



Code 3700

HEADlab Overview

Modular multi-channel frontend system for mobile data acquisition for sound and vibration measurements.

OVERVIEW

HEADlab

Code 3700

HEADlab is a second-generation, modular, high-quality data acquisition system that includes controllers, input and playback modules, supply modules (rechargeable battery), and extensive accessories.

A wide range of controllers and modules is available for multiple applications. HEADlab systems may comprise several hundred channels and allow sampling rates of 2.048 kHz up to 204.8 kHz. Thanks to the integrated locking mechanism, the modules can be connected to form rugged units and easily separated again.

Both the setup and operation are very simple and intuitive, thus enabling even beginners to use HEADlab systems successfully.



KEY FEATURES

- › Flexible connection of the HEADlab hardware to form sub-sample-accurately (typ. $<1 \mu\text{s}$) synchronized systems with several hundred channels
- › Connection of binaural sensors, headsets, RPM, pressure, charge, temperature sensors, measurement bridges, ICP and condenser microphones, ...
- › Acquisition of CAN FD, CAN and OBD-2 (incl. WWH-OBD), as well as FlexRay signals
- › Sampling rates from 2.048 kHz to 204.8 kHz
- › Wide-range input (HD mode, Dual ADC)
- › Synchronization of multiple HEADlab systems via HEADlink, navigation satellite systems, or PTP (Precision Time Protocol)
- › Stand-alone measurements with labHSU or labSAR (industrial PC, web interface) and controller
- › Supply modules (rechargeable battery) for independent power supply for several hours
- › Simple and intuitive operation using the ArtemiS SUITE software or the web interface of labHSU and labSAR
- › Extensive accessories for reliable measurements in almost all environments
- › Further modules are in preparation to expand the product family

APPLICATIONS

- › Sound and vibration analysis
- › Troubleshooting
- › Sound Engineering
- › Quality assurance
- › Acoustic environmental protection

DETAILS

HEADlab systems can be individually customized to include controllers, input, playback, and power supply modules, as well as other accessories.

Controller

A powerful controller is the centerpiece of a HEADlab system. It ensures sub-sample-accurate data concentration and synchronization, supplies the input modules with power, and establishes the connection to the computer (or to the *labSAR* industrial PC) via USB or LAN.

With 10 *labV24 II* input modules connected, a *labCTRL II.1* controller enables measurements with a maximum of 240 channels at a sampling rate of 24 kHz or a maximum of 30 channels at a sampling rate of 204.8 kHz.

Several controllers can be connected to a computer via USB or LAN to form a sub-sample-accurately synchronized HEADlab system. Via LAN, the number of controllers used and the external channels depend on both the capacity of the network and the computing power of the computer. Using a standard computer, several hundred channels can be recorded at sampling rates from 2.048 kHz to 204.8 kHz.

Modules

The high-quality input modules are connected directly to a Controller via HEADlink. With Dual Link (the connection between the *labCTRL II.1* controller and the input module is established using two HEADlink cables), measurements with twice the number of channels (compared to Single Link) can be performed at sampling rates \geq system sampling rate.

Various playback modules are available for aurally-accurate playback of binaural recordings using equalized headphones, subwoofers, etc. from HEAD acoustics that can also be connected to larger, synchronized playback systems for listening studios, for example.

Depending on the configuration, the rugged and noiseless power supply modules supply HEADlab modules without an external power supply for several hours.

HEADlink 2.0 Transmission Protocol



The second generation is characterized in particular by the HEADlink 2.0 transmission protocol which allows twice the sampling rate with the same number of channels at a maximum of 204.8 kHz compared to the first-generation HEADlink 1.0 transmission protocol (with a maximum of 102.4 kHz).

In addition to the second-generation controllers – *labCTRL II.1*, *labCOMPACT12 II*, and *labCOMPACT24 II* – there are various input modules available. For example, *labV24 II* provides 24 channels, flexibly adjustable measurement ranges between 10 mV and 30 V, a favorable lower cut-off frequency of 0.14 Hz, a 1 M Ω input impedance, and many other outstanding features.

First-generation controllers and input modules can be combined with second-generation controllers and input modules. In mixed mode, the protocol to be used is negotiated for each HEADlink connection.

Synchronized HEADlab Systems

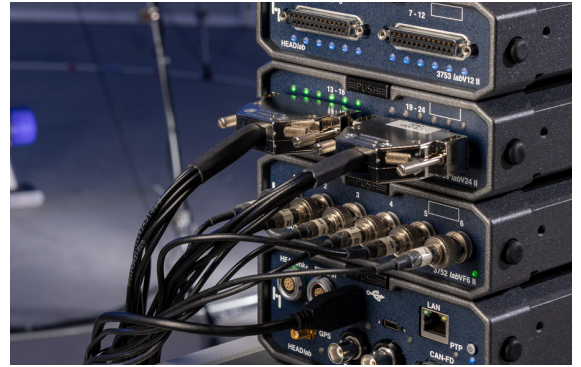
Individual HEADlab systems with multiple controllers and several hundred channels (the number of channels being limited only by the capacity of the network and the computing power of the computer) can be set up in no time. Various options are available to synchronize the interconnected or networked controllers including all connected input modules with sub-sample accuracy.

Measurements With HEADlink

- › Any controller used in a system is connected to the next controller via HEADlink.

Measurements Without HEADlink – With Spatially Separated Controllers, for example

- › Via time signal of a navigation satellite system (only with *labCTRL II.1* controller)
The measurements can be subsequently synchronized via the time stamp using the integrated receiver of the navigation satellite system, e.g., the GPS signal.
- › Via PTP (Precision Time Protocol)
(with the *labCTRL II.1*, *labCOMPACT 12 II*, and *labCOMPACT 24 II* controllers; the measurement network requires PTP-capable hardware)
The measurements can be synchronized using PTP for Ethernet. This applies to both the control with ArtemiS SUITE and the *labSAR I.1* web interface.



