

**APPLICATION
EXAMPLES
INCLUDED**



Code 6777

TS 26 131-32

2G/3G/4G/5G/WLAN mobile terminal acoustic measurements, narrowband and wideband

OVERVIEW

TS 26 131-32

Code 6777

2G/3G/4G/5G/WLAN mobile terminal acoustic measurements, narrowband and wideband

3GPP TS 26.131 and 3GPP TS 26.132 specify test methods and minimum requirements to assess acoustic characteristics of narrowband (NB), wideband (WB), super-wideband (SWB), and fullband (FB) 2G/3G/4G/5G/WLAN terminals.

HEAD acoustics has implemented the test methods and requirements for narrowband and wideband into the ACQUA standard TS 26 131-32. In combination with other HEAD acoustics components, TS 26 131-32 forms the test platforms TP89¹, TP90², and TP190³ which are certified by GCF/PTCRB (Global Certification Forum/PCS Type Certification Review Board) for testing mobile devices.

KEY FEATURES

Automated and repeatable test sequences

Handset testing

Headset testing

Handheld hands-free testing

Desktop/vehicle-mounted hands-free testing

Prepared measurements according to 3GPP TS 26.132 Version 17.2.0 (2023-03)

Assessment according to 3GPP TS 26.131 Version 17.3.0 (2022-12)

APPLICATIONS

Compliance testing of 2G/3G/4G/5G/WLAN mobile terminals applying acoustic interfaces according to 3GPP TS 26.131 Version 17.3.0 (2022-12) and 3GPP TS 26.132 Version 17.2.0 (2023-03)

GCF/PTCRB compliance testing of 2G/3G/4G/5G mobile devices according to GCF work item 252

Experimental development and optimization of 2G/3G/4G/5G/WLAN mobile terminals with instrumental evaluation of speech quality



DETAILS

DESCRIPTION

General

The tests implemented in the ACQUA standard TS 26 131-32 cover all relevant acoustic requirements for 2G/3G/4G/5G/WLAN mobile terminals for narrowband and wideband scenarios. Typical terminal types for testing compliance are handsets, headsets and desktop/vehicle-mounted/handheld hands-free devices.

TS 26 131-32 includes of preset measurements and automated measurement sequences and allows fast and easy acquisition, analysis, and documentation of measurement data. The requirements from 3GPP TS 26.131 are automatically compared to the measurement results. Conformity with the requirements is immediately visible in ACQUA and can be published in ACQUA reports.

ACQUA projects and standards

There are two kinds of projects available for each terminal type. Common ACQUA projects which are editable and standard projects which are read-only for ensuring compliant testing to the technical specification.

- › Handset
- › Headset
- › Handheld hands-free
- › Desktop and vehicle-mounted hands-free

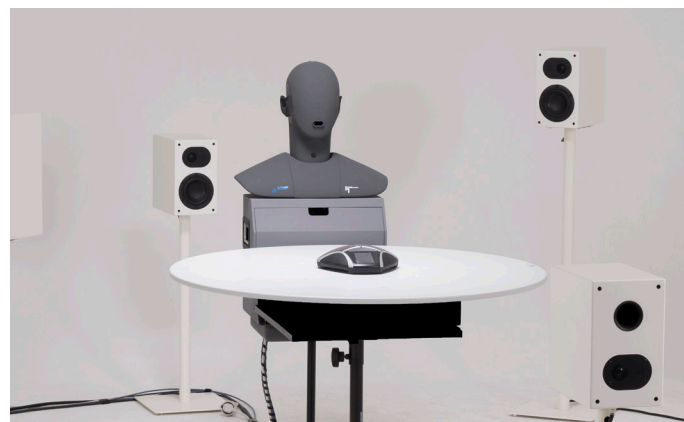
Measurements and analyses

TS 26 131-32 contains the following measurements and analyses:

- › Delay
- › Frequency response
- › Loudness rating and sidetone masking rating
- › Distortion
- › Delay and speech quality in conditions with packet arrival time variations and packet loss
- › Jitter buffer management behavior
- › Echo control
- › Speech quality with background noise



Handheld hands-free measurement



Desktop hands-free measurement



Headset measurement

Special features

TS 26 131-32 contains automated features for convenient measuring:

- › Automated volume control via Bluetooth® HID profile
- › Automated determination of ECRP with HHP IV for handsets providing non-traditional earpiece
- › Automated handset positioning with HHP IV

HEAD acoustics provides GCF and PTCRB certified test platform

In combination with particular combinations of HEAD acoustics hardware and software, TS 26 131-32 forms the test platforms TP89¹, TP90², and TP190³. All of these test platforms are officially approved and certified by GCF and PTCRB for testing mobile devices.

