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

BEQ II.1 (Code 1347)

Binaural front end with 24 bit technology and USB interface

Overview

BEQ II.1 is a two-channel USB front end with digital, programmable filters.

Signal conditioning, separate pulse inputs, ADAT and AES/EBU inputs and outputs, a USB interface, various equalization options for aurally accurate recordings and many more features make the BEQ II.1 an extremely versatile and user-friendly tool.

The built-in batteries and the possibility to operate the front end with a cigarette lighter guarantee a maximum of portability.

Features

- Aurally accurate recordings with binaural head microphones or head shoulder units
- Equalization options: ID, FF, DF, USER, no equalization
- Interfaces for the direct connection of common measurement sensors - microphones, line and ICP
- Separate pulse interfaces
- USB, AES/EBU and ADAT interfaces
- Connection of up to four BEQ units via ADAT for eight-channel recordings (connection to the PC with a digital sound card providing an optical ADAT input)
- Connection to a HEAD*lab* system or SQuadriga II
- Sampling rates: 32 kHz, 44,1 kHz, 48 kHz, 88,2 kHz, 96 kHz
- Per-channel sensitivity adjustment
- Optional amplification (+10 dB) for analog output
- Automatic system check
- Control via PC (remote control software or ArtemiS SUITE Data Acquisition Module HEAD Recorder) or Bluetooth® remote control (HEAD remote control App)
- Battery operation or external DC power supply
- Battery management and sound level meter: charge level display via remote control software (included) or the optional remote control

The 24 bit front end BEQ II.1

combines the characteristics of a two-channel front end, an equalizer, and an A/D converter in one mobile and extremely versatile measurement device.

Binaural sensors and measurement systems such as head shoulder units and binaural head microphones can be connected to the BEQ II.1 quickly and easily and equalized by means of the programmable filters.

Built-in signal conditioning makes it possible to connect commonly used dynamic measurement sensors (microphones, line, ICP) directly to the front end.

In addition, two pulse inputs are provided for measuring RPM, speed. The pulse inputs are not electrically isolated, allowing for higher pulse frequencies depending on the sample rate. If electrical isolation is required nevertheless, it is possible to use an adapter with an optocoupler (included).

The AES/EBU interfaces allow a quick and easy expansion of the system, for example, by connecting with a headphone equalizer *lab*P2 for monitoring and playback. By connecting a second digital front end (e.g. BEQ II.1) it is very easy to set up a multi-channel acquisition system.

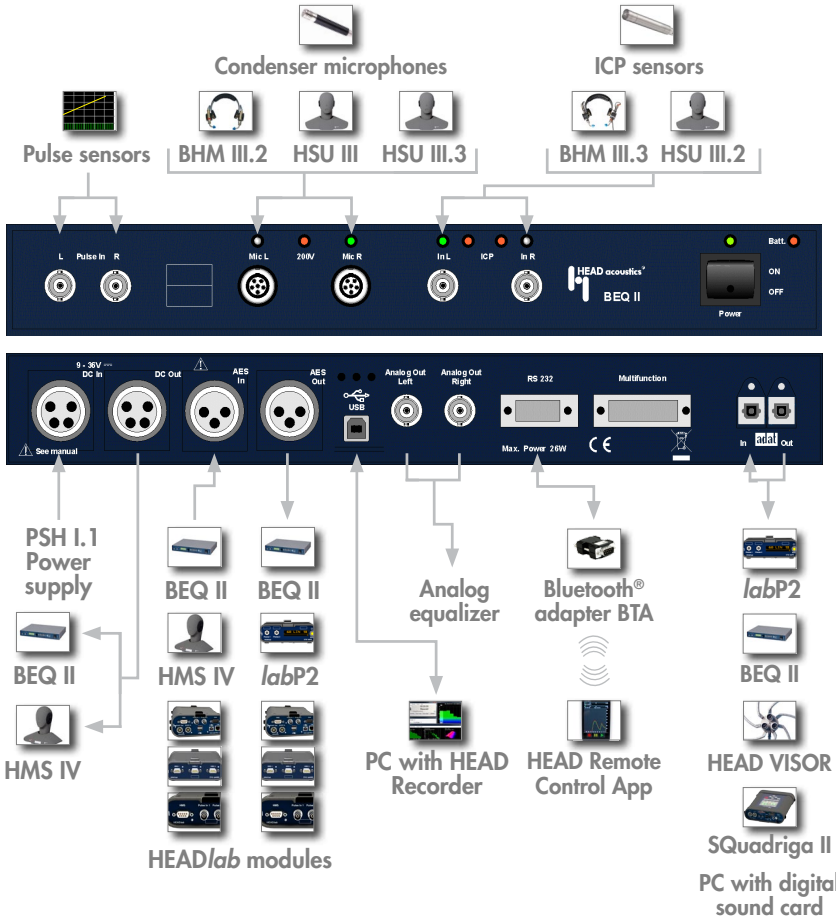
Provided that a digital sound card with an optical ADAT input is installed in the computer, the ADAT interface allows, for example, up to four BEQ units to be connected, which makes eight-channel recordings possible.

