

# FEMTO

## Instruction Manual

By Digital & Analog

[www.calyxaudio.com](http://www.calyxaudio.com)

## Thank you for purchasing FEMTO

Music is the most important messenger of human emotion as well as a meaning of its expression since human beings appeared on this earth. Music created by amazing inspiration of many gifted composers makes people moved and our normal lives enriched.

The absolute sound and real music performed in real space like concert halls are the most important experience that makes people get to the musical essence. Besides, audio products reproducing music are a way of modern civilization making our lives better.

Since 1999, the year of establishment, **Digital & Analog Co., Ltd.** (as known as **D&A**) has been providing class-D I.C.s to various audio OEM companies. And **D&A** started to make its own high-end audio products since 2008 and as a result, we succeeded to build audio products with excellent measured performance which any other amplifiers were not able to reach so far. **Calyx** is the by-product of such an effort based on **D&A's** many experiences like designing, manufacturing and selling of class-D ICs and supporting its customers to make their audio products using **D&A's** I.C.s. **Calyx** has been tested subjectively as well as objectively under a lot of test circumstances.

A great Chinese poet 'Bai Ju Yi' of the Tang Dynasty expressed sound as followings in on of his book;

"A poem has passion as its root, words as its buds, sound as its flower and meanings as its fruits"  
So we named our products as **Calyx**, in the meaning of corolla of music described as flower by the renowned poet.

**Calyx** will enrich your life as a strong support of musical flower. This coincides exactly with our slogan;

**"Technology making the world affluent."**

**Calyx** is high-end products, which you can be proud of possessing it.

**Digital & Analog Co., Ltd.** has developed class-D amplification technology with many patents on the technology.

From now on, we provide high-end audio products to music lovers like you

Thanks and enjoy the music.

Seungmok Yi  
CEO/President

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# 1. WARNINGS

Please take a moment to read these notes before installing your Calyx Femto, as they will enable you to get the best performance and prolong the life of the unit.

As our engineers are striving for the constant research and development to develop the quality of products, shape or structure of our model can be changed without previous notice.

※ We advise you follow all instructions, read all warnings and keep the instructions for future reference.



This symbol indicates that dangerous voltage which can cause electric shock is present inside this unit.



This symbol alerts you to important operating and maintenance instructions accompanying the unit.

Do not overload outlets or extension cords

- ▶ This can result in a risk of fire or electric shock.

Never touch the power cords or the unit with wet hands.

- ▶ This can result electric shock.

Never use the frayed or damaged or cracked or broken power cords.

- ▶ This can result in a risk of fire or electric shock.

Do not expose the unit to rain or moisture.

- ▶ This can result in a risk of fire or electric shock..

Do not expose the unit to direct sun radiation or other heat sources.

- ▶ This could lead to overheating and malfunction of the unit.

During thunderstorms, disconnect the power cords from the wall outlet.

- ▶ Voltage peaks due to lightning could damage the unit.

Never attempt to repair, disassemble or reconstruct the unit.

- ▶ Serious electric shock could result.

Do not put any objects on top of the unit.

- ▶ If the objects fall, it may cause harm to the user.

Please ensure there is ample ventilation

- ▶ The unit will become hot when in use

To clean the unit, please follow next instructions.

- ▶ Wipe its case with a dry, lint-free cloth.  
Do not use any cleaning fluids containing alcohol, ammonia or abrasives.  
Do not spray an aerosol at or near the amplifier.

Do not move the unit, while it is powered on.

- ▶ This can cause harm to the unit

Do not place the unit on an unstable surface or shelf.

- ▶ If the unit falls, it may cause harm to the unit or to the user.

Do not use attachments not recommended by your dealer

- ▶ This may cause harm to the unit

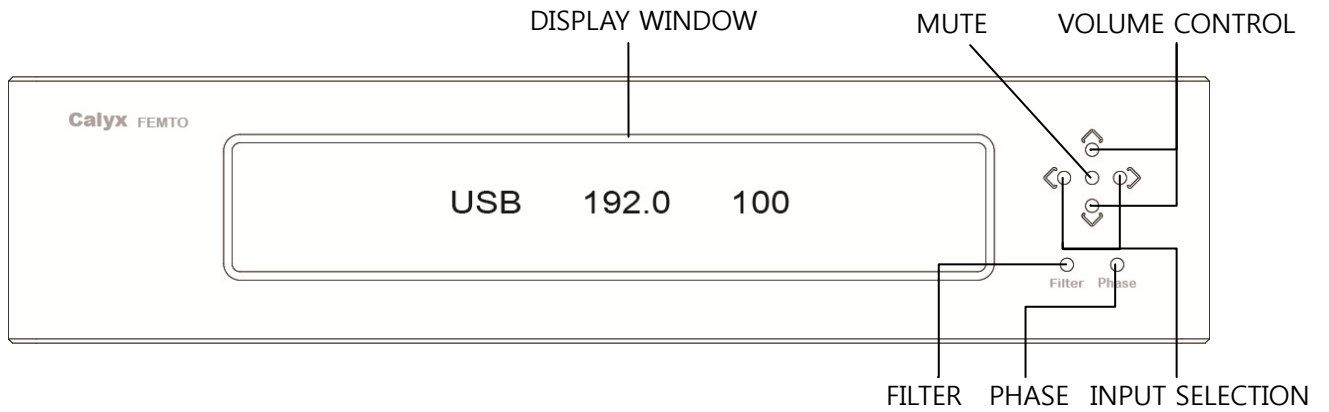
Do not listen to loud music for a long time.

- ▶ This may cause harm to user's hearing ability

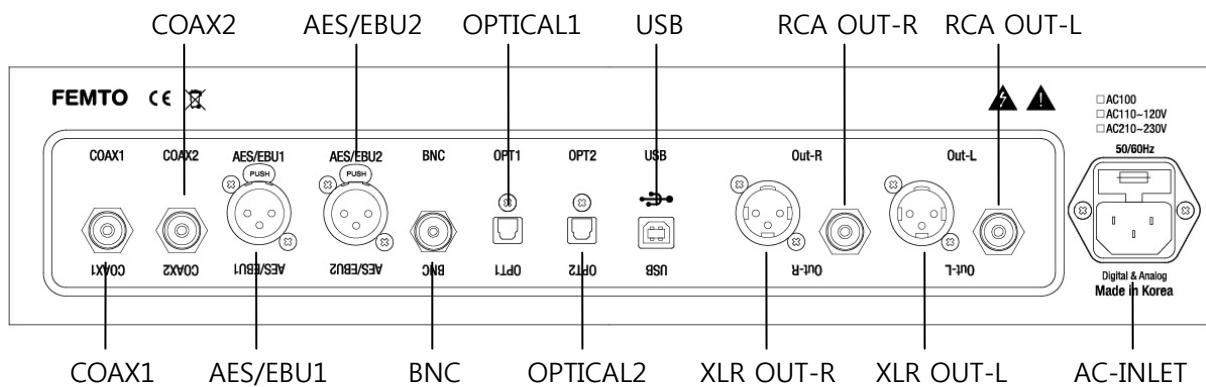
※ If the product needs repair, please contact your local Calyx dealer.

