HEAD acoustics

DATA SHEET

Code 2460

playStudio

Stationary High-End Playback Unit for Listening Studios and Simulators

OVERVIEW

playStudio

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Stationary High-End Playback Unit for Listening Studios and Simulators

The playStudio playback system is used for two-channel playback of binaural recordings using high-quality headphones, subwoofers, loudspeakers, etc.

playStudio has been developed for the special requirements of listening studio playback. The powerful all-rounder can connect to headphones and loudspeakers, can be installed on a rack, and is cascadable.

You can operate playStudio within a HEAD*lab* system via HEAD*link* or directly connect it to a computer via USB. Operation is simple and intuitive via the integrated display with rotary knob or via the software. In order to achieve a sound impression that corresponds to the original sound field during playback, a maximum of two headphones that have been individually equalized and calibrated at the factory can be connected.

For subwoofer reproduction, the high-quality HSW II.1 subwoofer is available, which is characterized by a realistic sound balance, especially in the low frequency range. In addition, shakers, oscilloscopes, sine-wave generators, and other playback devices can be connected.

You can also use playStudio together with PreSense, SoundSeat II, and shakers for a comprehensive and realistic simulation experience.

By connecting the HDA IV.2 HEADphone Distribution Amplifier, the number of headphones in a system for aurally-accurate playback can be multiplied.

KEY FEATURES

High-end playback unit for all requirements

Two headphone outputs for shared listening

Native AES and ADAT/S/PDIF interfaces for cascading with standard cables (without adapter)

Simultaneous operation of BNC (unbalanced) and XLR (balanced)

Hardware limiter to protect against hearing damage

Individual level adjustment and equalization for highest playback quality

Display and rotary knob for ease of use

APPLICATIONS

Aurally-accurate playback of binaural recordings

Fixed installation in a listening studio

Sophisticated driving simulators

Airborne sound via headphones

Loudspeaker playback (also subwoofer) in listening studios

Shaker for PreSense

DETAILS

Playback via Headphones

› Two 6.3 mm headphone sockets on the front to connect compatible headphones, e.g., HD OP II.1, HD OP III.1, HD CL II.1, or HD CL III.1
› Factory-adjusted individual equalization for compatible headphones

Limiter

› playStudio has a limiter that limits the playback volume to a maximum value (can be set manually)
› The limiter is used to protect hearing and prevent damage to health when playing very loud signals.

Equalization Filters

› Free Field (FF), Diffuse Field (DF), Independent of Direction (ID), Linear (LIN, without equalization), and User (USR, user-defined) playback equalizations

IIR Filter

› A maximum of four IIR filters can be installed
› The IIR filters can be used to process low signal frequencies, e.g., for shakers, which is only possible to a limited extent when using equalization filters (FIR filters)

Power-Up Configuration

› Selector switch that can be used to configure a start of playStudio when supply voltage is applied

Preamplifier / Digital Signal Processor

› playStudio can be used as a preamplifier and digital signal processor for filtering, delaying, and limiting for a subwoofer or a shaker for PreSense
› Shaker applications: SoundSeat II
› Subwoofer applications: SoundCar, listening studio, individual listening sessions

Cascading

› Series connection of several playStudio or additional playback units (discontinued: *lab*P2, *lab*O2, *lab*P2-V1, *lab*O2-V1) via ADAT or AES
› playStudio can be used with the SQala software in a listening studio or to operate loudspeakers/subwoofers
› playStudio can be operated with other devices via the AES or ADAT interface without operating software

NVH Simulation

› playStudio can be used with PreSense, preferably in combination with HXB-PreSense
› Latency-free playback via ADAT
› Playback, e.g., with shaker equalization, via HEAD*link* within a synchronized HEAD*lab* measurement setup
› If there are several excitation channels, the second playback device can be connected to the first one via ADAT cascading as in the regular measurement setup (HEAD*link* to ADAT/AES)

playStudio with HD OP II.1

ELEMENTS ON THE FRONT

Headphone Outputs

HD OP II.1

HD OP III.1

HD CL II.1

HD CL III.1

You can connect our compatible headphones to the two headphone outputs to achieve correctly equalized playback.

Two headphone outputs enable shared listening.

Available equalizations are Free Field (FF), Diffuse Field (DF), Independent of Direction (ID), Linear (LIN, without equalization), and User (USR, user-defined).

The serial numbers of the headphones supplied and individually equalized at the factory can be found above the headphone outputs.

Rotary Knob

Mute

Play

Stop

Use the rotary knob and the display to manually adjust various playback settings (channel selection, playback range, equalization, source, mute function). Select the playback range and activate the mute function directly. All other settings and functions can be accessed via the settings menu.