If measuring ACQUA standard TS 26 131-32 without modifications with the respectively specified hardware and software plus ACOPT 23 and/or ACOPT 24, the test reports will include a stamp that the test results have been achieved on a test platform certified by GCF and/or PTCRB.

OPTIONS

Hardware

Bluetooth Volume Control

CBA IV-V1 (Code 6599-V1)

- › Bluetooth transceiver for *labCORE* module *coreBT2* (USB-based, includes antenna)

Software

Super-Wideband / Fullband extension

UG TS 26 SWB/FB (Code 60028)

- › 3GPP TS 26.131/132, 3G/4G terminals, extension super-wideband and fullband

Electrical interfaces extension

UG TS 26 EL ITF Tests (Code 60065)

- › 3GPP TS 26.131/132, extension mobile terminal electrical interface tests

GENERAL REQUIREMENTS

Hardware

General

labCORE (Code 7700)

- › Modular multi-channel hardware platform
- coreBUS* (Code 7710)
- › I/O bus mainboard
- coreOUT-Amp2* (Code 7720)
- › *labCORE* Power amplifier board
- coreIN-Mic4* (Code 7730)
- › *labCORE* Microphone input board
- coreBEQ* (Code 7740)
- › Binaural equalization for one artificial head
- Radio communication tester (third party device)

HEAD measurement system

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 human-like ear canal simulator right and artificial mouth

HMS II.3 ViBRIDGE (Code 1703.3)

- › HEAD measurement system, low-noise, with human-like ViBRIDGE ear simulators (left and right) and artificial mouth

Only for binaural applications

Appropriate HEAD impedance simulator for the respective HEAD measurement system:

HIS L (Code 1701)

- › HEAD impedance simulator, left, version 2021

HIS L LN (Code 1701.1)

- › HEAD impedance simulator, left, low-noise version, version 2021

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ACQUA Options

ACOPT 23 (Code 6848)

- › Option GCF

ACOPT 24 (Code 6849)

- › Option PTCRB

Bluetooth Volume Control

coreBT2HID (Code 7786)

- › labCORE Bluetooth human interface device (requires CBA IV-V1)

RELEASE NOTES

Database revision and specification version

Database revision	Based on specification	ACQUA version
Revision 16	3GPP TS 26.131 V17.3.0 (2022-12) and 3GPP TS 26.132 V17.2.0 (2023-03)	at least 6.0.200

SCOPE OF DELIVERY

TS 26 131-32 (Code 6777)

- › delivered as ACQUA database backup V2C file
- › License file for ACQUA dongle
- Revision history
- › PDF file

GENERAL REQUIREMENTS

HIS L LN HEC (Code 1701.2)

- › HEAD impedance simulator, left, low-noise, human-like ear canal version

Handset measurements

One of the following handset positioners:

HHP IV (Code 1406)

- › Handset positioner, MotoMount (Hexapod) version
- HHP III.1 (Code 1403)
- › Handset positioner, VariMount version

Software

General

One of the following software applications:

ACQUA (Code 6810)

- › Advanced Communication Quality Analysis Software, full license version

ACQUA Compact (Code 6860)

- › Compact test system

Ambient noise measurements

ACOPT 21 (Code 6844)

- › Option 3QUEST - 3fold Quality Evaluation of Speech in Telecommunication (narrowband/wideband)

One of the following software applications:

3PASS lab (Code 6990)

- › Advanced background noise simulation system with automated equalization – lab version

HAE-BGN (Code 6971)

- › Basic background noise simulation system with semi-automated equalization

Packet-switched network measurements

coreIP (Code 7770)

- › labCORE I/O module, Voice over IP reference gateway

coreIP-AMR (Code 7772)

- › labCORE AMR codec option

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GENERAL REQUIREMENTS

Packet loss / variation measurements

ACOPT 30 (Code 6857)

› Option POLQA

coreIP-IMP (Code 7771)

› *lab*CORE VoIP impairment option

Echo control measurements

ACOPT 32 (Code 6859)