# 2. Functions

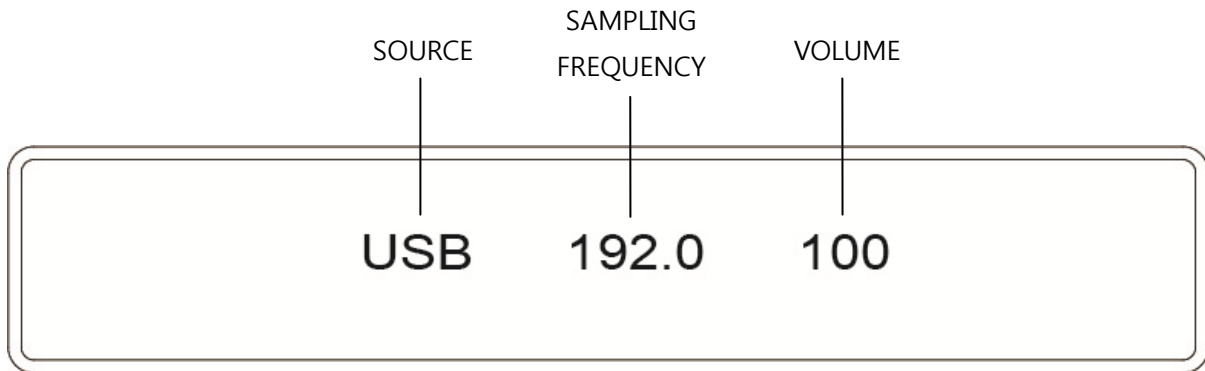
## Front Panel



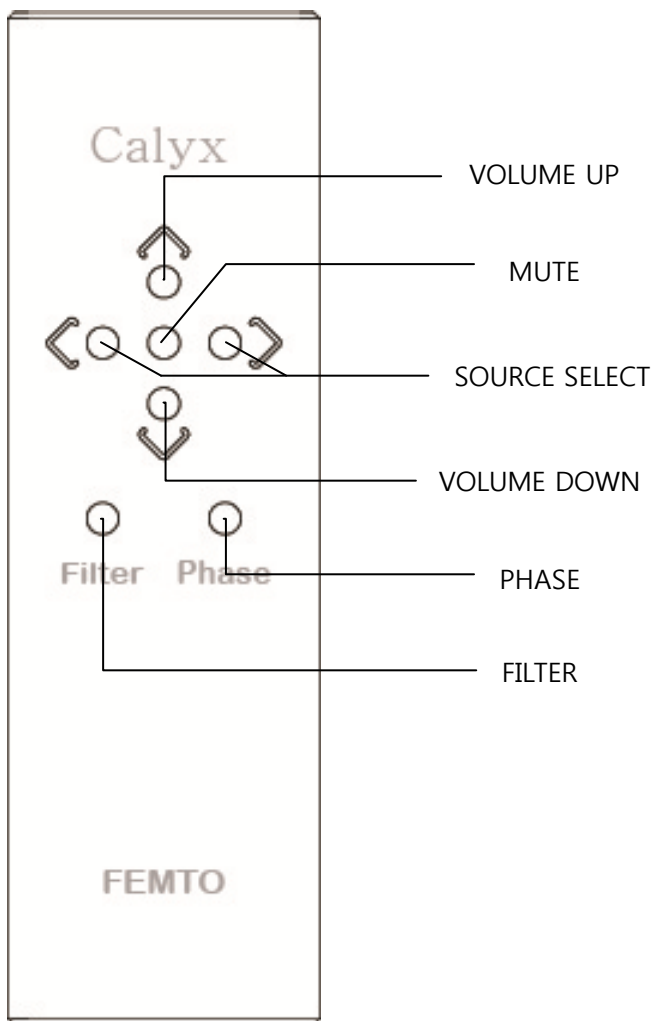
## Rear Panel



## Display Window



## Remote Control



# 3. Description of Functions

## 1 Power Switch

This is located on the left side panel when you see from the front.  
Press once to turn the unit on and once more to turn it off.

## 2 Input select

These buttons select the signal from the digital inputs on the rear panel.

## 3 Level- Output level control buttons

They adjust the output analog level.  
This high quality digital volume control allows you to adjust from 0(mute) to 100 (0dB).

## 4 Remote Sensor

The signals from the remote control are received by this sensor. Please point your remote control to the sensor when using the remote control.

## 5 Display

### Input Display

This shows you which digital signal is selected.

### Sampling Frequency

This indicates the sampling frequency of incoming digital signal.

### Level Display

This shows you the output level of analog signal.

### Digital Filter

There are 3 different digital filters you can choose. When you press the button of filter, it changes "Filter 1", "Filter 2" and "Filter 3".

### Phase of Analog output

Analog out of FEMTO is true-balanced out. You can choose the right configuration of analog phase for your pre-amplifier or power amplifier. "Normal" means pin 2 is hot "Inverse" means pin 3 is hot.

## 6 Digital Inputs

The digital signal can be used using various types of cables.

AES-EBU 1, 2-----110 Ohm digital cables. The connectors look same as XLR connectors.

Coaxial 1, 2-----75 Ohm coaxial cables


Optical 1, 2 -----Optical fiber cables

BNC ----- 75 Ohm coaxial cable

USB -----USB 2.0 compliant cable

## 7 Analog Outputs

Connect one of the analog outputs to the input of your pre-amplifier or power amplifier

 **CAUTION** Please check the output level as "0" when you connect FEMTO to your amplifier directly.

### Unbalanced (or RCA) outputs

These connectors accept standard unbalanced cables with RCA-type plugs.

### Balanced outputs

These are balanced connectors which ensure superior signal transmission.

The pin assignment is as followings:

Pin 1: Ground

Pin 2: Non-inverted (or Hot)

Pin 3: Inverted (or Cold)

## 8 AC-Inlet

Insert the supplied power cord into this connector and plug the other end into a wall AC outlet.

 **WARNING**

- Do not use the unit with any other than the supplied power cords.
- The shape of the AC inlet and the plug of the supplied power cord depend on the voltage rating and destination country. Using any other type of cable except the supplied power cord poses the risk of fire and damage.
- This product is available in version for 100V, 110~120V, or 210~230V AC. Make sure that the voltage shown on the rear panel matches the AC line voltage in your area.





# WARNING

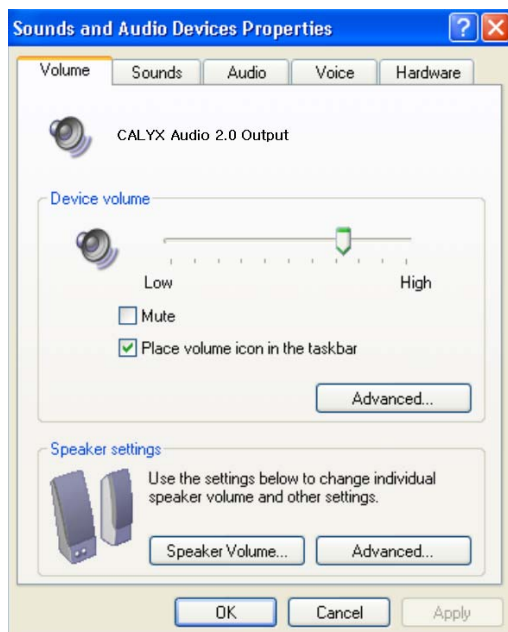
- Do not open the unit, as this involves a severe risk of electric shock.
- If the unit does not operate, the internal fuse may have blown. Never attempt to replace the fuse yourself. Be sure to contact your Calyx dealer or an authorized service station.

# 4. Software Installation for USB

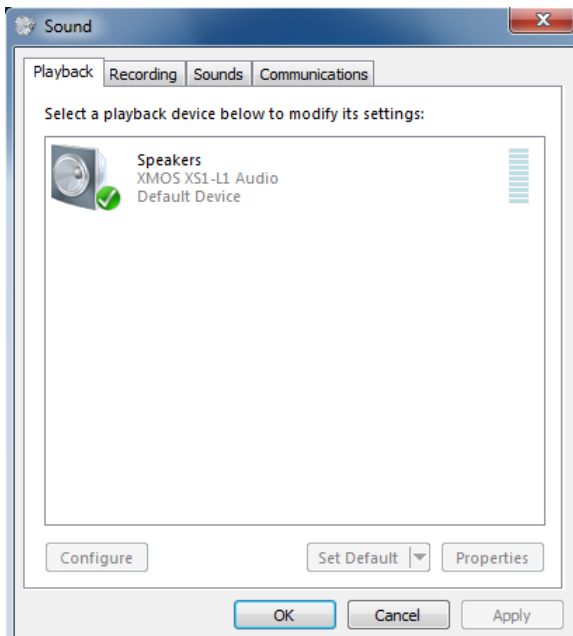
## 1 Window

Download and install the latest driver in the calyx audio website ([www.calyxaudio.com](http://www.calyxaudio.com))

If the internet is not available, install the CD.



