equipment can be identified by their use of RCA type connectors, typical of home hi-fi equipment, for their IHF inputs and outputs. Professional systems typically use XLR type connectors or hard-wired connections.

The **BI400**, **BU400B** and **UB400B** are interface amplifiers designed to interconnect consumer grade and semi-professional equipment into professional, balanced, low impedance audio systems.

The **BI400** is a **bi-directional stereo** interface, which bridges a stereo pair of professional 600 ohm balanced or unbalanced +4dBm lines with XLR connectors and converts those signals to a nominal .25volt IHF level (-10dBu) on RCA connectors. The IHF output can feed, for example, the record inputs of an audio card or recorder. Simultaneously the BI400 also converts the unbalanced, high impedance, stereo, .25-volt IHF playback outputs from the audio card with RCA connectors to a +4dBm output capable of driving balanced or unbalanced lines of 600 ohms or greater line impedance on XLR connectors.

The **UB400B** is a **uni-directional four-channel** interface that converts **four IHF level signals on RCA connectors** into **four balanced professional XLR** outputs. The UB400 is particularly useful in protecting the four, eight or sixteen main or monitoring IHF outputs of low cost mixers and audio playback devices. The UB400 is also a very low cost way to interconnect two audio players into a balanced system.

The **BU400B** is also a **uni-directional four channel** interface but it **converts four balanced professional XLR** signals into **RCA IHF** levels suitable for feeding the line inputs of a multi-channel recorder or mixer.

Several of these interface units can comfortably share a single external WA100, 24VDC / 400mA wall-mount AC/DC power supply. Battery packs for remote or back-up use are available for this product line. Check your dealer or a current price list for availability. Up to three of these interface units will mount side-by-side in only one rack unit using the available rack mounting kit. They may also be neatly stacked or mounted side-by-side on your desk with the available angled desk mounting kits.

The BI100, BU400B and UB400B use rugged XLR type connectors for the balanced inputs and outputs. Gold plated RCA type jacks mate to the IHF world.

CIRCUIT DESCRIPTION

INPUT STAGES

The balanced input stages of the BU400B and BI400 utilize an FET input LF347 quad op-amp in a clean, quiet, inverting instrumentation amplifier configuration. Input levels up to +24dBm will be handled without clipping. Excess levels cause only clean clipping without hang-up or phase reversal. Equal gains from both HI and LO inputs allow unbalanced sources to be easily accommodated. Bridging impedance is a high 40Kohms with good CMR.

LEVEL CONTROLS

Each IHF and balanced output is controlled by its own front panel potentiometer. These controls are factory set for standard IHF level of -10dBu (.25V) and Pro level of +4dBm.

LINE OUTPUT

Balanced output stages of the BI400 and UB400B utilize a unique active balanced output driver IC, the SSM2142, which senses whether the connected load is balanced and floating or is unbalanced due to either side being grounded. A balanced output load will be driven with equal and antiphase levels on the HI and LO output lines. An unbalanced (one side grounded) load will cause the driver IC to shut off the signal output to the grounded side of the load and double the output level applied to the other side, thus maintaining equal output to either type of load. The output stage will drive loads of 600 ohms and higher. Nominal output is +4dBm with clipping at +22dBm into balanced loads. Maximum output *at clipping* is reduced by 6dB when driving an unbalanced load, since the full output swing of only one driver is available.

POWER SUPPLY

All units require 22 to 30VDC and are designed to share a common external 24VDC "Wall Wart" type power supply. A pair of loop-thru DC connectors on the rear of each module permits several units to be daisy-chained with P/N20602-1 DC power cables to a single WA100-1 (or optional WA100-2) power supply. The WA100-1 is a 400mA supply. The BI400 and the UB400B each draw 70mA and the BU400B draws 40mA. Any combination, which adds up to less than 400mA, can be powered by a single supply. The interface units incorporate an "artificial ground" power supply splitting circuit to track the DC input voltage and provide a center point voltage reference for the audio stages.

INSTALLATION

UNPACKING

Inspect the equipment. 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 you ordered. All units are supplied as standard with their own WA100-1 power supply. Specify WA100-2-EXCH Power Supply if you need operation at other than 120VAC.

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

MOUNTING

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). Rack mount system P/N 21075-501 mounts three units in one 19-inch rack. 1/3RU Filler Panels are available to fill unused rack spaces, specify P/N 21097-501.

Their interfaces are light enough that they can also be attached directly to the equipment they are interfacing using either Velcro or duct tape.

WIRING

AUDIO CONNECTIONS

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. Pin 1 is grounded as shipped but may be floated to interrupt a hum producing ground loop by opening the unit and clipping out the GND LIFT jumpers.

