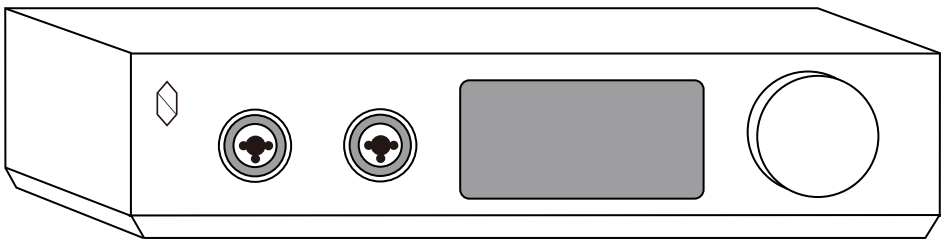
# WELCOME

Thank you for choosing COS H1. We at COS Engineering are thrilled to share with you the joy of soaking in music through this unit.

Please have a few minutes for this manual before powering H1 on.



# CONTENTS

# UNPACKING

You will find in the H1 box the following:

- COS H1
- a power cord
- this manual

Please keep the H1 box. In an unlikely event that maintenance is needed, the box shall be used for protection of H1 in transit.

# PLACEMENT

H1 needs a solid and stable surface to stand firmly, and four boots should help keep it level. H1 does not need much air to stay operational, but suffocating it is certainly a bad idea. Where H1 is placed is not critical, but please keep it away from known magnetic fields.

# MAINS CONNECTION

H1 works from 100 to 240VAC mains, so voltage selection is not needed.

# INPUT

#1 USB Audio (USB Type B connector)
H1 supports both USB Audio Class 1.0 and 2.0 with the following sampling rates and bit depths:

- Audio Class 1.0 - up to 96K samples per second, 16/24 bits depth
- Audio Class 2.0 - up to 192K samples per second, 16/24 bits depth and DSD64/DSD128 (DoP)

Please set H1 into standby mode and use the USB AUDIO switch on the back panel to make your selection. The selected class takes effect when H1 leaves standby mode. Both Audio Class 1.0 and 2.0 work on MAC OS, but only 1.0 works on Windows. They are natively supported; there is no need for additional device drivers.

#2 Optical Input (Toslink)
#3 S/PDIF Input (RCA connector)
#4 AES/SBU Input (XRL female connector pair)

## LINE OUT

H1 provides a pair of RCA unbalanced output on the back panel.


## HEADPHONE

The particular connectors utilized on H1 are 3-pin female XLR + 1/4" stereo jack combo. The centers are for 1/4" stereo jacks and provide connections of up to 2 unbalanced headphones. Whereas the female XLRs are for connection of a balanced headphone. The one on the left is for the left channel and the one on the right for the right channel.

The pin assignments are,

- pin 1 : Signal Ground
- pin 2 : Signal + (non-inverting)
- pin 3 : Signal - (inverting)

Since the loudness depends on several factors such as the headphone impedance and efficiency, it is advised to turn the volume down to minimum (-95.5dB) for the first time. Play the music and then gradually turn up the volume till the proper loudness is reached.

# BUFFER SELECTION

There is a buffer switch on the back panel, and it should be turned on for optimum performance. Sometimes digital music data do not move along and get converted in perfect tandem, which causes jitters, and even a few micros-seconds' timing error is enough to perturb the ears and frustrate the mind. Therefore, H1 uses a buffer of one-second depth, along with an independent and accurate clock, to receive data, align them and send them out in precise time frames for conversion.

For videos, the buffer should be switched off. This selection makes H1 reduce the depth of the buffer a little to ensure video-audio synchronization. Switching the buffer on or off takes effect immediately.

# USB AUDIO SELECTION

H1 supports both USB Audio Class 1.0 and 2.0. The main difference between USB Audio Class 1.0 and 2.0 is that the USB Audio Class 1.0 can't go beyond 96K samples per second with 24 bit data depth.

Microsoft Windows supports Audio Class 1.0, whereas Mac OS X and major Linux distributions support both Audio Class 1.0 and 2.0. No device driver is needed for computers to communicate with H1 through USB port. Some NAS (Network Attached Storage) devices also support USB Audio. Please consult your NAS manufacturer for USB Audio class and compatibility information.

Always power H1 off or put H1 into standby mode before adjusting the USB Audio Selection switch. The selection takes effect when H1 is powered on or leaves standby mode.

## POWERING ON

After power is switched on, the COS logo will appear with the firmware version on the display for a few seconds, and the working status such as input source will be shown afterwards. Now H1 is successfully powered on and ready for input source selection.

## SELECTING INPUT SOURCE

The default input source is USB 1.0 or 2.0 depending on your selection on the back panel, and the next input source can be selected by shortly pressing the knob. The order of the selection is USB 1.0 (or 2.0), Optical, RCA, XLR, and back to the USB 1.0 (or 2.0) as a loop.