Stand-alone Measurements

labSAR

labSAR enables stand-alone measurements with HEADlab systems even in difficult environments, e.g., on test benches and production lines, in automated quality tests (e.g., EoL), long-term monitoring in the field of acoustics environmental protection, etc. With *labSAR*, measurements can also be remotely controlled manually via smartphone, tablet, or computer.

- › Switching the rugged *labSAR I.1* on and off via the power supply (protected IoT operating system)
- › Interfaces: USB, LAN, WLAN
- › Connecting a maximum of four controllers via USB (and HEADlink)
- › The number of the controllers that can be connected to *labSAR* via LAN depends on the performance of the network technology used, the number of connected modules, and the sampling rates used
- › LAN switch device for synchronizing multiple HEADlab systems via PTP (Precision Time Protocol)
- › External SSD storage device (1 TB or 2 TB)
- › Wireless control of *labSAR* systems via web interface using a smartphone, tablet, or computer
- › Multi-client measurements (using *labCTRL II.1* as of firmware version 1.2) with other computers and Recorders of ArtemiS SUITE (or *labSAR* systems) for monitoring, back-ups, ...

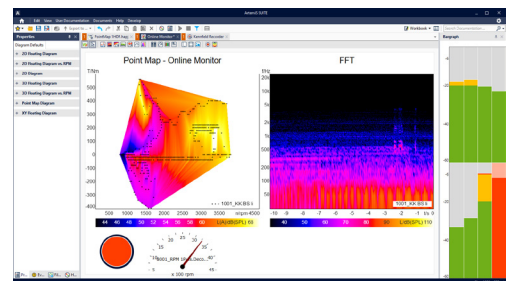
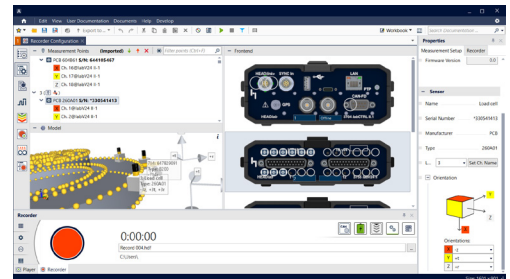


Software – Data Acquisition and Configuration

Recorder of ArtemiS SUITE

The Recorder of ArtemiS SUITE is characterized by its task-oriented, clearly structured user interface and ease of use. Take, for example, the visual representation of the measurement chain that enables the entire measurement system to be configured intuitively via drag-and-drop and by using the Properties tool window. This and other functions enable even inexperienced users to safely perform their measurements.

- › Fast system configuration
 - › Assistance functions for automatic sensor calibration, TEDS queries, channel leveling, ...
 - › Offline frontends for virtual configuration of the measurement equipment
 - › Extensive, individually expandable Sensor Libraries
- › Transparent measurement setup
 - › 3D grid model for visualizing measurement points for easy configuration
 - › Connecting the sensors to the input modules and measurement points of the 3D grid model via drag-and-drop
 - › Fast and easy sensor alignment
- › Individually adjustable triggers (start, stop, pre, post, ...)
- › Direct online monitoring
 - › Online control of incoming signals
 - › 2D and 3D analyses (various diagrams: Point Map, XY Floating, ...), tachometer, single values, level meter, ...
- › Effective decoding
 - › Easy signal decoding: CAN FD, CAN, OBD-2 (incl. WWH-OBD), FlexRay, navigation satellite systems, RPM, and Resolvers
- › Flexible Flow Control for recurring tasks, ...
 - › Programming skills are not required
- › Hands-on User Documentation for effective reporting, ...

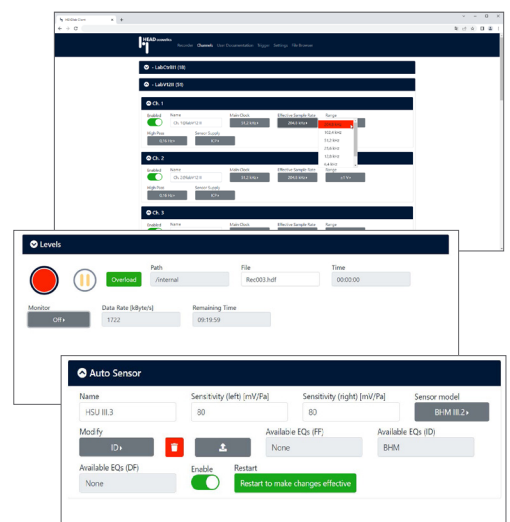


Browser-Based User Interface

Users have the option of operating *labCTRL* II.1 (in combination with *labSAR* I.1) and *labHSU* via the browser-based user interface or via WLAN using a smartphone or tablet (a network connection is required).

The Recorder of ArtemiS SUITE is not required.