Active balanced outputs and inputs require a reference ground connection to the source or receiving device for proper operation. The rack frame or a studio buss connection can provide this ground if the output 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

A single wall-wart power supply may be looped through each interface unit using DC interconnect cables P/N 20602-1. Noise performance of the units can be degraded by poor DC ground connections between units sharing a common supply; however, 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 might short against the chassis or rack frame.

OPTIONS

World Power Supply

Specify WA100-2-EXCH for operation at other than 120VAC. This universal international Power Supply comes with an assortment of AC mains connectors and will operate on 90-264VAC, 47-63Hz.

Battery Operation

Battery pack power modules are available. Check our web site for current information.

MAINTENANCE

There is no routine maintenance required for these products. 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 continue to work with reduced headroom below 22VDC. Momentary surges up to 36VDC will cause some increased internal heating, but above 36VDC, ICs may fail.

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.

PERFORMANCE SPECIFICATIONS:

	BALANCED TO UNBALANCED	UNBALANCED TO BALANCED
GAIN	-14dB nominal, -8dB maximum; User adjustable for -10dBu(.25V) output with 0, +4 or +8dBm inputs	+14dB nominal, +22dB maximum; User adjustable to 0, +4 or +8dBm output with -10dBu (.25V) input
NOMINAL LEVELS	+4dBm input, -10dBu (.25V) out	-10dBu (.25V) in, +4dBm out
PEAK LEVELS	+22dBm in, +8dBu (2.0V) out	+8dBu (2.0V) in, +22dBm out
NOISE 20kHz BANDWIDTH	-90dBu maximum output	-80dBm maximum output
HARMONIC DISTORTION 20Hz to 20kHz	.02% Max at Peak Level .005% Max at Nominal Level	.02% Max at Peak Level .005% Max at Nominal Level
FREQUENCY RESPONSE	±.25dB, 20 to 20kHz	±.25dB, 20 to 20kHz
CROSSTALK	70dB minimum at 10kHz	70dB minimum at 10kHz
INPUT IMPEDANCE	Balanced, 20kohm bridging	Unbalanced 10,000 ohms
OUTPUT IMPEDANCE	Unbalanced, 1500 ohms maximum impedance	Balanced, 40 ohms maximum impedance
DIMENSIONS	1.5" (3.8cm) H x 5.5" (14cm) W x 5.75" (14.6cm) D	
WEIGHT	1.5 lbs. Net; 3 lbs. Shipping Weight	
CONNECTORS	XLR (Balanced Inputs & Outputs) RCA phono jacks (Unbalanced Inputs & Outputs)	
POWER	BI400 & UB400B: 24VDC @.07A BU400B: 24VDC @.04A Connector sleeve is Positive, Center Pin Negative	

Models Available:

BI400—Bi-Directional Stereo IHF to PRO

UB400B—Uni-Directional Quad IHF to Balanced

BU400B—Uni-Directional Quad Balanced to IHF

Power Supplies

All units are supplied with an external 24VDC power supply, as follows:

WA100-1

Wall mount power supply (UL, CSA), 24VDC at .4A output, 115VAC/60Hz, and 16VA input, supplied 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

- 20602-1** Loop-thru DC interconnect cable, 13" (33cm) long
- BBU100-1** Battery Pack unit houses four 9V alkaline batteries (batteries not included). Normal 4 hour life.
- DCA100-1** DC to DC converter powers several units from 12VDC mobile and belt pack batteries. Supplies 24VDC @ .2amp maximum.
- Desk Mount Kits:**
- 20617-501** Angled Desk Mount Base
 - 20617-502** Angled Desk Mount Base and One Stacker (2 units high)
 - 20617-503** Angled Desk Mount Base and Two Stackers (3 units high)
 - 20617-504** Stacker (2 units high)
- Rack Mount System:**
- 21075-501** Mounts up to three units in one 19-inch rack
 - 21097-501** 1/3RU Rack Filler Panel for 21075-501

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 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.

ATI DISCLAIMS ANY WARRANTIES, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR USE, EXCEPT AS EXPRESSLY SET FORTH HEREIN. THE SOLE OBLIGATION OF ATI UNDER THIS LIMITED WARRANTY SHALL BE TO REPAIR OR REPLACE THE COVERED PRODUCT, IN ACCORDANCE WITH THE TERMS SET FORTH HEREIN. ATI EXPRESSLY DISCLAIMS ANY LOST PROFITS, GENERAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM BREACH OF ANY WARRANTY, OR ARISING OUT OF THE USE OR INABILITY TO USE ANY ATI PRODUCT.

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.