

System Components for the Mobile Variant of the HEAD 3D Sound Simulation System H3S



System Components

• **HSB-H3S**

HEAD Supply Box

Power supply for the system components in the vehicle

- Direct connection of the HSB-H3S to the on-board electric system
- Battery-buffered power for the system components (up to 20 minutes)

• **HXB-H3S**

HEAD Extension Box

Extension box with connection possibilities for input and processing of control signals

- Connection of digital and analog sensors for acquiring control quantities (e.g. RPM, speed, accelerator pedal, gearshift, tip-up / tip-down, brakes, ignition)
- CAN bus
- USB 2.0 interface

Additional System Components (not included)

For setting up the mobile variant of the H3S, the following additional components are required:

• **Embedded PC**

Powerful, rugged PC for mobile use in the car

• **Tablet PC**

High-quality tablet PC as control panel for the H3S

• **Equalizer**

Programmable digital equalizer PEQ V (code 2492)

• **Headphone**

• **H3S Software**

For information about the H3S software, including its various options, please refer to datasheet

• **PEAK CAN Adpater**

Direct acquisition of CAN data

• **HSB-H3S (Code 7030)**

HEAD Supply Box for a mobile H3S

• **HXB-H3S (Code 7031)**

HEAD-Extension Box (with Tellert SICO2B) with various connection possibilities for a mobile H3S

Overview

The HSB-H3S and the HXB-H3S are system components of the mobile variant of the H3S.

Together with the other system components, they constitute a mobile simulator, which can be installed in any stock vehicle without any need for complicated modifications to the vehicle itself.

The advantage of the mobile variant of the H3S is obvious: As the simulated vehicle sounds are played back in a real driving situation, the situational context - which is extremely important for noise judgments - does not need to be simulated.

In such a system, vehicle sounds can be excellently compared with each other. The system is equally well suited for benchmarking, for the definition of target sounds and for the acoustic comparison of different vehicle configurations.

Simulations can be performed not only while driving, but also with switched off engine in the standing vehicle (stationary simulation).



The hardware components (here: PC, HSB-H3S, HXB-H3S and a PEQ V) can be easily stored in the trunk of any stock vehicle.

HEAD Supply Box HSB-H3S

The supply unit HSB-H3S is connected to the on-board electric system of the vehicle and provides power to the system components (HSB-H3S, embedded PC, tablet PC, PEQ V etc.).

A built-in battery guarantees an uninterrupted supply in case of short on-board power outages.

HEAD Extension Box HXB-H3S

The HXB-H3S is designed for acquiring the control signals that inform the H3S about the current driving situation. For this purpose, two digital interfaces (RPM, speed) and six analog interfaces (throttle, gearshift, tip-up / tip-down, brakes, ignition) are provided. The signal configuration is done easily via software and RS-232.

The HXB-H3S processes the incoming signals and passes them directly to the H3S control software. Based on these data and an innovative synthesis algorithm, the H3S system reacts in real time to changes of speed, RPM, throttle position etc.

Real-time vehicle data can also be acquired via the CAN bus interface of the HXB-H3S. The interface is accessible via two connectors in parallel. This allows the CAN bus to be looped through easily.