To avoid channel transition glitches, the headphone output and line out is forced to 0V during the transitions, so a small click sound from the relay is normal.

## ADJUSTING VOLUME LEVEL

H1's volume control is composed of a ladder of high precision resistors and an array of analog switches which are low in resistance, noise, and distortion; no mechanical parts are used. Rotating the knob clockwise brings the volume up; counterclockwise, down. H1's display shows volume, from -95.5dB to 0dB, with 0.5dB increments.

## LINE OUT CONTROL

A pair of RCA line outs can be used to connect to other equipment such as power amplifiers. To enable this feature, just turn on the "Line" switch on the back panel.

## STANDBY MODE

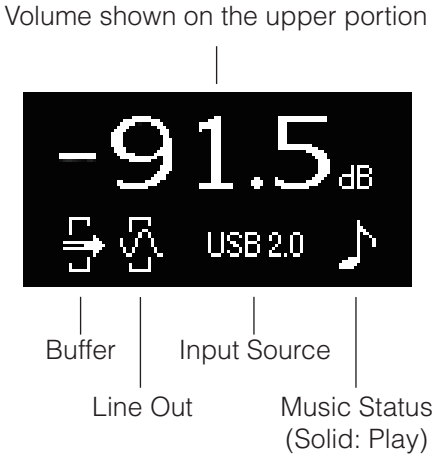
A long press (about one second) on the knob puts H1 into standby mode. In this mode, the volume and output relays are turned off, and H1 goes into a state of low power consumption. Another long press on the knob makes H1 leave standby mode; music resumes and volume hops back to the previous level.

## POWERING OFF

The Power switch sits next to the AC inlet on the back panel. Since the power consumption is low, it is not a bad idea, when music is not played, to leave H1 in standby mode.

# DISPLAY

A 128 by 64 pixels white OLED display is used to show the current status.



# TIPS for OPTIMUM PERFORMANCE

- Give H1 ten minutes to warm up and attain an internal thermal equilibrium, which ensures a seamless flow of enchanting music.

- Switch the one-second buffer on for music and off for video.

- Turn off the up-sampling feature of your player and play music at its original sampling rate. H1's dedicated DSP with COS Engineering's algorithms will do the job.

- Fix the volume of your player at its maximum and use H1 to adjust volume. Failing to do so may reduce the bit-depth of music data and compromise musicality.

# SPECIFICATIONS

DAC

| | |
|---|---|
| Digital Inputs | USB x1, Asynchronous 1.0/2.0;<br>SPDIF x 1; TosLink x 1; AES x 1 |
| Sampling Rate | Optical / RCA / XLR: up to 192K PCM<br>24 bits & DSD64 (DoP)<br><br>USB 1.0 – up to 96K PCM 24 bits<br>USB 2.0 - up to 384K PCM 24 bits &<br>DSD64/DSD128 (DoP) |
| Digital-to-Analog Converter | 24-bit DAC x 1<br>(up to 192Ksps, 24-bit) |
| Digital Filter | COS Proprietary<br>Linear Phase Delay |

Volume

| | |
|---|---|
| Steps | 192 steps by 0.5dB/step |
| Total Range | 96dB |
| Accuracy | Within ± 0.1dB |

Headphone

| | |
|---|---|
| Frequency Response | + 0dB, - 0.5dB (20Hz ~ 20KHz) |
| THD+N | < 0.001% (- 100dB)<br>(192Ksps, 24-bit, 20Hz ~ 20KHz,<br>A-weighted, 16 ohm load, 2Vrms) |
| Signal-to-Noise Ratio | > 110dB<br>(192Ksps, 24-bit, 20Hz ~ 20KHz,<br>A-weighted, 16 ohm load, 2Vrms) |
| Headphone Impedance | 16 ohm and up |
| Full Scale Output | Unbalanced : 6 Vrms<br>Balanced : 12 Vrms |

# SPECIFICATIONS

Line Out

| | |
|---|---|
| Frequency Reponse | + 0dB, - 0.5dB (20Hz ~ 20KHz) |
| THD+N | < 0.001% (- 100dB)<br>(192Ksps, 24-bit, 20Hz ~ 20KHz,<br>A-weighted, 2Vrms) |
| Signal-to-Noise Ratio | > 110dB<br>(192Ksps, 24-bit, 20Hz ~ 20KHz,<br>A-weighted, 2Vrms) |
| Full Scale Output | 2Vrms |

General

| | |
|---|---|
| Disply | 128 x 64 pixels white OLED |
| Weight | 3 Kg |
| Dimension | 260 mm (W) x 250 mm (D)<br>60 mm (H) - boots are not included<br>72mm (H) - boots are included |
| Power | 100 ~ 240VAC<br>Normal Operation < 20W<br>Standby 0.5W (typical) |