The color of the LED in the rotary knob indicates whether playback is in progress, paused, or muted.

Display

The display shows the various playback settings that can be adjusted using the rotary knob.

The following settings are displayed: Level meter, playback range, equalization type, source, synchronization and sampling rate, power supply, automatic playback configuration, digital output, IIR filter, limiter, muting.

Power Switch

Power

Use the power switch (rocker switch "On – Neutral (rest position) – Off") to switch playStudio on and off.

ELEMENTS ON THE BACK

XLR

HSW II.1

HDA IV.2

These two balanced signal outputs can be used to connect a subwoofer, shaker for PreSense, or headphone amplifier.

XLR and BNC can be operated simultaneously.

AES/EBU In/Out

playStudio

This 2-channel connection enables you to cascade several playback devices and use them with the SQala software in a listening studio.

The advantage of AES is that signals continue to be transmitted even when the device is switched off (AES electrical loop). This is particularly used for cascading in the listening studio.

For latency-free cascading (e.g., in Group Mode), the inputs and outputs can be digitally connected in a one-to-one configuration via AES and ADAT.

The status LED indicates whether a device is synchronized via AES.

HEAD*link*

HEADlab modules

This connection enables you to use playStudio for playback via HEAD*lab* (e.g., online monitoring in a wind tunnel).

The HEAD*link* connection can also be used to output excitation signals for measurements. A maximum of eight signal channels can be output.

The HEAD*link* status LED indicates whether a HEAD*link* 1.0 connection exists.

BNC

Audio device

These two unbalanced signal outputs, each of which can be individually equalized, can also be used to operate a subwoofer, shaker for PreSense, and additional audio devices.

BNC and XLR can be operated simultaneously.

USB Ports

Computer

Connect playStudio to a Windows computer via the USB-C port and use it for playback. Playback can be performed with two or eight signal channels.

The USB-A port (host) is only intended for service purposes.

ADAT/S/PDIF In/Out

HXB-PreSense

playStudio

Use this connection to connect playStudio to audio equipment (e.g., sound cards).

You can also cascade several playStudio via ADAT and use them in a listening studio with the SQala software.

You also have the option of using playStudio with PreSense, preferably in combination with HXB-PreSense. Latency-free playback is possible via the ADAT connection.

As an alternative, this interface can also be used for transmission via S/PDIF.

The status LED indicates whether a device is synchronized via DAT or S/PDIF.

Auto Power

On/Off

Use this switch to configure whether or not playStudio is to start automatically when the power supply is connected to the Power-In port.

On: playStudio starts automatically when the power supply is connected to the Power-In port. This is required if the device is part of a system that is switched on via a main switch (e.g., SoundSeat II).

Off: playStudio can only be switched on using the switch on the front of the device.

Power In

labPWR I.x

Power adapter

Use this connection to connect the power adapter or a compatible supply module (*lab*PWR I.1, *lab*PWR I.2, *lab*PWR I.3).

PLAYBACK AND CONTROL

ArtemiS SUITE (as of Version 17.5)

In ArtemiS SUITE, the software for sound and vibration analysis, playback for listening and monitoring is controlled via the very easy-to-use and convenient Player (included in APR 000, APR Framework). The output of a defined excitation signal in the Recorder (APR 040, Recorder is required) enables accurate and high-quality audio output, which is essential for acoustic measurements and analyses.

If a signal contains information on the equalization and the dynamic range used during recording, ArtemiS SUITE will transmit this information to playStudio, thus ensuring that both the equalization and the playback level are automatically set correctly.

SQala Listening Studio (as of Version 4.5)

In listening studios, all the playback systems used are controlled by the SQala jury testing software. Headphone playback can be optimized at low frequencies using playStudio and subwoofers to create perfectly tuned playback systems. With combined and synchronized headphone-subwoofer playback, equalization, level, etc. are set correctly. The AES/EBU connection is available for cascading playback systems.

PreSense

Our NVH simulation tools, such as the Prognoise TPA software or the interactive PreSense NVH Simulator, enable multimodal playback.

With stationary PreSense applications (e.g., SoundSeat II, SoundCar), two additional headphones can be used, and headphone playback can be optimized at low frequencies to form tuned playback systems using shakers. With mobile applications (e.g., with a mobile simulator), a subwoofer can be used in addition to an extra pair of headphones to support low-frequency reproduction. Cascading should be done via ADAT (up to eight channels), thus ensuring that different signals can be output on the headphones and the shakers.

