HEAD acoustics

DATA SHEET

Code 60073

TS 103 334/607

ETSI TS 103 334/607 Wireless Wearable (Wrist-Worn) Terminals (NB, WB)

OVERVIEW

TS 103 334/607

Code 60073

ETSI TS 103 334/607 Wireless Wearable (Wrist-Worn) Terminals (NB, WB)

TS 103 334/607 is an ACQUA standard containing specified measurements and requirements of ETSI TS 103 334 and ETSI TS 103 607. The ACQUA standard provides comprehensive tests for manufacturers to evaluate the signal and voice quality of wireless wearable (wrist-worn) terminals. It supports different access networks for connecting to the wireless terminal – packet-/circuit-switched mobile networks, or Bluetooth® wireless technology.

KEY FEATURES

Complete implementation as ACQUA standard of:

- ETSI TS 103 334 (2018-01) – Speech and multimedia Transmission Quality (STQ); Transmission requirements for wearable wireless terminals from a QoS perspective as perceived by the user
- ETSI TS 103 607 (2024-07) – Speech and multimedia Transmission Quality (STQ); Transmission requirements for wearable wireless wideband speech terminals from a QoS perspective as perceived by the user

Automated and repeatable test sequences

Automated determination of nominal volume

Automated measurements with variable echo path by means of HRR I (HEAD acoustics Rotating Reflector)

Measurements and requirements for bandwidths: narrowband and wideband

APPLICATIONS

Testing of speech transmission via wireless wearable (wrist-worn) terminals according to ETSI TS 103 334 (2018-01) and ETSI TS 103 607 (2024-07).

DETAILS

DESCRIPTION

Equipment

The TS 103 334/607 test suite runs on ACQUA and requires ACQUA Options such as 3QUEST, POLQA, and speech-based Double Talk for various analyses depending on different use cases. The *lab*CORE hardware platform distributes signals between ACQUA and applied hardware (wearable terminal, head and torso simulator) for the playback and recording of acoustics signals. Further, measurements with interfering background noise require the 3PASS *lab* background noise simulation software.

Structure

The ACQUA standard consists of one ACQUA project. The project includes measurements and analyses for devices processing narrow-band signals and/or wideband signals. The provided measurements and analyses assess the results according to the requirements of ETSI TS 103 334 and ETSI TS 103 607.

DATABASE CONTENTS

Receiving Direction

- Loudness rating
- Frequency response
- Distortion
- Noise
- Double Talk

Sending Direction

- Loudness rating
- Frequency response
- Distortion
- Noise
- Double Talk
- Activation level to remove idle mode attenuation

Echo Performance and Stability Loss

- Terminal coupling loss
- Stability loss

› Temporal echo effects
› Spectral echo attenuation
› Variable echo path
› Echo during Double Talk

Performance in the Presence of Background Noise

› Comfort noise
› 3QUEST – Speech quality
› Background noise transmission far end speech

Codec Specific Tests

› TOSQA – Listening speech quality (only narrowband)
› POLQA – Listening speech quality

OPTIONS

HRR I (Code 6597)
› HEAD acoustics Rotating Reflector (Variable Acoustic Echo Path)

*core*BT2HID (Code 7786)
› *lab*CORE Bluetooth Human Interface Device (CBA IV-V1 Bluetooth Transceiver required)

*core*BT2-LC3-HFP (Code 7785)
› *lab*CORE Bluetooth LC3 Option for HFP (*core*BT2 required)

RELEASE NOTES

Database revision and specification version		
Database revision	**Based on specifications**	**ACQUA version**
Revision 01	ETSI TS 103 334 (2018-01) ETSI TS 103 607 (2024-07)	at least 6.1.110

GENERAL REQUIREMENTS

Hardware Platform

*lab*CORE (Code 7700)
› Modular multi-channel hardware platform
*core*BUS (Code 7710)
› *lab*CORE I/O bus mainboard
*core*OUT-Amp2 (Code 7720)
› *lab*CORE power amplifier board
*core*IN-Mic4 (Code 7730)
› *lab*CORE microphone input board
*core*BEQ (Code 7740)
› *lab*CORE binaural equalization, incl. filter set for one artificial head (delivered with *lab*CORE)

Operating Software

One of the following software applications:

ACQUA (Code 6810)
› Advanced Communication Quality Analysis Software, full license version
ACQUA Compact (Code 6860)
› Compact test system

Head and Torso Simulator

One of the following Head Measurement Systems:

HMS II.3 (Code 1703)
› Head Measurement System, basic version with right ear simulator, 3.3 pinna, and artificial mouth
HMS II.3 LN (Code 1703.1)
› Head Measurement System, low-noise version with right ear simulator, 3.3 pinna, and artificial mouth
HMS II.3 LN HEC (Code 1703.2)
› Head Measurement System, low-noise version with right human-like ear canal simulator and artificial mouth