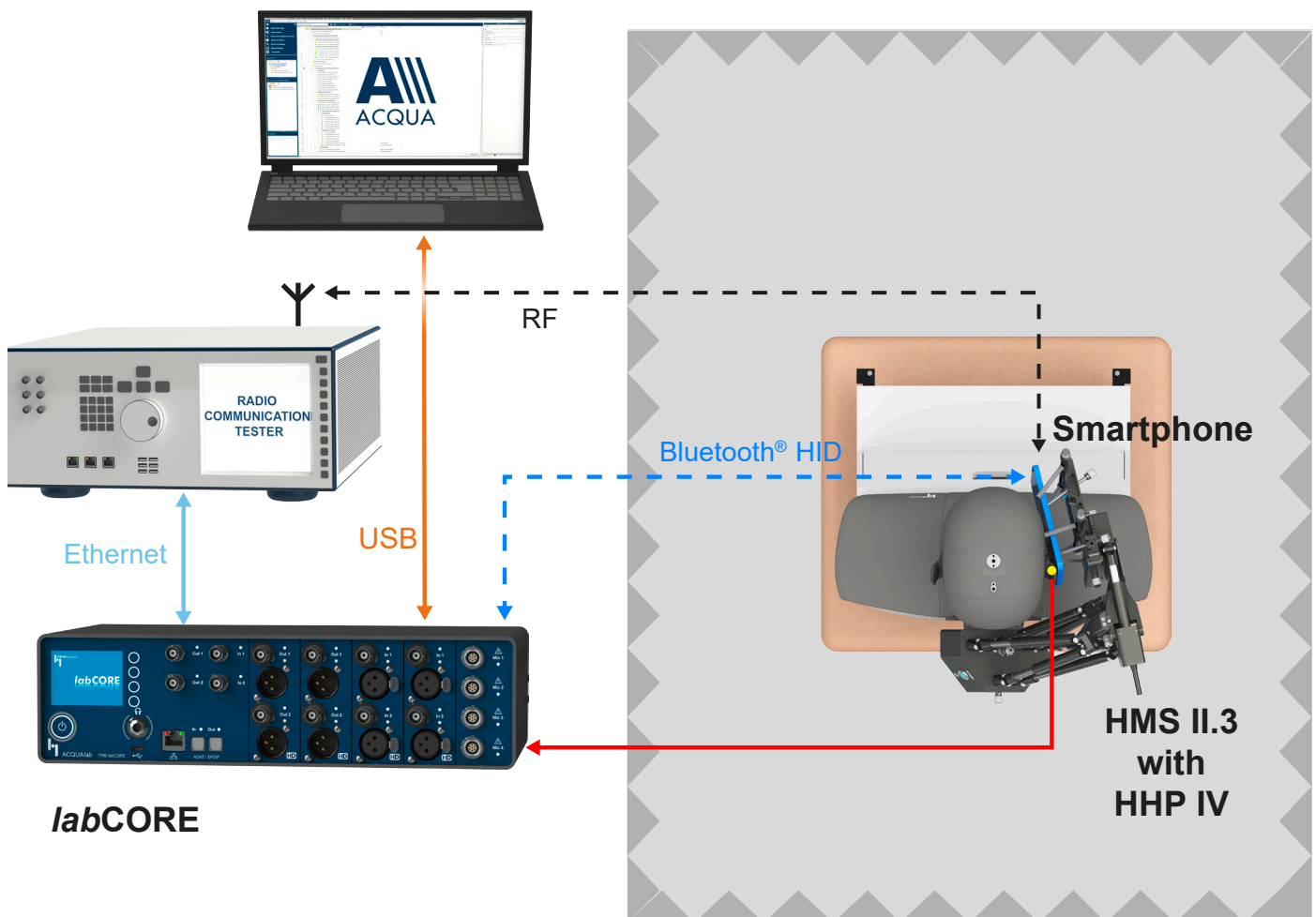
› Option Speech-based Double Talk analysis

