

**labV6HD (Code 3728)**

6-channel line/ICP input module with high-dynamic input range



**Overview**

labV6HD is a 6-channel Line/ICP module, which allows all channels to be used either as high-dynamic wide-range inputs or conventionally with fixed measuring ranges from 10 mV to 30 V.

This provides the option to record signals with a high dynamic range too. The wide-range inputs do not require adjustments due to possible undermodulations or signal clipping even with strongly fluctuating levels. This makes it possible, for example, to record engine run-ups with level ranges differing over time without the need to change the recording level settings.

Microphones, acceleration sensors, and other ICP sensors can be connected to labV6HD. Furthermore, the high input impedance also allows the use of high-impedance voltage sources.

Another labV6HD highlight is the "0 Hz ICP/DC coupling" developed by HEAD acoustics, which allows ICP measurements from 0 Hz to 45 kHz. For example, users are allowed to connect seismic ICP sensors for measuring extremely low-frequency signals.

**Features**

- Input module with 6 Line/ICP channels, a high-dynamic input range, and „0 Hz ICP/DC Coupling“

**High-dynamic input range**  
(HD Mode, Dual ADC)

- A single measuring range for recording high dynamic signals
  - for example, run-up measurements with level ranges differing over time or with fluctuating signal levels

**Fixed measuring ranges**

- 10 mV / 100 mV / 1 V / 10 V
- 30 V (high-mode measuring range)

**„0 Hz ICP/DC Coupling“  
from HEAD acoustics**

- ICP/DC coupling:  
0 Hz to 22 kHz or 45 kHz
- Connecting ICP sensors for measuring very low-frequency signals, e.g. with seismic ICP sensors

**Connections to front ends from HEAD acoustics**

- labCTRL I.2 (HEADlab controller)
- labCOMPACT12 / labCOMPACT24 (compact systems)
- SQuadriga III
- MMF III.0 / MMF III.0-V1 (BrakeOBSERVER front ends)
- VFE II.1 / VMA II.1 / VMA III.0 (HEAD VISOR arrays)

**Connections for sensors**

- Line/ICP sensors
  - Microphones, pulse sensors etc.
  - Charge, temperature, pressure sensors etc.
  - High-impedance voltage sources
- ICP switchable for AC/DC coupling
- TEDS sensors
- Binaural headset BHS II (via adapter CLB I.2)

**Functions**

- Input impedance: 1 MOhm
- 24 bit data with high phase accuracy
- Sampling frequency up to 96 kHz (3 channels)
- 7 W power consumption
- Electrical isolation of the labV6HD inputs to the inputs of other HEADlab modules and the PC interface

**Filters**

- Analog high-pass filter 0.16 Hz, 1. order, not switchable in AC mode
- Analog high-pass filter (switchable): 22 Hz, 2nd order

## Scope of supply

- *labV6HD* (Code 3728)  
6-channel Line/ICP input module  
with high-dynamic input range

## Optional

- CLL X.xx (Code 3780-xx)  
Cable *HEADlink*  
LEMO 8-pin ↔ LEMO 8-pin  
[*labV6HD* ↔ *labCTRL 1.2*]
- *labCTRL 1.2* (Code 3702)  
LAN / USB controller
- BHS II (Code 3322)  
Binaural headset (recordings)
- CLB 1.2 (Code 9847)  
Adapter for connecting BHS II to  
*labV6HD*

## Technical data

### General

Number of channels:	6
Sampling frequencies (Fs):	2, 3, 4, 6, 8, 12, 24, 48, 96 kHz (3 channels at 96 kHz); depending on the system sampling rate, for each module one individual sampling rate can be adjusted
Coupling:	DC, AC, ICP, ICP-DC
Power supply:	10 V to 28 V
ICP voltage supply:	22.4 V (max. 23 V)
ICP current supply:	4 mA (±20 %)
Electric strength:	Max. ±35 V
Resolution:	24 bit
Frequency range:	0 Hz to 22 kHz at $F_s = 48$ kHz 0 Hz to 45 kHz at $F_s = 96$ kHz
Input impedance:	1 MOhm
Power consumption:	7 W, at 23 °C (73.4 °F)
Maximum cable length to the controller:	60 m (2362") (with cable CLL X)
Cooling:	Convection, no fan
Dimensions incl. BNC connectors: incl. locking mechanism and rubber pads:	140 x 180 x 42 mm (WxDxH) (5.5" x 7.1" x 1.6") 148 x 180 x 48 mm (WxDxH) (5.8" x 7.1" x 1.9")
Weight:	650 g (1.4 lb)
Operating temperature:	-10 °C to 60 °C (14 °F to 140 °F)
Storage temperature:	-20 °C to 70 °C (-4 °F to 158 °F)

### Dynamic range

There is no standardized definition of „dynamic range“.

