HEAD acoustics®
Ebertstraße 30a
52134 Herzogenrath
Tel.: +49 2407 577-0
Fax: +49 2407 577-99
eMail: info@head-acoustics.de
Web: www.head-acoustics.de

Data Sheet

SQuadriga II (Code 3320)

Mobile recording and playback system - suitable as stand-alone system or USB front end

Overview

SQuadriga II is a 24 bit recording and playback system for a wide range of applications. Its compact dimensions and low weight, its built-in battery and its variety of connection possibilities provide for a high degree of mobility and functional versatility.

SQuadriga II saves time domain data on a removable SDHC card in stand-alone operation, whereas it saves directly to PC or notebook in front-end mode via USB. SQuadriga II can be conveniently operated via its function buttons and its touchscreen display, as well as via the HEAD Recorder software running on a connected computer.

ICP microphones and acceleration sensors, a calibrateable BHS II headset, pulse and CAN sensors, an artificial head or other sensors can be connected directly or via adapters or adapter cables. SQuadriga II allows both the channel configuration and the sensor setup to be configured and saved on the device.

Without an external power source, the built-in rechargeable battery allows the extremely compact SQuadriga II unit to run up to six hours. With additional standard batteries (AA type) inserted in the separate battery compartment, the operating time in stand-alone mode can be further extended.

SQuadriga II operates silently and is ready for operation immediately after turning it on.

Features

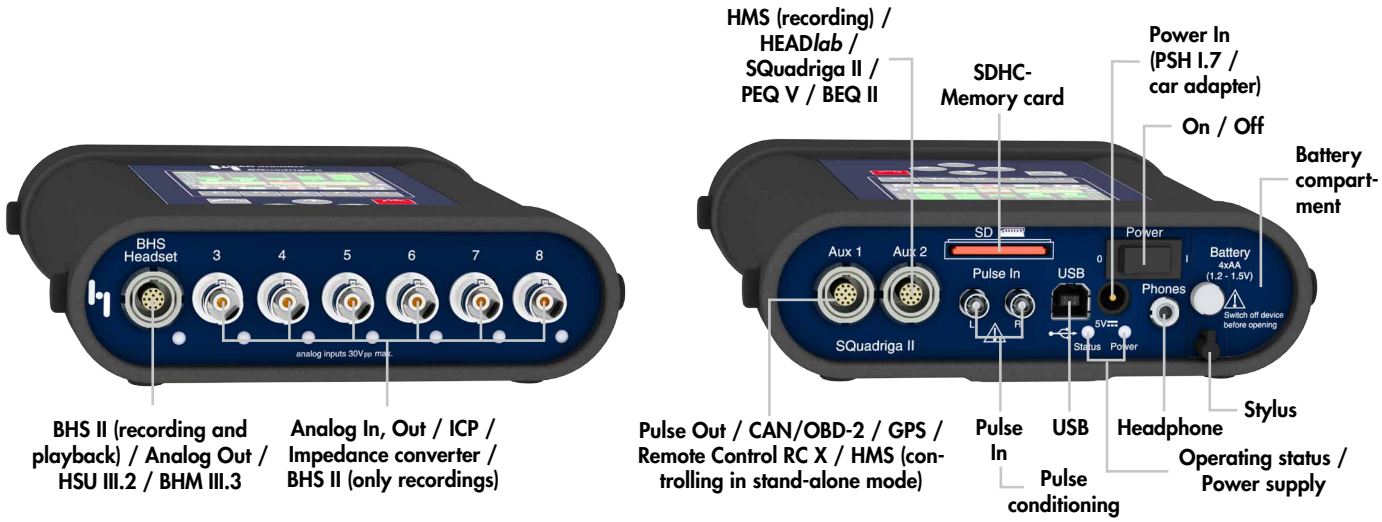
- Operating modes:
  - stand-alone mode
  - front-end mode (via USB)
- USB 2.0 highspeed interface
  - SQuadriga II as USB mass storage device
- Recording, analysis, playback
- Recording format: 16 or 24 bit
- Sampling rates: 8, 16, 32; 44.1; 48; 51.2; 64; 88.2; 96 kHz
- Recording triggers (start/stop triggers from A/D signals, pulses, CAN signals etc.)
- Removable SDHC memory card (4 GB, other capacities are optional)
- Large color graphics display respectively touchscreen (7.3 cm/2.83")
- FFT based real-time analyses (not in record mode): FFT, Octave, 3rd Octave, Time Signal, Loudness, Spec. Loudness, Sharpness
- Adjustable IIR filters (playback and monitoring - not in record mode)
- Display versus time of CAN, RPM and GPS quantities
- Auto Range (channel by channel or for all active channels)
- Limiter (up to 51.2 kHz)
- Real-time clock
- User documentation (ArtemiS SUITE compatible)
- Virtual SQuadriga configuration via the SQuadriga II Simulator
- Power supply via PSH I.7 power adapter, car adapter, built-in rechargeable battery or replaceable standard batteries
  - Up to six hours of stand-alone operation capacity