< Windows XP >

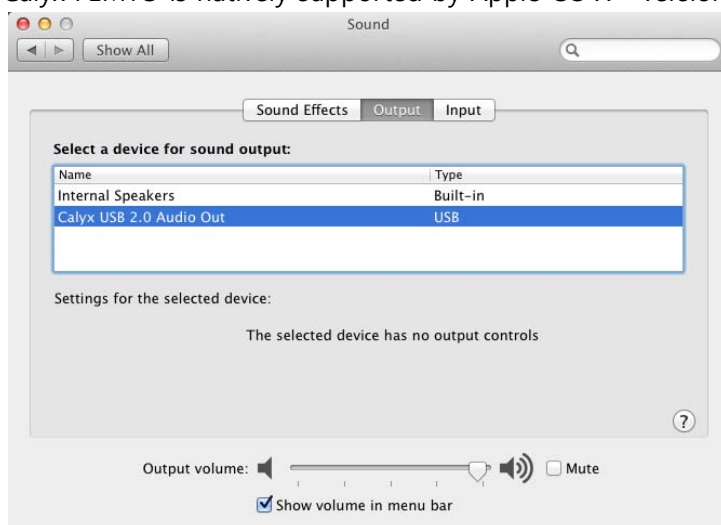


< Windows Vista & Windows 7 >

Open Control Panel and check Sounds and Audio Devices (or Sound) to make sure that under Sound Playback in the Audio tab, "CALYX Audio 2.0 Output (or XMOS XS1-L1 Audio)" is selected.

## 2 Apple OS-X

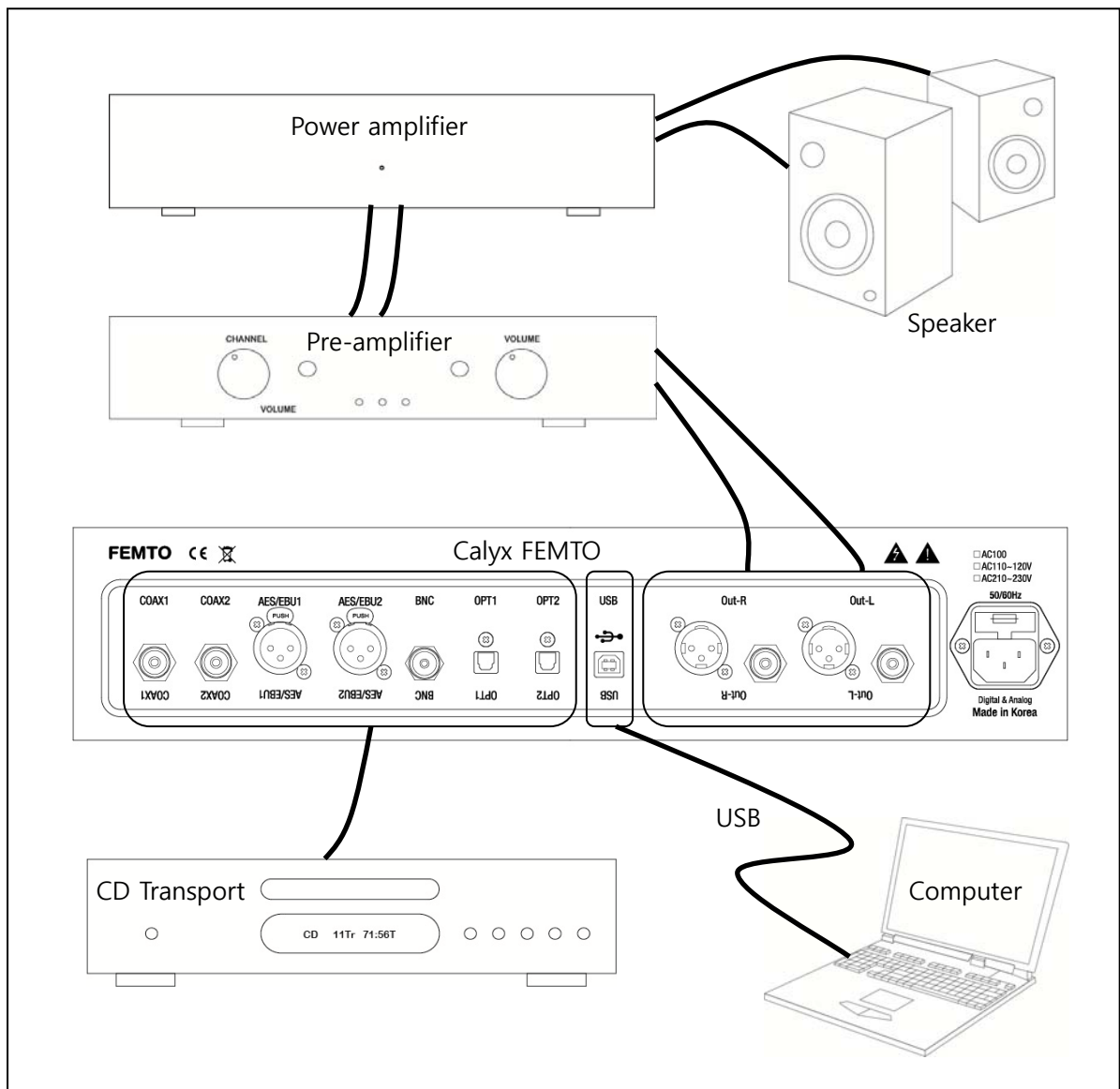
Calyx FEMTO is natively supported by Apple OS X™ version 10.6.3 and above.



# Connection Diagram

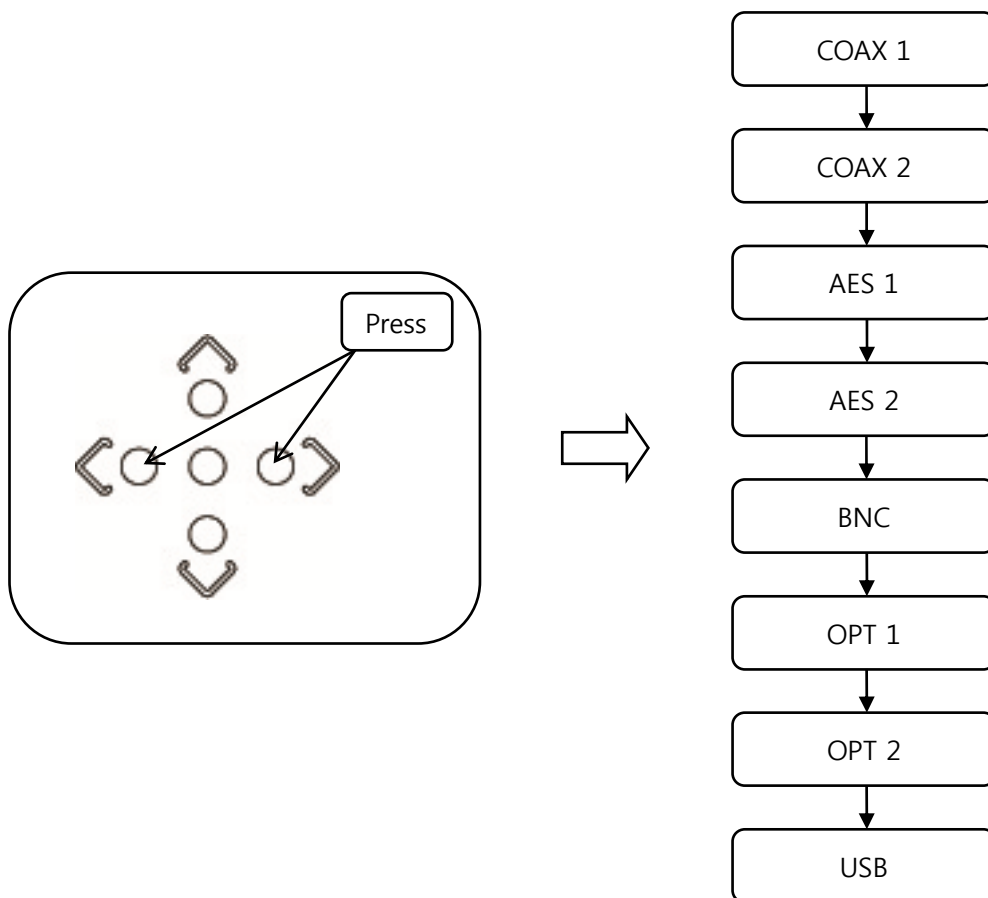
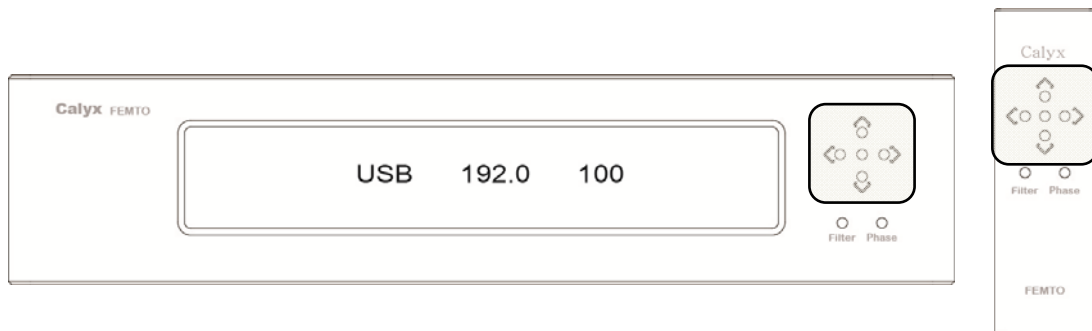
**⚠ Caution** Turn off the power to all components before making connections.