- › Clear display of all channels in the configurable channel list
- › Easy-to-use Recorder
- › Predefinition of sensor configurations, triggers, and User Documentations up to complete Recorder Configurations in ArtemiS SUITE for import via the web interface
- › Presets for varying measurement tasks



Supported Sensors / Devices

	labCTRL II.1	labCOMPACT12 II	labCOMPACT24 II	labVVF6 II	labV12 II	labV24 II	labM6 II	labV8x3-Iso II	labV12-O4 II	labHSU	labV6HD	labCF6	labT6	labSG6	labDX	labHRT6	labP2	labP2-V1	labO2	labO2-V1
HEADlab Modules	10	1	1							1										
Sensors																				
Voltage / IEPE/ICP (TEDS)		12	24	6	12	24	6	8	12	2	6	6								
Voltage / Microphone (Supply for impedance converter, switchable polarization voltage)							6			2										
RPM	2									1					2	6				
Thermocouples (types K and RTD)													6							
Measuring bridges (resistive, DC, full, half, and quarter bridges)														6						
Charge												6								
BUS Data																				
CAN (CAN FD, CAN, OBD-2, WWH-OBD)	2														2					
FlexRay															1					
Miscellaneous																				
Configurable power supply for sensors							✓							✓						
Electrical isolation (of the inputs from each other)								✓ ¹					✓	✓						
Navigation satellite system receiver	✓														✓					
Excitation																				
Shakers									4										2	2
Binaural Measurements																				
HMS V	✓	✓	✓							✓										
HSU III.2		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓								
HSU III.3							✓			✓										
BHM III.3		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓								
BHS II		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓								
Playback																				
Headphones										1							2	2		1
Subwoofer																			2	2

¹ Electrical isolation per triax sensor

HEADlab Overview

Controller

labCTRL II.1 (Code 3704)

High-Performance Controller

labCTRL II.1 is the second-generation controller that enables measurements with a maximum of 240 channels thanks to 10 HEADlink interfaces. With Dual Link measurements, 120 channels are possible. When connected to a computer with ArtemiS SUITE installed, labCTRL II.1 can also be used in larger HEADlab systems and connected to several controllers. In addition, labCTRL II.1 can be used stand-alone in combination with the labSAR I.1 industrial PC and controlled wirelessly with a smartphone or tablet using a web interface.



- › HEADlink 2.0
- › Sampling rates from 2.048 kHz to 204.8 kHz
- › USB or LAN connection to the computer
- › Connection of up to 10 input modules
- › Formation of larger, synchronized HEADlab systems with multiple controllers
- › Dual Link connection to labV12 II, labV24 II, labV12-O4 II, and labV8x3-Iso II
- › Navigation satellite system receiver, configurable pulse inputs, CAN FD interface with programmable termination
- › Auto-On function for switching on a HEADlab system remotely
- › Sub-sample accurate synchronization of several HEADlab systems
- › Multi-client measurements using several HEADlab systems for monitoring a measurement, for back-ups, ...
- › Power supply to connected input modules

labCOMPACT12 II (Code 31020) / labCOMPACT24 II (Code 31021)

Cost-Effective Controllers (Compact Systems)

labCOMPACT12 II and labCOMPACT24 II are compact systems that combine the basic functions of a labCTRL II.1 controller and those of a labV12 II 12-channel or labV24 II 24-channel input module in one handy device. This enables cost-effective solutions that can be expanded with an additional input module and other compact systems and controllers.



labCOMPACT12 II: Connection of 12 voltage and IEPE/ICP sensors (TEDS)

labCOMPACT24 II: Connection of 24 voltage and IEPE/ICP sensors (TEDS)

- › HEADlink 2.0
- › Sampling rates from 2.048 kHz to 204.8 kHz
- › USB/LAN connection to the computer
- › Controller mode
- › Formation of larger, synchronized HEADlab systems with multiple controllers
- › Direct connection of a HEADlab input module
- › Control with ArtemiS SUITE
- › Flexible measurement ranges between 10 mV and 30 V
- › High signal-to-noise ratio of 109 dB(A)
- › 0.14 Hz lower cut-off frequency
- › 1 MΩ input impedance
- › Power supply to the connected input module



Input Modules

labVF6 II (Code 3752)

6 Channels for Voltage and IEPE/ICP Sensors (TEDS)



- › HEADlink 2.0
- › Sampling rates up to 204.8 kHz
- › Flexible measurement ranges between 10 mV and 30 V
- › Analog highpass and lowpass filters
- › 60 V electric strength
- › 0.14 Hz lower cut-off frequency
- › 1 M Ω input impedance
- › Switchable coupling: DC, AC, ICP, ICP-DC

labV12 II (Code 3753)

12 Channels for Voltage and IEPE/ICP Sensors (TEDS)



- › HEADlink 2.0
- › Sampling rates up to 204.8 kHz
- › Dual Link
- › Flexible measurement ranges between 10 mV and 30 V
- › 60 V electric strength
- › 0.14 Hz lower cut-off frequency
- › 1 M Ω input impedance
- › Switchable coupling: DC, AC, ICP, ICP-DC

labV24 II (Code 3755)

24 Channels for Voltage and IEPE/ICP Sensors (TEDS)



- › HEADlink 2.0
- › Sampling rates up to 204.8 kHz
- › Dual Link
- › Flexible measurement ranges between 10 mV and 30 V
- › 60 V electric strength
- › 0.14 Hz lower cut-off frequency
- › 1 M Ω input impedance
- › Switchable coupling: DC, AC, ICP, ICP-DC

labM6 II (Code 3754)

6 Channels for Condenser Microphones, Voltage and IEPE-/ICP Sensors (TEDS)



- › HEADlink 2.0
- › Sampling rates up to 204.8 kHz
- › 10 V wide-range input (HD mode, Dual ADC technology) for measurement signals with high dynamic ranges and strongly fluctuating levels
- › Conventional measurement ranges between 30 mV and 30 V
- › 15 V or 60 V supply voltage of the impedance converter of the module
- › 200 V polarization voltage, switchable per channel
- › 1.58 Hz lower cut-off frequency
- › Switchable coupling: DC, AC, ICP, ICP-DC

labV8x3-Iso II (Code 3756)

