



## Features

### Connection options for control

- Via HEADlink to
  - HEADlab Controller labCTRL II.1
  - labHSU frontend
  - HEADlab Compact Modules
    - labCOMPACT12 / labCOMPACT12-V1
    - labCOMPACT24 / labCOMPACT24-V1
- Via USB to a PC

### Further connection options

- Via XLR (symmetric outputs)
  - Subwoofers (via equalizer)
    - Subwoofer pair HSW I
    - Subwoofer HSW II.1
  - High Precision Loudspeaker HPL
  - Shakers (via equalizer)
  - HEADphone Distribution Amplifiers
    - HDA IV.1 (for four HD IV headphones)
    - HDA IV.2 (for eight HD IV headphones)
  - Sine generators, oscilloscopes, etc.
  - Closed dynamic headphones HD V.1 for HEAD Audiometer
- Via HEADlink
  - labO2, labO2-V1, labP2, labP2-V1
  - HXB PreSense
  - Devices with an AES interface (via AES/EBU adapter)

- Devices with an optical interface (via ADAT adapter)
- Via BNC (asymmetric outputs)
  - Playback devices (audio section)

### Handling and control

- Via software from HEAD acoustics
  - ArtemiS SUITE
  - SQala
  - PreSense
  - HEAD Companion
  - HEADscape
- Via control switch (OLED display with status information)
- Using as Windows audio device

### Equalization filters

- Independent of Direction (ID)
- Free Field (FF)
- Diffuse Field (DF)
- User-specific (USER)
- Four IIR filters can be installed
- Subjective Equalization Filter (SEQ)

### Cascading

- Cascaded playback equalizers labO2 and labO2-V1 as well as headphone equalizers labP2 and labP2-V1 can form synchronous playback systems for headphones, subwoofers, shakers, etc.
- Users can cascade
  - two headphone equalizers and playback equalizers via HEADlink
  - more than two headphone equalizers and playback equalizers via the AES/EBU adapter CLX X.1

## DATA SHEET

### labO2 (Code 3731)

2-channel playback equalizer with Line outputs, USB interface, HEADlab-compatible

### Overview

The playback equalizer labO2 is suitable for 2-channel playback with high-quality subwoofers, loudspeakers, shakers, and other devices.

Via HEADlink labO2 can be used in a HEADlab system or connected directly to a PC via USB. Operation is easy and intuitive via the built-in display with a rotary control switch or via software.

For subwoofer playback, the high-quality HSW I and HSW II.1 subwoofers are available, which are characterized by a realistic sound balance, particularly in the low-frequency range. In addition, the High Precision Loudspeaker HPL, shakers, oscilloscopes, and sine generators, as well as other playback devices can be connected.

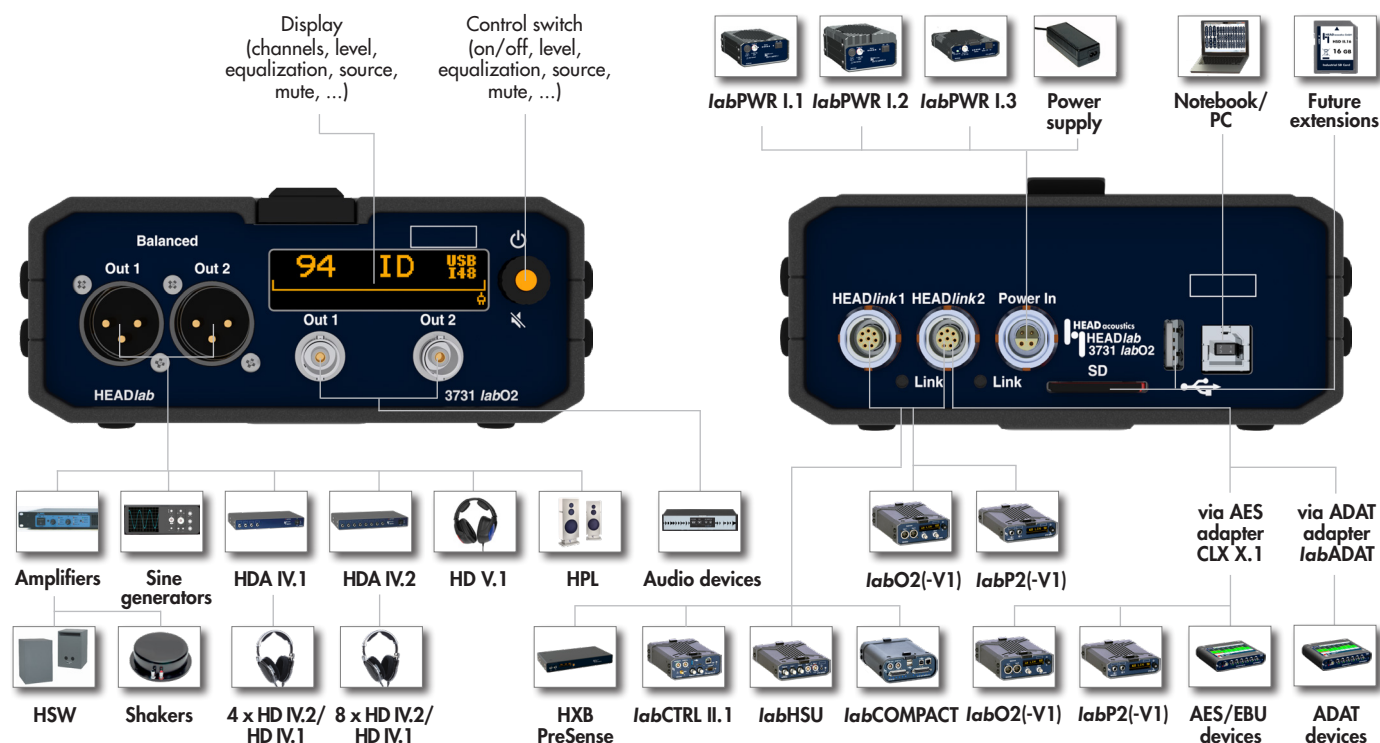
labO2, labO2-V1, as well as the headphone equalizers labP2 and labP2-V1 can be combined to form a synchronous playback system, which accurately equalizes the subwoofers and the headphones, removes delays between the headphone signal and the subwoofer signal, and calibrates the sound pressure levels. Shakers can be synchronized to the playback as well.