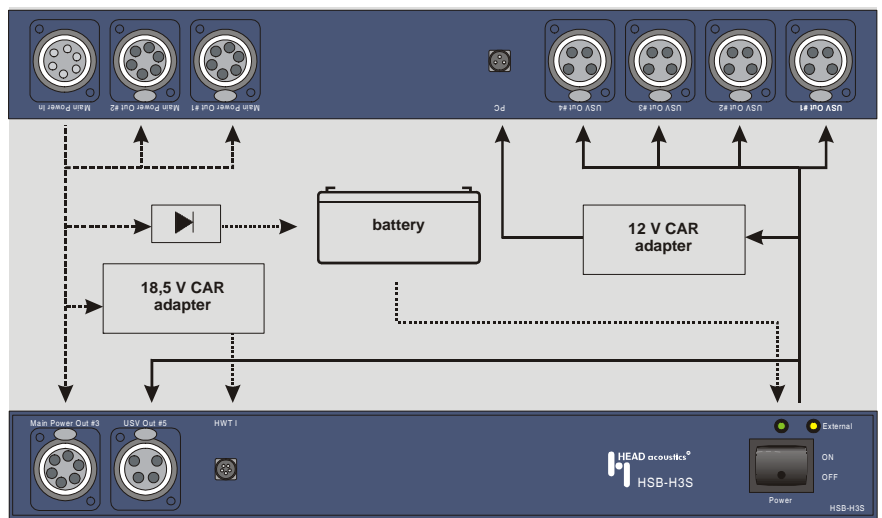
The extremely flexible H3S software also allows a mixed-mode operation with both analog / digital signals and CAN bus signals. The HXB-H3S is connected to the control panel (tablet PC) in the vehicle via a USB 2.0 interface.

Additional System Components (not included)

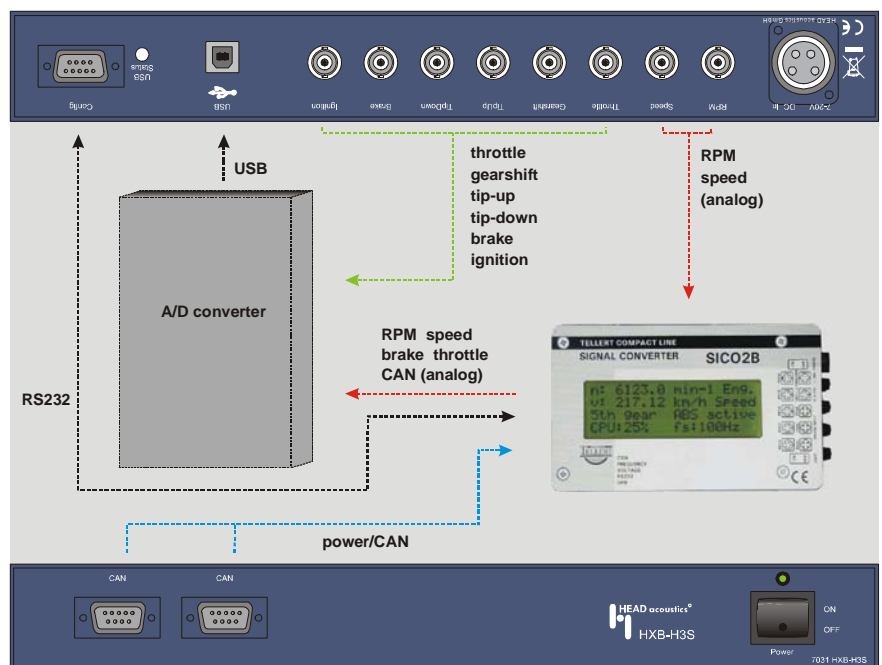
For setting up the mobile variant of the H3S, the following additional system components are required:

- **Embedded PC**

Stored on a PC the H3S software recalculates the acoustic driving situation continuously. Via RS 232 the PC is connected with the HXB-H3S and allows the sensors and the CAN interface to be configured individually.



Overview: HEAD Supply Box, HSB-H3S



Overview: HEAD Extension Box, HXB-H3S

- **Tablet PC**

The control panel running the H3S-Control software continuously receives real-time data about the vehicle status from the HXB-H3S via USB. Via a network connection, the information is then passed to the embedded PC, where it is used as the basis for the dynamic simulation.

- **Equalizer PEQ V (code 2492)**

For the aurally accurate playback of the simulated sounds, the programmable digital equalizer PEQ V is used, which allows two headphones to be connected.

- **Headphone**

An equalized dynamic headphone with high wearing comfort and Acoustic Noise Cancelling is ideal for suppressing ambient noise.