IN PRACTICE

APPLICATION EXAMPLES

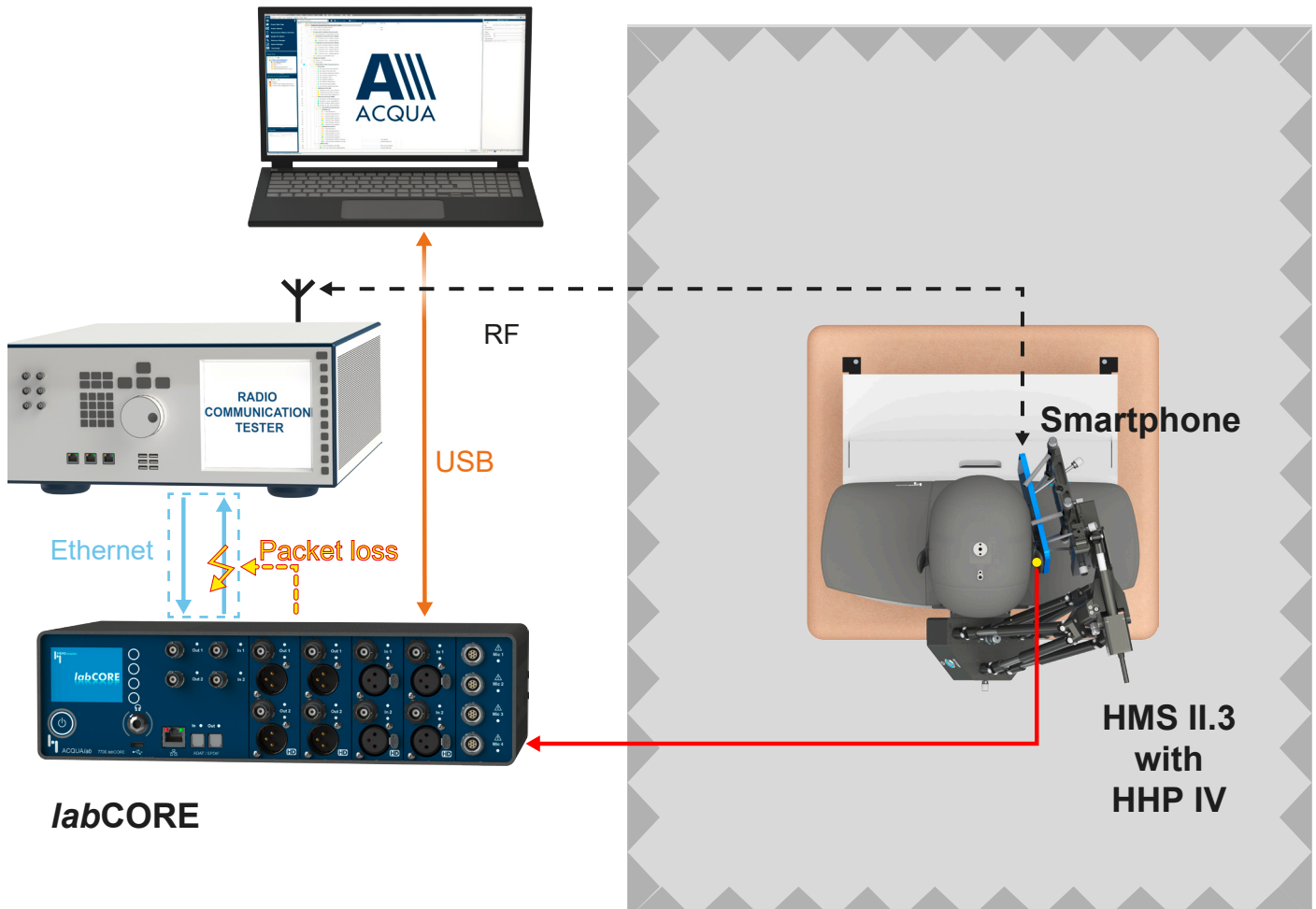
Handset: Automatic determination of nominal volume (exemplary)

The handset is clamped into HHP IV and connects via packet-switched network to a radio tester. *labCORE* transmits the audio signal via the radio tester to the handset. Furthermore, it connects to the handset by Bluetooth HID profile for setting the required volume step automatically. The handset plays back the signal through its earpiece. *labCORE* receives the signal from HMS II.3 and transmits it to ACQUA for recording. ACQUA plays back signals, determines the volume step of the handset, as well as analyzing the recorded signals according to the receive loudness rating requirements of 3GPP TS 26.131.



