HEAD acoustics

DATA SHEET

Code 1750

UG HMS/HSU move°S

Upgrade HMS / HSU to move°S Motorized Head-Turning Version

OVERVIEW

UG HMS/HSU move°S

Code 1750

Upgrade HMS / HSU to move°S Motorized Head-Turning Version

UG HMS / HSU move°S is an optional upgrade for HEAD Measurement Systems HMS II.x of the 2021 generation as well as for all Head Shoulder Units (HSU) III of the 2021 generation[1].

The upgrade adds motorized turning of the artificial head with high precision and full repeatability. move°S can realistically simulate the head movements of a real person. The mechanism operates virtually noiseless and therefore can also be used during measurements.

Where applicable and useful, move°S can serve as a replacement for rotation of the complete HMS on the motorized turntable HRT I.

UG move°S is available for qualified HMS / HSU (see 'General Requirements' on page 4) as an option before initial delivery as well as an upgrade of qualified HMS / HSU[1] units already delivered.

1. The generation of HSU III can be identified via the type number ('T/N') on each unit's type label. Type numbers starting with 'A' designate the previous HSU III generation (not upgradeable with move°S). Type numbers starting with 'B' and beyond designate HSU III units of the 2021 generation, which are upgradeable with move°S.

KEY FEATURES

Upgrades qualified HMS II and HSU III with motorized turning of the artificial head

Realistically simulates head movements of a real person

Virtually noiseless operation – can be used between and also during measurements

Software-controlled movement, e.g., via control information in HEAD acoustics test suites

Precise synchronization with audio playback / recording via pulses for full repeatability of test runs

Multiple options for control and automation, e.g., via Python® scripts

APPLICATIONS

Comprehensive testing of, e.g.,:

- Virtual / Augmented Reality (VR / AR) headsets
- In-vehicle communication systems and devices (ICC, eCall, hands-free communication, etc.)
- Effects of acoustic reflections on shoulders and / or nearby surfaces, e.g., in vehicles
- Arbitrary applications using head tracking
- Systems with direction-dependent behavior, e.g., multi-user conferencing systems

DETAILS

Turning the head in response to acoustical or visual input is a very innate, instinctive human process. Obviously, turning the head fundamentally alters the acoustic situation for talking and listening. Most notable are changes of level and spectrum, which in turn change localization, psychoacoustic parameters and influence of interfering noise. Test cases with direction-dependent acoustics therefore benefit from an artificial head that can turn in respect to its shoulders. Ideally, the head should be able to turn during measurements, which necessitates motorized, noiseless, and human-like motion capabilities. For this purpose, HEAD acoustics developed the move°S technology.

Implementation

The move°S technology comprises an electro-mechanic drive system integrated into the shoulder unit of qualified HEAD acoustics artificial heads. The drive system operates virtually noiseless, allowing turning of the head between, but also during measurements. The maximum angle and speed match real life: an angle of 135° per direction and a speed from 0° to 90° in 1.25 seconds in "no-noise" operation. The maximum speed for a 90° turn is 0.7 seconds.