Direct connectors

- USB 2.0
  - PC/notebook/tablet PC (Windows) with ArtemiS SUITE Data Acquisition Module ASM 04 (HEAD Recorder)
- BHS
  - Binaural headset BHS II (aurally accurate recordings, monitoring and playback)
- 6 x BNC
  - ICP/LINE
  - Analog In/Out
  - AC/DC
- 2 x Pulse (SMB; SMB > BNC adapters are included)
- Phones (equalized headphone output e.g. for the headphone HD IV.1)

Connections via adapters or adapter cables

- CAN/OBD-2
- Artificial head HMS IV
- HEAD*lab* modules *lab*V6/*lab*VF6, *lab*M6
- Connecting a second SQuadriga II device
- Equalizer PEQ V (playback)
- Front end BEQ II
- Pulse Out
- GPS
- Pulse (pulse conditioning)
- High-impedance voltage sources (impedance converter)
- Remote control RC X



Direct connectors

BNC

The six AC- and DC-compatible BNC inputs can be used as analog in or ICP inputs, each input has optional HP filters (2 Hz and 22 Hz). Independently of each other, they can also be used as analog outputs. For each channel, the input sensitivity of the BNC channels is separately adjustable.

BHS Headset

With the BHS II headset connected, sound events can be recorded and played back binaurally and authentically. The headset interface has its own A/D and D/A converters, a booster-amplifier and two optional highpass filters. The ICP measurement microphones of the headset BHS II can be calibrated.

With the adapter CLB I.2 the BHS II headset can be connected to the BNC interfaces, too (recording only).

Pulse In

Two electrically isolated pulse inputs (SMB) can be used to connect pulse sources directly via BNC. SMB > BNC adapters are included.

The pulses are sampled with 32 times of the sampling rate. At a sampling rate of 48 kHz, the maximum pulse frequency is limited to 600 kHz, or 1 MHz at 96 kHz.

USB

The USB 2.0 interface transmits data at high speeds of up to 480 Mbps. SQuadriga II can be identified as a USB mass storage device.

Phones (playback/monitoring)

The equalized headphone output, which allows, for example, the dynamic headphone HD IV.1 to be connected, has its own booster.

Connections via adapters or adapter cables

Multi function (SVA II.0)

Simultaneous connection of CAN or OBD-2 sensors, an artificial head HMS IV (configuration), a GPS antenna and the remote control RC X.1-V1 (SVA II.0 as of SQuadriga II, version C, firmware 2.0).

CAN/OBD-2 (CLD VII.1 adapter)

Via the CLD VII.1 adapter and an user-specific CAN cable, SQuadriga II receives CAN data. A DBC database can be saved on the SDHC card, so that four CAN signals can be decoded directly while monitoring.

OBD-2 information (via CAN according to ISO 15765-4) can be polled via this interface as well. For this, in addition the cable CDO X.xx (Code 3786-xx) is required.

AES/EBU (CLX VII.1 adapter cable)

The AES interface can be used to connect SQuadriga II to an artificial head of the HMS IV generation (in stand-alone mode in combination with the RS232 interface).

SQuadriga II detects the artificial head automatically, which can then be configured and controlled (via the software HEAD Recorder or in stand-alone mode via RS232) for making artificial head recordings.

The connection via AES/EBU is synchronized and sample-accurate.

RS232 (CLD VII.8 adapter)

This interface allows an HMS III or HMS IV artificial head to be controlled in stand-alone mode.

Additionally, the cable CAB I.xx (Code 5475) is required.

GPS (CLG VII adapter)

The GPS adapter allows the recording of GPS coordinates, speed information, etc. The information are stored in a separate channel.

Pulse Out (CLB VII.4 adapter)

In front-end mode, the adapter provides a 2-channel pulse output.

HEAD*lab* (CLD VII.6 adapter)

Via adapter CLD VII.6, SQuadriga II can be used as a controller extended with a HEAD*lab* module (*lab*V6 or *lab*VF6 and *lab*M6). In addition, a power box *lab*PWR I.1 and the cables CLL X.xx and CLL XI.xx are required.

Second SQuadriga II (CLL VII.1 adapter cable)

Via this interface, two SQuadriga II units can be combined into one system, allowing additional, samplesynchronized channels to be recorded. In stand-alone mode, the data are stored on the SDHC card of one SQuadriga II.

ADAT In/Out (CLA VII.5 adapter)

This interface converts ADAT signals to signals that are transmitted via Toslink connectors. This allows, for example, connection to a programmable equalizer PEQ V or a binaural front end BEQ II (as of BEQ II, version C).

