

## GAODIMIC® Full Sound Range Audio Isolator ( AI180-NG )

- Upgraded in the hardware, and improved in the performance, Add a switch to select the input signal.
- Excellent performance in Frequency Response Characteristics of Full Range (20-24K Hz), without jumping.
- With new type of shielding high-quality transformer material, greatly improving in frequency response characteristics

### I. Product & Type

AI180-NG

2 CHANNELS



INPUT PORT ( 6.35MM & CANON)



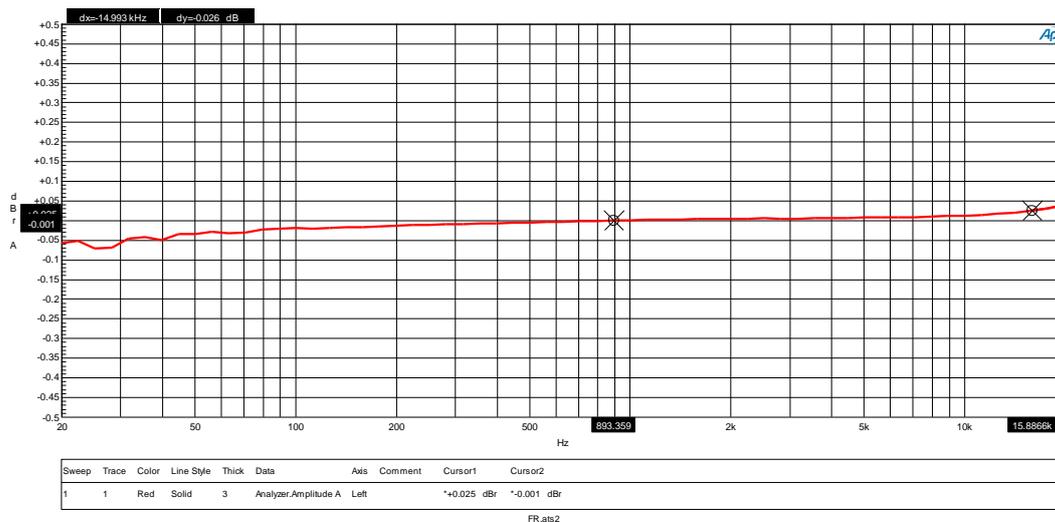
OUTPUT PORT

### II. Function

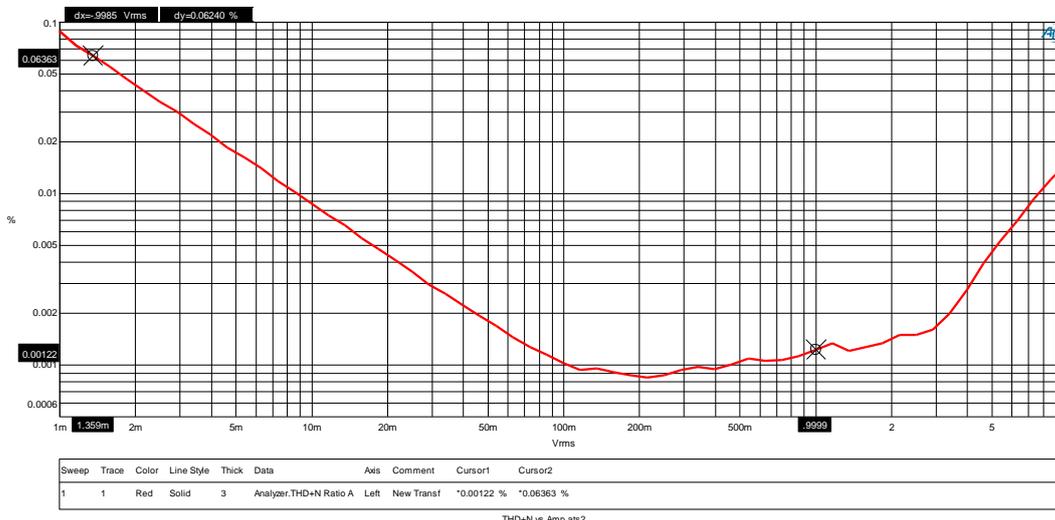
- Eliminates the voltage differences, caused by different phase lines, or different ground voltage, etc. For example : eliminates noise from the audio system when the computer connects the projector or the display.
- Converts the unbalanced signal to the balanced signal with the difference Canon Line, then, the signal transmission distance will be increased to 100M from 20M.
- In the scene of the stage, avoids impact sound to be generated, when the signal line or musical instruments be changed.
- Support the TS unbalanced input signal, and TRS balanced input signal, with selection switch.

