



3PASS test setup in anechoic room with HMS II.3, MSA I and 8 loudspeakers

## DESCRIPTION

The major advantage of 3PASS compared to its predecessor is its ability to **preserve and reproduce the essential spatial characteristics of background noise** which makes the system valuable for the development of complex background noise reduction algorithms. This is of particular importance for modern smartphones, especially for those with multiple microphones and indispensable when focusing on their real life performance.

Another advantage is the **automated digital equalization** via *labBGN* (playback) and *MSA I* (recording). Moreover, due to the fact that both 3PASS and the previous background noise system HAE-BGN are based on the same front end hardware (*labBGN*), users of both systems save considerable investments costs. Furthermore, existing HAE-BGN software can be upgraded to the new 3PASS software at a reduced price (UG-3PASS, Code 6991).

Major components of the new system are:

- 3PASS software (for Windows PC)
- Measurement front end *labBGN* (for background noise playback and microphone connection)
- Microphone array *MSA I* (for sound recordings and room equalization)

An 8-loudspeaker setup including amplifiers and cables complements the system setup.

## APPLICATIONS

- Speech and audio quality analysis of devices and transmission systems in the presence of background noise according to ETSI TS 103 224

## FEATURES

- Preserves and reproduces the essential spatial characteristics of background noise
- Automated digital equalization via *labBGN* and *MSA I*
- Including noise database as specified by ETSI TS 103 224 with synchronous recordings for three use cases:
  - Telephone terminal at ear
  - Handheld hands-free terminal at typical user position
  - Desktop hands-free terminal at typical user position
- User-friendly software control

## SYSTEM REQUIREMENTS

- **labBGN (Code 6486):** ACQUA*lab* (8+2 Channel) Background Noise Front End
- **MSA I (Code 6487):** 8 Channel Microphone Surround Array (for System Equalization & Recording)
- **HMS II.3-33 (Code 1230.1):** HEAD Measurement System, Basic Version with Ear Canal Coupler, Pinna Type 3.3 & Artificial Mouth. Note: Only required for use case "Telephone terminal at ear". Alternatively: B&K HATS (requires mounting adapter MA MSA I)
- **2x 4-channel power amplifiers**
- **8 loudspeakers**
- **2x CSO I.0 (Code 9822):** Loudspeaker Cable Set
- **PC** with dual core processor, 1.6 GHz or faster, 2 GB RAM, 40 GB free disk space, 3 USB Ports (for connecting dongle, CUU I and *labBGN*), CD-ROM drive (for software installation),

## DATA SHEET

### 3PASS (Code 6990) 3-dimensional Playback of Acoustic Sound Scenarios

#### Overview

3PASS is the new HEAD acoustics system which is capable of preserving and reproducing the essential spatial characteristics of real-life background noise scenarios in different test rooms.

Due to its three-dimensional approach it is especially suited for the evaluation of complex noise reduction algorithms, e.g. as often found in modern smartphones with multi-microphone arrangements.

The concept and methodology of 3PASS conforms to the new ETSI standard TS 103 224. A noise database as specified by the standard is included and is ready for use with 3PASS.

3PASS is a software for Windows® 7 Professional or Windows® 8/8.1 Pro which is used in conjunction with the front end *labBGN* as well as the microphone surround array *MSA I* and the HEAD measurement system *HMS II.3*.

After automatic recognition of the connected hardware, all parameters are set via the software. All settings and subsequently created filters can be saved. Via USB, all settings, filters and sound files are transferred to the front end. The equalization is conducted automatically via *labBGN* and *MSA I*.

The 3PASS system thus allows to preserve and reproduce the essential spatial characteristics of background noise.

Microsoft® Windows® 7 Professional or Windows® 8/8.1 Pro (English or German version, including all current service packs).