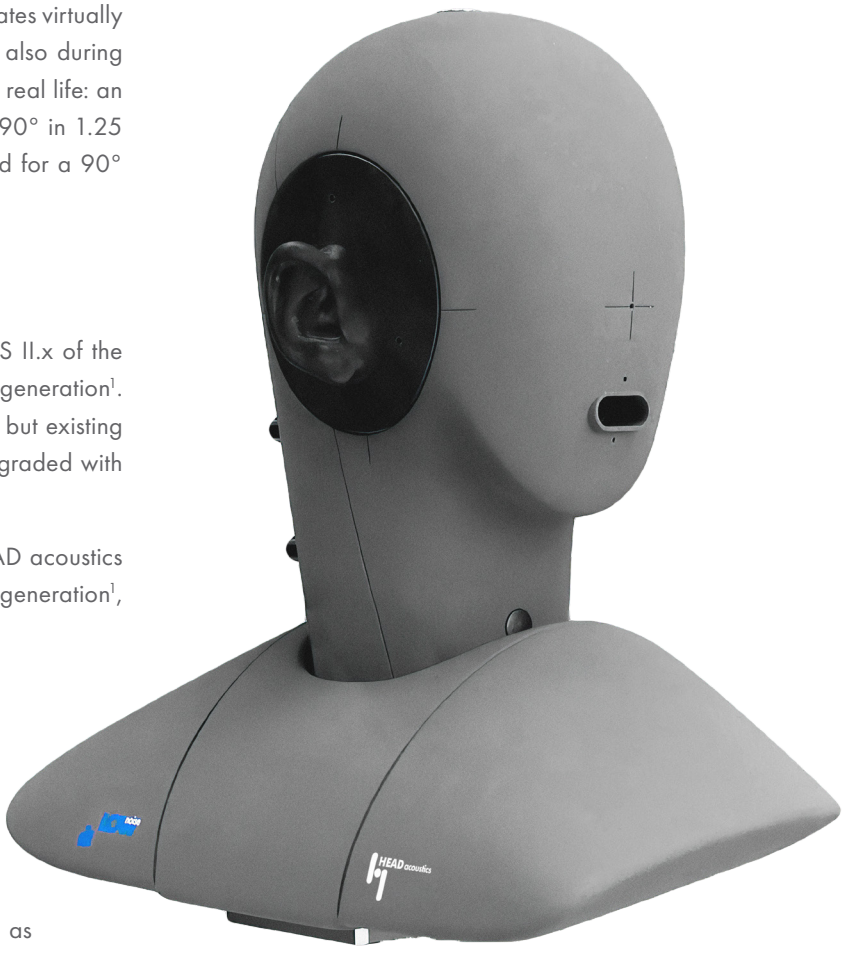
Retrofitting

move°S is available as an optional upgrade for HMS II.x of the 2021 generation as well as for HSU III of the 2021 generation[1]. The technology can be purchased for initial delivery, but existing qualified HMS II.x and HSU III[1] units can also be upgraded with move°S technology at HEAD acoustics Germany.

move°S cannot be used with any other model of HEAD acoustics artificial heads such as HMS II or HSU III of the previous generation[1], HMS IV, or HMS V.

Operation

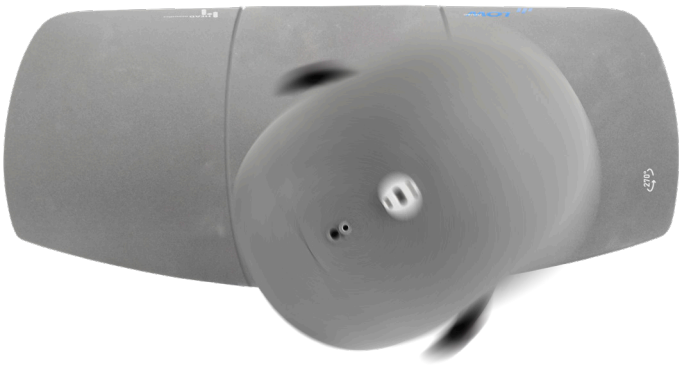
move°S is operated via software. In the future, relevant HEAD acoustics test suites will contain control information for fully automated rotation of the head between or during measurements. Operation can also be controlled and automated as desired via length-encoded pulse signals (basic functionality) or pulse-triggered execution of scripted control commands (full functionality) in Python®.



A turned HMS II.3 ViBRIDGE with move°S technology

TECHNICAL DATA

Articulation range	±135°
Angular resolution	0.1°
Angular reproducibility	0.1°
Rotation speed › "no-noise" operation › maximum	 90° in 1.25 seconds 90° in 0.7 seconds
Connections	D-Sub 9-pin (at HMS / HSU) USB (at PC) BNC (sync / trigger source)
Power supply	LEMO 4-pin, 24 V, 60 W



In "no-noise" mode, move°S allows a virtually noiseless 90 degree turn of the artificial head in 1.25 seconds. The total possible articulation is 270 degrees.

SCOPE OF DELIVERY

UG move°S (Code 1750)
› Upgrade HMS / HSU to motorized head-turning version

CUD IV (Code 6113)
› Adapter USB + BNC ↔ D-Sub 9-pin

CAB II.10 (Code 6093-10)
› Cable D-Sub 9-pin, 10 m extension

Power Supply

User Manual

GENERAL REQUIREMENTS

Hardware

One of the following HEAD acoustics artificial heads:
HMS II.3 (Code 1703)
HMS II.3 LN (Code 1703.1)
HMS II.3 LN HEC (Code 1703.2)
HMS II.3 ViBRIDGE (Code 1703.3)
HMS II.4 (Code 1704)
HMS II.5 (Code 1705)
HMS II.6 (Code 1706)
HMS II.7 (Code 1707)
HSU III[1] (Code 1323)
HSU III.2[1] (Code 1391)
HSU III.3[1] (Code 1326)

Software

One of the following HEAD acoustics Software:

ACQUA (Code 6810)
› Advanced Communication Quality Analysis Software, Full-license Version (upcoming versions)