The combination of high-performance battery (or DC) operation, light weight and rugged design makes the BEQ II.1 a versatile measurement tool.

The BEQ II.1 can be controlled via the included remote control software or the ArtemiS SUITE Data Acquisition Module HEAD Recorder.

For controlling a BEQ II.1 device via remote control, the Bluetooth® adapter BTA (for receiving control signals of the HEAD Control Remote App for Android smartphones) is available.

Interfaces



Scope of supply

- BEQ II.1 (Code 1347)
  Binaural front end with with 24 bit technology and USB-interface
- Power supply for BEQ II.1
  15 V / 60 W / XLR 4-pin
  90 to 275 V AC, 50 to 60 Hz
- HEAD Tools setup DVD, incl. HMS Remote Control
- Pulse adapter with optocoupler
- CXX II.3 (Code 5177-3)
  Cable XLR 3-pin male ↔ XLR 3-pin female (AES/EBU), 2.95 m (118")
- PCC I.9x (Code 997X)
  Mains cable for power supply (country-specific)
- CUSB II.1.5 (Code 5478-1.5)
  Cable USB 2.0, with ferrite, 1.5 m (4.9 ft)
- HSC VI.0 (Code 9870)
  Carrying case
- Manual BEQ II

Options (not included)

- CMD III.0 (Code 9809)
  Breakout cable 2 x BNC ↔ D-Sub, 15-pin (Pulse In for HMS), 1.5 m (59")
- CAB I.xx (Code 5475-xx)
  Cable D-Sub. 9-pin male ↔ D-Sub. 9-pin female (RS232)

Remote control (PC via USB)

HEAD Recorder: ArtemiS SUITE Data Acquisition Module (Code 5004)

Remote control (Bluetooth®)

BTA (Code 1968): Bluetooth® adapter for HEAD Remote Control App

HEAD Remote Control App: Software app for Android smartphone or tablet

Artificial head measurement systems

HMS IV.0 (Code 1500): Artificial head measurement system

Binaural ICP sensors

HSU III.2 (Code 1391): Head shoulder unit with ICP microphones

BHM III.3 (Code 1303): ICP head microphone

ICP sensors

ICP sensors (microphones, accelerometers etc.)

Binaural sensors with condenser microphones

HSU III (Code 1323): Head shoulder unit with condenser microphones

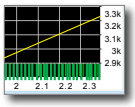
HSU III.2 (Code 1326): Head shoulder unit with condenser microphones

BHM III.2 (Code 1302): Head microphone with condenser microphones

Condenser microphones

Standard condenser microphone (via LEMO)

Pulse sensors



Pulse sensors (via BNC), TTL compatibel

Playback/monitoring

*lab*P2 (Code 3732): Binaural headphone equalizer

*lab*P2-V1 (Code 3732-V1): Binaural headphone equalizer

SQuadriga II

SQuadriga II (Code 3320): Mobile recording and playback system

HEAD*lab*

*lab*CTRL I.2 (Code 3702): LAN/USB controller

*lab*HMS (Code 3742): HEAD*lab* module with 3 HMS interfaces

*lab*DX (Code 3741): Digital module with HMS interface

HEAD VISOR

HEAD VISOR (Code 7500ff): System for on-line localization of sound sources in real time