Connecting an HDA IV HEADphone Distribution Amplifier multiplies the number of headphones that can be used in a system.

### Power supply

- Power supply unit
- Power Boxes
- Controllers, Compact Modules, frontends

## Front and rear view *labO2*



## Further connection options

### Subwoofers and loudspeakers

For playback via the symmetric XLR outputs, HEAD acoustics offers the high-quality subwoofers HSW I and HSW II.1, featuring realistic sound balance and homogenous sound radiation particularly in the low-frequency range.

The HSW I subwoofer has an optimized efficiency factor in the low-frequency range, making it ideal for high-quality playback in a listening studio, for example.

Thanks to its relatively compact size the subwoofer pair HSW II.1 is particularly suited for playback in a vehicle environment.

Both the HSW I and the HSW II.1 are shipped with power amplifiers.

In addition, the active high-end speaker pair High Precision Loudspeaker HPL is available, which comes very close to the principle of a perfect sound converter, making it ideal for playback in listening studios.

### HEADphone Distribution Amplifiers

The HEADphone Distribution Amplifiers HDA IV.1 and HDA IV.2 can be connected directly to the XLR outputs.

Simultaneously, up to four dynamic headphones HD IV can be connected to HDA IV.1, up to eight HD IV to HDA IV.2, and used synchronously for aurally-accurate playback. A level calibration is performed by the factory for each headphone connected to an HDA IV device so that equalization and playback level are correct.

Cascading several HDA IV devices allows the number of headphone outputs to be increased even more without a loss of sound quality.

### Playback equalizers and headphone equalizers

Via HEADlink an additional playback equalizer or headphone equalizer can be connected and supplied with power.

### Devices with AES/EBU interface

Via the AES/EBU adapter, devices with an AES/EBU interface can be connected.

The AES/EBU adapter can also be used to cascade several *labO2*, *labO2-V1*, as well as headphone equalizers to form synchronous playback systems.

### Devices with optical interface

Using the *labADAT* adapter, the HEADlink interface can also be used as an optical input and output (ADAT or S/PDIF) to connect devices with an optical interface.

### Other playback devices (audio section)

In addition to the XLR interfaces for professional audio, two unbalanced BNC interfaces are available for connecting further playback devices. The BNC outputs can be equalized individually.

### Using as Windows audio device

*labO2* can be used as Windows audio device. An additional sound board is not necessary.

## Playback and control

### ArtemiS SUITE

Using ArtemiS SUITE, the software for sound and vibration analyses, playback is controlled via the easy-to-use Player (Basic Framework).

If a signal contains information about the equalization and measurement range used for the recording, ArtemiS SUITE passes such information to the *labO2* unit, which automatically sets the correct equalization and playback level.