Therefore, the **Signal to Noise Ratio** (SNR or S/N) value is given as a value for all *HEADlab* modules. This based on the level of a sinusoidal tone with maximum modulation in relation to the full relevant bandwidth noise floor level of the system, measured with the entire relevant frequency range.

Sometimes in the literature the term „**dynamic range**“ is used identically to the S/N, but this „dynamic range“ value is often based on a narrow-band calculation of the inherent noise.

Depending on the analysis bandwidth, the *labV6HD* will then have a much higher „dynamic range“ value.

## Line/ICP inputs

Number of channels:	6 x BNC					
	HD Mode					
Ranges (AC/DC, inputs are TEDS-compliant):	$\pm 10 \text{ mV}_{\text{PEAK}}$	$\pm 100 \text{ mV}_{\text{PEAK}}$	$\pm 1 \text{ V}_{\text{PEAK}}$	$\pm 10 \text{ V}_{\text{PEAK}}$	$\pm 30 \text{ V}_{\text{PEAK}}$	$\pm 10 \text{ V}_{\text{PEAK}}$
S/N, at 23 °C, $F_s = 48 \text{ kHz}$ , termination $50 \Omega$ , 20 Hz to 20 kHz incl. 0.16 Hz filter in AC mode:	82.5 dB(A)	101 dB(A)	110,5 dB(A)	110 dB(A)	96 dB(A)	133 dB(A)
Dynamic range (5 Hz analysis bandwidth):	117.5 dB	136 dB	145.5 dB	145 dB	131 dB	168 dB
Inherent noise signal level, at 23 °C, $F_s = 48 \text{ kHz}$ , termination $50 \Omega$ , 20 Hz to 20 kHz incl. 0.16 Hz filter in AC mode <300 mV: $\geq 300 \text{ mV}$ :						-116 dBV(A) -93 dBV(A)
THD+N, at 23 °C, $F_s = 48 \text{ kHz}$ , signal 1 kHz, 50 % level, 20 Hz to 20 kHz incl. 0.16 Hz filter in AC mode:	-73 dB(A)	-93 dB(A)	-98 dB(A)	-97 dB(A)	-82 dB(A)	-97 dB(A)
Crosstalk measurement, at 23 °C, $F_s = 48 \text{ kHz}$ , termination $75 \Omega$ , signal 1 kHz, 50 % level:	>99 dB(A)	>120 dB(A)	>130 dB(A)	>130 dB(A)	>119 dB(A)	>130 dB(A)
Frequency response (accuracy final value), at 23 °C, $F_s = 48 \text{ kHz}$ , 50 % level, 20 Hz to 20 kHz incl. 0.16 Hz filter in AC mode: Tolerance:	<0.13 dB 1.5 %	<0.052 dB 0.6 %	<0.052 dB 0.6 %	<0.052 dB 0.6 %	<0.07 dB 0.6 %	<0.045 dB 0.5 %
DC accuracy, at 23 °C, $F_s = 48 \text{ kHz}$ , 50 % level: Tolerance:	<0.13 dB 1.5 %	<0.017 dB 0.2 %	<0.009 dB 0.1 %	<0.009 dB 0.1 %	<0.009 dB 0.1 %	<0.009 dB 0.2 %
Filters (analog) HP filter (not defeatable in AC mode): HP filter 2nd order (switchable):	0.16 Hz 22 Hz					
Filter (digital) HP filter:	In proportion to the sampling rate: 1 Hz ( $F_s = 48 \text{ kHz}$ ) (0.5 Hz ( $F_s = 24 \text{ kHz}$ ), 0.25 Hz ( $F_s = 12 \text{ kHz}$ ), ...)					
TEDS (IEEE 1451.4), read:	TEDS class 1, shared signal wire (version 0.9 and 1.0)					

## HEADlink (HEAD acoustics standard)

Controlling/data transfer via controller:	LEMO 8-pin
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