24 Channels for 8 Triax Accelerometers



- › HEADlink 2.0
- › Sampling rates up to 204.8 kHz
- › Dual Link
- › Data acquisition with high numbers of channels for universal measurements, modal analyses, etc.
- › Direct connection (8x Microtech) of common triax acceleration sensors (IEPE/ICP)
- › Electrical isolation of the triax inputs from each other and also from the digital HEADlink interfaces

labV12-O4 II (Code 3759)

4 Output Channels for Shakers and 12 Input Channels for Voltage and IEPE/ICP Sensors (TEDS)



- › HEADlink 2.0
- › Sampling rates up to 204.8 kHz
- › Dual Link
- › Simultaneous excitation of a structure using 4 shakers and measurement of 12 responses for modal analyses etc.
- › 4 outputs for shaker excitation
 - › Direct connection of the shaker amplifiers to the BNC sockets
 - › Low, flat output impedance covering the entire frequency range: 6 Ω
- › 12 inputs for triax and other sensors
 - › Flexible measurement ranges between 0.01 V_p and 30 V_p
 - › 1 M Ω input impedance
- › Additional manual control of the outputs (Out Control switch)

labHSU (Code 3710)

2 Channels for Artificial Heads and Other Binaural Measurement Systems as well as Conventional Sensors and Headphones



- › HEADlink 2.0 (as of firmware 2.1)
- › Sampling rates up to 204.8 kHz
- › Frontend for connecting artificial heads (HSU III.2, HSU III.3, HMS V, HMS IV) and other binaural measurement systems (BHM III.3, BHS II), IEPE/ICP and pulse sensors, condenser microphones
- › Three operation modes available: Stand-alone mode, controller mode, and module mode
- › Stand-alone mode (the "stand-alone recording" tool pack is required)
 - › Usage without a computer only via smartphone or tablet
 - › Operation by means of a browser-based user interface
 - › Recording equalization directly on labHSU
 - › Storing of the measurement data directly on labHSU (64 GB storage) or USB stick
- › Wide-range input to avoid overloads
- › Extremely high dynamic range of 174 dB thanks to Dual ADC technology
- › Auto-On function for switching on labHSU remotely
- › Aurally-accurate, equalized playback using headphones from HEAD acoustics
- › Basic functions of a controller (controller mode)
- › Connection of an additional input module in controller mode
- › Power supply to the input module connected

labV6HD (Code 3728)

6 Channels for Analog and IEPE/ICP Sensors with Wide-Range Input



- › HEADlink 1.0
- › Sampling rates up to 102.4 kHz
- › 10 V HD wide-range input (HD mode, Dual ADC technology) for signals with high dynamic ranges, e.g., run-up measurements with level ranges differing over time or fluctuating signal levels
- › Flexible measurement ranges between 10 mV and 30 V
- › 30 V high-mode measurement range
- › Extremely high dynamic range of 168 dB (Dual ADC technology)
- › Analog highpass filters
- › 1 M Ω input impedance
- › 0 Hz ICP-DC coupling from HEAD acoustics

labCF6 (Code 3725)

6 Channels for Charge or IEPE/ICP Sensors



- › HEADlink 1.0
- › Sampling rates up to 102.4 kHz
- › Charge or ICP mode adjustable per channel
- › Charge mode
 - › Charge amplifier for charge sensors (individually shielded)
 - › Measurement ranges adjustable per channel: 10 pC, 100 pC, 1 nC, 10 nC, 100 nC, 1 μ C
- › ICP mode
 - › ICP switchable for AC/DC coupling
 - › Measurement ranges adjustable per channel: 10 mV, 100 mV, 1 V, 10 V, 30 V
- › Peak detector function (for each channel)
- › Charge overload function (e.g., when connecting mismatched sensors)
- › 0 Hz ICP-DC coupling from HEAD acoustics

labT6 (Code 3726)

6 Channels for Thermocouples Type K or RTD



- › HEADlink 1.0
- › Sampling rates up to 100 Hz
- › Selectable per channel: thermocouple type K or RTD (PT100, PT1000)
- › Cold Junction Compensation for each channel (in thermocouple mode)
- › Module equipped with measurement curve linearization function
- › Automatic detection of defect cables or thermocouples
- › Maximum sampling rate 100 Hz
- › >500 k Ω input impedance
- › Electrical isolation per channel

labSG6 (Code 3727)

6 Channels for Resistive Measuring Bridges (Strain Gauges) or Sensors with Symmetric or Asymmetric Outputs and Unipolar or Bipolar Supply



- › HEADlink 1.0
- › Sampling rates up to 51.2 kHz
- › Connection of full, half, and quarter bridges: 120 Ω , 350 Ω , 750 Ω , and 1000 Ω
- › Connection of sensors with output signals, e.g., 0 V to 5 V, ± 5 V, 0 V to 10 V, ± 10 V, 0 mA to 20 mA 3-wire, 4 mA to 20 mA 2-wire, 4 mA to 20 mA 3-wire
- › Auto-Zero function for automatic bridge balancing
- › Shunt calibration of measuring bridges
- › Power supply to sensors or measuring bridges adjustable per channel

labDX (Code 3741)

6 Channels for RPM, CAN FD, CAN, OBD, FlexRay, HMS IV, HMS III, Navigation Satellite Systems



- › HEADlink 1.0
- › CAN FD, CAN, OBD-2, and FlexRay
- › Two pulse inputs, separately configurable for
 - › a high maximum pulse rate without signal conditioning
 - › a low maximum pulse rate with signal conditioning and offset compensation
- › Connection of an HMS IV or HMS III artificial head (no longer available)
- › Connection of a navigation satellite system receiver

labHRT6 (Code 3743)

