



Features

204.8 kHz maximum sampling rate

- Sampling frequencies:
 - 2.048 kHz up to 131.072 kHz @ 32.768 (2ⁿ) kHz
 - 2.75625 kHz to 176.400 kHz @ 41.1 kHz
 - 3 kHz up to 192 kHz @ 48 kHz
 - 3.2 kHz up to 204.8 kHz @ 51.2 kHz
- A common sampling rate can be set for each group of 12 channels

Dual Link

- Simultaneous connecting of *labV24 II* via *HEADlink 1* and *HEADlink 2* to a Controller or front-end for measurements with double sampling rate

Transmission protocol HEADlink 2.0

Via *labCTRL II.1* at system sampling frequencies 32.768 (2ⁿ) kHz / 48 kHz / 51.2 kHz

- Dual Link
 - Up to 24 channels with up to 32.768 kHz / 48 kHz / 51.2 kHz
 - Up to 12 channels with up to 65.536 kHz / 96 kHz / 102.4 kHz
 - Up to 6 channels with up to 131.072 kHz / 192 kHz / 204.8 kHz
- Single Link
 - Up to 24 channels with up to 16.384 kHz / 24 kHz / 25.6 kHz
 - Up to 12 channels with up to 32.768 kHz / 48 kHz / 51.2 kHz

- Up to 6 channels with up to 65.536 kHz / 96 kHz / 102.4 kHz
- Up to 3 channels with up to 131.072 kHz / 192 kHz / 204.8 kHz

Coupling

- Switchable: DC, AC, ICP, ICP-DC

Ranges

- 0.01 V, 0.1 V, 1 V, 10 V, 30 V

Favorable lower cutoff frequency

- 0.14 Hz

High input impedance

- 1 M Ω

0 Hz ICP-DC coupling from HEAD acoustics

- 0 Hz to 86.4 kHz frequency range

Connection to Controllers/front-ends from HEAD acoustics

- Via transmission protocol *HEADlink 2.0*
 - Controller *labCTRL II.1*
- Via transmission protocol *HEADlink 1.0*
 - Controller *labCTRL I.2*, *labCTRL I.1*
 - *HEADlab* high-end dual-channel data acquisition system *labHSU*
 - Compact systems *labCOMPACT12-V1*, *labCOMPACT24-V1*

DATA SHEET

labV24 II (Code 3755)

24-channel voltage/ICP input module of the 2nd *HEADlab* generation for applications with high channel numbers

Overview

labV24 II is an input module of the 2nd *HEADlab* generation. Thanks to the support of the *HEADlink 2.0* transmission protocol, the input module offers double the sampling rate with the same number of channels compared to *HEADlink 1.0*. In combination with the Controller of the 2nd *HEADlab* generation *labCTRL II.1*, *labV24 II* achieves a maximum sampling rate of 204.8 kHz.

Furthermore, the compact and rugged input module features a particularly favorable lower cutoff frequency and an input impedance of 1 M Ω .

Users can adjust their ranges flexibly between 10 mV and 30 V and are largely protected against errors in the measurement setup thanks to the overload detection and the maximum electric strength of 60 V.

In addition, *labV24 II* provides the ICP-DC coupling developed by HEAD acoustics, e.g., for measuring low-frequency signals with seismic sensors.

At the front of the input module, the interfaces are summarized in two D-Sub sockets to connect the sensors via breakout cables.

- Binaural artificial head of the latest generation HMS V
- BrakeOBSERVER frontend MMF III.0
- HEAD VISOR frontend VMA II.1

Connection of sensors

- Voltage/ICP sensors (TEDS)
- Head-shoulder unit HSU III.2
- Binaural headset BHS II
- Head microphones BHM III.3
- High-impedance voltage sources

Features

Power Supply

- Power supply by Controller/frontend via HEADlink 1
- 12.5 W power consumption

More features

- Silent (no fan)
- Rugged design
- 60 V electric strength
- Overload detection for automatic disconnection of effected channels in case of overvoltages
- Electrical isolation of the *labV24 II* inputs from the inputs of other modules of a HEADlab system and the PC interface