- For connection of digital cables, please use the right cables for each signal.
- For "Coax 1, 2", use the RCA type coaxial cables of characteristic impedance 75 Ohm.
- For AES/EBU, use the cables of characteristic impedance 110 Ohm
- For USB, use a "USB 2.0 compliant" cable.



## 5. Input Source Selection

1. Connect the digital output of the source component to one of the digital inputs of FEMTO
2. Turn power to all components on.
3. Use the input select buttons on the FEMTO or remote controller.
4. Operate the source component for playback.



## 6. Guaranteed Specifications

Digital Inputs: Two Coaxial, Two Optical, Two AES-EBU, BNC, USB

Digital Input Resolution and Sampling Rate:

SPDIF: Up to 24bit, 44.1, 48, 88.2, 96, 176.4, 192 kHz

USB: Up to 24bit, 44.1, 48, 88.2, 96, 176.4, 192 kHz

OS (Operating System) Requirement for USB:

Windows XP, Windows Vista, Windows 7

Mac OS X,

Frequency Response:

20Hz ~ 32kHz @ - 0.5dB - Balanced Output / 20Hz ~ 38kHz @ - 0.25dB - Unbalanced Output

Total Harmonic Response:

Less than 0.0003% @ 1KHz, 0dB - Balanced Output & Unbalanced Output

Signal-To-Noise Ratio:

130 dB, A-weighted - Balanced Output / 124 dB, A-weighted - Unbalanced Output

Dynamic Range:

130 dB, A-weighted - Balanced Output / 124 dB, A-weighted - Unbalanced Output

Channel Separation:

144 dB @ 1KHz, 126 dB @ 20KHz - Balanced Output,

140 dB @ 1KHz, 124 dB @ 20KHz - Unbalanced Output

Output Voltage:

6.8 Vrms - Balanced Output / 2 Vrms - Unbalanced Output

Output Level Control:

-  $\infty$  ~ 0 dB, 0.5 dB Step

Power requirements:

AC110V / AC110~120V / AC220~240V (The voltage is fixed when factory out.)

Maximum Dimensions:

Width : 430mm , Height : 102mm , Depth : 403.8mm

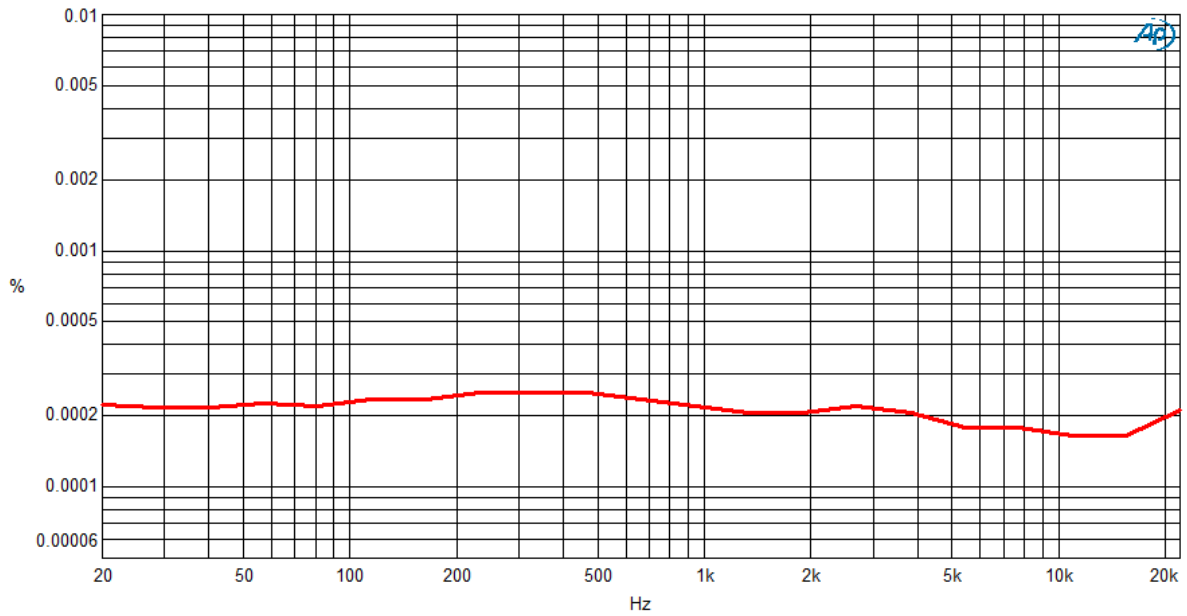
Mass:

