

BEQ II.0 (Code 1346)

Compact two-channel front end with 24 bit technology and USB-interface



The mobile front end BEQ II.0

is a universal and easy-to-use measurement tool with a USB interface. In combination with ArtemiS, the front end is a complete, mobile two-channel analyzer.

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

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 a Pulse Splitter Box PSB II or an

adapter with an optocoupler (included).

The AES/EBU interfaces allow a quick and easy expansion of the system, for example, by the combination with a playback system. By connecting a second digital front end (e.g. BEQ II.0, BEQ II.1 or artificial heads of the HMS III and HMS IV generation) 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.

Overview

The compact front end BEQ II.0 is an ideal tool for applications requiring high quality sound and vibration data acquisition. Integrated signal conditioning allows measurement sensors to be connected directly without the need for additional amplifiers. The USB interface connects the BEQ II.0 to a notebook or desktop PC. If the computer is equipped with a digital sound card providing an optical ADAT input, several BEQ units and artificial heads can be connected via the ADAT interface, which transfers the data to the computer.

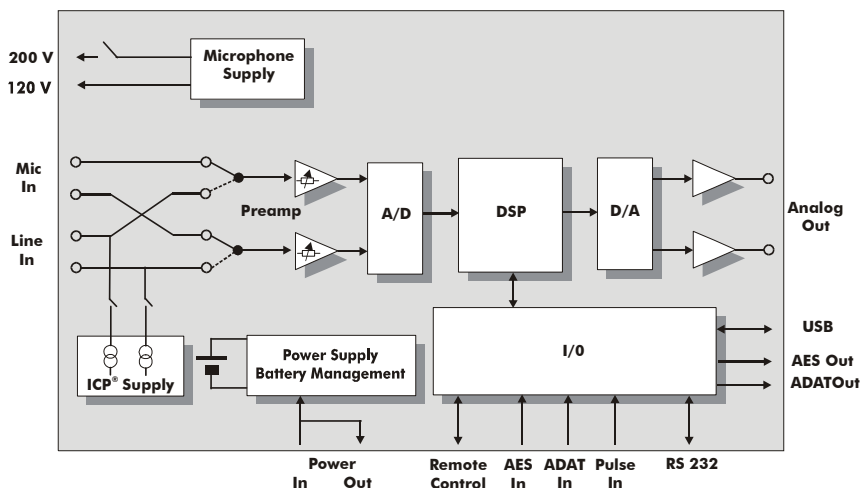
The built-in batteries and the possibility to operate the front end with a cigarette lighter guarantee a maximum of portability.

When combined with a Notebook PC and the well-known measurement and analysis software ArtemiS, the BEQ II.0 becomes a full-featured portable two-channel analyzer.

The combination of battery (or DC) operation, light weight, rugged design and ease of use make the BEQ II.0 a versatile measurement tool that allows the user to concentrate on his measurements and troubleshooting.

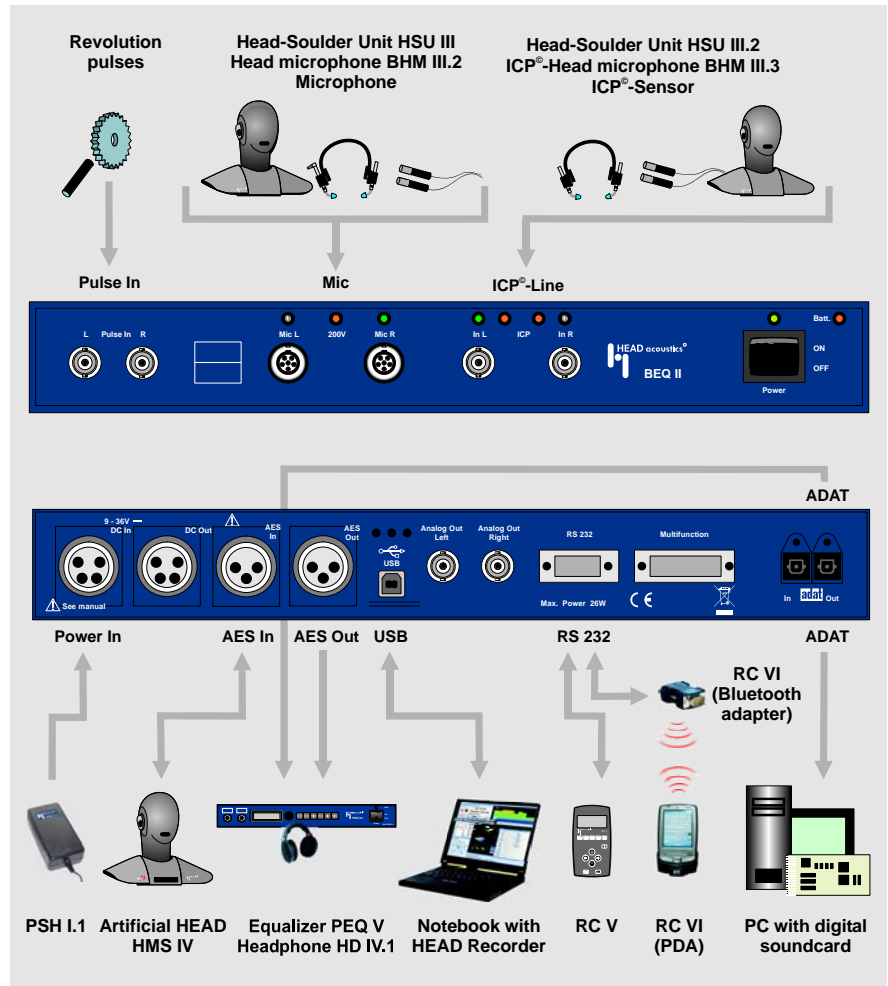
Applications

- Sound and vibration analysis
- Acoustic environment protection
- Troubleshooting
- Sound engineering
- Quality control