HEAD Companion (as of Version 3.3)

Use the license-free HEAD Companion software to perform a variety of functions that support both the management and the use of audio and measurement data. For example, HEAD Companion enables you to perform firmware updates to ensure that you are using the latest features and improvements. The software also supports binaural, aurally-accurate playback of HDF files (HEAD Data File format), which is important for acoustic tests and analyses. HEAD Companion can also be used to configure the limiter and adjust the filter settings for your playback frontend to optimize the audio quality. In addition to the two factory-equalized headphone slots, there are free slots that can be assigned to additional equalizers which are also installed using HEAD Companion.

Therefore, HEAD Companion is the ideal tool for users who need a simple and free solution for managing acoustic files, while ArtemiS SUITE is intended for professional users who require comprehensive analysis and editing functions. However, ArtemiS SUITE is vital when it comes to complex acoustic analyses and specific applications.

HEADscape

HEADscape, the software solution for analyzing and classifying soundscape measurements in accordance with ISO 12913-2, also enables aurally-accurate playback.

Equalization Filters

playStudio provides the following equalizations: Free Field (FF), Diffuse Field (DF), Independent of Direction (ID), and Linear (LIN, without equalization). In addition, a maximum of four IIR filters and a user-defined FIR filter can be installed. The IIR filters can be used, for example, for lowpass, highpass, or bandpass filtering, to increase and decrease signal levels, or for other applications. The FIR filter enables you to create and customize specific transfer functions to optimize the audio quality.

FURTHER CONNECTION OPTIONS

Headphones

HEAD acoustics provides dynamic headphones that are individually equalized at the factory to ensure aurally-accurate playback. The serial number of the headphones can be found above the corresponding headphone output.

Subwoofer and Loudspeaker

For playback via the balanced XLR outputs, HEAD acoustics offers the high-quality HSW II.1 subwoofer, which is characterized by uniform dispersion characteristics, especially in the low-frequency range. Thanks to its optimized efficiency in the lower frequency range, this subwoofer is suitable for high-quality reproductions, e.g., in listening studios.

Thanks to its small size, the HSW II.1 subwoofer is particularly suitable for playback in a vehicle environment. Power amplifiers are included in the scope of delivery.

Headphone Distribution Amplifier

The HDA IV.2 HEADphone Distribution Amplifier can be connected directly to the XLR outputs.

A maximum of eight dynamic headphones can be connected to HDA IV.2 simultaneously and used synchronously for aurally-accurate playback. Level calibration is performed at the factory for all connected headphones to ensure that equalization and playback levels are correct.

By cascading several HDA IV.2s, the number of headphone outputs can be multiplied without sacrificing sound quality.

Other Playback Devices (Audio Sector)

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

Usage as a Windows Audio Device

playStudio can be used as a Windows audio device and behaves like a normal sound card. This eliminates the need for an additional sound card. In this mode, playStudio is available to any software and can also be used on computers that do not have the HEAD USB driver installed. However, aurally-accurate playback cannot be guaranteed in this mode.

SCOPE OF DELIVERY

› playStudio (Code 2460)
Stationary High-End Playback Unit for Listening Studios and Simulators

› CUSB V.1.5 (Code 5474-1.5)
Cable USB-C to USB-C, 1.5 m

› PS 24-60-L4 (Code 0617B)
Power supply 24 V, 60 W, LEMO 4-pin

› Manual

OPTIONAL ACCESSORIES

› CBB I.xx (Code 1175-xx)
Cable BNC <> BNC
available lengths: 0.1 m; 0.5 m; 1 m; 2 m; 3 m

› HDA IV.2 (Code 2489)
HEADphone Distribution Amplifier for 8 dynamic headphones

› Headphones with individual equalization
  » HD OP I.1 (Code 2511.1)
  Premium open dynamic headphones
  » HD OP II.1 (Code 2512.1)
  High-end open dynamic headphones
  » HD OP III.1 (Code 2513.1)
  Reference open dynamic headphones
  » HD CL I.1 (Code 2521.1)
  Premium closed dynamic headphones
  » HD CL II.1 (Code 2522.1)
  High-end closed dynamic headphones
  » HD CL III.1 (Code 2523.1)
  Reference closed dynamic headphones

› *lab*PWR I.1 (Code 3711)
HEAD*lab* supply module (max. 40 W)

› *lab*PWR I.2 (Code 3712)
HEAD*lab* supply module (max. 100 W)

› *lab*PWR I.3 (Code 3713)
HEAD*lab* supply module (max. 35 W)

› CLL X.xx (Code 3780-xx);
HEAD*lab* connection cable between module and controller
available 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; 15 m; 20 m, 25 m; 30 m; 40 m; 50 m; 60 m

› CXX II.xx (Code 5177-xx)
Cable AES/EBU XLR male 3-pin <> XLR female 3-pin
available lengths: 0.3 m; 1 m; 2.95 m; 10 m; 20 m; 30 m; 40 m