18.5kg in Net

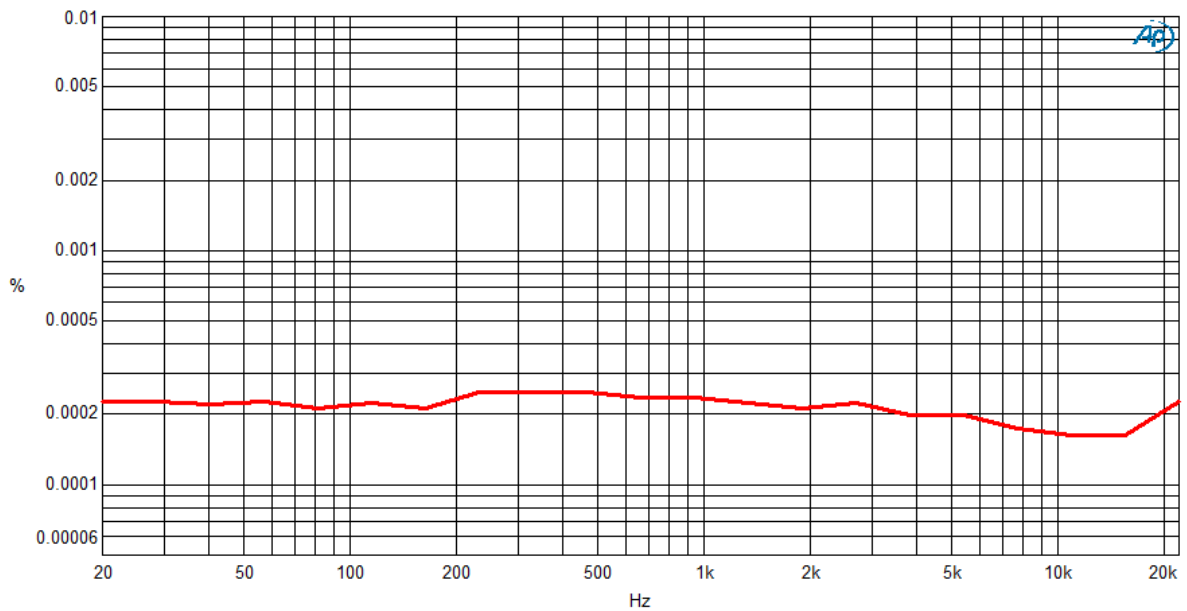
20kg in Gross

**\*Specifications and design subject to change without notice for improvements**

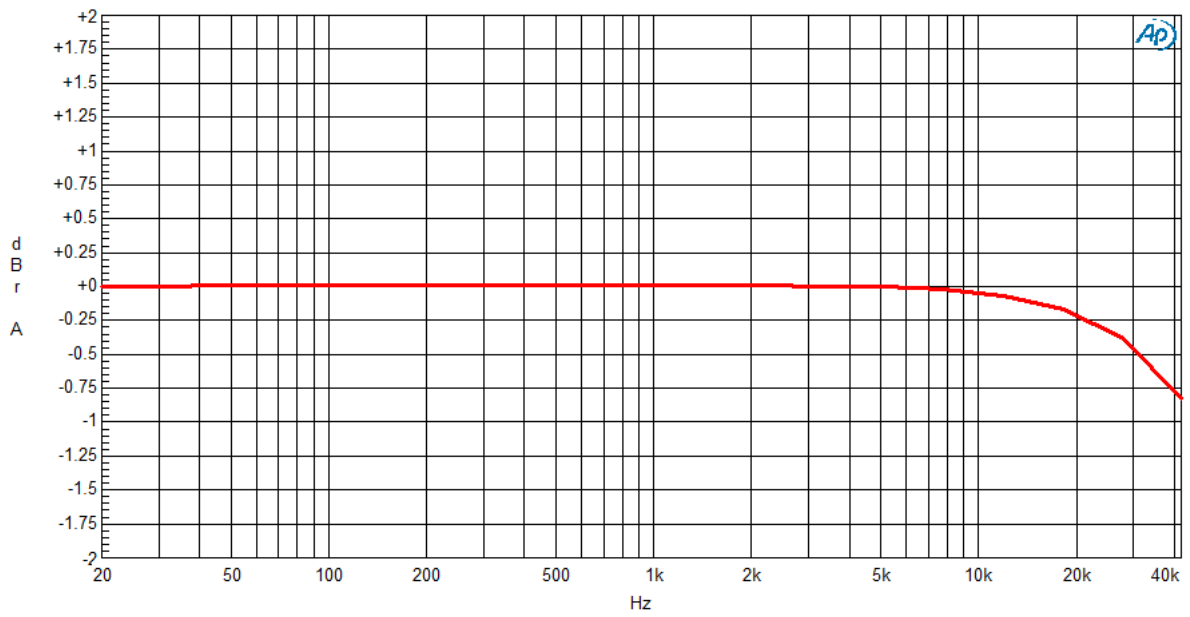
# 7. Measured Performances



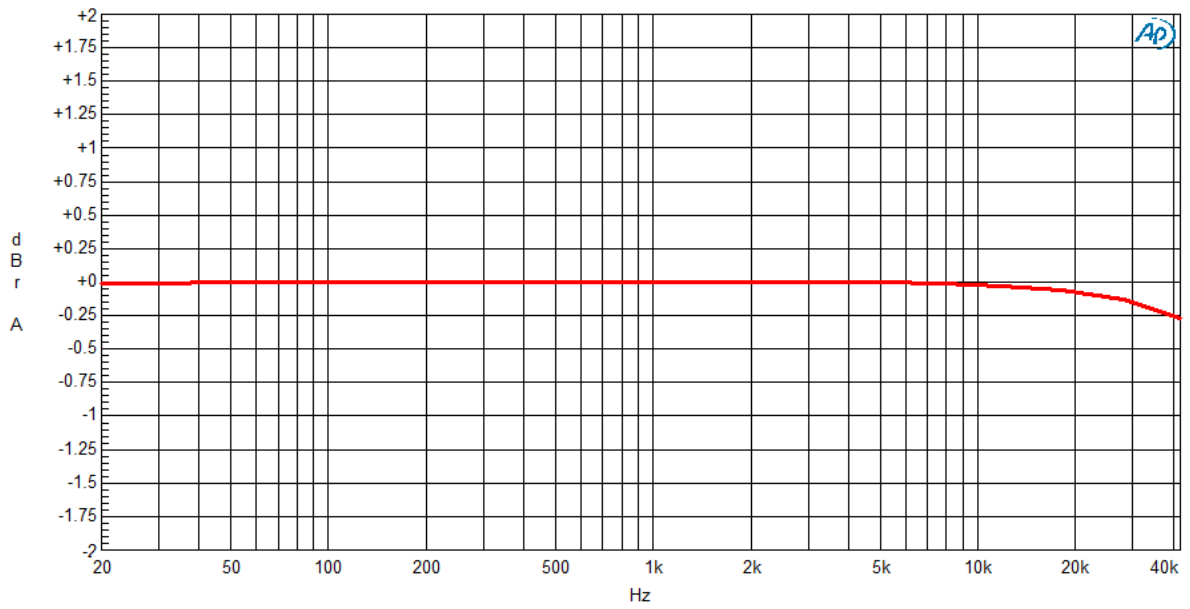
< Frequency vs. THD – Balanced Output (XLR) >



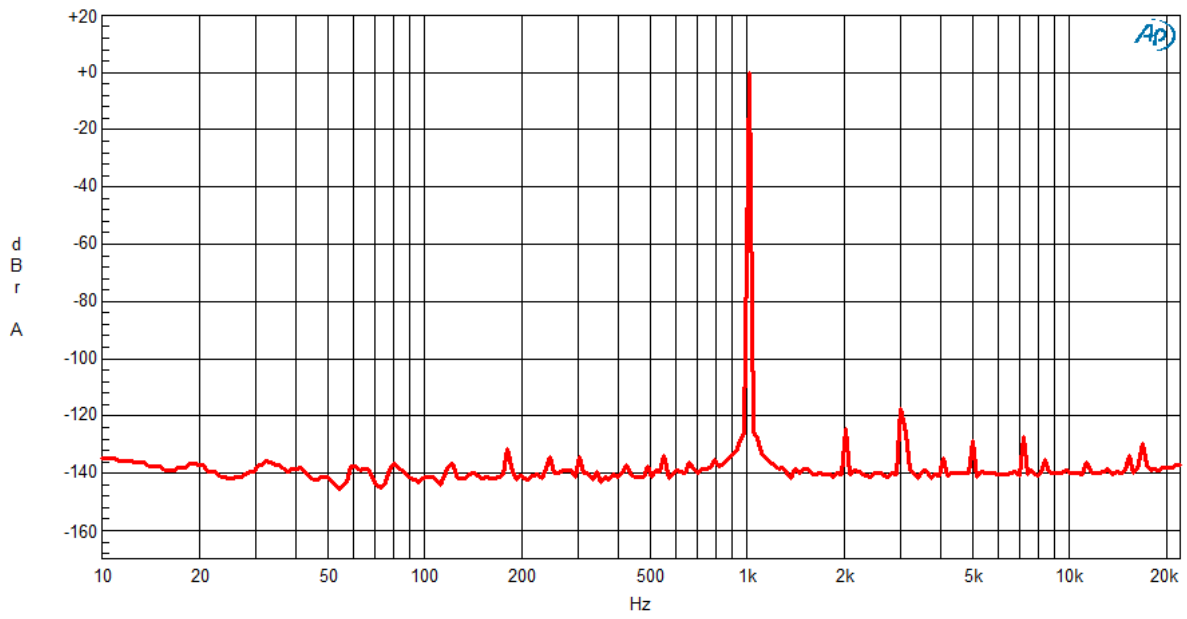
< Frequency vs. THD – Unbalanced Output (RCA) >