### SQala listening studios

In SQala listening studios, headphone playback can be optimized using *labO2* in the low-frequency range with subwoofers to create matched playback systems. For a combined and synchronized headphone-subwoofer playback, equalization, level, etc. are set correctly.

The CLX X.1 AES/EBU adapter is available for cascading playback equalizers and headphone equalizers.

### PreSense

NVH simulation tools from HEAD acoustics, such as the TPA software Prognose or the interactive NVH simulator PreSense allow multimodal playback.

For stationary PreSense applications (e.g., SoundSeat, SoundCar) the headphone reproduction in the low-frequency range can be optimized with shakers to form synchronized playback systems.

For mobile applications (e.g., Mobile Simulator) a subwoofer can be used to support the low-frequency playback.

### HEAD Companion

HEAD Companion is a license-free software, which enables aurally-accurate playback of HDF files (HEAD Data File format).

### HEADscape

HEADscape, the software solution for analyzing and classifying soundscape measurements according to ISO 12913-2, also allows aurally-accurate playback.

### Control switch and display

The control switch and the display allow various settings (channel selection, level, equalization, source, mute) to be configured manually.

### Limiter

*labO2* is equipped with a limiter that limits the playback level to a certain maximum. This maximum output level can be configured manually.

### Equalization filters

*labO2* is equipped with the „Independent of Direction“ (ID) equalization, developed by HEAD acoustics, the „Free Field“ (FF) and „Diffuse Field“ (DF) equalizations, as well as a user-specific (USER) equalization (FIR filter).

In addition, up to four IIR filters can be loaded. The IIR filters can be used, for example, for low-pass, high-pass, or band-pass filtering, increasing or reducing a signal level, or other applications.

An additional SEQ (Subjective Equalization) equalization is predefined. With this IIR filter, which was developed on the basis of listening tests, the reproduction of artificial head recordings is perceptibly and audibly improved compared to the technically correct playback.

### HEAD Audiometer

HEAD Audiometer is a software option of ArtemiS SUITE (Advanced Playback) for measuring characteristics and parameters of hearing (not applicable for medical purposes).

Together with the closed, dynamic HD V.1 headphones, which achieves an excellent attenuation of external noise, *labO2* and HEAD Audiometer form a perfectly matched unit for performing hearing tests.

## Scope of supply

- *labO2* (Code 3731)  
2-channel playback equalizer with Line outputs, USB interface, HEAD*lab*-compatible
- CUSB II.1.5 (Code 5478-1.5)  
Cable USB 2.0, 1.5 m
- Data media

## Recommended accessories

- PS 24-60-L4  
24 V, 60 W, LEMO 4-pin.  
Power supply for *labO2*

## Optional

### HEAD*lab* Controller

- *labCTRL* II.1 (Code 3704)  
LAN/USB Controller for HEAD*lab*

### HEAD*lab* Compact Modules

- *labCOMPACT12*  
(Code 3708)
- *labCOMPACT12-V1*  
(Code 3708-V1)
- *labCOMPACT24*  
(Code D3709)
- *labCOMPACT24-V1*  
(Code D3709-V1)

### Frontends

- *labHSU* (Code 3710)  
High-end 2-channel frontend

### Subwoofers

- HSW II.1 (Code 2952)  
HEAD subwoofer
  - KMT power amplifier DC 5
- HSW I (Code 2950)  
2 x HEAD subwoofers
  - KMT power amplifier DC 5

### Loudspeakers

- HPL (Code 2968)  
2 x High Precision Loudspeaker

### HEADphone Distribution Amplifiers

- HDA IV.1 (Code 2488)  
HEADphone Distribution Amplifier for 4 x HD IV.2 / HD IV.1
- HDA IV.2 (Code 2489)  
HEADphone Distribution Amplifier for 8 x HD IV.2 / HD IV.1

## Playback equalizers

- *labO2-V1* (Code 3731-V1)  
2-channel playback equalizer with Line outputs, headphone connector, USB interface, HEAD*lab*-compatible

## Headphone equalizers

- *labP2* (Code 3732)  
Binaural headphone equalizer, USB interface, HEAD*lab*-compatible
- *labP2-V1* (Code 3732-V1)  
Binaural headphone equalizer, USB interface, HEAD*lab*-compatible

## Playback systems

- HXB PreSense (Code 7661)  
Playback system for PreSense

## Power Boxes

- *labPWR I.1* (Code 3711)  
Power Box for HEAD*lab* systems (up to 40 W)
- *labPWR I.2* (Code 3712)  
Power Box for HEAD*lab* systems (up to 100 W)

- *labPWR I.3* (Code 3713)  
Power Box for HEAD*lab* systems (up to 35 W)