Pulse conditioning (SCU-P2)

Adapter for conditioning of varied pulse signals and transfering TTL compatible pulses to SQuadriga II

Impedance converter (SCU-V2)

Adapter for connecting two high-impedance voltage sources

BHS II (CLB I.2)

Adapter for connecting BHS II to SQuadriga II via BNC interfaces (only recordings)

HSU/BHM (CLB I.3)

Adapter for connecting HSU III.2/ BHM III.3 to SQuadriga II (via headset interface)

Operation modes

Front-end mode

In front-end mode, SQuadriga II is controlled from a notebook, PC or tablet PC (Windows) via USB using the HEAD Recorder software, and recordings are saved directly to the hard disk of the computer. The HEAD Recorder provides all the proven features, such as intuitive sensor setup via the front-end view, real-time monitoring with up to 16 analysis windows, or flow control functions.

Stand-alone mode

In stand-alone mode, operation is easy and intuitive via buttons or via the touchscreen display using a stylus.

Frequently used menus can be reached quickly, considerably facilitating the operations. Recordings are saved to the removable SD card, which is detected automatically by SQuadriga II.

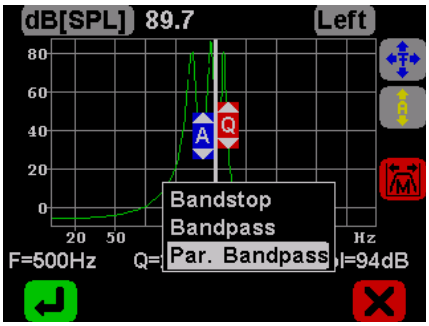
SQuadriga II and HEAD*lab*

In HEAD*lab* mode, SQuadriga II can be operated as a controller with a connected HEAD*lab* signal module (*lab*V6 or *lab*VF6 and *lab*M6). SQuadriga II controls and configures the module.

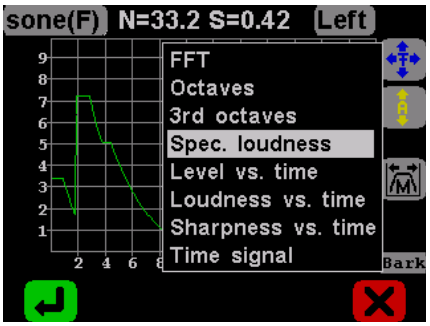
Real-time analyses (monitoring/playback)

For playback and monitoring (not in record mode), SQuadriga II provides the real-time analyses FFT, Octave, Third Octave, Time Signal. While analyzing, an IIR filter (bandpass/bandstop/param. bandpass) with adjustable filter parameters (quality, frequency/attenuation) is available. Furthermore, SQuadriga II provides the psychoacoustic analyses Loudness as well as Spec. Loudness and Sharpness.

CAN respectively OBD-2 quantities as well as Pulse and GPS signals can be displayed as a time signal too.



Using the IIR filter, SQuadriga II allows filtering while monitoring and playback.



The psychoacoustic analyses are FFT based. Sharpness is displayed as a single value too.

SQuadriga II offers various selection windows which can be used as input or output windows (settings, operating conditions, recording, measurements, level, real-time analyses, playback, etc.).

Remote control RC X

The remote control RC X allows the starting and stopping of SQuadriga II recordings. The RC X is available in three variants:

- RC X.1 is connected via USB with the PC (in front-end mode; controlling via HEAD Recorder)
- RC X.1-V1 is connected to the multi function adapter SVA II.0 (in stand-alone mode)
- RC X.1-V2 is directly connected (AUX 1) to SQuadriga II (in stand-alone mode)

From a distance of up to 20 m, the RC X.1/RC X.1-V1 can be wirelessly controlled by the radio module RC X.2 (in preparation).

ArtemiS SUITE extensions

The ArtemiS SUITE software modules (ASM) provide varied, individual extensions for SQuadriga II:

- Documentation templates suitable for the SQuadriga II user documentation (ASM 00)
- Creation of reports such as using the user documentation (ASM 02)
- Database with extensive search functions (ASM 03)
- Controlling the SQuadriga II functions in front-end mode (ASM 04)
- More than 130 analyses, filter options and statistical calculations (ASM 01, 12, 13, 14, 15, 16, 17 und 19)
- Modal analyses using the impact measurement tool (ASM 18)
- Latency-free real-time filters for monitoring with SQuadriga II (ASM 19)
- Export of SQuadriga II recordings in external formats (ASM 23)
- Extracting individual signals from CAN, OBD-2 measurements (ASM 24)
- Channel-related calculation functions (ASM 27)

SQuadriga II simulator

The SQuadriga II simulator is a stand-alone software which allows the user to configurate SQuadriga II virtually on a PC. The configurations can be stored on the SD card and loaded in SQuadriga II.

Power supply

PSH I.7 power adapter

The PSH I.7 power adapter provides power to SQuadriga II and charges the built-in battery. The PSH I.7 is a compact power adapter with a wide-range input.