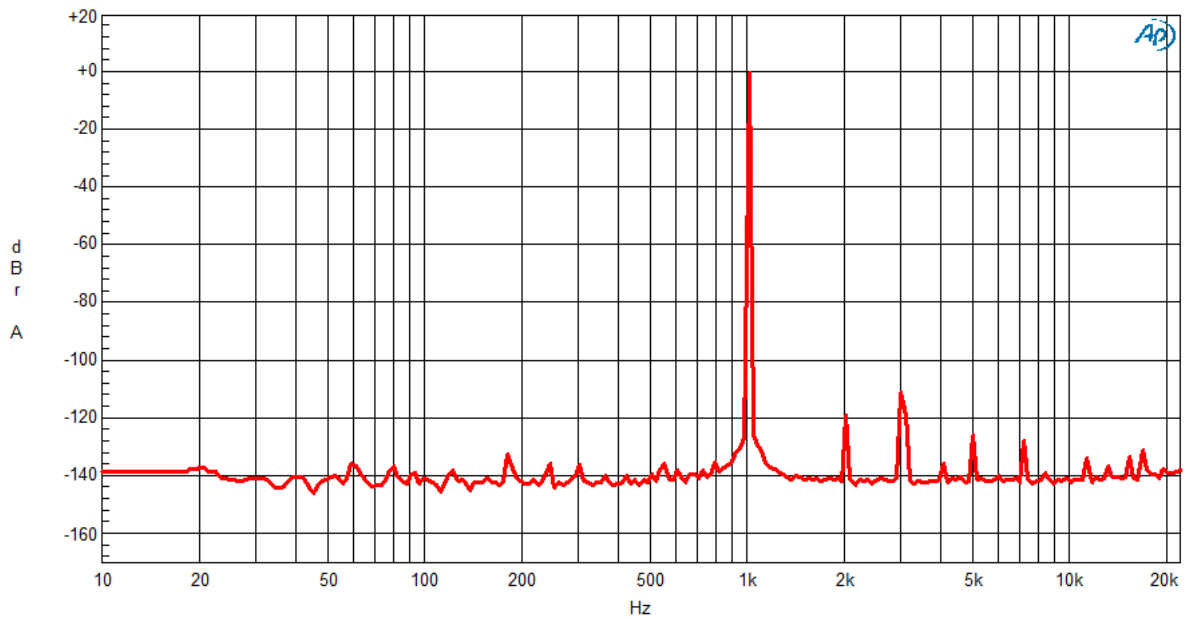
< Frequency Response – Balanced Output (XLR) >