ACQUA Compact (Code 6860)
› (upcoming versions)

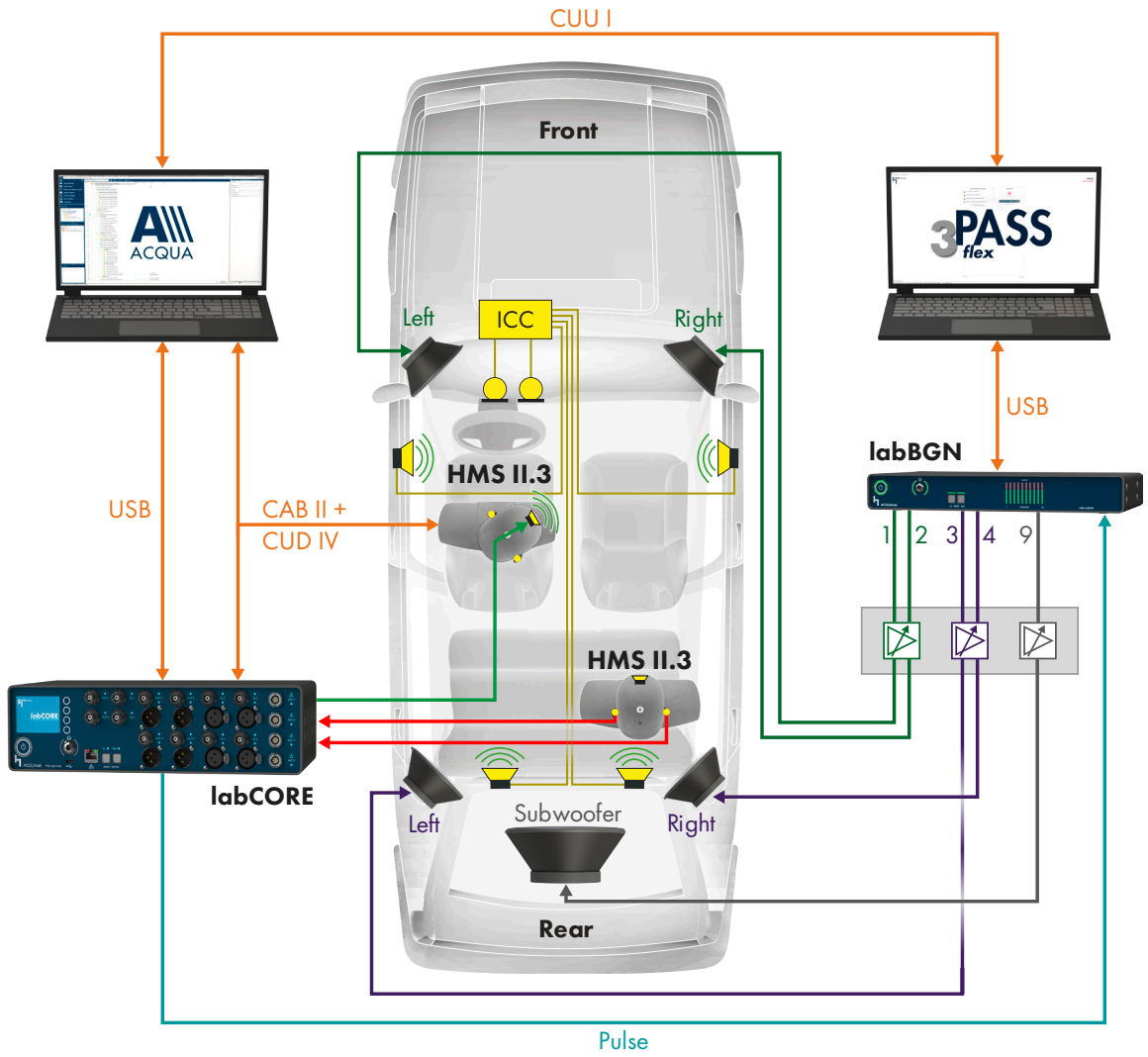
Further software to be determined.

IN PRACTICE

APPLICATION EXAMPLE

Measurement of an In-Car-Communication System with move°S

This exemplary test scenario depicts testing the behavior of a vehicle-integrated In-Car-Communication (ICC) system. The system aims to make conversation between occupants less stressful by recording speech with dedicated microphones and playing it back in the car cabin in real time. However, in a conversation between the driver and a diagonally-opposite passenger, the driver often turns the head towards the passenger instinctively to make communication easier. move°S allows to test the ICC system's behavior in regards to this changing acoustic situation.



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