### III. Characteristics

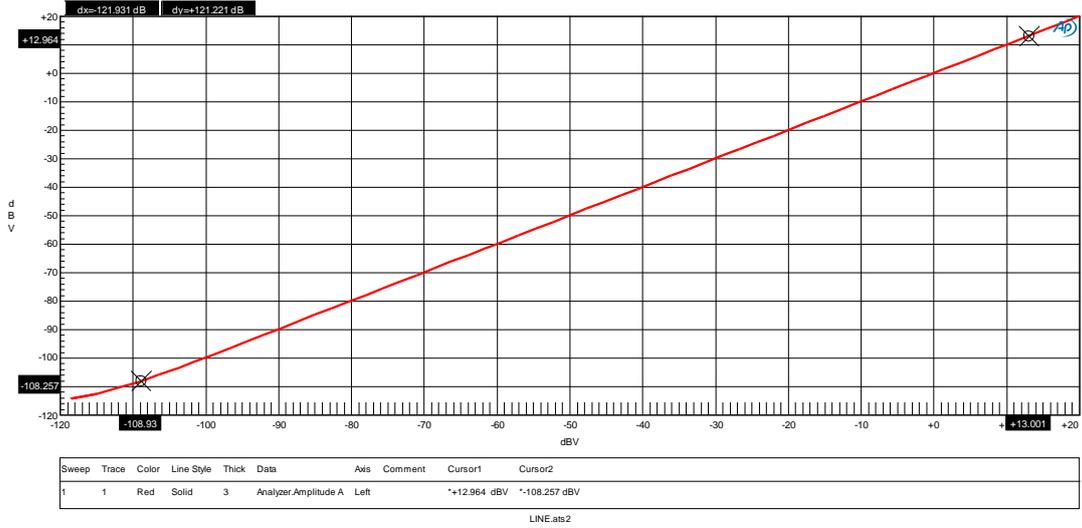
Frequency Response



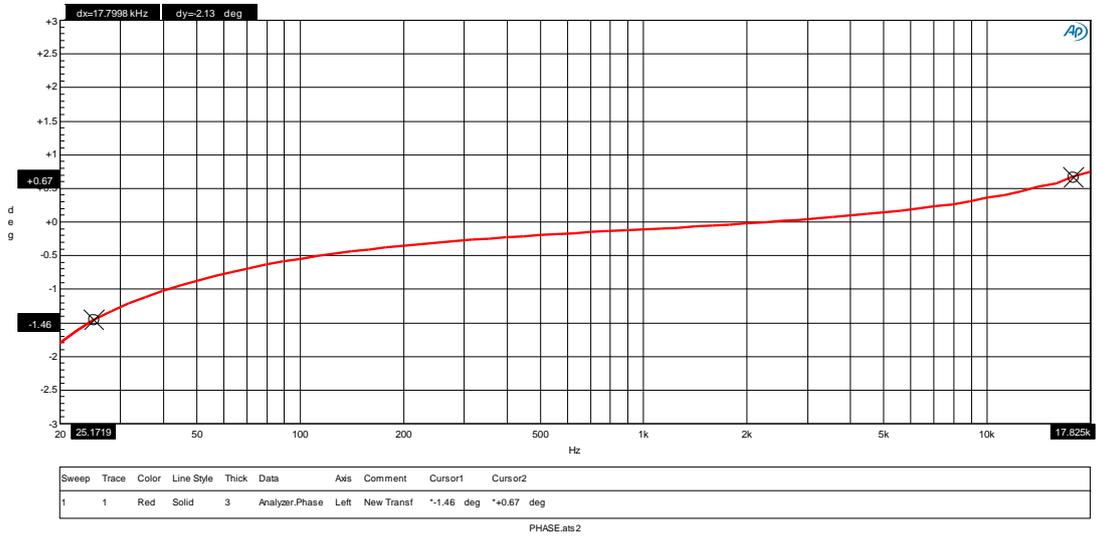
THD+N vs vs Input Signal Amplitude



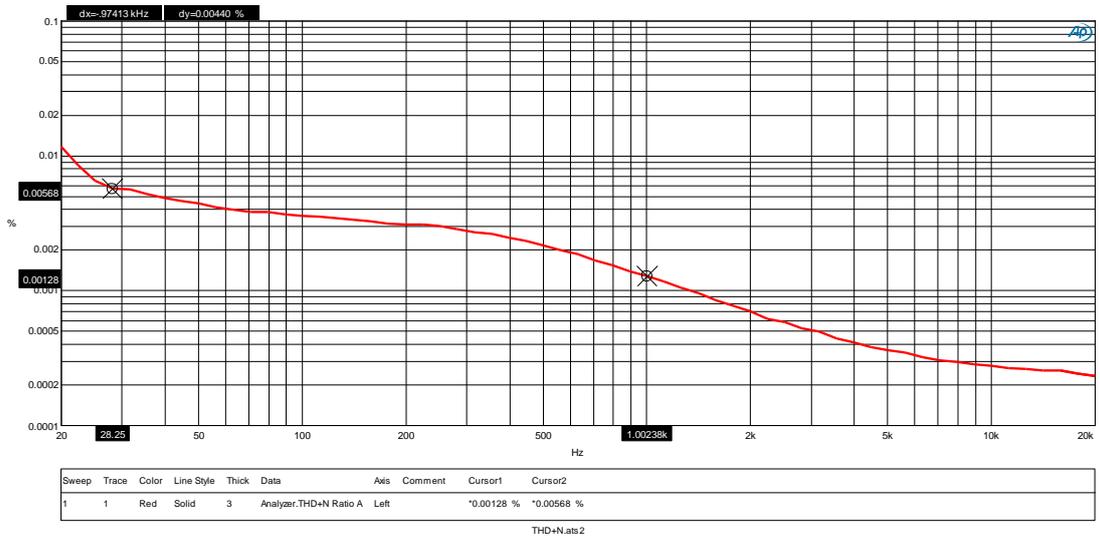
Linearity



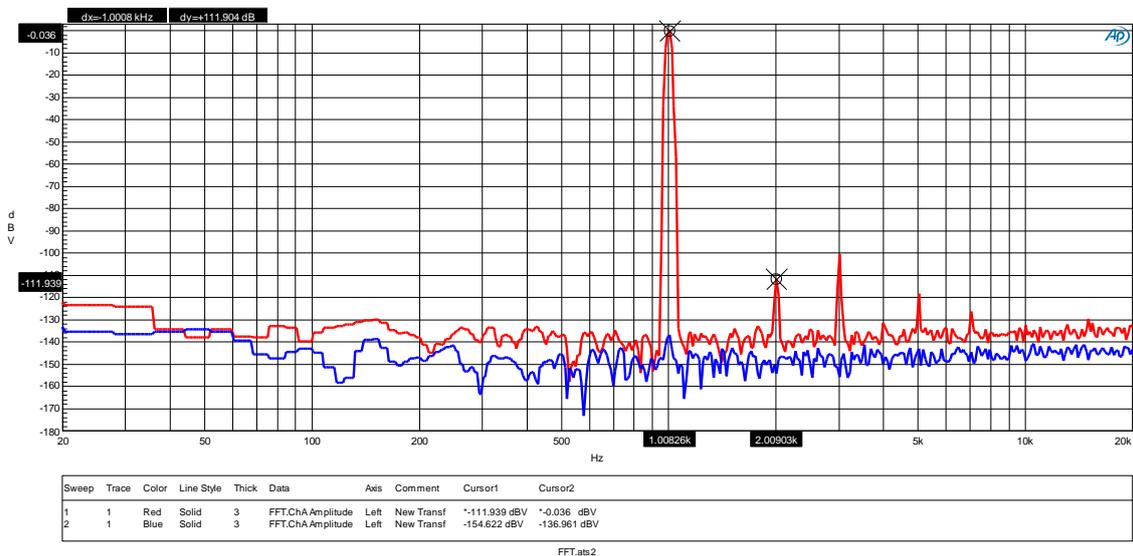
Phase vs Frequency



THD+Nvs Frequency



FFT



### IV. Parameters

<b>TYPE</b>	AI180-NG ( The Standard Version of the 3rd Generation Product)	
<b>Channels</b>	2	
<b>Frequency Response</b>	20Hz-20KH	
<b>Primary Proportion</b>	<b>Secondary</b>	600:600 (@1kHz)
<b>Transmission Gain</b>	1:1	
<b>Distortion</b>	0.00122% (@1Vinput); 0.015% (@10Vinput)	
<b>Frequency Deviation</b>	<b>Response</b>	-0.075dB (@20Hz) ; 0.045dB (@20KHz)
<b>Input Signal Selection</b>	Toggle Switch	
<b>Shielding Ground Mode</b>	Toggle Switch	
<b>Call Mode Key</b>	N/A	
<b>Core Components</b>	<b>Transformer</b>	Shielding High Precision Transformer

### V. Usage Scenario

#### Scenario 1 - Between Mixer and Video Camera



When the video camera and the mixer use external power supply, there is a potential between the difference power supply. It is necessary to use Audio isolator to eliminate noise and protect the mixer from burning out.

It is possible to disconnect mixer from the municipal power supply, but if the mixer connect to the video camera or other equipment, the audio isolator (protector) should be applied to protect the mixer's safety.