6 Channels for High-Resolution Measurement of Rotational Speeds



- › HEADlink 1.0
- › Two operation modes: pulse sampling or pulse duration
- › Measurement inputs in single-ended or differential mode
- › Switchable termination in differential mode
- › Switchable pull-up resistor in single-ended mode
- › Adjustable power supply to the sensors
- › Bundling of several input channels for a maximum sampling of 6.9 MHz
- › Edge detection

Power Supply Modules

labPWR I.1 (Code 3711)



- › Power supply to smaller HEADlab systems up to 40 W
- › Energy: 55 Wh
- › Uninterruptible switching between external power supply and battery
- › Direct supply via on-board voltage is possible
- › Noiseless operation (no fan)

labPWR I.2 (Code 3712)



- › Power supply to larger HEADlab systems up to 100 W
- › Energy: 55 Wh
- › Uninterruptible switching between external power supply and battery
- › Direct supply via on-board voltage is possible
- › Noiseless operation (no fan)

labPWR I.3 (Code 3713)



- › Power supply to smaller HEADlab systems up to 35 W
- › Energy: 50 Wh
- › Uninterruptible switching between external power supply and battery
- › Direct supply via on-board voltage is possible
- › Noiseless operation (no fan)
- › Auto-On function (with labHSU) for switching on a HEADlab system by switching an external voltage source

Power Consumption

› labCTRL II.1	8 W	› labV6HD	7 W	› labP2	10 W
› labCOMPACT 12 II	18 W	› labCF6	8 W	› labP2-V1	10 W
› labCOMPACT 24 II	22 W	› labHRT6	10 W	› labO2	10 W
› labV24 II	12.5 W	› labDX	7 W	› labO2-V1	10 W
› labV12 II	8.7 W	› labSG6	9.5 W		
› labV6 II	6.5 W	› labT6	2 W		
› labM6 II	12 W				
› labV8x3-Iso II	8 W				
› labV12-O4 II	12.5 W				
› labHSU	10 W				

Playback Modules

2-Channel Playback Modules

labP2 (Code 3732)



- › Aurally-accurate playback using two headphones from HEAD acoustics
- › Connection to a computer via USB or to a controller via HEADlink
- › Equalization filters: ID (Independent of Direction), FF (Free Field), DF (Diffuse Field), USER
- › Four additional IIR filters that can be loaded
- › Operation via rotary switch (OLED display for status indication) or via software from HEAD acoustics
- › Cascadable, e.g., for use in listening studios with the SQala jury testing software

labP2-V1 (Code 3732-V1)



- › Variant of labP2 with identical range of functions for mounting in a 19" rack

labO2 (Code 3731)



- › Aurally-accurate playback with subwoofers, loudspeakers, headphone amplifiers, shakers, ...
- › Connection to a computer via USB or to a controller via HEADlink
- › Equalization filters: ID (Independent of Direction), FF, DF, USER
- › Four additional IIR filters that can be loaded
- › Operation via rotary switch (OLED display for status indication) or via software from HEAD acoustics
- › Cascadable, e.g., for use in listening studios with the SQala jury testing software

labO2-V1 (Code 3731-V1)



- › Aurally-accurate playback with headphones from HEAD acoustics, subwoofers, loudspeakers, headphone amplifiers, shakers, ...
- › Connection to a computer via USB or to a controller via HEADlink
- › Equalization filters: ID (Independent of Direction), FF, DF, USER
- › Four additional IIR filters that can be loaded
- › Operation via rotary switch (OLED display for status indication) or via software from HEAD acoustics
- › Cascadable, e.g., for use in listening studios with the SQala jury testing software
- › Mounting in a 19" rack

Fastening Accessories

HEAD acoustics provides high-quality fastening accessories for HEAD*lab* and other measurement equipment. Using these fastening accessories, HEAD*lab* systems, artificial heads, *labSAR* components, etc. can be securely fastened and protected.

Fastening Accessories for HEAD*lab* Systems, *labSAR*, Artificial Heads, etc.

Connection Plates

- › *labCP* I.1
- › *labCP* I.2
- › *labCP* I.3
- › *labCP* I.4
- › *labCP* I.5

The *labCP* connection plates can be screwed together and to the threaded holes on the sides of the modules, ensuring a particularly high level of stability. Some connection plates can be flexibly combined with each other to securely connect customized HEAD*lab* and *labSAR* systems.



MDM Systems

- › MDM I.0
- › MDM I.1
- › MDM I.2
- › MDM I.3
- › MDM I.4
- › MDM I.5
- › MDM I.6
- › MDM I.7
- › MDM I.10

Using the MDM systems, HEAD*lab* devices can be safely mounted in vehicles with or without integrated ISOFIX attachment systems. In addition, laptops and artificial heads from HEAD acoustics can be securely fastened, ensuring that the entire measurement equipment is secured and poses no danger to people.



Other Fastening Accessories

- › *labMA-a*
- › *labMA-p*
- › HSM V
- › HTB IV
- › *labSMP I.1*
- › *labRCH I.1*

The *labMA-a* and *labMA-p* mount adapters have the same locking mechanism as all HEAD*lab* housings and can be screwed to an MDM system or an artificial head/HEAD*lab* platform to fasten a measurement system in vehicles or on test benches.

The HSM V and HTB IV artificial head/HEAD*lab* platforms can be used to fasten HMS or HSU artificial heads and HEAD*lab* modules.

The *labSMP I.1* mounting plates and the *labRCH I.1* carrying handle enable HEAD*lab* systems to be transported safely.