Filters

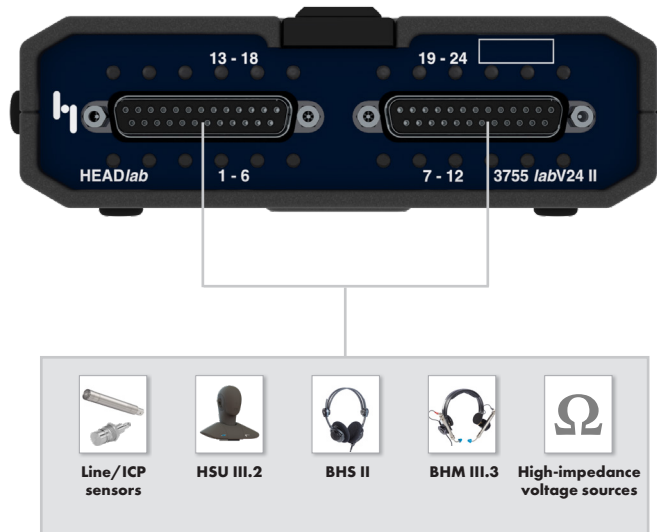
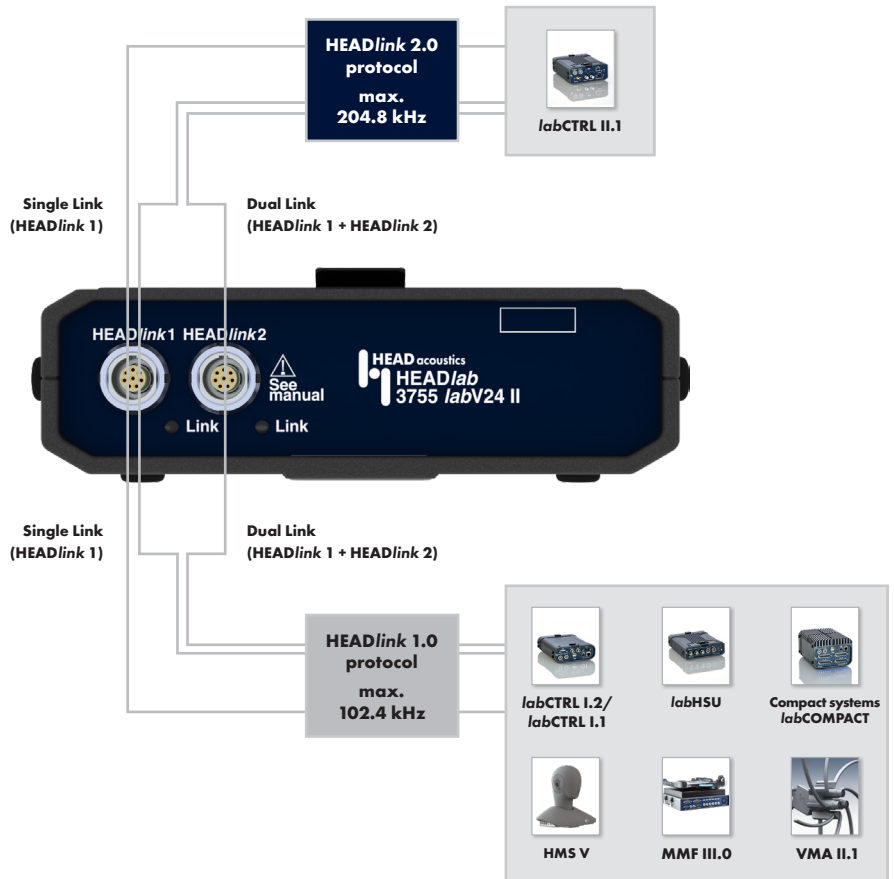
- Analog highpass filters
 - 0.14 Hz, 1st order (cannot be switched off in AC mode)
 - 22 Hz, 2nd order (switchable channel by channel)

Handling

- Integrated locking mechanism (the modules can easily be mated to a system)

HEADlab systems

- Systems with a *labCTRL II.1* Controller (and a Power Box *labPWR*)
 - Via Single Link: Connecting up to 10 *labV24 II* input modules
 - Via Dual Link: Connecting up to 5 *labV24 II* input modules
- Depending on the processing power of the PC and the network utilization, larger systems with several Controllers *labCTRL II.1* (and Power Boxes *labPWR*) can record up to 600 channels simultaneously.



Scope of supply

- *labV24 II* (Code 3755)
24-channel voltage/ICP input module of the 2nd *HEADlab* generation for applications with high channel numbers

Optional

- CDB XII-V1.xx (Code 9894-V1-xx)
Breakout cable D-Sub 25-pin ↔ 12 x BNC female (channels 1-6, 13-18)
- CDB XII-V2.xx (Code 9894-V2-xx)
Breakout cable D-Sub 25-pin ↔ 12 x BNC female (channels 7-12, 19-24)
- CDB XI-V1.xx (9893-V1.xx)
Breakout cable D-Sub 25-pin ↔ 12 x BNC male (channels 1-6, 13-18)
- CDB XI-V2.xx (9893-V2.xx)
Breakout cable D-Sub 25-pin ↔ 12 x BNC male (channels 7-12, 19-24)
- CLL X.xx (Code 3780-xx)
Cable *HEADlink*
Lemo 8-pin ↔ Lemo 8-pin
- CLB I.2 (Code 9847)
Adapter for connecting BHS II (via CDB X.1)