- **PEAK CAN Adapter**

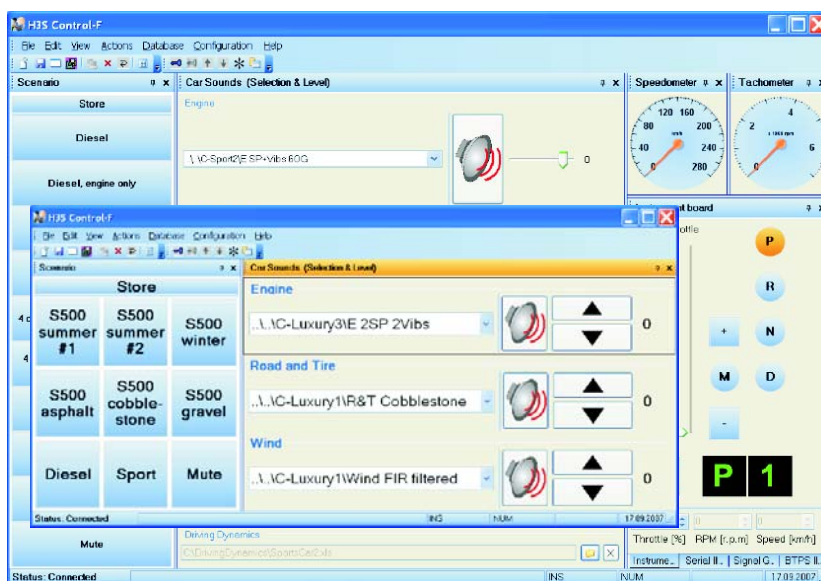
If only CAN data are needed, the PEAK CAN adapter can be used to acquire the CAN data directly.

Standard Delivery Items

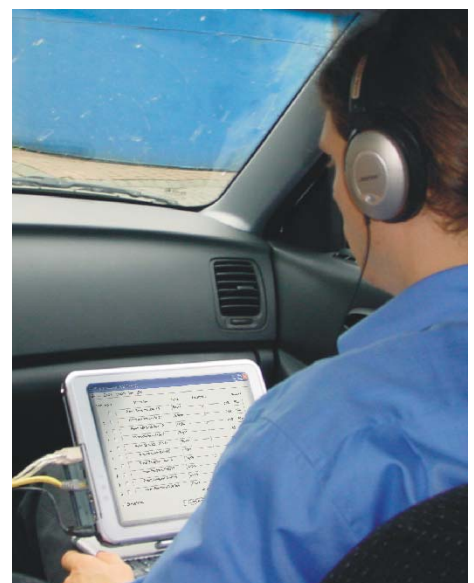
- **HSB-H3S (code 7030)**
HEAD Supply Box for a mobile H3S
- **CXO III.1 (code 5188)**
Cable XLR 6-pin > pigtail, external DC
for power supply of HSB-H3S
- **HXB-H3S (code 7031)**
HEAD Extension Box (with Tellert SICO2B) with various connection possibilities for a mobile H3S
- **CXX III.03 (code 5179-03)**
Cable XLR 4-pin, male <> XLR 4-pin, female, 0.3 m (1 ft), 3 pcs.
for power supply of HXB-H3S
- **CAB I.03 (code 5475-03)**
RS-232 cable, D-SUB 9-pin, 0.3 m (1 ft)
for configuration of HXB-H3S
- **CUSB II.3 (code 5478-3)**
USB 2.0 cable, with ferrite, 3 m (9.8 ft) for connection HXB-H3S > tablet PC
- **Network cable (LAN)**
for tablet PC, 3 m (9.8 ft)
- **Power Supply Cable**
for power supply of HSB-H3S > tablet PC, 3 m (9.8 ft)

Required Software (not included)

- **H3S Base Software (code 7007)**
 - HEAD 3D Sound Simulation System (H3S), setup DVD
 - H3SControl
 - H3S PrepareEngineData
 - HEAD Audio Recorder and Editor
 - Documentation (PDF)
- **Dongle**
- **H3S TP1 (code 7008)**
H3S real-time switching between different simulated engines
- **H3S TP2 (code 7009)**
H3S real-time filtering
- **H3S TP4 (code 7011)**
Driving dynamics model for stationary simulator
- **H3S TP5 (code 7012)**
H3S interface for PROGNO[ISE]



The H3S Control can be specifically customized to the respective needs and saved. This allows working with different surfaces, for example, during the preparatory phase and for the tests while driving.