< Frequency Response – Unbalanced Output (RCA) >

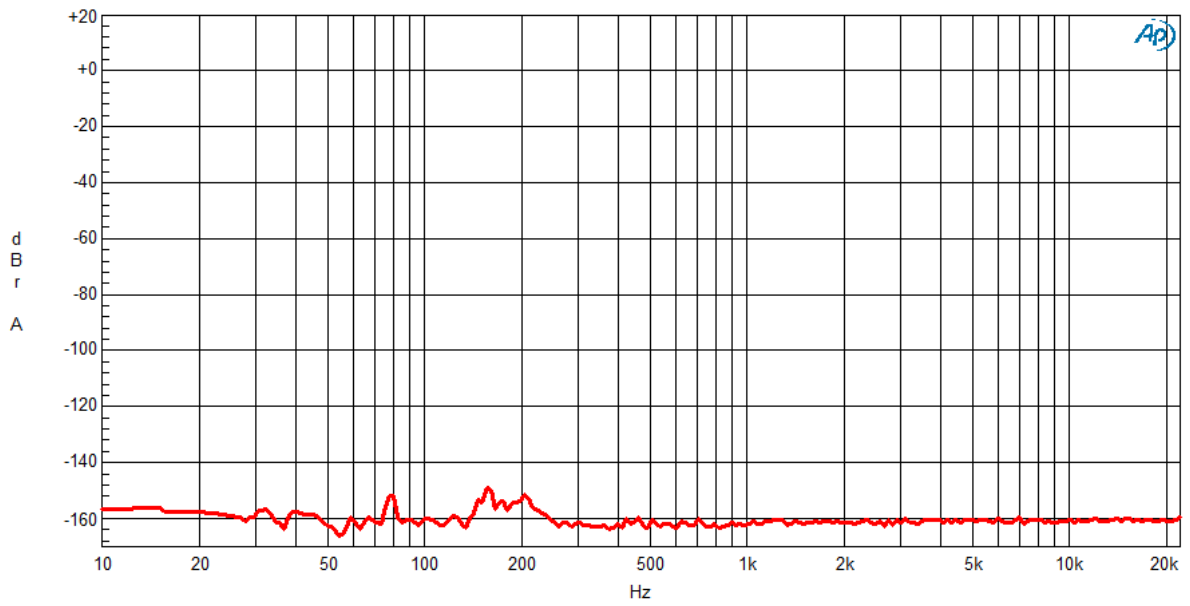


< FFT 0dB – Balanced Output (XLR) >

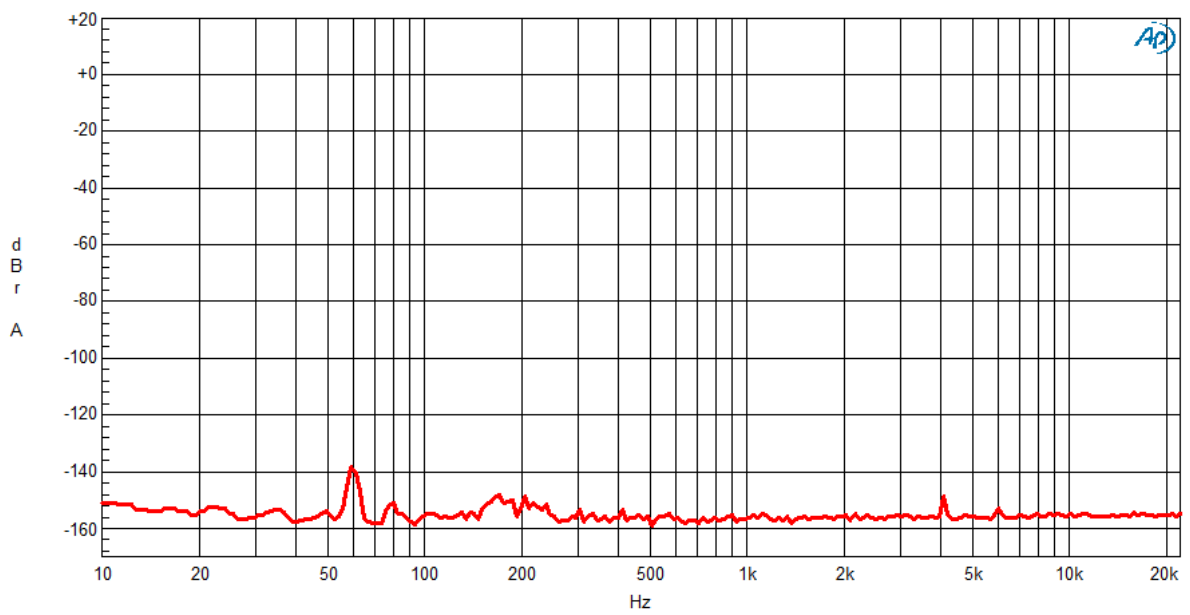


< FFT 0dB – Unbalanced Output (RCA) >

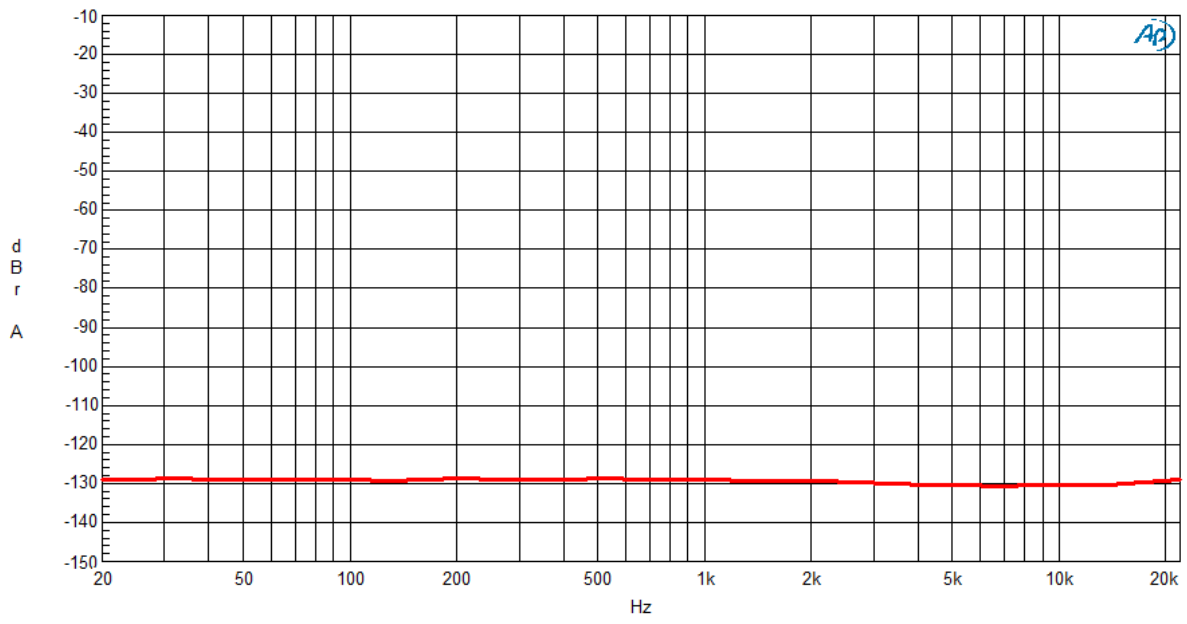




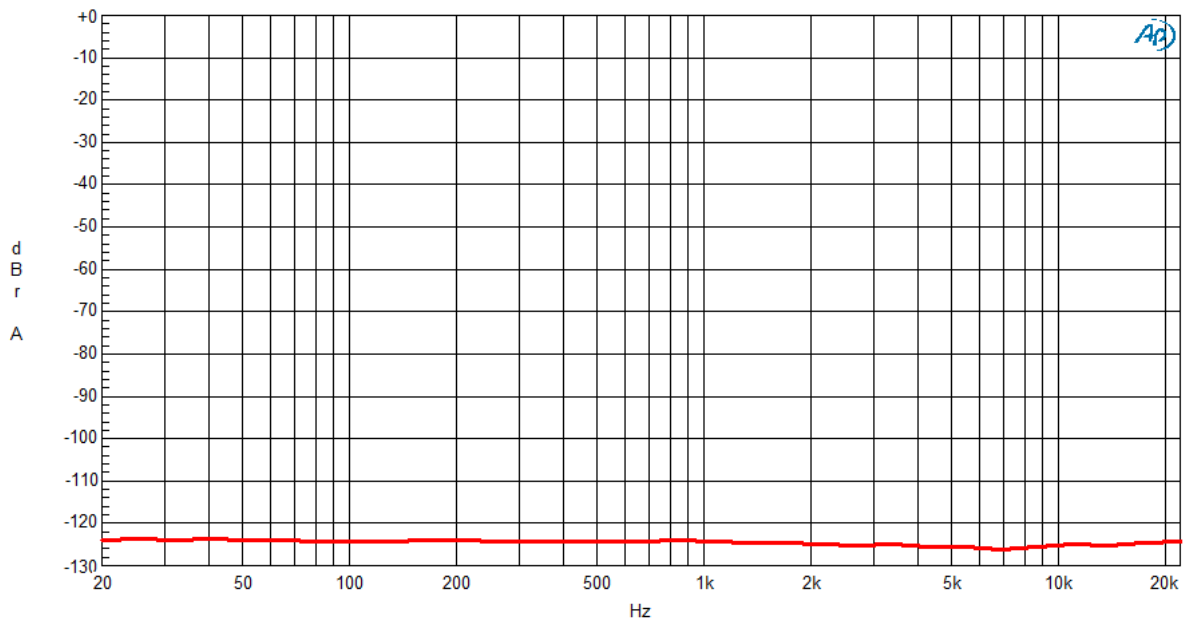
< Noise Floor – Balanced Output (XLR) >



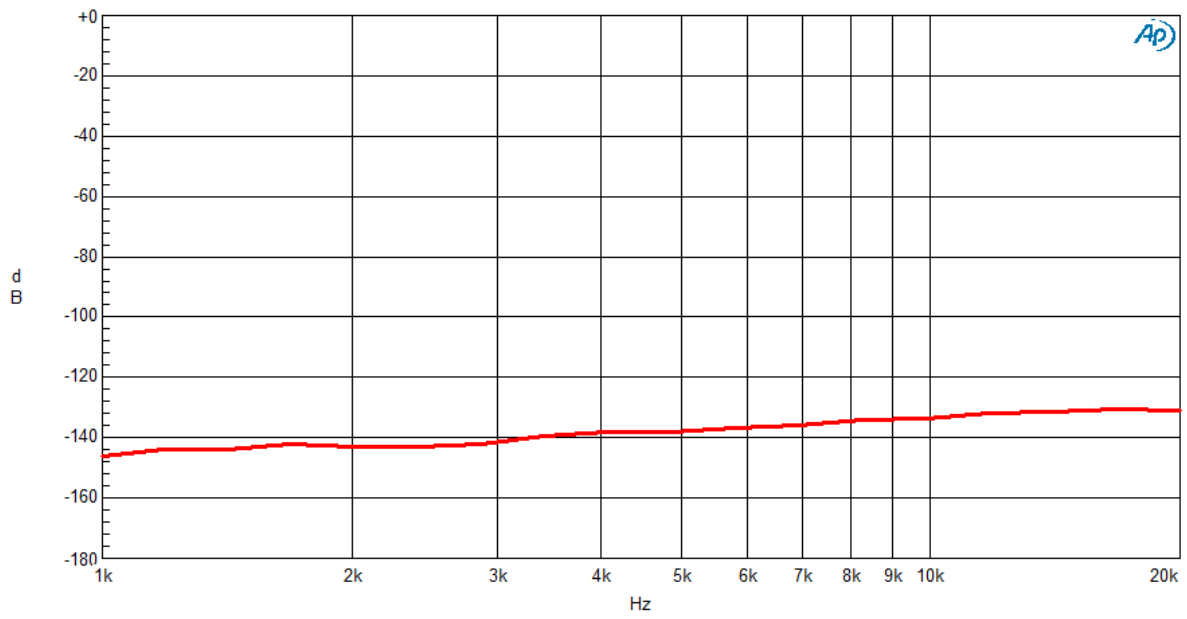
< Noise Floor – Unbalanced Output (RCA) >



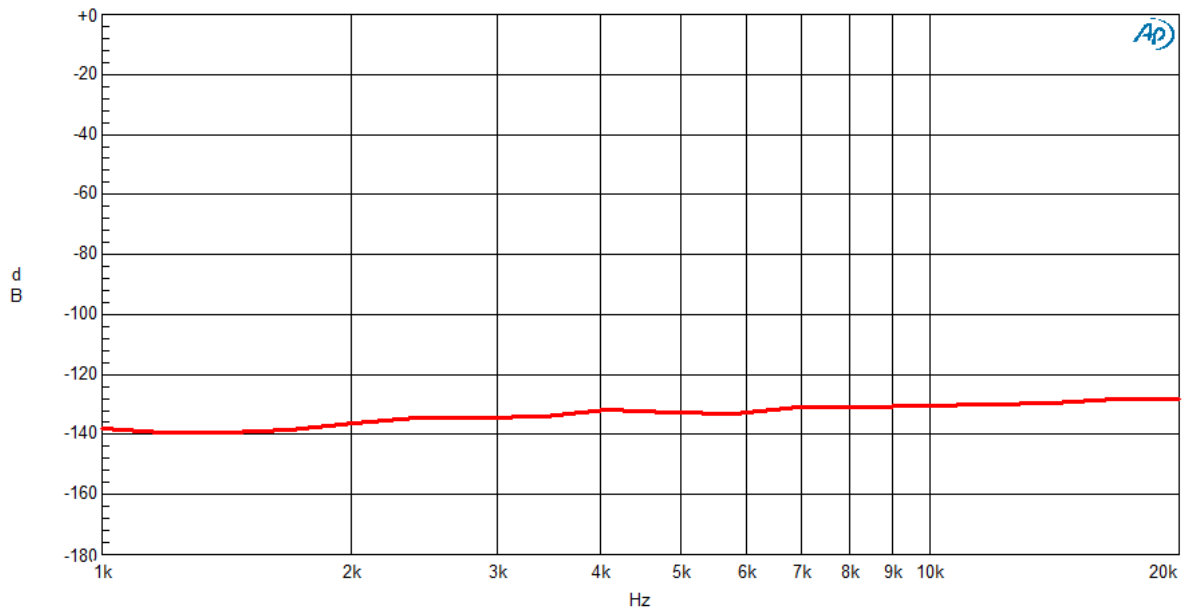
< Dynamic Range – Balanced Output (XLR) >