Technical data

General

Connectors data acquisition/data generation	24 x voltage-in/ICP-in
Communication interfaces	2 x <i>HEADlink</i>
Supply connection	<i>HEADlink</i> 1 (input)
Supply voltage	10 V _{DC} to 28 V _{DC}
Max. power consumption stand-alone operation	9.6 W
Max. power consumption with sensors connected	12.5 W
System sampling frequency 44.1 kHz	32.768 (2 ⁿ) kHz (with <i>labCTRL II.1</i>), 44.1 kHz (with <i>labHSU/HMS V</i>), 48 kHz, 51.2 kHz
Min. to max. sampling frequency @ 32.768 (2 ⁿ) kHz	2.048 kHz to 131.072 kHz
Min. to max. sampling frequency @ 44.1 kHz	2.75625 kHz to 176.400 kHz
Min. to max. sampling frequency @ 48 kHz	3 kHz to 192 kHz
Min. to max. sampling frequency @ 51.2 kHz	3.2 kHz to 204.8 kHz
Synchronization	<i>HEADlink</i>
Max. sampling frequency	204.8 kHz
Cooling	Convection, no fan
Operating temperature	-10 °C to +60 °C
Storage temperature	-20 °C to +70 °C
Dimensions	148 x 173 x 48 mm (W x D x H)
Weight	823 g

Digital *HEADlink*

Connector	2 x Lemo 8-pin
Number of interfaces	2
Supply voltage	10 V _{DC} to 28 V _{DC}
<i>HEADlink</i> version	<i>HEADlink</i> 1.0, <i>HEADlink</i> 2.0
Electrical isolation	Yes
Synchronization	32.768 (2 ⁿ) kHz, 44.1 kHz, 48 kHz, 51.2 kHz
Maximum cable length	60 m

Analog input voltage/ICP

Number of channels	24
Connector	2 x D-Sub 25-pin
Quantity	Voltage
Ranges	0.01 V _p , 0.1 V _p , 1 V _p , 10 V _p , 30 V _p
Input impedance	1000 k Ω
Frequency range	0 Hz to 86.4 kHz
Coupling	DC, AC, ICP, ICP-DC
Analog highpass filter	0.14 Hz, 1st order, $\pm 5\%$ 22 Hz, 2nd order, switchable, $\pm 5\%$
Digital highpass filter @ fs = 48 kHz, proportional to fs	0.1 Hz
Digital lowpass filter @ fs = 48 kHz, proportional to fs	21.6 kHz
Resolution	32 bit
Electrical isolation input/output	Yes
Electrical isolation channel by channel	No
Max. input voltage	60 V
TEDS (IEEE 1451.4) read	TEDS class 1, shared signal wire (version 0.9 and 1.0)
ICP voltage	22.8 V
ICP current	4 mA ($\pm 7.5\%$)
Common mode rejection	90 dB

Analog input voltage/ICP – ranges

Range	0.01 V _p	0.1 V _p	1 V _p	10 V _p	30 V _p
S/N	79 dB(A)	99 dB(A)	109 dB(A)	109 dB(A)	108 dB(A)
Crosstalk	-93 dB	-101 dB	-121 dB	-120 dB	-98 dB
THD+N	-77 dB	-87 dB	-101 dB	-103 dB	-78 dB
Dynamic 5 Hz analysis bandwidth	115 dB	135 dB	145 dB	145 dB	144 dB
Input related noise (24 kHz bandwidth)	1.2 μ V	1.2 μ V	3.6 μ V	36 μ V	120 μ V
AC accuracy @ 1 kHz	2.5%	0.4%	0.4%	0.4%	0.4%
DC accuracy	1.5%	0.25%	0.1%	0.1%	0.1%
Frequency response 20 Hz to 20 kHz @ fs = 48 kHz	+0.05 dB, -0.02 dB	+0.07 dB, -0.02 dB	+0.09 dB, -0.02 dB	+0.08 dB, -0.02 dB	+0.02 dB, -0.85 dB
Frequency response 20 Hz to 40 kHz @ fs = 96 kHz	+0.05 dB, -0.21 dB	+0.07 dB, -0.02 dB	+0.11 dB, -0.02 dB	+0.08 dB, -0.02 dB	+0.04 dB, -2.8 dB
Frequency response 20 Hz to 80 kHz @ fs = 192 kHz	+0.05 dB, -0.88 dB	+0.05 dB, -0.10 dB	+0.15 dB, -0.02 dB	+0.08 dB, -0.02 dB	+0.05 dB, -6.66 dB
Linearity 0 to 80 dB below full scale	0.34 dB	0.05 dB	0.03 dB	0.03 dB	0.03 dB
Linearity 80 to 100 dB below full scale	2.7 dB	0.35 dB	0.15 dB	0.08 dB	0.11 dB
Linearity limit (>0.5 dB deviation)	-83 dB	-108 dB	-116 dB	-115 dB	-107 dB

ICP is a registered trademark of the PCB Piezotronics Inc. Lemo is a registered trademark of the Lemo SA.