#### Scenario 2 - Between Mixer and Broadcast Vehicle



On-site broadcast vehicle's electricity is generated by diesel engines usually, and the power supply is virtual ground potential. On the other side, the mixer always be supplied by municipal electricity. There may be a huge ground potential pressure difference between the mixer and broadcast vehicle, which will produce current noise, even will cause impulse potential to destroy equipment.

Audio isolator (protector) should be applied to prevent current noise and to protect the mixers at both ends from burning out.

### Scenario 3 - Between Mixer and Musical Instruments



During the performance of the band, the distance between the electric guitar and the mixer is longer (the cable is more than 10 meters), and the disturbance factor on the spot is uncontrollable. At this time, DI (isolator can be used for emergency response) is needed.

DI (Isolator) has three uses in this scenario:

- The unbalanced high impedance interface of the electric guitar is converted to the balanced low impedance interface. The matched impedance avoids the loss of bass signal and is more suitable for access to the mixer.
- Non-balanced transmission avoids the audio noise problem caused by long cables.
- With the audio isolator (protector), there is no current impact of ground potential difference between front and rear equipment, which prevents the impulse signal produced by the inserting or pulling out of the electronic instruments.

### Scenario 4 - Between Mixer and Computer ( Computer Connect with Large Screen)



The switching power supply is used in the large screen. When the switching power supply is working, the high frequency eddy current (it usually be called as induction current) always be generated by the electromagnetic field in the metal of the wire.

Because the large screen is connected with the computer video line, then, it leads to the accumulation of induced potential on the computer side, which is connected with the mixer through the computer audio line, thus releasing the physical conditions for the potential difference, which is expressed as current sound and even burn down the computer seriously.

Why does it usually burn down computers? Because we always like to insert the connector into the mixer first and then the computer, then, the fire shock will occurs at the side of the computer, and cause to burns down the computer . At this time, audio isolator (protector) is needed to protect the mixer and computer from breakdown and prevent the audio current noise.

### Scenario 5 - Long-Distance Transmission Between Mixer and Computer



The 3.5mm audio output interface of the computer adopts unbalanced transmission, which is vulnerable to external electronic equipment and radio interference. The most common source is power lines, which produce buzzing noise if they are close to unbalanced cables. The second, old-fashioned non-LED stage lights (e.g. spotlights and dimmers) may also increase signal interference.

In those scenarios, it is necessary to add an audio isolator (protector) on the computer's output side to convert the unbalanced signal into the balanced signal, so as to ensure that the long-distance transmission will not be disturbed.

