



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 @ 44.1 kHz
 - 3 kHz up to 192 kHz @ 48 kHz
 - 3.2 kHz up to 204.8 kHz @ 51.2 kHz

Transmission protocol HEADlink 2.0

Via *labCTRL II.1* with system sampling frequencies of 32.768 (2ⁿ) 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

HD wide-range input (HD mode, Dual ADC)

- 10 V range for recording signals with high dynamics

Conventional ranges

- 0.03 V, 0,3 V, 3 V, 30 V

Connection of condenser microphones

- Switchable supply voltage for impedance converter – consistent for all channels: ±60 V / ±15 V
- 200 V polarization voltage, switchable channel by channel
- Connection of TEDS-capable condenser microphones

Coupling

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

Favorable lower cutoff frequency

- 1.58 Hz

Connection to controllers/frontends

- Via transmission protocol HEADlink 2.0
 - Controller *labCTRL II.1*
- Via transmission protocol HEADlink 1.0
 - HEADlab high-end dual-channel data acquisition system *labHSU*
 - Compact systems *labCOMPACT12*, *labCOMPACT12-V1*, *labCOMPACT24*, *labCOMPACT12-V1*
 - Binaural artificial head HMS V
 - BrakeOBSERVER frontend MMF III.0
 - HEAD VISOR frontend VMA II.1
 - Controller of the first HEADlab generation

Connection of additional sensors

- Voltage/ICP sensors (TEDS)
- Binaural headset BHS II
 - Via adapter CLB I.2 and 2 x CBL X.01

DATA SHEET

labM6 II (Code 3754)

6-channel voltage/microphone input module of the second HEADlab generation with HD wide-range input (High Dynamics)

Overview

labM6 II is an input module of the second HEADlab generation. Thanks to 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 second HEADlab generation *labCTRL II.1*, *labM6 II* achieves a maximum sampling rate of 204.8 kHz.

Up to six condenser microphones can be connected directly to the *labM6 II*. The supply voltage of the impedance converter of the module can be switched between 15 V and 60 V, for using low noise microphones, for example. BNC adapters can also be connected to the LEMO sockets, which allows the use of ICP sensors (AC or DC).

All channels can be used either as HD wide-range input or conventionally with fixed measuring ranges from 30 mV to 30 V. The HD wide-range input allows to measure signals with high dynamics and strongly fluctuating levels. Adjustments of the settings due to possible overmodulations or undermodulations not necessary.

The „0 Hz ICP-DC coupling“ developed by HEAD acoustics is another highlight. It can be used to measure low-frequency signals with seismic sensors, for example.

- Head-shoulder units
 - HSU III.3
 - HSU III.2
Via Adapter CLB I.2 and 2 x CBL X.01
 - HSU III