Artificial Arm

Forearm phantom according to TS 103 607, Annex A (third-party equipment)

Background Noise Performance

3PASS *lab* (Code 6990)
› Advanced background noise simulation system with automated equalization – lab version

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SCOPE OF DELIVERY

TS 103 334/607 (Code 60073)
- delivered as ACQUA database backup

V2C file
- License file for ACQUA dongle

Revision history
- PDF file

GENERAL REQUIREMENTS

ACOPT 21 (Code 6844)
- Option 3QUEST – 3-fold Quality Evaluation of Speech in Telecommunication (narrowband/ wideband)

Measurement microphone (third-party equipment)
- 200 V polarization, 7-pin LEMO (1B), pressure field

Objective Listening Quality

ACOPT 30 (Code 6857)
- Option POLQA – Perceptual Objective Listening Quality Analysis

Only for narrowband measurements:

ACOPT 10 (Code 6820)
- Option TOSQA

Double Talk Performance

ACOPT 32 (Code 6859)
- Option Speech-based Double Talk analysis

The access network to the wireless terminal determines the necessary equipment for establishing the connection:

Connection via network simulator

Radio communication tester (third-party equipment)
- For packet-switched network and/or circuit-switched network

For packet-switched connection to *lab*CORE
- *core*IP (Code 7770)
  - *lab*CORE I/O module, Voice over IP Reference Gateway

Audio codec extensions for *lab*CORE:
- *core*IP-AMR (Code 7772)
  - *lab*CORE VoIP AMR codec option (*core*IP module required)
- *core*IP-EVS (Code 7773)
  - *lab*CORE VoIP EVS codec option (*core*IP module required)

Connection via Bluetooth

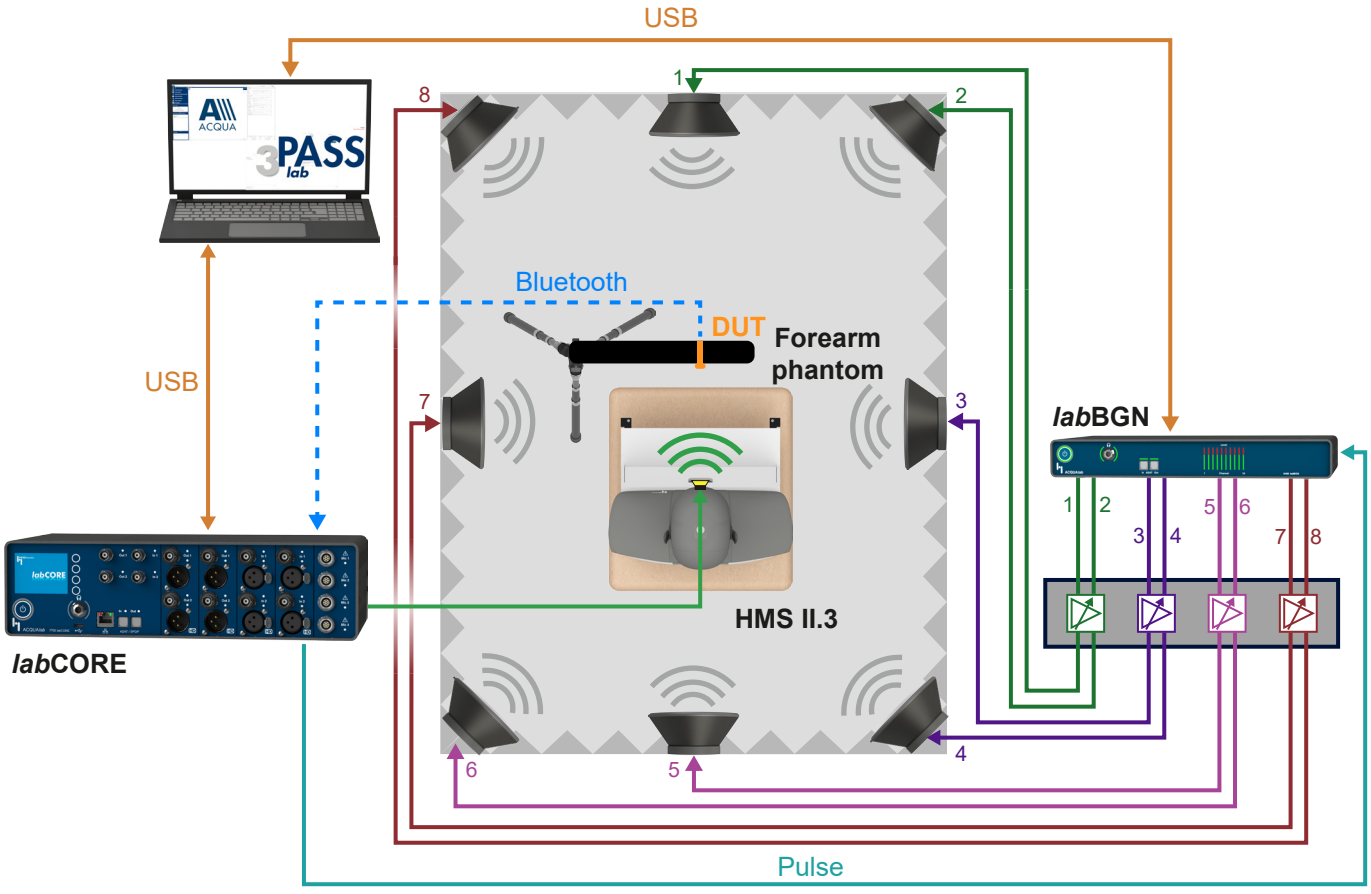
*core*BT2 (Code 7782)
- *lab*CORE I/O module, Bluetooth reference access point, version 2