Internal battery

The built-in lithium-ion battery allows SQuadriga II to be operated autonomously for up to six hours.

USB

When SQuadriga II is connected to a notebook, PC or tablet PC (Windows) via USB, power from the USB port supports the battery supply; the battery is not charged in this case.

Batteries

SQuadriga II has a battery compartment with reverse polarity protection, which holds four AA type NiMH or alkaline batteries. They can be used to extend the operating time of SQuadriga II when the internal battery is exhausted.

Car adapter (optional)

The SCA II.2 car adapter can be used to power and charge SQuadriga II from a car battery, for example.

The input voltage range is from 10 V to 26 V DC, the output voltage is 5 V DC. In order to connect the car adapter SCA II.2, the adapter cable CLO VII.9 or the cables CXO I.1 and CLX III.xx are required additionally.

Scope of supply

- SQuadriga II (Code 3320)
  Mobile recording and playback system
- HSD II.4 (Code 3331-4)
  Industrial SDHC card for SQuadriga II, 4 GB
- SDHC card reader
- PSH I.7 (Code 3341)
  Power adapter for SQuadriga II
- CSB VII.0 (Code 3350)
  2 x cables SMB ↔ BNC (including BNC adapters), 15 cm
- CUSB II.1.5 (Code 5478-1.5)
  Cable USB 2.0, 1.5 m
- HSC V.1 (Code 3330)
  Carry case for SQuadriga II and accessories
- Carry strap for SQuadriga II
- HEAD Tools CD (incl. SQuadriga II Tools, SQuadriga II Simulator)

Overview adapters/adapter cables

Aux 1

Interface for connecting:

- SVA II.0 (Code 3360)
  Multi function adapter (as of SQuadriga II, version C, firmware 2.0) for the simultaneous connection of:
  - CAN bus (OBD-2 according to ISO 15765-4 via CAN with CDO X.xx)
  - Cable RS232 (HMS controlling)
  - GPS antenna (included)
  - Remote control RC X.1-V1
- CLD VII.1 (Code 3351)
  Adapter CAN bus (OBD-2 according to ISO 15765-4 via CAN with adapter CLD VII.1 and cable CDO X.xx)
- CLB VII.4 (Code 3354)
  Adapter Pulse Out
- CLG VII (Code 3357)
  Adapter GPS
- CLD VII.8 (Code 3358)
  Adapter RS232

Aux 2

Interface for connecting:

- CLX VII.1 (Code 3352)
  Adapter cable AES/EBU
- CLL VII.1 (Code 3353-1)
  Adapter cable SQuadriga II
- CLA VII.5 (Code 3355)
  Adapter ADAT In/Out
- CLD VII.6 (Code 3356)
  Adapter HEAD*lab*

BNC

- SCU-V2 (Code 3394)
  Adapter for connecting high-impedance voltage sources
- CLB I.2 (Code 9847)
  Adapter for connecting BHS II with SQuadriga II (only recordings)

Pulse In

- SCU-P2 (Code 3393)
  Adapter for conditioning pulse signals

BHS Headset

- CLB I.3 (Code 9848)
  Adapter for connecting HSU III.2/ BHM III.3 with SQuadriga II

Power In

- SCA II.2 (Code 3345)
  External car adapter

  Additionally required:
  CLO VII.9 (Code 3359)
  SCA II.2 ↔ car supply

  or:

  CXO I.1 (Code 5176), XLR4 ↔ Cable lug (2 m) and CLX III.xx (Code 3676-xx), XLR4 ↔ SCA II.2

Overview cables

- CDO X.xx (Code 3786-xx)
  Cable OBD-2, max. 3 m
- CLO VII.9 (Code 3359)
  Cigar lighter ↔ Lemo 2-pin.
  (see car adapter SCA II.2)
- CSB VII.0 (Code 3350)
  2 x cables SMB ↔ BNC (including BNC adapters)
- CUSB.xx (Code 5478-xx)
  Cable USB 2.0, max. 3 m
- CLL X.xx (Code 3780-xx)
  Cable Lemo 8-pin ↔ Lemo 8-pin (SQuadriga II ↔ HEAD*lab* via CLD VII.6)
- CLL XI.xx (Code 3781-xx)
  Cable Lemo 4-pin ↔ Lemo 4-pin (*lab*PWR I.1 ↔ HEAD*lab* input module)
- CLB IV.1 (Code 9826-04)
  Breakout cable Lemo 14-pin ↔ 2 x BNC (Line out), 40 cm
- CAB I.xx (Code 5475)
  Cable D-Sub 9-pin male ↔ D-Sub 9-pin female (RS232 for CLD VII.8), max. 3 m