Combination Options: Fastening Accessories Combined

	<i>labCP I.1</i>	<i>labCP I.2</i>	<i>labCP I.3</i>	<i>labCP I.4</i>	<i>labCP I.5</i>	MDM I.0	MDM I.10	MDM I.3	MDM I.7	MDM I.6	MDM I.4	MDM I.5	<i>labMA-a</i>	<i>labMA-p</i>	<i>labSMP I.1</i>	HSM V	HTB VI	<i>labRCH I.1</i>
<i>labCP I.1</i>		✓	✓					✓					✓	✓				✓
<i>labCP I.2</i>	✓	✓	✓	✓	✓			✓					✓	✓	✓	✓	✓	✓
<i>labCP I.3</i>	✓	✓	✓	✓	✓			✓					✓	✓	✓	✓	✓	✓
<i>labCP I.4</i>		✓	✓					✓										
<i>labCP I.5</i>		✓	✓					✓										
MDM I.0								✓	✓	✓	✓	✓						
MDM I.10								✓		✓	✓	✓						
MDM I.3	✓	✓	✓	✓	✓	✓	✓				✓	✓						
MDM I.7						✓							✓	✓				
MDM I.6						✓	✓											
MDM I.4						✓	✓	✓										
MDM I.5						✓	✓	✓										
<i>labMA-a</i>	✓	✓	✓						✓				✓	✓	✓	✓	✓	✓
<i>labMA-p</i>	✓	✓	✓						✓				✓	✓	✓	✓	✓	✓
<i>labSMP I.1</i>		✓	✓										✓	✓	✓			
HSM V		✓	✓										✓	✓				
HTB VI		✓	✓										✓	✓				
<i>labRCH I.1</i>	✓	✓	✓										✓	✓				

Accessories

Software

ArtemiS SUITE

Required

APR 000 (Code 50000)

APR Framework

- › Basis of ArtemiS SUITE

Measurements / Data Preparation

APR 040 (Code 50040)

Recorder

- › Recorder of ArtemiS SUITE

ASP 302 (Code 51302)

Data Preparation

- › Measurement data preparation

ASP 801 (Code 51801)

Basic Decoder

- › Decoding of signals: CAN FD, CAN, ...

Data Processing / Analysis

APR 010 (Code 50010)

Pool Project

- › Interactive processing and analyzing

APR 050 (Code 50050)

Automation Project

- › Automated processing and analyzing

ASP 001 (Code 51001) to ASP 203 (Code 51203)

Analysis modules of ArtemiS SUITE

Modal Analysis

APR 420 (Code 50420)

Modal Analysis Project

- › AI-based and intuitively performable modal analysis

APR 400 (Code 50400)

ODS Project

- › Animation and analysis of deflection shapes

APR 410 (Code 50410)

Shape Comparison Project

- › Analysis and comparison of deflection shapes

Jury Testing

APR 500 (Code 50500)

Jury Testing – SQala Basic

- › Jury Testing software

ASP 501 (Code 51501)

Jury Testing – SQala Net

ASP 502 (Code 51502)

Jury Testing – SQala Server

More ArtemiS SUITE modules

Web Interface for Configurations and Measurements Without ArtemiS SUITE

Available for:

- › *labCTRL* II.1
- › *labHSU*

Hardware

Artificial Heads, Binaural Sensors

HMS V (Code 1502)

- › Artificial Head Measurement System

HSU III.2 (Code 1391)

- › Head Shoulder Unit
- › ICP microphones

HSU III.3 (Code 1326)

- › Head Shoulder Unit
- › Condenser microphones

BHS II (Code 3322)

- › Binaural Headset

BHM III.3 (Code 1303)

- › ICP Headset Microphone

Headphones

- › Headphones from HEAD acoustics

Subwoofer

HSW II.1 (Code 2952)

- › HEAD Subwoofer incl. DC 3 power amplifier from KMT

Navigation Satellite System Receiver

- CDG I.1 (Code 3796)
 - › Navigation satellite system receiver
- CGA I.1 (Code 9856)
 - › Active navigation satellite system rod antenna
- CGA I.0 (Code 9855)
 - › Active navigation satellite system antenna with cable

WLAN Adapter

- USB WLAN adapter (Code 0275)

USB Storage Media

- HUSB III.64 (Code 3334)

Remote Controls

- RC X.1 (Code 9850)
- RC X.2 (Code 9851)
 - › Radio module for controlling RC X.1

Power Supply

Power Adapters

- PS 24-60-L4
24 V, 60 W, LEMO 4-pin
(Code 0617B)
 - › For HEADlab systems up to a maximum of 60 W
- PS 24-150-L4
24 V, 150 W, LEMO 4-pin
(Code 0620B)
 - › For HEADlab systems with more than 40 W and up to a maximum of 150 W
- PS 15-60-X4
15 V, 60 W, XLR 4-pin
(Code 0610)
 - › For labP2-V1, labO2-V1

Supply Modules

- labPWR I.1 (Code 3711)
 - › For HEADlab systems up to a maximum of 40 W
- labPWR I.2 (Code 3712)
 - › For HEADlab systems up to a maximum of 100 W
- labPWR I.3 (Code 3713)
 - › For HEADlab systems up to a maximum of 35 W

