HEAD acoustics

DATA SHEET

APPLICATION EXAMPLE INCLUDED

Code 60044

UG P.1140-WB

ITU-T P.1140, Emergency Call (eCall) Devices, Wideband Extension

OVERVIEW

UG P.1140-WB

Code 60044

ITU-T P.1140, Emergency Call (eCall) Devices, Wideband Extension

In the event of a car accident, emergency call systems automatically trigger a hands-free call to an emergency call center. For ensuring optimal call quality between car and response service, the ITU specified comprehensive tests in Recommendation ITU-T P.1140 for speech communication during emergency calls originating from vehicles. HEAD acoustics implemented the included methods for wideband (WB) communication in the UG P.1140-WB ACQUA standard.

The ACQUA standard provides assessments according to the wideband part of Recommendation ITU-T P.1140 (07/2026) which is referenced in CEN EN 17240:2024 (CTP 1.1.15.1).

KEY FEATURES

Implementation of the wideband part from Recommendation ITU-T P.1140 (07/2026) as ACQUA project

Recommendation ITU-T P.1140 is the only globally published standard for NG-eCall and eCall quality testing

Measurements for packet-switched networks with permitted audio codecs (AMR, AMR-WB EVS-WB, EVS-SWB) especially required to test Next Generation eCall (NG-eCall, NG112) devices

APPLICATIONS

Quality analysis, experimental development, and optimization of speech communication with emergency call in-vehicle systems for

Next Generation eCall (NG-eCall, NG112)
in accordance with

- Recommendation ITU-T P.1140 (07/2026)
- CEN EN 17240:2024 (CTP 1.1.15.1)

eCall
in accordance with

- Recommendation ITU-T P.1140 (07/2026)

DETAILS

Ensuring sufficient speech communication quality at both ends of an emergency call is vital. Recommendation ITU-T P.1140 verifies elemental as well as advanced quality criteria for in-vehicle hands-free communication in case of an emergency. Testing according to Recommendation ITU-T P.1140 includes integrated eCall in-vehicle systems as well as aftermarket eCall kits.

DESCRIPTION

General

The ACQUA standard UG P.1140-WB provides an implementation of measurements and requirements to verify compliance of audio performance according to Recommendation ITU-T P.1140 for wideband speech transmission.

Structure

The ACQUA standard consists of one ACQUA project. It includes measurements and analyses for eCall systems which are capable of processing wideband signals.

The project provides measurements and analyses for assessing test results according to the requirements from Recommendation ITU-T P.1140 (07/2026). Thus, it applies to state-of-the-art eCall systems supporting Next Generation eCall.

Equipment

Applying the ACQUA standard UG P.1140-WB includes various equipment which is mostly provided by HEAD acoustics. This equipment comprises operating software (ACQUA), a background noise simulation system (3PASS *flex*, HAE-car for legacy tests), sophisticated analysis methods (POLQA, Double Talk), as well as hardware devices (*lab*CORE, HMS II.3). The measurement equipment is complemented by third-party equipment (pressure-field microphone, radio communication tester).

DATABASE CONTENTS

UG P.1140-WB consists of measurements and requirements for the analysis of:

- Delay
- Loudness rating
- Frequency response
- Idle channel noise
- Echo attenuation
- Switching characteristics
- Double Talk performance
- Variation of Receive Loudness Rating in the presence of background noise
- Background noise transmission (silent call performance)
- Delay and speech quality for packet-switched connections

OPTIONS

HRR I (Code 6597)

- HEAD acoustics Rotating Reflector

ACOPT 43 (Code 6877)

- Option Psychoacoustics - Advanced Analysis

RELEASE NOTES

Database revision and specification version			
Database revision	**Based on specification**	**ACQUA version**	***lab*CORE firmware version**
Revision 03	Recommendation ITU-T P.1140 (07/2026)	at least 6.3.100	at least 3.16

SCOPE OF DELIVERY

UG P.1140-WB (Code 60044)

- delivered as ACQUA database backup

V2C File

- License file for ACQUA dongle

Revision history

- PDF file

Audio files (*.dat) with background noise test signals

GENERAL REQUIREMENTS

Basis

P.1140-NB (Code 60038)

- ITU-T P.1140, Emergency Call (eCall) Devices, Narrowband Part

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)

Head and Torso Simulator

One of the following HEAD Measurement Systems:

HMS II.3

- HMS II.3 (Code 1703)
  - HEAD Measurement System, basic version with right ear simulator, 3.3 pinna, and artificial mouth
- HIS L (Code 1701)
  - HEAD Impedance Simulator, left

Continued on next page

GENERAL REQUIREMENTS

HMS II.3 LN
- HMS II.3 LN (Code 1703.1)
  - HEAD Measurement System, low-noise version with right ear simulator, 3.3 pinna, and artificial mouth
- HIS L LN (Code 1701.1)
  - HEAD Impedance Simulator, left, low-noise version

HMS II.3 LN HEC
- HMS II.3 LN HEC (Code 1703.2)
  - HEAD Measurement System, low-noise version with human-like ear canal simulator right and artificial mouth
- HIS L LN HEC (Code 1701.2)
  - HEAD Impedance Simulator, left, low noise, human-like ear canal version

HMS II.6[1]
- HMS II.6 (Code 1706)
  - HEAD Measurement System, with artificial mouth and free-field microphones (left and right)

HMS II.7[1]
- HMS II.7 (Code 1707)
  - HEAD Measurement System, with artificial mouth and free-field ICP microphones (left and right)
- *core*IN-ICP4 (Code 7735)
  - *lab*CORE ICP® sensor input board, instead of *core*IN-Mic4

Network Simulation

Radio communication tester (third-party equipment)
- For NG-eCall testing, one of the following features is required:
  - Forwarding of NG-eCall service URN to *lab*CORE SIP client
  - Forwarding RTP stream from IMS server to *lab*CORE

1 Recommendation ITU-T P.1140 specifies the usage of a head-and-torso simulator (HATS) according to Recommendation ITU-T P.58, which needs to be equipped with artificial ears according to Recommendation ITU-T P.57. However, for measurements of far-field scenarios, only the corresponding equalization (e.g., FF or DF) according to Recommendation ITU-T P.58 is relevant for comparable test results and HMS II.6 / HMS II.7 can be considered as compliant for testing of Recommendation ITU-T P.1140.