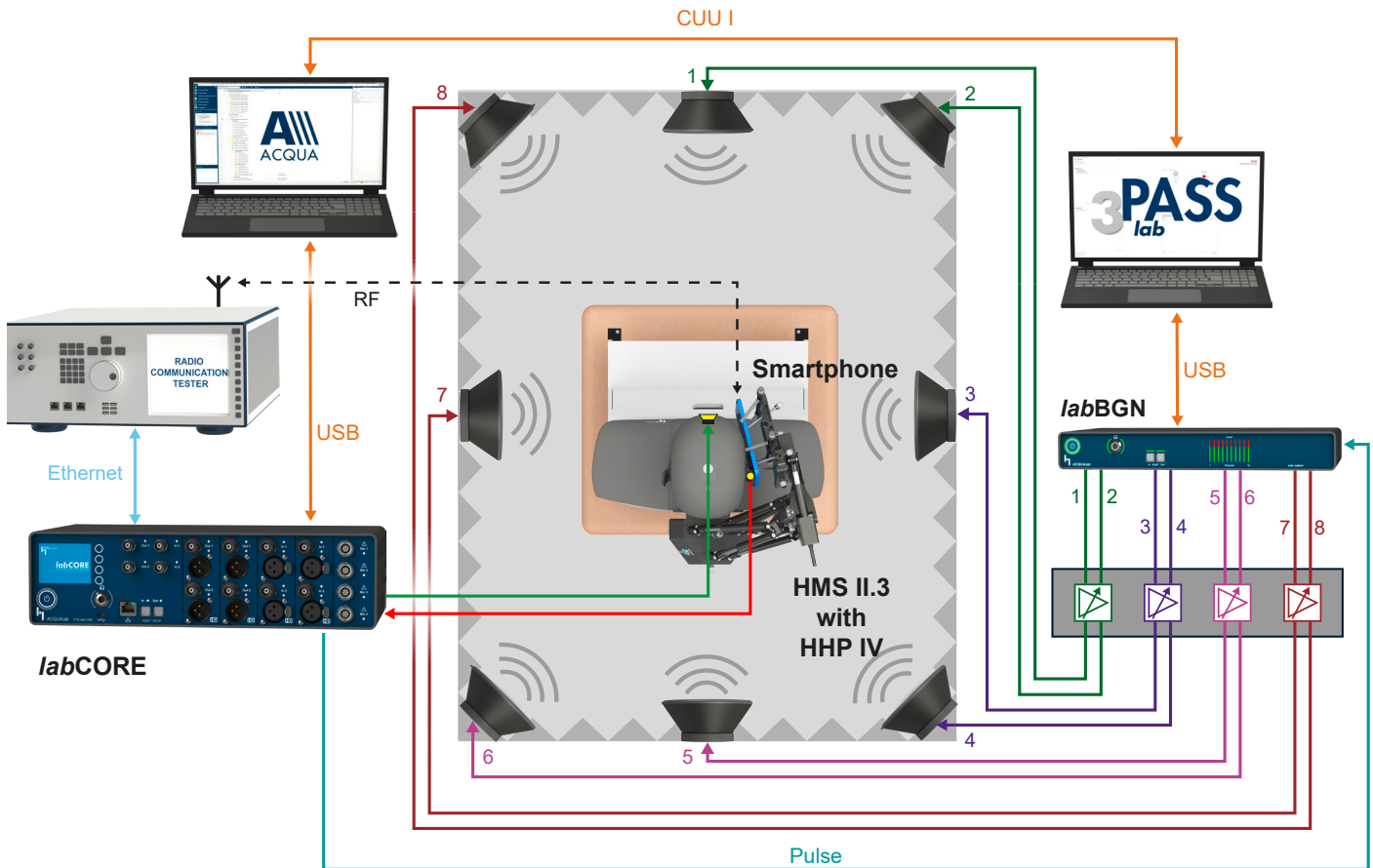
Handset: VoIP measurements with packet loss (exemplary)

The handset is clamped into HHP IV and connects via packet-switched network to a radio tester. *labCORE* transmits an audio signal including impaired packets via the radio tester to the handset. The handset processes the signal and plays it back through its earpiece. *labCORE* receives the signal from HMS II.3 for recording. ACQUA analyses and assesses the recorded signals according to the requirements of 3GPP TS 26.131.



Handset: VoIP measurements with ambient noise (exemplary)

The handset is clamped into HHP IV and connects via packet-switched network to a radio tester. *labCORE* transmits signals to HMS II.3 for playback and receives signals from HMS II.3 for recording. ACQUA generates the signals for playback and analyzes the recorded signals. 3PASS *lab* plays back background noises and ACQUA assesses speech signal processing of the smartphone under real-life conditions according to the requirements of 3GPP TS 26.131.



1. TP89: ACQUA, MFE III.1, and ACQUA standard according to specification releases 9 of 3GPP TS 26.131 and 3GPP TS 26.132.
2. TP90: ACQUA, MFE VI.1, and ACQUA standard according to specification releases 3GPP TS 26.131 12.4.0 / 3GPP TS 26.132 12.6.0.
3. TP190: ACQUA, *labCORE*, and ACQUA standard according to specification releases 3GPP TS 26.131 17.3.0 / 3GPP TS 26.132 17.2.0.

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