## Adapters and cables

- CLX X.1 (Code 3797-1)  
AES/EBU adapter
- *labADAT* (Code 3794)  
ADAT adapter
- CLL X.xx (Code 3780-xx)  
Cable LEMO 8-pin. ↔ LEMO 8-pin. (cable HEAD*link*)  
Available cable lengths:  
0,17 m, 0,26 m, 0,36 m, 0,5 m, 1 m, 1.5 m, 2.5 m, 5 m, 10 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m
- CSS IV.xx (Code 9828.xx)  
Loudspeaker extension cable (Speakon)  
Available cable lengths:  
2 m, 5 m, 10 m
- CXX II.xx (Code 5177-xx)  
Cable AES/EBU XLR 3-pin., male ↔ XLR 3-pin., female  
Available cable lengths:  
30 cm, 1 m, 3 m, 10 m, 20 m, 30 m, 40 m

## Headphones for HEAD Audiometer

- HD V.1 (Code 2495)  
Closed, dynamic headphones

## Software

- ArtemiS SUITE  
Basic Framework (Code 5000)
  - Advanced Playback (Code 5011)
    - HEAD Audiometer
- SQala – Jury Testing
  - SQala Basic (Code 5050)
  - SQala Net (Code 5051)
  - SQala Server (Code 5058)
  - SQala Client (Code 5059)
- PreSense (Code 7600ff)
- HEAD Companion (Code 4906)
- HEADscape (Code 5600)

## Technical Data

### General

Interfaces	2 x XLR 3-pin. (symmetric) 2 x BNC (asymmetric) 2 x LEMO 8-pin. (HEAD <i>link</i> ) 1 x USB high-speed client 1 x USB high-speed host 1 x SSD card slot 1 x LEMO 4-pin. (power in)
Sampling frequencies ( $F_s$ )	32 kHz, 44.1 kHz, 48 kHz
Power supply	9.3 V to 36 V
Power consumption	10 W
Frequency range	0 Hz to 20 kHz
S/N	104 dB(A)
THD+N	
XLR	-92 dB(A) at -6 dB <sub>FS</sub>
BNC	-94.5 dB(A) at -6 dB <sub>FS</sub>
Frequency response	0.04 dB (20 Hz to 20 kHz) at $F_s = 48$ kHz
Crosstalk	
at 1 kHz	110 dB(A)
20 Hz to 20 kHz	105 dB(A)
Equalization	FF, ID, DF, LIN (no equalization), USER (max. 1024 taps) 4 x IIR filter 2nd order 1 x predefined SEQ filter (Subjective Equalization)
Maximum cable length to the controller	60 m (with HEAD <i>link</i> cable CLL X.60)
Cooling	Convection, no fan
Dimensions	148 x 180 x 63 mm (W x D x H)

## Technical Data

### General

Weight	801 g
Operating temperature	-10 °C to 60 °C
Storage temperature	-20 °C to 70 °C

### XLR interfaces (switching between the XLR and the BNC outputs)

Number of channels	2
Interfaces	XLR 3-pin.
Output impedance	50 $\Omega$
Max. output level	17.66 V <sub>eff</sub> equivalent to 119 dB <sub>SPL</sub> ; symmetric output
Nominal level	1 V <sub>eff</sub> equivalent to 94 dB <sub>SPL</sub>
Max. output power per channel	0.625 W
Electrical isolation	Yes, together with the BNC interfaces to the other interfaces and the power supply

### BNC interfaces (switching between the BNC and the XLR outputs)

Number of channels	2
Interfaces	BNC
Output impedance	10 $\Omega$
Max. output level	8.86 V <sub>eff</sub> equivalent to 119 dB <sub>SPL</sub> ; asymmetric output
Nominal level	0.5 V <sub>eff</sub> equivalent to 94 dB <sub>SPL</sub>
Max. output power per channel	0.55 W
Electrical isolation	Yes, together with the XLR interfaces to the other interfaces and the power supply

### Digital HEADlink

Connector	2 x LEMO 8-pin.
Number of interfaces	2
Supply voltage	10 V <sub>DC</sub> to 28 V <sub>DC</sub>
HEADlink version	HEADlink 1.0
Synchronization	48 kHz
Maximum cable length	60 m

### Digital USB client

Connector	1 x USB type B
Number of interfaces	1
USB specification	USB 2.0
Data rate (gross)	480 Mbit/s

### USB 2.0 high-speed host (for service purposes)

Updates, future extensions, etc.

### SD card slot (for service purposes)

Updates, future extensions, etc.

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