Microphone

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

Measurement and Analysis 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

Background Noise Simulation

3PASS *flex* (Code 6995)
- Advanced background noise simulation system with automated equalization - flex version

Packet-Switched Network (NG-eCall)

*core*IP (Code 7770)
- I/O module, Voice over IP reference gateway

*core*IP-IMP (Code 7771)
- *lab*CORE VoIP impairment option (*core*IP module required)

ACOPT 30 (Code 6857)
- Option POLQA

One of the following 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)

Echo During Double Talk

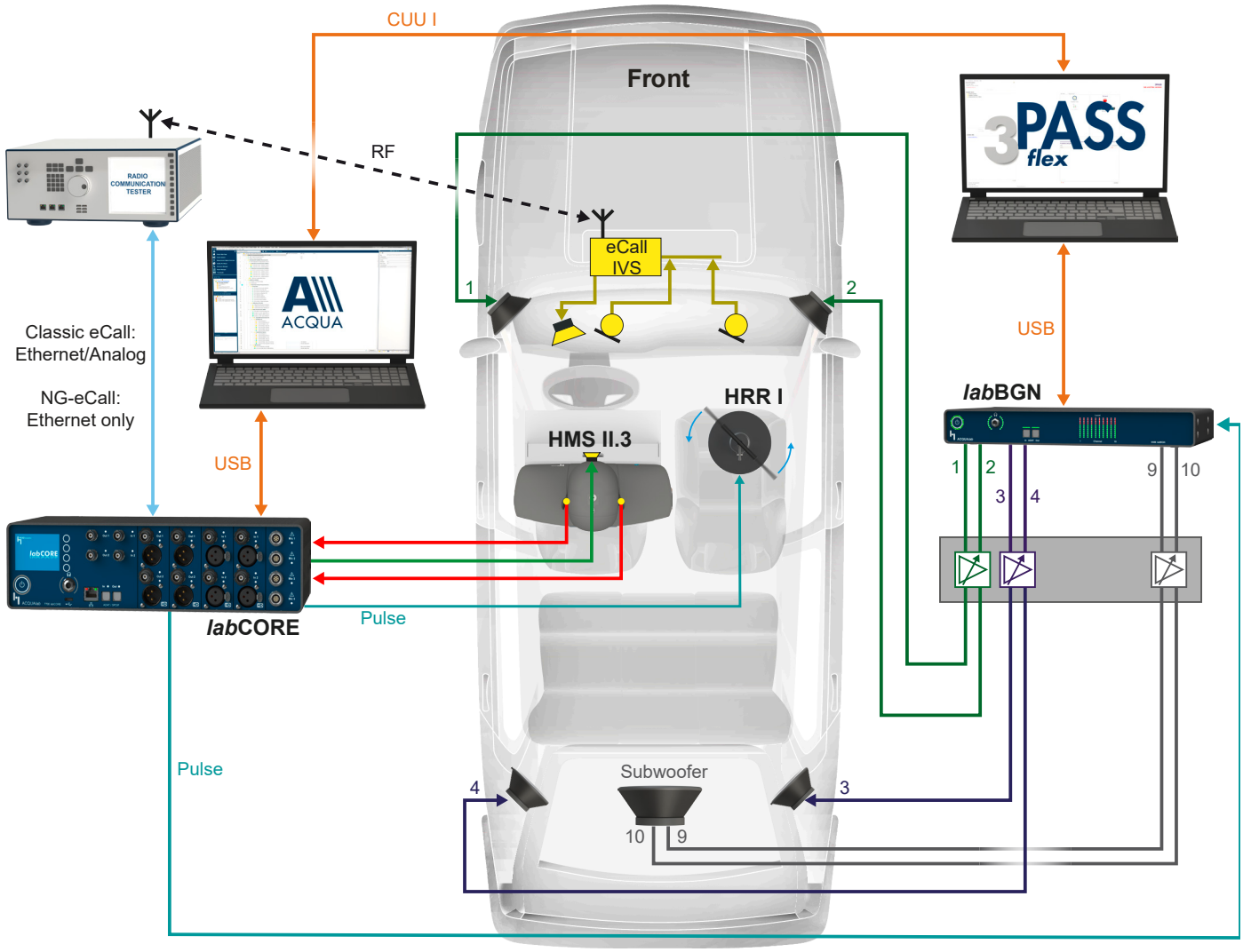
ACOPT 32 (Code 6859)
- Option Speech-based Double Talk analysis

IN PRACTICE

APPLICATION EXAMPLE

Measurements Configuration for Recommendation ITU-T P.1140 (07/2026)

Measurement configuration for compliance testing according to Recommendation ITU-T P.1140 (07/2026). The device under test is a car with an eCall in-vehicle system (IVS). A radio communication tester establishes the RF connection to the eCall IVS. HMS II.3 simulates the user conducting a wideband hands-free emergency call. HRR I provides a time-variant echo path. 3PASS *flex* simulates background noise. Together, *lab*CORE and ACQUA generate, send, and receive signals and automatically trigger background noise playback for precise synchronization.



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HEAD acoustics

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