Overview accessories

- BHS II (Code 3322)
  Recording and playback headset
- HSD II.x (Code 3331-x)
  Industrial SDHC card for SQuadriga II
  - 4 GB: HSD II.4 (Code 3331-4)

  or:
  - 8 GB: HSD II.8 (Code 3331-8)

  or:
  - 16 GB: HSD II.16 (Code 3331-16)
- RC X.1 (Code 9850)
  Remote Control for connection to the PC
- RC X.1-V1 (Code 9850-V1)
  Remote control for connection to the multifunction adapter SVA II.0
- RC X.1-V2 (Code 9850-V2)
  Remote control for connection to SQuadriga II (AUX 1)
- RC X.2 (Code 9851)
  Radio remote control (ZigBee) for controlling the RC X.1/RC X.1-V1/ RC X.1-V2 (in preparation)
- *lab*MA-a (Code 3760)
  Mount adapter with active lock. For connecting SQuadriga II with HEAD*lab* two *lab*MA-a are required.
- *lab*MM (Code 3769)
  Magnetic mounts for fastening onto the mount adapter *lab*MA-a

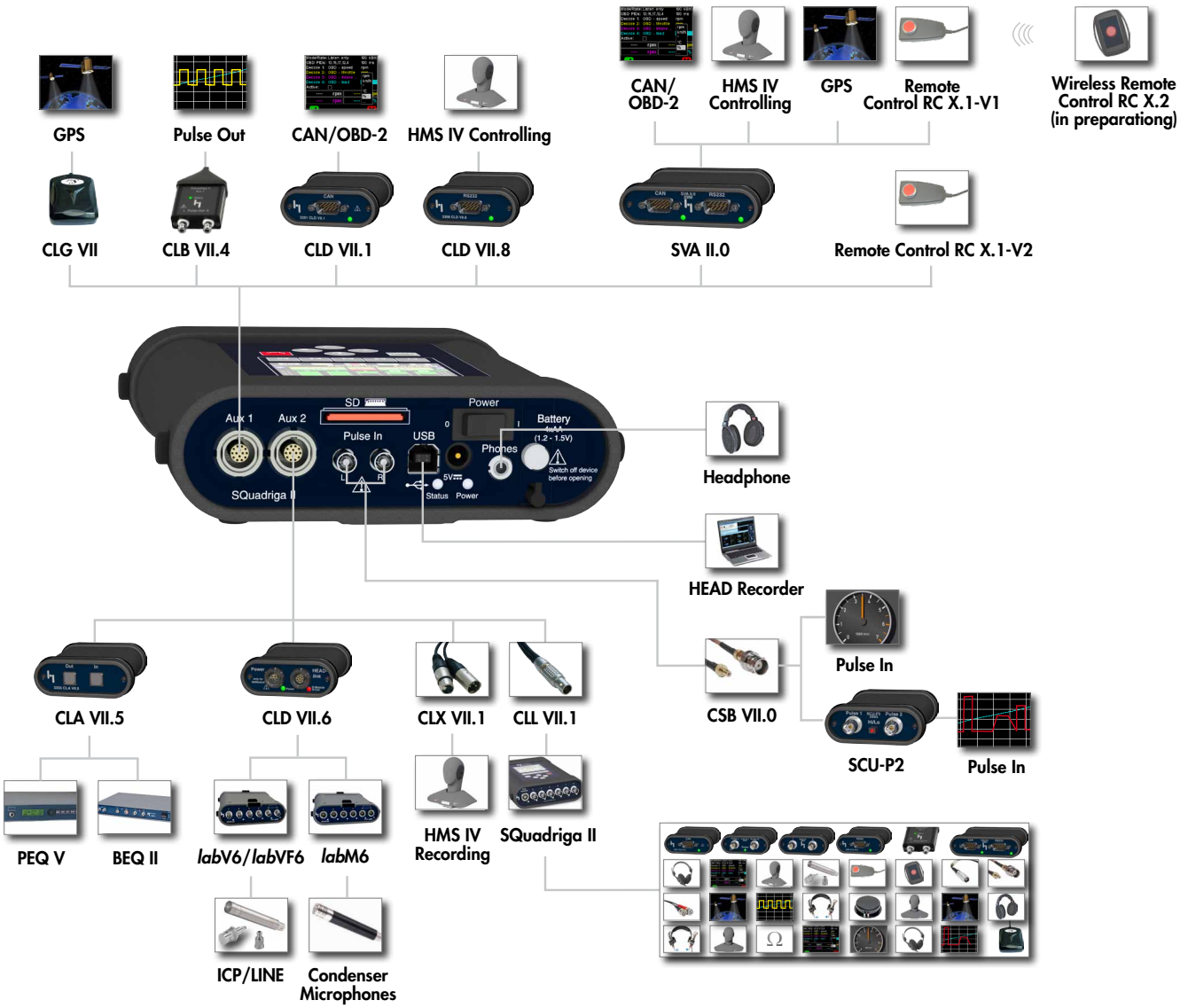
Software (optional)