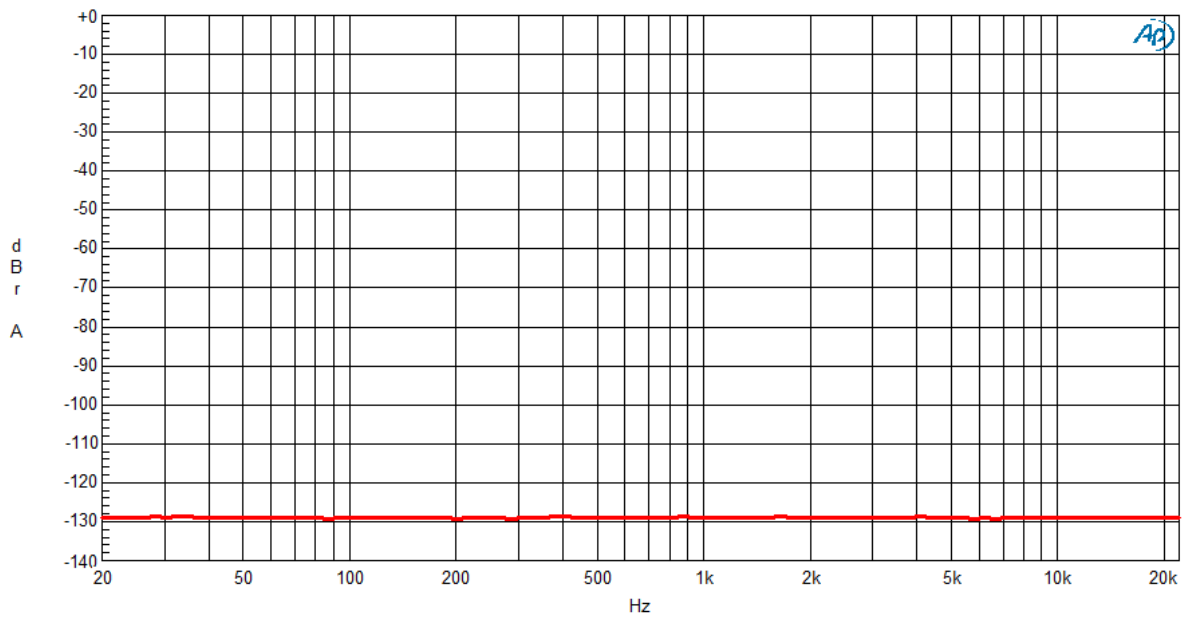
< Dynamic Range – Unbalanced Output (RCA) >



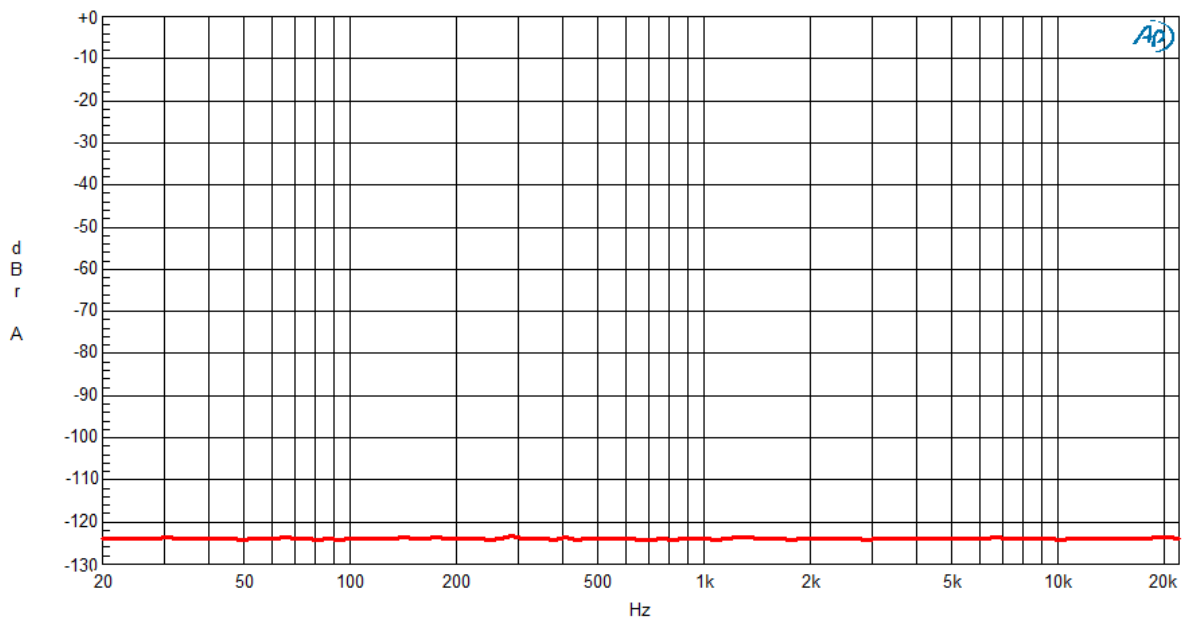
< Crosstalk – Balanced Output (XLR) >



< Crosstalk – Unbalanced Output (RCA) >




< SNR – Balanced Output (XLR) >



< SNR – Unbalanced Output (RCA) >

## 8. Trouble-shootings

If there seems to be a problem with your unit, please check the following points first.  
Please contact your local Calyx dealer or authorized distributor if the problem persists.

 **CAUTION** Before changing any connections, please be sure to turn **OFF** the all the components connected.

**Power does not come on:** Check whether the power cord is properly plugged in.

**No sound or Level is low:** Check whether source component and amplifiers are turned on.  
Check input selector setting.  
Check if all cables are connected correctly.  
Check the output setting.

**Sound is briefly interrupted:** Check for contact problems.  
Check if the cable conforms to right specifications.

**No sound from one channel:** Switch the left and right connections of the analog output cables.  
No sound from the same side---> Amplifier may be at fault.

**The remote control does not work:** Check the batteries.  
Replace the batteries with new ones.

## 9. Warranty

Product	Digital to Analog Converter	Model	Calyx FEMTO
Purchase Date	/ /	Warranty Period	1 year
Purchased From			
User's Name			
Street Address			
City		Country / State	
Zip Code		E-mail	
Telephone		Mobile	
<p>Concerning products which have gone out of production, we will continue to supply the spare parts required for repairs during a period of 3 years after production stop, counting from the month and year when the production stop occurs.</p>			
<p>Read through the warranty conditions carefully.</p> <p>To obtain warranty service, you must deliver the product, freight prepaid, in either its original packaging or packaging affording an equal degree of protection to the Digital &amp; Analog authorized service facility specified.</p> <ol style="list-style-type: none"> <li>For a period of one year from the original date of purchase of the product, Digital &amp; Analog will repair or replace with new or refurbished product or parts, any product or parts determined to be defective without charge.</li> <li>In the following cases, the purchaser must pay the service charge to repair the product.             <ol style="list-style-type: none"> <li>After the warranty period has expired</li> <li>Although the warranty period has not expired, the purchaser must pay the service charge in the following cases.                 <ul style="list-style-type: none"> <li>This warranty does not cover damage which occurs from unauthorized repair, alteration of any kind.</li> <li>This Warranty does not cover damage due to improper maintenance or improper installation</li> <li>This Warranty does not cover the product that was not purchased from authorized dealer.</li> <li>The factory-applied serial number has been altered or removed from this product</li> </ul> </li> </ol> </li> <li>If you want the service, please enclose warranty certificate and dated purchase receipt.</li> <li>We don't republish the warranty. Keep your warranty carefully.</li> <li>This Limited Warranty is valid only on products bought through authorized resellers.</li> </ol> <p>Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may have other rights which vary from state to state.</p>			