### Scenario 6 - Between Mixer and Big Screen in KTV Room



Large screen or projector display always be applied in some karaoke systems, and large screen and projector also be supplied by switching power supply, then, eddy current generates inductive potential, which forms inductive current after the connection of audio lines. Audio isolator (protector) is used to make the front stage and singing machine do not produce current noise.

Sometimes the current noise appears after the wireless microphone is inserted. The audio isolator (protector) is necessary to insulate the receiver from the cabinet to eliminate the current noise.

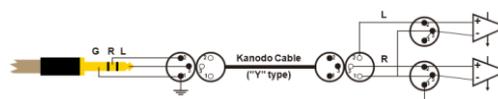
## VI. Instructions

- The device can be installed in the front end of the signal source, and can be installed in the rear end of the amplifier. It is effectively to work in the compensation circuit also.
- Passive mode of work, and plug and play.

### 1) SCENARIO A : CONNECTS WITH Canon "Y" TYPE CABLE

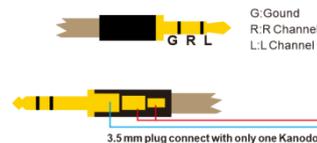
In normally, "Y" type cable (3.5mm audio plug to 6.35mm JACK or Canon plug) connects with audio mixer by 2 Canon cables directly (As shown as right figure). But, this is not a balance audio transmission, the Canon cable can't support long distant to transfer, unless there will be some noise.

On the scenario, the isolator(FRAIP) can be applied between the "Y" type cable and the audio mixer, and the audio transmission will become a kind of balance connection.



### 2) SCENARIO B : 3.5MM AUDIO PLUG CONNECTS WITH ONE Canon PORT

If there is only one Canon port is available, we can parallel connect the left channel with the right channel, then, put it in the same Canon port (as shown as the right figure). L channel and R channel parallel connect and link to Pin2 on Canon port. It is recommended that connect a 2~4.7K resistance for each linker.



### 3) SCENARIO C : CONNECTS WITH MUSICAL INSTRUMENTS

Switch to "LIFT" side for all TS unbalance signal, and switch to "GND" for TRS balance signal.

### 4) SCENARIO D : CONNECTS WITH AUDIO MIXER

As shown as the right figure, the isolator (FRAIP) supports balance and unbalance connection methods. Base on different purpose, the input signal can be sent to the isolator's "AIN" or "BIN", controlled by mixer's "MAIN", "GROUP", "AUX".



## VII. Notes

ATTN1: "PLUG & PLAY" IS NOT RECOMMEND, WHEN THE MOBILE AUDIO PLUG IS BE CONNECTED WITH ISOLATOR (FRAIP).

Mobile Audio Plug's structure is shown as the right figure. Mobile Audio Plug has 4 channels, and the L channel is positive electrode with 2~3V voltage, and others are negative electrode. If the isolator must be applied, a "4 channels - 3 channels" converter must be used.



ATTN2: IF THE CANON CABLE'S GROUND VOLTAGE IS TOO HIGH TO CONNECT WITH THE MIXER, WE SHOULD APPLY A "CANON - 6.35(JACK)" CONVERTER TO BALANCE THE GROUND LOOP

## VIII. Reference

1. AC system adopts "single - phase - 3 lines", or "3 - phases - 5 lines" system. In the different engineering projects, devices will be supplied by different phases of the AC power system. It leads to that different zero lines are different voltage in different devices, and the different shields of devices are different voltage also. On the other side, audio amplifying system usually adopts audio lines to connect in series, and, AC 50Hz sine wave would be generated by signal line, zero line and ground line. It means that the mixer will get 50Hz noise signal and amplify it to output as sharp murmurs.

2. "Cutting the ground line directly" is always be taken to solve the problem, when there is an AC noise in the audio project, but it will make the safety ground of device shell will no longer exist, and all system will be in dangerous. In fact, the application of isolator is the right way to solve the problem on earth.
  3. In the case that audio signal transmission over a distance of 100M, it is easy to produce high voltage loop grounding, and shields between the equipment will generate voltage pressure. It will cause the distortion of audio signal with current noise interference phenomenon is serious, even will cause the device to be burned flint.
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