IN PRACTICE

APPLICATION EXAMPLES

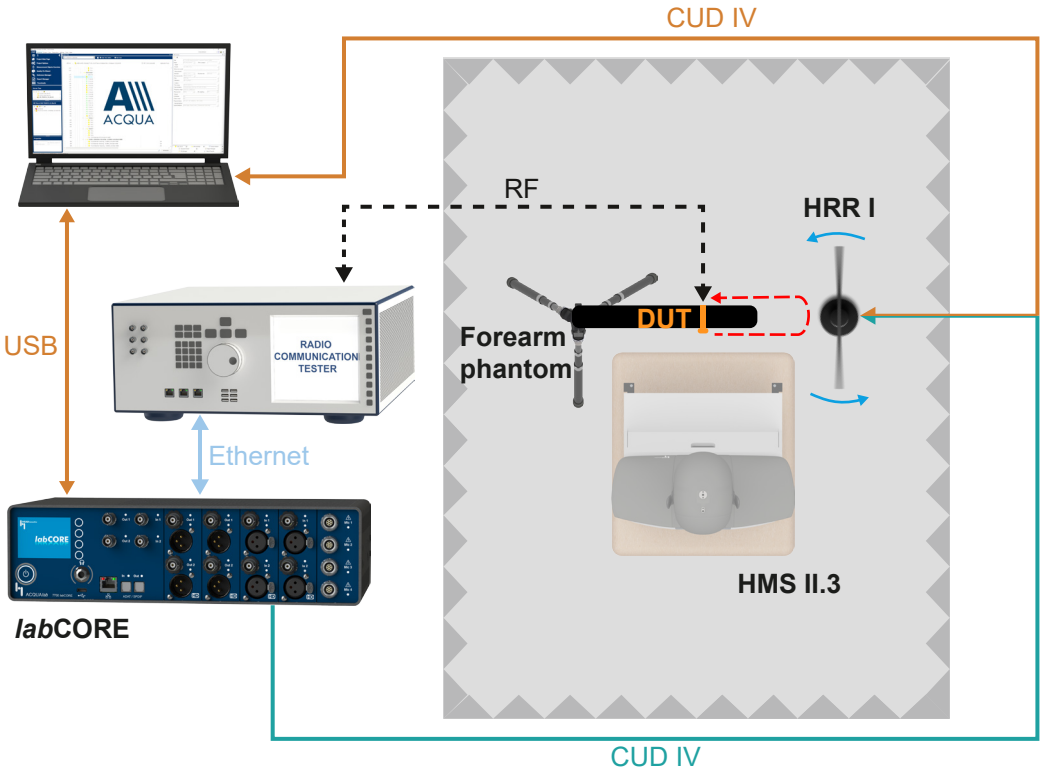
Performance in the Presence of Background Noise

The wireless wearable terminal is attached to a forearm phantom. It is connected to *lab*CORE via Bluetooth. *lab*CORE transmits a speech signal to HMS II.3 for playback and receives the recorded signal from the wireless wearable terminal via Bluetooth. ACQUA generates the signals for playback and analyzes the recorded signals. For assessing the terminals performance in the presence of background noise, 3PASS *lab* plays back interfering background noises and ACQUA assesses speech signal processing of the wireless wearable terminal according to the requirements of ETSI TS 103 607.



Echo Performance with Variable Echo Path

The wireless wearable terminal is attached to a forearm phantom. It is connected to *lab*CORE via a packet-switched network established by a radio communication tester. For assessing the performance with variable echo path, ACQUA sends a speech signal via *lab*CORE to the wearable terminal for playback. HRR I reflects the acoustic signal while rotating its surface. Simultaneously, the microphone of the terminal records the reflected signal which is analyzed by ACQUA to assess the echo attenuation of the wearable terminal.



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