Technical Data

Filters (analog):	2.4 Hz (±10 %), highpass 1st order, passive (fixed) 180 Hz (±10 %) highpass 1st order, passive (switchable) 22 Hz (±10 %) highpass 3rd order, passive/active (switchable) 180 Hz highpass 1st order and 22 Hz highpass 2nd order
A/D Converter:	Resolution: 24 bit, sampling rates: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 256 times oversampling, (f_S <50 kHz), 128 times (f_S >50 kHz)
Analog In (in common):	
Frequency range:	20 Hz: ±0.1 dB 20 kHz: ±0.15 dB 40 kHz: -1 dB (f_S = 96 kHz)
Crosstalk attenuation:	121 dB (1000 Hz) at 124 dB_{SPL}
Overload reserve:	6 dB (except at 144 dB_{SPL} measurement range)
Microphone In:	2 inputs for measuring microphones (LEMO)
Polarisation voltage:	200 V (can be switched off electronically)
Supply voltage:	120 V
Amplifier:	Analog amplifier/attenuator in steps of 10 dB for the measuring range: 94 dB_{SPL} to 144 dB_{SPL}, digital amplification for the range 84 dB_{SPL}
Distortion factor (THD+N in the range of 114 dB_{SPL}):	-98 dB, -99 dB(A), at f_S = 48 kHz (20 Hz to 20 kHz) -86 dB, -89 dB(A), at f_S = 96 kHz (20 Hz to 20 kHz) (when stimulated with sine 50 %, 1 kHz)
Inherent noise (electrical):	-4 dB_{SPL}, -5 dB_{SPL}(A), at 94 dB_{SPL}, at f_S = 48 kHz 15 dB_{SPL}, 13 dB_{SPL}(A), at124 dB_{SPL}, at f_S = 48 kHz 0 dB_{SPL}, at 94 dB_{SPL}, at f_S = 96 kHz (20 Hz to 40 kHz) 19 dB_{SPL}, at 124 dB_{SPL}, at f_S = 96 kHz (20 Hz to 40 kHz)
Dynamic range (S/N_{FS}; incl. headroom):	104 dB, 105 dB(A), at 94 dB_{SPL} (20 Hz to 20 kHz) 115 dB, 117 dB(A), at 124 dB_{SPL} (20 Hz to 20 kHz)
Analog In (without ICP):	2 inputs on BNC socket (same tech. spec. as Microphone In)
Measurement range:	-36 dB(V) to +24 dB(V) in 10 dB steps (analog and ICP inputs)
Input voltage:	Sine 1 V_{eff} equiv. to 0 dB(V)
Input capacity:	250 pF
Inherent noise:	0.56 μV_{eff}, at -26 dB(V), (A) 4.5 μV_{eff}, at 4 dB(V), (A)
Analog In (with ICP):	ICP supply can be activated separately for each channel
Voltage supply:	29.5 V, 4 mA
Dynamic range (S/N_{FS}):	98 dB, 104 dB(A), at -16 dB(V)
Analog Out:	1 V_{eff}+6 dB headroom (switchable gain: +10 dB)
Dyna mic range (S/N_{FS}):	98 dB(A)
Distortion factor (THD+N):	103 dB(A) with +10 dB gain -94 dB(A) -90 dB(A) with +10 dB gain (when stimulated with sine 50 %, 1 kHz)
Pulse In:	2 inputs with BNC sockets, TTL-compatible, not electr. isolated, pulse frequency: f_S/2, max. 35 kHz (depending on sampling frequency at duty cycle 50 %), with adapter for electrical isolation: max. 10 kHz
Input impedance:	10 kOhm
Input voltage:	15 V max.; low level: lower than 0.8 V, high level: higher than 2.4 V
Digital In:	AES/EBU (AES3-92) on XLR for ext. synchronization, four-channel recordings; sampling rates: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz ADAT optical on Toslink plug ADAT sampling rates (external): 44.1; 48 kHz

Digital Out:	AES/EBU (AES3-92) on XLR, sampling rate: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz (internal and external can be synchronized) ADAT optical on Toslink plug ADAT sampling rates (external): 44.1 kHz; 48 kHz (internal and external can be synchronized)
Equalization:	FF, ID, DF, USER, no equalization
RS232:	D-Sub 9 pin, (5 V DC / pin 9 for power supply of ext. devices, e.g. Bluetooth® adapter BTA for HEAD Remote Control App)
Multifunktion:	D-Sub 15 pin, pulse inputs, 5 V out, max. 400 mA
USB 2.0 (full speed):	1 MByte/s, four-channel recordings with 24 bits per channel, up to 48 kHz (respectively 16 bit up to 96 kHz)
DC In:	4 pin, XLR
DC Out:	4 pin, XLR, max. 3 A (looped through from DC In)
Battery type:	NiMH: 12 V / 2.0 Ah
Charging method:	Quick charging (max. 3 h) and transition to pulsed trickle charging, switch off with -dU/dt, temperature and charging time monitoring
Operating time:	Switch-off at battery voltage below 9 V und ICP supply for both channels max. 2.50 h
Currents, power:	Charging and operation: 2.15 A / 26 W
Trickle charging:	0.1 A / 1.2 W
Trickle charging and operation:	0.75 A / 9 W
Dimensions (with BNC sockets):	32.5 x 4.5 cm x 24.5 cm (WxHxD) 12.8“ x 1.77“ x 9.65“
Weight:	2.7 kg
Operating temperature:	0 °C to 50 °C / 32 °F to 122 °F (non-condensing)
Storage temperature:	-20 °C to 65 °C / 4 °F to 149 °F

In order to install software and drivers from HEAD acoustics, administrator rights are required. To operate the software, only standard user rights are needed.