Special features

- Signal conditioning for common measurement sensors (microphones, line, ICP®)
- Per-channel sensitivity adjustment
- USB, AES/EBU and ADAT interfaces
- Additional separate pulse inputs
- Switchable amplification for analog output (+10 dB)
- Eight-channel recordings with up to four BEQ II units or two BEQ II units and two HMS IV artificial heads
- 24 bit technology
- Sampling rates: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
- Stationary and mobile operation
- Remote control via the included remote control software or optionally via the HEAD Recorder software, the handheld remote control unit RC V or the Bluetooth remote control unit RC VI
- Battery operation or external DC power supply
- Battery management: charge level display via RC V, RC VI and remote control



Connection options for BEQ II - front (upper) and rear side (lower)

Standard delivery items

- BEQ II.0 (Code 1346)
- PSH I.1 (Code 1364)
Power supply for BEQ II.0
- HEAD Tools setup CD, including HEAD Audio Recorder and HMS Remote Control
- Pulse adapter with optocoupler
- CXX II.3 (Code 5177-3)
AES/EBU, XLR - XLR, 3-pin, 3 m (9.84 ft)
- PCC I.9x (Code 997X)
Mains cable (country-specific) for PSH I.1
- CUSB II.1.5 (Code 5478-1.5)
Cable USB 2.0, with ferrite, 1.5 m (4.9 ft)
- Manual BEQ II

Accessories (not included)

- RC V (Code 1312)
Handheld remote control
- RC VI (Code 1966)
Remote control for HMS IV.0 (Bluetooth adapter and PDA)
- BHM III.2 (Code 1302)
Binaural head microphone
- BHM III.3 (Code 1303)
ICP® head microphone
- HMS IV.0 (Code 1500)
Digital artificial head measurement system with CompactFlash and USB interface
- HMS IV.1 (Code 1501)
Digital artificial head measurement system with CompactFlash and USB interface
- HSU III (Code 1323)
Head-shoulder unit with analog measurement microphones for aurally accurate recordings
- HSU III.1 (Code 1390)
Artificial head microphone for high sound pressure levels
- HSU III.2 (Code 1391)
Head-shoulder unit with ICP® microphones
- PSB II (Code 1329)
Pulse Splitter Box
- PVA IV.3 (Code 2486)
Power voltage amplifier
- PEQ V (Code 2492)
Programmable equalizer
- CMD III.0 (Code 9809)
Cable 2 x BNC, 1.5 m (4.9 ft)
Pulse In for BEQ II
- CAB I.3 (Code 5475-3)
DSUB - DSUB, 9-pin, 3 m (9.84 ft)
RS232 connection cable
- HEAD Recorder (Code 4630)
Recording software
- ArtemiS (Code 4600)
Multi-channel analysis system

Technical data

Filters (analog):

2.4 Hz ($\pm 10\%$), highpass 1st order, passive (fixed)
180 Hz ($\pm 10\%$) highpass 1st order, passive (switchable)
22 Hz ($\pm 10\%$) highpass 3rd. order, passive / active (switchable)
180 Hz highpass 1st order and 22 Hz highpass 2nd order

A/D Converter:

Resolution: 24 bit, sampling rate: 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: $\pm 0,1$ dB
20 kHz: $\pm 0,15$ 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

Polarisation voltage: 200 V (can be switched off electronically)

Supply voltage: 120 V (Lemo plug)

Amplifier: analog amplifier/attenuator in steps of 10 dB for the measuring
range: 94 dB_{SPL} - 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 - 20 kHz)
-86 dB, -89 dB(A), at $f_s = 96$ kHz (20 Hz - 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), at 124 dB_{SPL}, at $f_s = 48$ kHz
0 dB_{SPL}, at 94 dB_{SPL}, at $f_s = 96$ kHz (20 Hz - 40 kHz)
19 dB_{SPL}, at 124 dB_{SPL}, at $f_s = 96$ kHz (20 Hz - 40 kHz)

Dynamic range (S/N_{FS} ; incl.
headroom): 104 dB, 105 dB(A), at 94 dB_{SPL} (20 Hz - 20 kHz)
115 dB, 117 dB(A), at 124 dB_{SPL} (20 Hz - 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 μ V_{eff}, at -26 dB(V), (A)
4.5 μ V_{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)

Technical Data (continued)

Analog Out:	1 V _{eff} + 6 dB headroom (switchable gain: +10 dB)
Dynamic range (S/N _{FS}):	98 dB(A) 103 dB(A) with +10 dB gain
Distortion factor (THD+N):	-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: $f_c/2$, 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:	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 rate: 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 (internal and external can be synchronized)
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; 48 kHz (internal and external can be synchronized)
RS 232:	D-Sub 9-pin., (5 VDC / pin 9 for power supply of ext. devices, e.g. RC V)
Multifunktion:	D-Sub 15-pin., compatible to HSB IV, 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, with RC V (illuminated) 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
Operating temperature:	0 °C - 50 °C / 32 °F - 122 °F (non-condensing)
Storage temperature:	-20 °C - 65 °C / 4 °F - 149 °F
Weight:	2.7 kg
Dimensions (W,H,D):	32.5 x 4.5 x 23 cm (24.5 cm = 9.65 inches with BNC sockets) 12.8 x 1.77 x 9.06 inches