Features

0 Hz ICP-DC coupling from HEAD acoustics

- 0 Hz to 86.4 kHz frequency range

Power Supply

- Power supply by controller/frontend via HEADlink
- Power consumption: 12 W

Analog highpass filters

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

More features

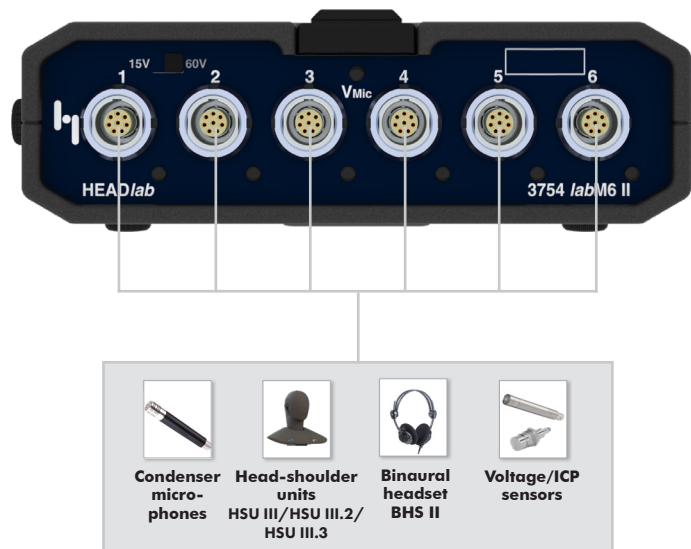
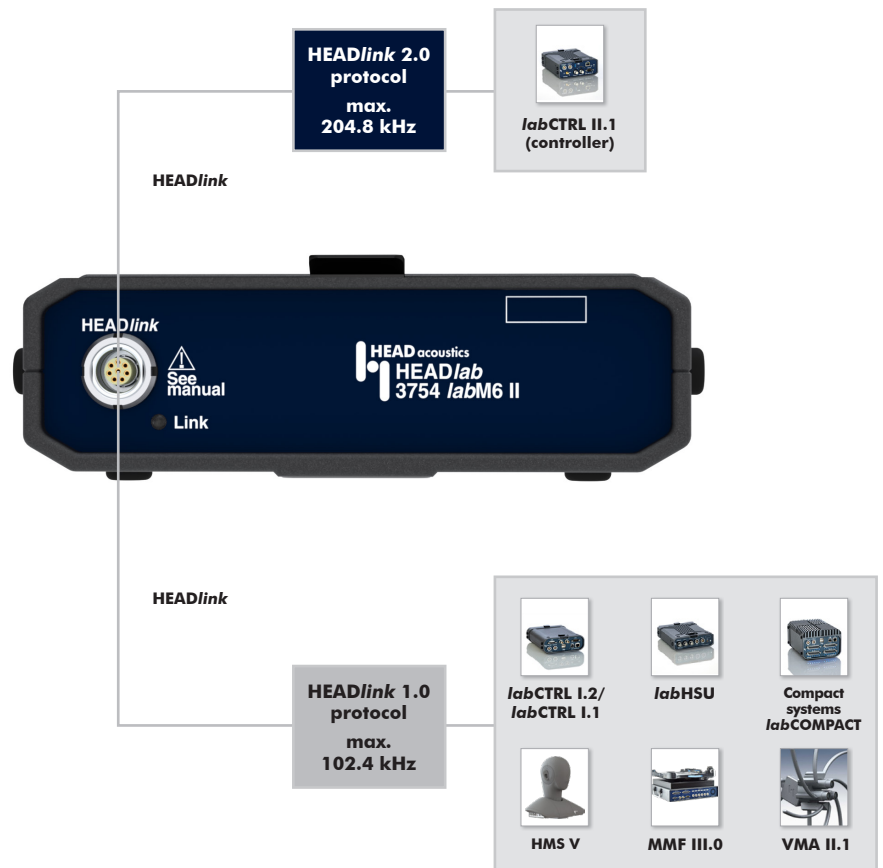
- Silent (no fan)
- Rugged design
- 60 V electric strength
- Overload detection for automatic disconnection of effected channels in case of overvoltage
- Electrical isolation of the inputs from the inputs of other HEADlab modules and the PC interface

Handling

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

HEADlab systems

- Systems with a *labCTRL II.1* controller (and a *labPWR* Power Box) can be equipped with up to 10 input modules *labM6 II*
- Depending on the processing power of the PC and the network utilization, larger systems with several controllers *labCTRL II.1* (and *labPWR* Power Boxes) can record up to 600 channels simultaneously



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

Scope of supply

- *labM6 II* (Code 3754)
6-channel voltage/microphone input module of the second *HEADlab* generation with HD wide-range input (High Dynamics)

Optional

- CBL X.01 (Code 3791-01)
Adapter 7-pin LEMO ↔ BNC, 0,1 m
- CLB I.2 (Code 9847)
Adapter for connecting BHS II and HSU III.2
- CLL X.xx (Code 3780-xx)
Cable *HEADlink*
LEMO 8-pin ↔ LEMO 8-pin
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

Technical data

General

Connectors data acquisition/data generation	6 x voltage in/mic in
Communication interfaces	1 x <i>HEADlink</i>
Connections via adapters or adapter cables	6 x voltage/ICP in with adapter CBL X.01
Supply connection	<i>HEADlink</i>
Power supply	10 V _{DC} to 28 V _{DC}
Max. power consumption stand-alone operation	7 W
Max. power consumption with sensors connected	12 W
System sampling frequency	32.768 (2 ⁿ) kHz, 44.1 kHz, 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 mm x 173 mm x 48 mm (W x D x H)
Weight	758 g