- HEAD Recorder
  ArtemiS SUITE Data Acquisition Module
  HEAD Recorder
  (Code 5004)
- ArtemiS SUITE Basic Framework
  (Code 5000)
- Additional ArtemiS SUITE modules

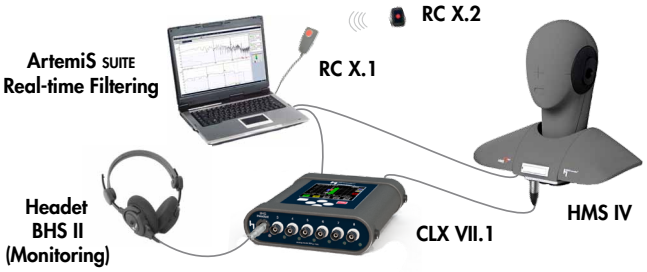
SQuadriga II - Overview

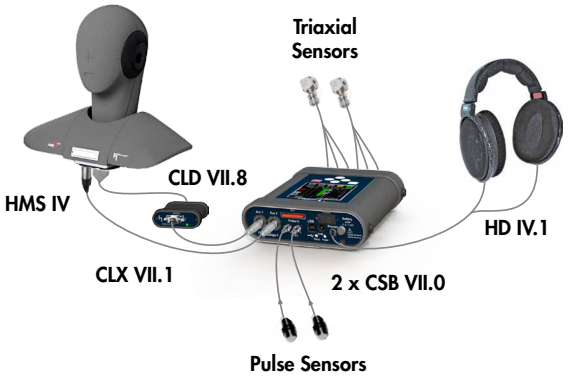
Front side

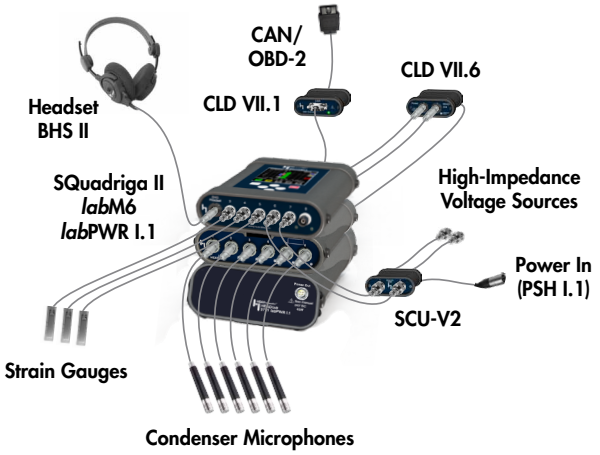
Rear side

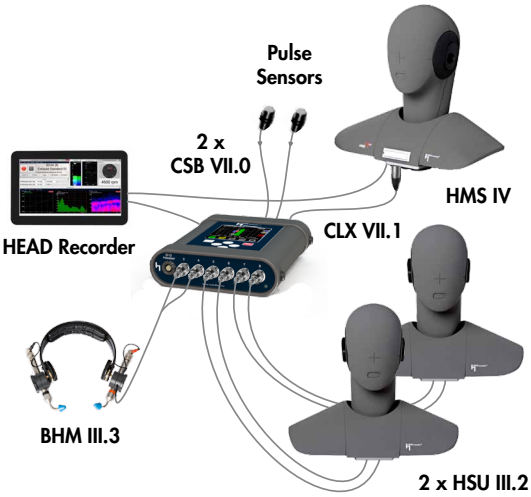


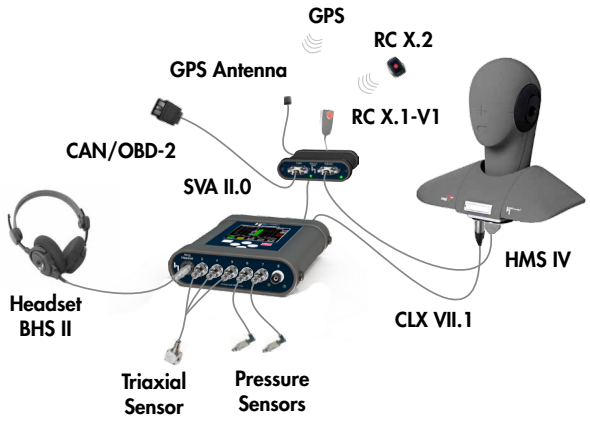
SQuadriga II - Configurations

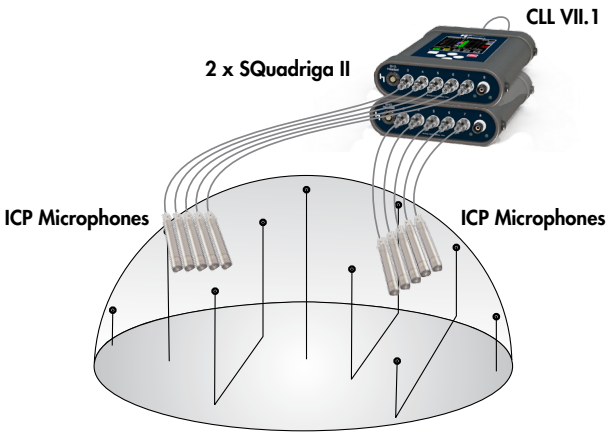


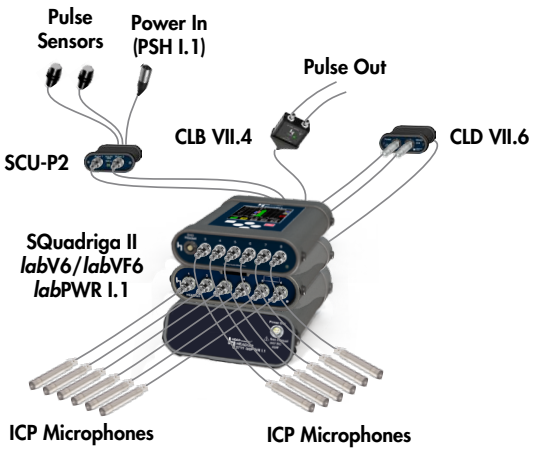












Technical Data SQuadriga II

General

Number of channels (direct connections):	10 6 x Line /ICP In, BHS In (2-channel), 2 x Pulse In
Connections via adapters or adapter cables:	CAN/OBD-2, HMS III/HMS IV, HSU/BHM, Analog-Out, BEQ II/ PEQ V (ADAT In/Out), HEAD*lab* (*lab*V6/*lab*M6), 2. SQuadriga II, Pulse Out, pulse conditioning for Pulse In, BHS via BNC, GPS, remote control RC X.1-V1, high-impedance voltage sources
Interfaces:	6 x BNC, 3 x Lemo 14-pin, 2 x SMB, 1 x USB, 1 x jack 3.5 mm
Resolution:	24 bit ΔΣ audio A/D and D/A converter
Input voltage:	5 V DC (+/-5 %), inverse-polarity protection
Power consumption Quick charging and operation: Quick charging (device: off state):	 12 W (max.) 5 W (max.)
Power supply via USB:	500 mA (max.), no charging, operation as bus-powered-device
Sampling frequencies (digital) Internal or external AES: HEAD*link*: External ADAT (opt):	 32; 44.1; 48; 51.2; 64; 88.2; 96 kHz (different sampling rates adjustable: each with ½ and ¼ of f_S) 48 kHz 48 kHz
TFT touchscreen:	Colour display 7.2 cm (2.83" / 43.2 x 57.4 mm), TFT, QVGA: 320 x 240 pixel
Memory (SDHC card HSD II.x):	4 GB; optional: 8 GB, 16 GB (file system FAT32)
Cooling:	Convection, no fan
Battery:	Lilon, 3.7 V, 5600 mAh
