

## HEADlab Compact Modules

Silent single module systems

12 analog/ICP sensors

- *labCOMPACT12* (Code 3708)
- *labCOMPACT12-V1* (Code 3708-V1)

24 analog/ICP sensors

- *labCOMPACT24* (Code 3709)
- *labCOMPACT24-V1* (Code 3709-V1)



### Overview

The compact modules or single module systems *labCOMPACT12* and *labCOMPACT24* combine the basic functions of a controller with 12-channel input modules into a handy device. This makes the compact modules flexible and affordable solutions for multi-channel analysis, particularly in the development of household appliances and office equipment.

The compact modules allow recordings with 12 (*labCOMPACT12*) or 24 (*labCOMPACT24*) channels with up to 48 kHz and 6 or 12 channels up to 96 kHz. They also feature a high phase accuracy of the 24-bit data and a signal-to-noise ratio of 107 dB(A).

Analog or ICP sensors can be connected to the front side via adapters.

The compact modules can be quickly and easily extended with an additional HEADlab input module, a compact module, or other HEADlab systems. The direct connection to a laptop or PC via USB or LAN ensures secure and stable data transfer (the variants are not equipped with a LAN interface). The compact modules are controlled and configured via the recording software (ASM 04) of ArtemiS SUITE.

When powered by a *labPWR* power box, the compact modules can be operated without an external power supply for several hours.

### Features

Compact single module systems for

- 12 analog/ICP sensors
  - *labCOMPACT12*
  - *labCOMPACT12-V1* (variant without LAN)
- 24 analog/ICP sensors
  - *labCOMPACT24*
  - *labCOMPACT24-V1* (variant without LAN)

- Coupling: AC, DC
- ICP supply (4 mA)
- High signal-to-noise ratio of 107 dB(A)

### Filters

- Analog high-pass filters, 2.5 Hz in AC mode and 22 Hz (switchable channel by channel)

### Power supply

- Power supply via *labPWR* power boxes or power adapters
- Low energy consumption
  - 14 W (*labCOMPACT12*)
  - 20 W (*labCOMPACT24*)

### Handling

- Rugged HEADlab housing with proven mechanical connection mechanism
- Silent (fanless), rugged design

### Applications

- Sound quality examination and optimization for technical products
  - Office equipment
  - IT equipment
  - Household appliances
  - and many others

### Connections

- Connection to a laptop or PC via USB (up to 5 m) or LAN (up to 100 m)
- Connection of TEDS sensors
- Recordings with the binaural headset BHS II (via adapter)
- Extension with a HEADlab input module, a compact module, or additional HEADlab systems
- Electrical isolation of signal inputs to PC connection (only LAN) and to power supply