Power Adapters for Supply Modules

- PS 24-60-L2
24 V, 60 W, LEMO 2-pin
(Code 0623B)
 - › For labPWR I.1, labPWR I.3
- PS 24-150-L2
24 V, 150 W, LEMO 2-pin
(Code 0621B)
 - › For labPWR I.1, labPWR I.2, labPWR I.3

labSAR

Recording Unit

- labSAR I.1 (Code 3705.1)
 - › Recording unit with web interface

Accessories

- labSAR I.2 (Code 3705.2)
 - › Power adapter
 - › LEMO 4-pin → terminal plug, LEMO 4-pin
- labSAR I.3 (Code 3705.3)
 - › USB cable
 - › Type A → type C, with screw connection
- LAN switch (standard)
 - › More information on request
- labSWP-4 (Code 3707.2-4)
 - › 4-port LAN switch (PTP, Precision Time Protocol)
- labSWP-8 (Code 3707.2-8)
 - › 8-port LAN switch (PTP, Precision Time Protocol)
- labSSD I (Code 3706.1)
 - › Removable frame for Solid State Discs (SSD)
- SSD-2 (Code 3706.2-2)
 - › Solid State Disc (SSD)
 - › 2 TB, internal SSD, 2.5", SATA

Adapters, Adapter Cables, Cables

Connection to the Computer

CUSB II.xx (Code 5478-xx)

- › USB cable
- › Type A → type B
- › Available cable lengths: 1.5 m, 3 m, 5 m

CUSB IV.1 (Code 5476-1)

- › USB cable
- › Type A → type C, with screw connection, 1 m

CRR III.xx (Code 9880-xx)

- › LAN cable (Cat 6a), round
- › Available cable lengths: 0.5 m, 1 m, 3 m, 5 m, 10 m, 20 m

CRR IV.xx (Code 9881-xx)

- › LAN cable (Cat 8.1), flat
- › Available cable lengths: 0.15 m (Cat 6), 0.25 m, 0.5 m, 1 m, 5 m, 3 m, 10 m, 15 m

Connection Between Modules

CLL X.xx (Code 3780-xx)

- › HEADlink cable
- › 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

labRFC (Code 3789)

- › Active adapter for loss-free extension of HEADlink connections using a Cat 5 cable
- › HEADlink → RJ45

LWL patch cable multi-mode Duplex

- › Optical cable
- › SC/PC → SC/PC

Power Supply – Adapters / Cables

labSPA (Code 3715)

- › Safe Power Adapter
- › LEMO 2-pin → LEMO 4-pin

CLL XI.xx (Code 3781-xx)

- › Power supply cable
- › LEMO 4-pin → LEMO 4-pin
- › Available cable lengths: 0.19 m, 0.42 m, 1 m, 5 m, 10 m, 15 m

CSL X.3 (Code 3787-3)

- › Speakon cable
- › Speakon 2-pin → LEMO 2-pin, 3 m

CLO X.3 (Code 3782-3)

- › Power supply cable
- › Connection of DC voltage sources
- › 2 x cable lug → LEMO 2-pin, 3 m

CLL XII.xx (Code 3795-xx)

- › Extension cable
- › LEMO 4-pin → LEMO 4-pin
- › Available cable lengths: 1 m, 2.5 m, 10 m

PDB II.1 (Code 3716)

- › Passive Power Distribution Box
- › 2 x cable lug → 4 x XLR 4-pin, 1 x Speakon 2-pin

PDB II.1-V1 (Code 3716-V1)

- › Passive Power Distribution Box
- › LEMO 2-pin → 4 x XLR 4-pin, 1 x Speakon 2-pin

Connection of Analog Sensors / BNC Sensors

labCOMPACT24 II / labV24 II

CDB XII-V1.1 (Code 9894-V1-1)

- › Breakout cable
- › D-Sub 25-pin → 12 x BNC, female, 1 m (channels 1 to 6, 13 to 18)

CDB XII-V2.1 (Code 9894-V2-1)

- › Breakout cable
- › D-Sub 25-pin → 12 x BNC, female, 1 m (channels 7 to 12, 19 to 24)

CDB XI-V1.1 (9893-V1-1)

- › Breakout cable
- › D-Sub 25-pin → 12 x BNC, male, 1 m (channels 1 to 6, 13 to 18)

CDB XI-V2.1 (9893-V2-1)

- › Breakout cable
- › D-Sub 25-pin → 12 x BNC, male, 1 m (channels 7 to 12, 19 to 24)

CDM II.1 (Code 3571-1)

- › Adapter cable
- › D-Sub 25-pin → 4 x Microtech, 1 m

*lab*COMPACT12 II / *lab*V12 II / *lab*V12-O4 II

CDB X-V1.xx (Code 3792-V1-xx)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, female, 1 m
- › (channels 1 to 6)
- › Available cable lengths: 0.3 m, 1 m

CDB X-V2.xx (Code 3792-V2-xx)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, female, 1 m
- › (channels 7 to 12)
- › Available cable lengths: 0.3 m, 1 m

CDB II-V1-1 (Code 3579-V1-1)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, male, 1 m
- › (channels 1 to 6)

CDB II-V2-1 (Code 3579-V2-1)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, male, 1 m
- › (channels 7 to 12)

CDM X.03 (Code 3793-03)

- › Breakout cable
- › D-Sub 25-pin → 6 x Microdot, 0.3 m

CDM I.1 (Code 3570-1)

- › Breakout cable
- › D-Sub 25-pin → 2 x Microtech, 1 m

*lab*M6 II

CBL X.01 (Code 3791-01)

- › Adapter cable
- › LEMO 7-pin → BNC, 0.1 m

*lab*CF6

SCU-V2 (Code 3394)

- › 2-channel impedance converter
- › Connection of high-impedance voltage sources

BHS II

CLB I.2 (Code 9847)

- › Adapter cable
- › LEMO 14-pin → 2 x BNC, male

HEAD VISOR

CDB II-V1 (Code 3556-V1)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, male,
- › 4 x 1. m, 2 m, 2.5 m