› CUSB V.xx (Code 5474-xx)
Cable USB-C to USB-C without side screw connection,
available lengths: 1 m; 1.5 m; 2 m

› CUSB IV.xx (Code 5476-xx)
Cable USB-A to USB-C with side screw connection
available lengths: 1 m; 2 m; 3 m; 5 m

› CLW II.xx (Code 9825-xx)
LWL cable (ADAT) with Toslink connectors
available lengths: 0.3 m; 1 m; 2 m; 3 m; 5 m; 10 m

› RMB IV.3 (Code 9852.1)
19" Rack Mount Bracket (1 Rack Unit) (2 pieces)

TECHNICAL DATA

GENERAL

Data acquisition / data generation connections	1 x USB-C
Communication interfaces	1 x HEAD*link*
Supply connection	LEMO 4-pin
Supply voltage	10 V_{DC} – 28 V_{DC}
Reverse polarity protection	Yes
Maximum power consumption during operation - device only	10 W
Maximum power consumption during standby	0.01 W
Maximum power consumption switched off	0.01 W
System sampling rate	32 kHz, 44.1 kHz, 48 kHz
Synchronization	external HEAD*link*, AES IN, ADAT IN, S/PDIF
Max. sampling rate	48 kHz
Cooling	Convection (without fan)
Operating temperature	-10 °C – +60 °C, +14 °F – +140 °F
Storage temperature	-20 °C – +70 °C, -4 °F – +158 °F
Dimensions (W x H x D)	327 mm x 47 mm x 188 mm
Weight	1484 g

Display

Display	OLED display
Touch capable	No
Resolution	128 x 32 pixels
Dimensions	55.02 mm x 13.10 mm

COMMUNICATION INTERFACES

USB Device

Plug connector	1 x USB-C
Number of interfaces	1
USB specification	USB 2.0
Data rate (gross)	480 Mbit/s
Electric isolation	No

HEAD*link*

Plug connector	1 x LEMO 8-pin
Number of interfaces	1
Supply voltage	10 V_{DC} – 28 V_{DC}
HEAD*link* version	HEAD*link* 1.0
Electric isolation	Yes
Synchronization	32 kHz, 44.1 kHz, 48 kHz
Maximum cable length	60 m

ANALOG OUTPUTS

Voltage

Plug connector	2 x BNC; 2 x XLR (symmetric)
Number of channels	2
Voltage ranges	max. ±12.5 V_p
Output impedance	5 Ω
DC capable	Yes
Frequency range	0 Hz – 20 kHz
Electrical isolation input/output	Yes
Electrical isolation, per channel	No
Resolution	24 bits
Equalization	Yes, playback equalization
Maximum voltage	±12.5 V_p
Nominal voltage	0.5 V_{eff}
Maximum output power per channel	0.5 W
Digital lowpass filter @ f_s = 48 kHz, proportional to f_s	24 kHz

Voltage symmetrical

Plug connector	2 x XLR 3-pin
Number of channels	2
Output impedance	50 Ω
DC capable	Yes
S/N	103 dB(A)
THD+N	-91 dB(A)
Crosstalk at 1 kHz	98 dB(A)
Electrical isolation input/output	Yes
Electrical isolation, per channel	No
Resolution	24 bits
Equalization	Yes, playback equalization
Maximum voltage	±25 V (differential)
Maximum output power per channel	0.5 W

Headphones

Plug connector	2 x jack 6.3 mm
Number of channels	2
Output impedance	5 Ω
DC capable	Yes
Frequency range	0 Hz – 20 kHz
Frequency response 20 Hz..20 kHz re 1 kHz	±0.04 dB
Digital lowpass filter @ f_s = 48 kHz, proportional to f_s	24 kHz
S/N	104 dB(A)
THD+N	-95 dB(A)
Crosstalk at 1 kHz	98 dB with 100 kΩ source impedance; 96 dB with 600 Ω source impedance
Electrical isolation, input/output	Yes
Electrical isolation, per channel	No
Resolution	24 bits
Equalization	FF, DF, ID, LIN, USR, and IIR filter
Maximum voltage	±12.5 V_p
Maximum level	21.94 dB(V)
Nominal level	-6.02 dB(V) 94 dB_{SPL}
Maximum output power per channel	1.2 W

DIGITAL INPUTS/OUTPUTS

Optical

ADAT	according to Alesis Corp.
S/PDIF	according to IEC 60958
Optical-Out synchronization	32 kHz, 44.1 kHz, 48 kHz
Optical-In synchronization	32 kHz, 44.1 kHz, 48 kHz

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