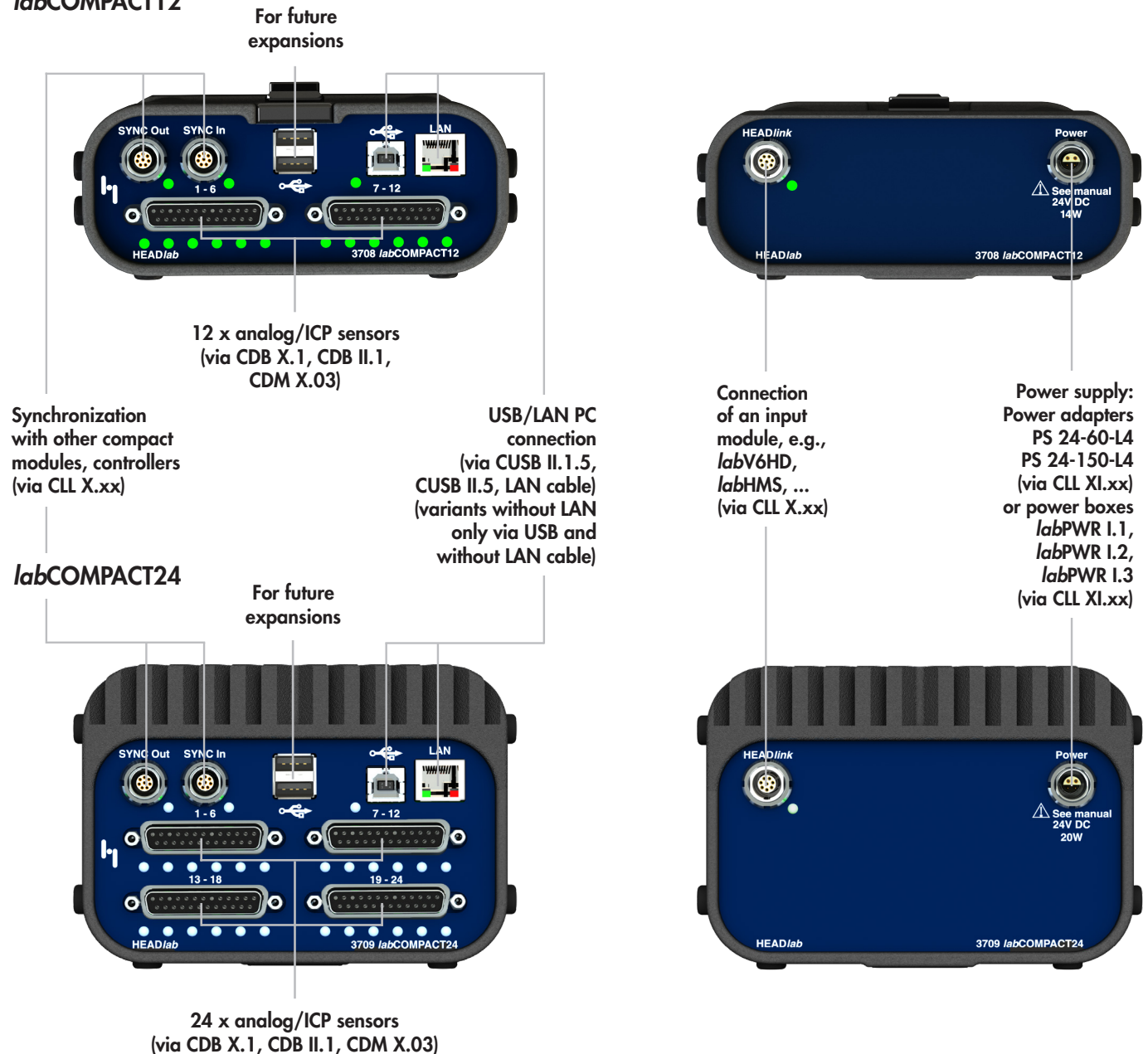
### Functions

- 24-bit data acquisition with high phase accuracy
- Sampling rate up to 48 kHz; 96 kHz with 6 (*labCOMPACT12*) or 12 channels (*labCOMPACT24*)
- Frequency range: 0 Hz to 43.2 kHz

Differences between the single module systems *labCOMPACT12* and *labCOMPACT24* and the variants *labCOMPACT12-V1* and *labCOMPACT24-V1* are noted in the corresponding text passages.

## Compact modules: Front and rear side

### labCOMPACT12



### Scope of supply labCOMPACT12

- labCOMPACT12 (Code 3708)  
or  
labCOMPACT12-V1 (Code 3708-V1)  
(variant without LAN)
- 2 x CDB X.1 (Code 3792)  
Breakout cable D-Sub 25-pin ↔  
6 x BNC female, 1 m
- Power adapter  
PS 24-60-L4 (Code 0617B)  
24 V / 60 W / LEMO 4-pin
- CUSB II.1.5 (Code 5478-1.5)  
Cable USB 2.0, 1.5 m
- Cable LAN, 3 m (not for the variant  
without LAN)

### Scope of supply labCOMPACT24

- labCOMPACT24 (Code 3709)  
or  
labCOMPACT24-V1 (Code 3709-V1)  
(variant without LAN)
- 4 x CDB X.1 (Code 3792)  
Breakout cable D-Sub 25-pin ↔  
6 x BNC female, 1 m
- Power adapter  
PS 24-60-L4 (Code 0617B)  
24 V / 60 W / LEMO 4-pin
- CUSB II.1.5 (Code 5478-1.5)  
Cable USB 2.0 1.5 m
- Cable LAN, 3 m (not for the variant  
without LAN)