CDB II-V2 (Code 3556-V2)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, male,
- › 1.35 m, 2 x 3.9 m, 2 x 4.45 m, 5.5 m

CDB II-V3 (Code 3556-V3)

- › Breakout cable
- › D-Sub 25-pin → 6 x BNC, male,
- › 2 x 2.95 m, 2.5 m, 3 x 3.2 m

Extension cable

CBB I.xx (Code 1175.xx)

- › BNC extension cable
- › BNC, male → BNC, male
- › Available cable lengths: 0.25 m, 0.5 m, 1 m, 1.5 m,
- › 2 m, 3 m, 5 m, 10 m

Digital Connections

*lab*ADAT (Code 3794)

- › ADAT adapter
- › HEADlink → 2 x LWL (TOSLINK)

CLW II.xx (Code 3794-xx)

- › AES/EBU cable
- › LWL cable (ADAT) with TOSLINK plug connectors
- › Available cable lengths: 0.3 m, 1 m, 2 m, 3 m, 5 m,
- › 10 m

CLX X.1 (Code 3797-1)

- › Adapter cable HEADlink → AES/EBU
- › LEMO 8-pin → XLR 3-pin, male, XLR 3-pin, female,
- › 1 m

CXX II.xx (Code 5177-xx)

- › AES/EBU cable
- › XLR 3-pin, male → XLR 3-pin, female
- › Available cable lengths: 0.3 m, 1 m, 3 m, 10 m,
- › 20 m, 30 m, 40 m

CDX X.3 (Code 3783-3)

- › HMS connection cable
- › XLR 3-pin, male, XLR 3-pin, female,
- › D-Sub 9-pin → D-Sub 9-pin, 3 m

Fastening / Transport

Connection Plates

- labCP I.1* (Code 3765.1)
 - › 2 x connection plate
 - › *labSAR I.1* → *labCTRL II.1*
- labCP I.2* (Code 3765.2)
 - › 2 x connection plate
 - › Two modules or one module → *labCTRL II.1*
- labCP I.3* (Code 3765.3)
 - › 2 x connection plate
 - › Three modules or two modules → *labCTRL II.1*
- labCP I.4* (Code 3765.4)
 - › 2 x connection plate
 - › *labSAR I.1* → *labSWP-x*, *labCTRL II.1*
- labCP I.5* (Code 3765.5)
 - › 2 x connection plate
 - › *labCTRL II.1* → *labSWP-x*

MDM ISOFIX Measuring Device Mount System

- MDM I.0 (Code 3764.0)
 - › Measuring device mount with ISOFIX attachment – base frame
 - › → MDM I.3 / MDM I.4 / MDM I.5
 - » MDM I.1 (Code 3764.1)
ISOFIX adapter
 - » MDM I.2 (Code 3764.2)
Protective covers
- MDM I.3 (Code 3764.3)
 - › HEADlab fastening for measuring device mount
 - › → MDM I.0 / MDM I.10
- MDM I.4 (Code 3764.4)
 - › Multi-channel connector plate (front or back)
 - › → MDM I.3 / MDM I.0 / MDM I.10
- MDM I.5 (Code 3764.5)
 - › Multi-channel connector plate (side)
 - › → MDM I.3 / MDM I.0 / MDM I.10
- MDM I.6 (Code 3764.6)
 - › Laptop holder including display support
 - › → MDM I.0 / MDM I.10
- MDM I.7 (Code 3764.7)
 - › Seat mount adapter for HMS / HSU for measuring device mount system with ISOFIX attachment
 - › → MDM I.0

CAN FD, CAN, OBD-2, FlexRay, RPM Connections

- CDO X.3 (Code 3786-3)
 - › OBD connection cable
 - › OBD plug, type B → D-Sub 9-pin, 3 m
- CMD 0.12 (Code 3788)
 - › CAN-/FlexRay adapter cable
 - › D-Sub 9-pin → 3 x D-Sub 9-pin
(CAN 1, CAN 2, FlexRay), 0.1 m
- CMD II.0 (Code 3788.2)
 - › CAN adapter cable
 - › D-Sub 9-pin → 2 x D-Sub 9-pin
CAN 1, CAN 2, 0.12 m, 0.2 m
- SCU-P2 (Code 3393)
 - › Adapter for pulse signal conditioning
 - › 2-channel pulse conditioning
 - › D-Sub 9-pin → 2 x BNC

Strain Gauge Connections

- CDL III.1 (Code 9818-1)
 - › Adapter cable
 - › LEMO 8-pin → D-Sub 9-pin, 1 m

Charge Connections

- CMB I (Code 3798)
 - › Microdot adapter
 - › BNC → Microdot

Fastening Accessories

labMA-a (Code 3760)

- › Connection plate, active latch

labMA-p (Code 3761)

- › Connection plate, passive latch

HSM V (Code 1520)

- › Seat Mount Adapter for HMS V, HSU, and HEAD*lab* systems

HTB VI (Code 1574)

- › HEAD Torso Box for HMS, HSU

labSMP I.1 (Code 3762)

- › HEAD*lab* mounting plate, e.g., for mounting on vehicle seats

labRCH I.1 (Code 3763)

- › Retractable Carry Handle

Carrying Case

labCASE I.1 (Code 3770)

- › Carrying Case for HEAD*lab*

HSC VI.1 (Code 9871)

- › Carrying Case for *labO2-V1* / *labP2-V1*

Rack Mount Bracket

RMB IV.3 (Code 9852.1)

- › 19" Rack Mount Bracket (2 pieces)
- › For *labP2-V1*, *labO2-V1*

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