Charging time (ext. power supply):	7 h (max.), with 1000 mA
Operation time battery: battery and USB:	 Typ. 6 h (stand-alone mode, 6 x ICP, writing on SDHC card) Typ. 16 h (500 mA via USB)
External battery:	4 x AA (Mignon), NiMH, Alkali, 1.25 V to 1.5 V, 2 h additional running time (typ.)
Dimensions (rubber pads and BNC connectors, incl.):	148 x 182 x 45 mm (5.9" x 7.2" x 1.8") (WxDxH)
Weight (without batteries, with stylus and SD card):	970 g (2.14 lb)
Operating temperature:	-20 °C to 50 °C (-4 °F to 122 °F) (0 to 90 % relative, non-condensing)
Storage temperature:	-20 °C to 70 °C (-4°F to 158 °F)

BNC Inputs

Number of channels:	6					
Interfaces:	6 x BNC, switchable separately as analog outputs					
Input impedance:	20 KΩ					
Electric strength:	30 V_{PP} (max.)					
ICP supply (switchable individually):	18 V, 2 mA (+/-10 %)					
Ranges:	14 dB(V)	4 dB(V)	-6 dB(V)	-16 dB(V)	-26 dB(V)	-36 dB(V)
Level FS (V_{eff}):	10 V_{eff}	3.162 V_{eff}	1 V_{eff}	316 mV_{eff}	100 mV_{eff}	31.6 mV_{eff}
Level FS (V_{SS}):	28.3 V_{SS}	8.94 V_{SS}	2.83 V_{SS}	894 mV_{SS}	283 mV_{SS}	89 mV_{SS}
S/N_{FS} (typ.):	97 dB 99 dB(A)	96 dB 99 dB(A)	96 dB 99 dB(A)	94 dB 96 dB(A)	87 dB 90 dB(A)	79 dB 81 dB(A)
THD+N (typ.), at 1 kHz, -6 dB_{FS}:	-80 dB 0.001 %	-88 dB 0.004 %	-89 dB 0.004 %	-88 dB 0.004 %	-81 dB 0.009 %	-72 dB 0.003 %
Crosstalk, typ. (sinus 1 kHz, same range, adj. channels):	110 dB	110 dB	110 dB	100 dB	100 dB	100 dB
Linearity (typ.):	117 dB	117 dB	118 dB	114 dB	103 dB	98 dB
Frequency range to 20 kHz (typ.):	+0.1 dB -0.3 dB	+0.1 dB -0.3 dB	+0.1 dB -0.3 dB	+0.1 dB -0.3 dB	+0.1 dB -0.3 dB	+0.1 dB -0.4 dB
Analog filters highpass (switchable): lowpass:	 DC / 2 Hz / 22 Hz (1st. order, +/-10 %) 30 kHz (anti-aliasing, 1st. order, oversampling: 256 times)					