### Required

(not included)

### Software

- ArtemiS SUITE Data Acquisition  
Module, ASM 04 (Code 5004)
- ArtemiS SUITE Basic Framework  
(Code 5000)

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

## Optional

### Power supply

- Power adapters
  - PS 24-60-L4 (Code 0617B)  
24 V / 60 W / LEMO 4-pin
  - PS 24-150-L4 (Code 0620B)  
24 V / 150 W / LEMO 4-pin  
[only for systems with more than 40 W total power consumption]
- Power boxes
  - *labPWR* I.1 (Code 3711)  
Power box for compact modules  
(up to max. 40 W)
  - *labPWR* I.2 (Code 3712)  
Power box for compact modules  
(up to max. 100 W)
  - *labPWR* I.3 (Code 3713)  
Power box for compact modules  
(up to max. 35 W)
- Power adapters for power boxes
  - PS 24-60-L2 (Code 0623B)  
24 V, 60 W, LEMO 2-pin
  - PS 24-150-L2 (Code 0621B)  
24 V, 150 W, LEMO 2-pin

### Adapter / adapter cables / cables

- CDB II.1 (Code 3556)  
Breakout cable D-Sub 25-pin ↔  
6 x BNC male, 1 m
- CDM X.03 (Code 3793-03)  
Breakout cable D-Sub 25-pin ↔  
6 x Microdot, 30 cm
- CUSB II.5 (Code 5478-5)  
Cable USB (USB type A → B), 5 m
- CLL X.xx (Code 3780-xx)  
Cable *HEADlink*  
LEMO 8-pin ↔ LEMO 8-pin
- *labRFC* (Code 3789)  
Active adapter for loss-free  
extension of *HEADlink* connections  
up to 180 m max.
- *labSPA* (Code 3715)  
Safe Power Adapter  
DC voltage source 18 to 35 V  
[via adapter cable CSL X.3]
- *labOA* (Code 3785)  
Optical adaptor (optical / electrical)  
Data transmission between compact  
module and input module across  
a distance of up to 1000 m max.  
using two *labOA* devices
- Optical Cable  
LWL-patch cable multimode  
Duplex, SC/PC ↔ SC/PC
- CLL XI.xx (Code 3781-xx)  
Power supply cable  
LEMO 4-pin ↔ LEMO 4-pin  
[PS 24-60-L4 / PS 24-150-L4 ↔  
compact module; PS 24-60-L2 /  
PS 24-150-L2 ↔ *labPWR*]
- CLL XII.10 (Code 3795-10)  
Extension cable  
LEMO 4-pin ↔ LEMO 4-pin,  
10 m
- CLO X.3 (Code 3782-3)  
Power supply cable  
2 x cable lug ↔ LEMO 2-pin,  
3 m  
[DC power source ↔ *labPWR* /  
*labSPA*]
- Cable CAT5  
Standard network cable CAT5e,  
5 m
- CLAN I.xx (Code 9864-xx)  
Network cable CAT6a  
[for use in harsh environmental  
conditions]

## Technical Data

Number of channels <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	12 24
Interfaces <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	2 x D-Sub 25-pin, 3 x LEMO 8-pin (1 x <i>HEADlink</i> , 2 x Sync), 3 x USB, 1 x LAN 4 x D-Sub 25-pin, 3 x LEMO 8-pin (1 x <i>HEADlink</i> , 2 x Sync), 3 x USB, 1 x LAN
Sampling frequencies (F <sub>s</sub> ) <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	2, 3, 4, 6, 8, 12, 24, 48, 96 kHz (6 channels at 96 kHz) 2, 3, 4, 6, 8, 12, 24, 48, 96 kHz (12 channels at 96 kHz)
Coupling:	DC, AC, ICP
Power consumption at 24 V and 25 °C <i>labCOMPACT12</i> : <i>labCOMPACT24</i> : <i>labCOMPACT12-V1</i> : <i>labCOMPACT24-V1</i> :	14 W 20 W 8 W 13 W
Input voltage:	18 to 28 V, nominal 24 V
Cooling:	Convection, no fan
Dimensions (WxDxH) <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	148 x 174 x 63 mm 148 x 174 x 101 mm
Weight <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	1172 g 2050 g
Operating temperature:	-10 °C to 60 °C
Storage temperature:	-20 °C to 70 °C