#### RELATED PRODUCTS

- **ACQUA** Communication Analysis System as one of the following variants (version 3.2.100 or later):
  - Full-license (Code 6810)
  - Workplace (Code 6830, for post-analysis and documentation only)
  - Compact Systems (Code 6860.xx)
- **MFE VI.1 (Code 6462):** Measurement Front End with integrated power amplifier, with option **MFEVI-BEQ (Code 6461)**
- **HHP III.1 (Code 1403):** Handset Positioner for *HMS II.3*, VariMount Version

**ACCESSORIES**

- **MA MSA I (Code 6488):** MSA I Mounting Adapter for Brüel & Kjaer HATS
- **HD IV.1 (Code 2380):** Dynamic headphones
- **HMT II (Code 1962):** HEAD Measurement Tripod (for use case “Hand-held hands-free”)
- **SB MSA I (Code 6489):** MSA I Stand Base (for Desktop Hands-free Equalization)
- **CUU I (Code 6085):** Adapter USB <> USB for Remote Control 3PASS (Connection ACQUA PC <> 3PASS PC)
- **RMB IV.3 (Code 9852):** 19” Rack Mount Bracket for labBGN (2 pcs.)



Background noise front end labBGN

**OPTIONS**

- **UG-3PASS (Code 6991):** Upgrade HAE-BGN -> 3PASS

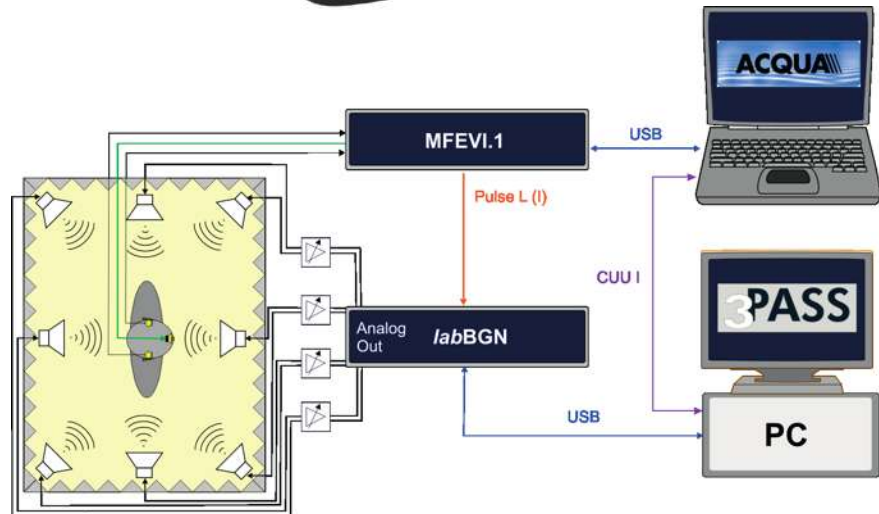
**DELIVERY ITEMS**

**3PASS** (Code 6990) comprises the following components:

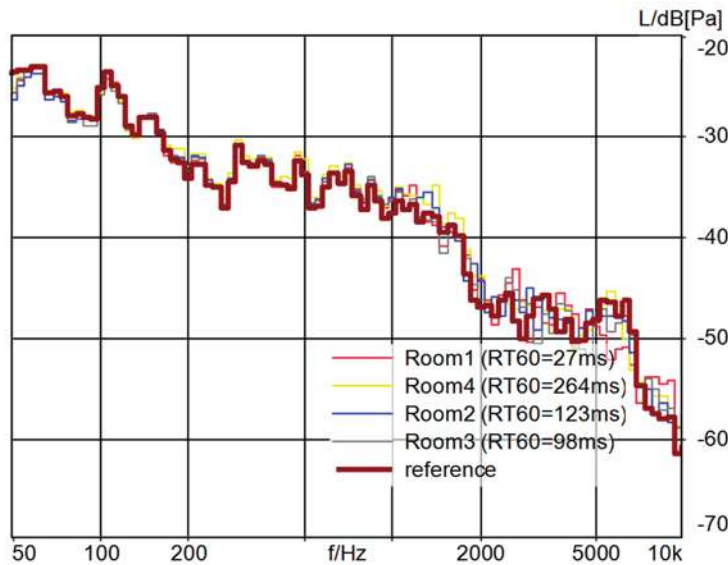
- Setup DVD including noise database as specified by ETSI TS 103 224
- Dongle (USB)



Microphone surround array MSA I mounted on HMS II.3



Configuration example: Test setup for measurement operation with ACQUA, 3PASS, HMS II.3, MFE VI.1, labBGN, 8 loudspeakers, power amplifiers



Reproduction accuracy of a background noise recorded at microphone entry point of DUT (Dark red: Original signal - Car noise played back over several loudspeakers in a reference room; Other colors: Result curves after automatic equalization in four rooms with different reverberation times)

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