Pulse Inputs

Number of channels:	2
Interfaces:	2 x SMB
Galvanical isolation:	yes
Pulse frequency, max.:	600 kHz (at f_S = 48 kHz); 1 MHz (at f_S = 96 kHz)
Input voltage range Low-level: High-level:	 0 V to +0,8 V +2,5 V to +5 V (max.)
Input impedance:	Typ. 830 Ω for U_{IH} = 2,5 V Typ. 400 Ω for U_{IH} = 5 V

BHS Headset Inputs

Number of channels:	2				
Interfaces:	Lemo 14-pin				
Equivalent noise level with BHS II:	30 $dB(A)_{SPL}$ (ID equalization) (typ.)				
Equalization:	ID				
Ranges:	134 dB_{SPL}	124 dB_{SPL}	114 dB_{SPL}	104 dB_{SPL}	94 dB_{SPL}
S/N_{FS}, electrical (typ.):	99 dB(A)	99 dB(A)	96 dB(A)	90 dB(A)	81 dB(A)
Noise, SPL, electrical (typ.):	40 dB_{SPL}(A)	30 dB_{SPL}(A)	24 dB_{SPL}(A)	20 dB_{SPL}(A)	19 dB_{SPL}(A)
THD+N (typ.), at 1 kHz, -6 dB_{FS}:	-82 dB 0.008 %	-82 dB 0.008 %	-83 dB 0.007 %	-81 dB 0.009 %	-72 dB 0.,03 %
Crosstalk (typ.) (sinus 1 kHz, same range, adj. channels):	>100 dB	>100 dB	>100 dB	>100 dB	>100 dB
Analog highpass filter (switchable):	2 Hz / 36 Hz				
Frequency range up to 20 kHz (typ.):	+0.1 dB	+0.1 dB	+0.1 dB	+0.1 dB	+0.1 dB	+0.1 dB

BNC Outputs

Number of channels:	6
Interfaces:	6 x BNC
Level (max.):	-10 dB(V) + 6 dB headroom
Output impedance (typ.):	250 Ω
S/N (typ.):	96 dB / 99 dB(A)
THD+N (typ.):	-82 dB, at sinus 1 kHz, -1 dB_{FS}
Crosstalk (DA>DA) (typ.):	>110 dB, at sinus 1 kHz
Frequency range (typ.):	10 Hz to 35 kHz (+0,1 dB / -0,2 dB) at f_S = 96 kHz (no DC)
Highpass filter analog: digital:	 1 Hz (1st. order) higher order, scaled with f_S

BHS Headset Outputs

Number of channels:	2
Interfaces:	Lemo 14-pin
Nominal level, typ. (frequency dependent):	110 dB_{SPL} with BHS II
THD+N, electrical (typ.):	-57 dB at playback sinus 104 dB_{SPL}, 1 kHz at R_L = 110 Ω
Frequency range (typ.):	-1 dB at 6 Hz; -1 dB at 20 kHz für R_L = 110 Ω
Equalizations:	FF, ID, DF, LIN (no equalization)

Phones Output

Number of channels:	1
Interfaces:	Jack 3,5 mm
Nominal level, typ. (frequency dependent):	108 dB_{SPL} with HD IV.1
THD+N typ., electrical:	-57 dB at playback sinus 104 dB_{SPL}, 1 kHz at R_L = 110 Ω
Frequency range (typ.):	-1 dB at 6 Hz; -1 dB at 20 kHz to R_L = 110 Ω
Equalizations:	FF, ID, DF, LIN (no equalization)

USB Interface (USB 2.0 Highspeed)

Data transfer:	480 Mbits/s

AUX 1/ AUX 2 (extensions for SQuadriga II)

Interfaces:	2 x Lemo 10-pin
Connecting adapters and adapter cables:	SVA II.0, CLD VII.1, CLX VII.1, CLD VII.8, CLG VII, CLB VII.4, CLD VII.6, CLL VII.1, CLA VII.5