## Analog/ICP Inputs

Number of channels <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	12 24
Interfaces <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	2 x D-Sub 25-pin 4 x D-Sub 25-pin
ICP voltage supply:	22 V
ICP current supply:	4 mA ( $\pm 35\%$ )
Electric strength:	Max. $\pm 35$ V
Resolution:	24 bit
Frequency range:	0 Hz to 43.2 kHz at $F_s = 96$ kHz
Input impedance:	30.3 kOhm
Ranges (AC & DC, inputs are TEDS-compliant):	$\pm 10$ mV <sub>PEAK</sub> $\pm 100$ mV <sub>PEAK</sub> $\pm 1$ V <sub>PEAK</sub> $\pm 10$ V <sub>PEAK</sub>
S/N, 20 Hz to 20 kHz incl. 2.5 Hz filter in AC mode:	79.8 dB(A)   97 dB(A)   107 dB(A)   106 dB(A)
THD+N, 20 Hz to 20 kHz incl. 2.5 Hz filter in AC mode:	-74 dB(A)   -93 dB(A)   -97 dB(A)   -92 dB(A)
Crosstalk measurement, termination $\leq 75 \Omega$ at $F_s = 48$ kHz:	> 100 dB(A)   > 120 dB(A)   > 130 dB(A)   > 130 dB(A)
Frequency response (accuracy final value), 20 Hz to 20 kHz incl. 2.5 Hz filter in AC mode: Tolerance:	<0.26 dB   <0.061 dB   <0.061 dB   <0.061 dB 3%   0.7%   0.7%   0.7%
DC accuracy (DC mode at 0 Hz): Tolerance:	<0.13 dB   <0.021 dB   <0.009 dB   <0.009 dB 1.5%   0.25%   0.1%   0.1%
Filters (analog) HP filter (not defeatable in AC mode): HP filter 2nd order (switchable): LP filter:	2.5 Hz 22 Hz 22.5 kHz at 48 kHz; 43.2 kHz at 96 kHz
TEDS (IEEE 1451.4), read:	TEDS class 1, shared signal wire (Version 0.9 and 1.0)

## HEADlink Input (HEAD acoustics standard)

Connecting HEADlab modules:	e.g., <i>labV6HD</i> , <i>labV12</i> , <i>labHMS</i> , <i>labDX</i> , <i>labM6</i> , etc.
Synchronization of the channels:	Sample-accurate
Sampling frequencies ( $F_s$ ) <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	2, 3, 4, 6, 8, 12, 24, 48, 96 kHz (6 channels at 96 kHz) 2, 3, 4, 6, 8, 12, 24, 48, 96 kHz (12 channels at 96 kHz)

## Sync Interfaces

Connection and synchronization of several compact modules and controllers:	2 x LEMO 8-pin (HEADlink)
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## USB Interface (USB 2.0 highspeed)

Data rate:	480 Mbit/s
Net data rate at maximum number of channels <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	Approx. 21 Mbit/s Approx. 35 Mbit/s
Cable length USB:	5 m (max.)

## LAN Interface (Gigabit Ethernet) (not for variants *labCOMPACT12-V1* and *labCOMPACT24-V1*)

Data rate:	1 Gigabit
Net data rate at maximum number of channels <i>labCOMPACT12</i> : <i>labCOMPACT24</i> :	Approx. 21 Mbit/s Approx. 35 Mbit/s
Cable length LAN:	100 m (max.)