The H3S software can be controlled via the tablet PC and the H3S-Control tool while driving.

Technical Specifications

HSB-H3S:

Power Supply

Supply voltage "Main Power In":
Power consumption:

12 – 14.8 V (on-board car power)
up to 300 W (complete system incl. PC, PEQs,
subwoofer, ...)

Maximal power consumption:
Battery charging:

20 W (with empty battery)
> 13 V (battery serves as UPS for short power outages, not for
long-term supply. A fully charged HSB-H3S battery can power a
complete system for up to 20 min. depending on the
configuration.)

Output Voltages

Output voltage "USV Out":
Output voltage "PC":
Output voltage "Tablet PC":

12 – 13.8 V (depending on battery state)
12 V / 4 A DC (only with HSB-H3S turned on)
18.5 V / 3 A DC (when supply voltage is present at "Main
Power In"), allows charging of the tablet PC

Weight:

3,2 kg (7.1 lb)

Dimensions (W x D x H):

327 mm x 327 mm x 44 mm (12.9" x 12.9" x 1.7")

Operating Temperature:

-10°C to 55°C (14°F to 131°F)

HXB-H3S:

Signal conditioning:

Tellert SICO2B

Power Supply

Supply voltage "Main Power In":
Power consumption:

7 – 20 V
1 W external ("Main Power In"), 2.5 W via USB

Digital inputs (pulse) RPM, speed

Connector:

BNC

Voltage:

TTL 0 – 5 V typ. (20 V max.), internal via 100 kOhm at 5 V
high 2.0 V min., low 0.8 V max.

Level:

RPM bandwidth:

0.1 Hz – 333.33 Hz standard (max. 0.1 Hz – 30 kHz),
equivalent to 0 – 20,000 rpm at 1 pulse/rev.

Speed bandwidth:

0.1 Hz – 20 kHz standard (max. 0.1 Hz – 30 kHz), equivalent
to 0.2 – 500 km/h (0.12 – 310 mph) at 4 pulses per wheel
rev.; default tire circumference 1.87 m (6.14 ft, type 195/60
R15)

Analog inputs (throttle, gearshift, tip-up, tip-down, brake, ignition)

Connector:

BNC

Input impedance:

100 MOhm, 100 pF

Throttle, brakes:

0 – 10 V (calibratable)

Gearshift:

0 – 10 V, 2 – 7 steps (depending on calibration)

Ignition:

0 – 10 V, 3 steps: "off", "ignition", "start" (calibratable)

Tiptronic off:

=> 0 V, 2 – 10 V => on

Tip-up / tip-down:

Rising slope triggers "gear up" / "gear down"

Voltage:

TTL 0 – 5 V, internal via 22 kOhm at 5 V

Level:

2.8 V min., low 0.8 V max.

Minimum pulse width:

600 ns (high); 600 ns (low)

Internal analog signals (RPM, speed, throttle)

Voltage (RPM):

0 – 5 V, 0 V = 0 rpm, 5 V = 20,000 rpm

Voltage (speed):

0 – 5 V, 0 V = 0 km/h (0 mph), 5 V = 500 km/h (310 mph)

Voltage (throttle):

0 – 5 V, 0 V = idle, 5 V = fully down

CAN interface

Connector:

2 x DSUB 9-pinl (connected in parallel)

CAN bit rate:

≥ 1 MBit (1 MBit/k, with $1 \leq k \leq 64$)

Weight:

2,2 kg

Dimensions (W x D x H):

327 mm x 230 mm x 44 mm (12.9" x 9.1" x 1.7")

Operating Temperature:

0°C to 55°C (32°F to 131°F)

DSM nano server:

Maximal power consumption: 80 W

Tablet PC:

Maximal power consumption: 30 W

PEQ V:

Maximal power consumption for each PEQ V: 8 W