Digital *HEADlink*

Connectors	1 x LEMO 8-pin
Number of interfaces	1
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/mic

Connectors	6 x LEMO 7-pin
Number of channels	6
Quantity	Voltage
Ranges	0.03 V _p , 0.3 V _p , 3 V _p , 30 V _p
Ranges HD mode	10 V _p
Input impedance	100 kΩ
Frequency range	0 Hz to 86.4 kHz
Coupling	DC, AC, ICP, ICP-DC
Analog highpass filter	1.58 Hz, 1st order, ±5 % 22 Hz, 2nd order, switchable, ±5 %
Digital highpass filter @ f _s = 48 kHz, proportional to f _s	1 Hz
Digital lowpass filter @ f _s = 48 kHz, proportional to f _s	21.6 kHz
Resolution	32 bit
Electrical isolation input/output	Yes
Max. input voltage	60 V
Microphone voltage switchable	±15 V ±60 V
Microphone current	10 mA @ ±15 V 3.5 mA @ ±60 V
Polarization voltage	200 V
Polarization current	0.2 mA
TEDS (IEEE 1451.4) read	TEDS class 1, shared return wire (version 0.9 and 1.0)
Common mode rejection	90 dB

Analog input voltage/ICP

Connectors	6 x BNC with adapter CBL X.01
Number of channels	6
Quantity	Voltage
Ranges	0.03 V _p , 0.3 V _p , 3 V _p , 30 V _p
Ranges HD mode	10 V _p
Input impedance	100 kΩ
Frequency range	0 Hz to 86.4 kHz
Coupling	DC, AC, ICP, ICP-DC
Analog highpass filter	1.58 Hz, 1st order, ±5 % 22 Hz, 2nd order, switchable, ±5 %
Digital highpass filter @ f _s = 48 kHz, proportional to f _s	1 Hz
Digital lowpass filter @ f _s = 48 kHz, proportional to f _s	21.6 kHz
Resolution	32 bit
Electrical isolation input/output	Yes
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 (±7.5%)
Common mode rejection	90 dB

Analog input voltage/mic – ranges¹

Range	0.03 V _p	0.3 V _p	3 V _p	30 V _p	10 V _p (HD)
S/N	94 dB(A)	108 dB(A)	109 dB(A)	108 dB(A)	136 dB(A)
Crosstalk	-114 dB	-127 dB	-132 dB	-127 dB	-127 dB
THD+N	-90 dB	-101 dB	-102 dB	-90 dB	-99 dB
Dynamic 5 Hz analysis bandwidth	131 dB	145 dB	146 dB	145 dB	173 dB
Input related noise (24 kHz bandwidth)	0.42 μ V	0.84 μ V	7.53 μ V	84.45 μ V	1.12 μ V
DC accuracy	1.5 %	0.25 %	0.15 %	0.1 %	0.1 %
AC accuracy @ 1 kHz	1.5 %	1.1 %	1.1 %	0.4 %	0.4 %
Frequency response 20 Hz to 20 kHz @ fs = 48 kHz	+0.05 dB, -0.05 dB	+0.05 dB, -0.05 dB	+0.07 dB, -0.05 dB	+0.06 dB, -0.05 dB	+0.06 dB, -0.05 dB
Frequency response 20 Hz to 40 kHz @ fs = 96 kHz	+0.02 dB, -0.05 dB	+0.05 dB, -0.05 dB	+0.07 dB, -0.05 dB	+0.05 dB, -0.05 dB	+0.05 dB, -0.05 dB
Frequency response 20 Hz to 80 kHz @ fs = 192 kHz	+0.02 dB, -0.28 dB	+0.02 dB, -0.05 dB	+0.07 dB, -0.05 dB	+0.02 dB, -0.05 dB	+0.02 dB, -0.05 dB
Linearity 0 to 80 dB below full scale	0.08 dB	0.04 dB	0.03 dB	0.04 dB	0.02 dB
Linearity 80 to 100 dB below full scale	0.6 dB	0.15 dB	0.13 dB	0.1 dB	0.13 dB

¹ Valid for: ambient temperature 23 °C/73 °F (\pm 3 °C/37 °F), operating duration \geq 1 h. Vibration excitation can cause deviation.