



Code 60038

P.1140-NB

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

OVERVIEW

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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-T specified comprehensive test methods for hands-free emergency calls originating from vehicles in Recommendation ITU-T P.1140. HEAD acoustics implemented the included methods for narrowband (NB) communication in the ACQUA standard P.1140-NB.

The ACQUA standard covers the narrowband part of Recommendation ITU-T P.1140 (07/2022) as well as UNECE AECS-02-02-Rev.8 which refers to Recommendation ITU-T P.1140 (06/2015).

KEY FEATURES

Complete implementation of narrowband part of Recommendation ITU-T P.1140 as automated ACQUA standard

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

Compliance tests for Recommendation ITU-T P.1140 as well as UNECE AECS

Full repeatability of all tests due to triggered background noise simulation

APPLICATIONS

Automated quality analysis, experimental development and optimization of in-vehicle emergency call systems in accordance with

- › Recommendation ITU-T P.1140
- › UNECE AECS-02-02-Rev.8

DETAILS

Ensuring proper speech communication quality at both ends of an emergency call is vital. Recommendation ITU-T P.1140 verifies elemental and also advanced quality criteria for in-vehicle hands-free communication in case of an emergency. Testing according to Recommendation ITU-T P.1140 includes complete systems and single devices of built-in eCall systems as well as aftermarket eCall kits. Where applicable, measurements are based on proven test methods laid out in Recommendations P.501, P.502, P.340 and P.1100 of ITU-T.

DESCRIPTION

HEAD acoustics provides measurements and requirements from Recommendation ITU-T P.1140 in the ACQUA standard P.1140-NB. An appropriate device under test undergoing and passing measurements and calculations from the ACQUA standard complies with Recommendation ITU-T P.1140.

The ACQUA standard gives information and instructions on measurement preparations such as calibration, equalization. Names of measurements and calculations within the database reference to the respective chapter in the ITU-T recommendation.

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

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

For testing under lifelike conditions, some measurements are performed in the presence of background noise. The ACQUA standard synchronizes playback of background noise with the measurements for full repeatability. An artificial head simulates the vehicle occupant conducting a hands-free emergency call. HEAD acoustics rotating reflector provides a time-variant echo path. The background noise of typical driving situations is simulated via background noise simulation software:

- › HAE-car (complying with ETSI ES 202 396-1) for measurements according to UNECE AECS-02-02-Rev.8
- › 3PASS flex (complying with ETSI TS 103 224) for measurements according to Recommendation ITU-T P.1140 (07/2022)

As testing is performed under laboratory conditions with a stationary car, P.1140-NB allows fast, convenient and reproducible testing for optimization of narrowband in-vehicle emergency call systems in compliance with the two standards.

OPTIONS

Hardware

HRR I (Code 6597)

- › HEAD acoustics Rotating Reflector

Software

coreIP (Code 7770)

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

coreIP-EVS (Code 7773)

- › EVS codec option

ACOPT 30 (Code 6857)

- › Option POLQA

RELEASE NOTES

Database revision and specification version

Database revision	Based on specification	ACQUA version
Revision 3	Recommendation ITU-T P.1140 (07/2022) UNECE AECS-02-02-Rev.8	at least 5.1.200 including update 1

SCOPE OF DELIVERY

P.1140-NB (Code 60038)

- › delivered as ACQUA database backup

V2C File

- › License file for ACQUA dongle

Revision history

- › PDF file

DAT files with background noise recordings (for import in HAE-car)

GENERAL REQUIREMENTS

Hardware

labCORE (Code 7700)

- › Modular multi-channel hardware platform

coreBUS (Code 7710)

- › I/O bus mainboard

coreOUT-Amp2 (Code 7720)

- › Power amplifier board

coreIN-Mic4 (Code 7730)

- › Microphone input board

coreBEQ (Code 7740)

- › labCORE binaural equalization, incl. filter set for one artificial head (delivered with labCORE)

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 & artificial mouth

HIS L (Code 1701)

- › HEAD impedance simulator, left

HMS II.3 LN

HMS II.3 LN (Code 1703.1)

- › HEAD measurement system, low-noise version with right ear simulator, 3.3 pinna & 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 & artificial mouth

HIS L LN HEC (Code 1701.2)

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

HMS II.6¹

HMS II.6 (Code 1706)

- › HEAD measurement system, with artificial mouth and free-field microphones (left & right)

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GENERAL REQUIREMENTS

HMS II.7¹

HMS II.7 (Code 1707)

- › HEAD measurement system, with artificial mouth and free-field ICP® microphones (left & right)

Radio communication tester (not delivered by HEAD acoustics)

Software

ACQUA (Code 6810)

- › Advanced Communication Quality Analysis Software, Full-license Version

ACOPT 32 (Code 6859)

- › Option Speech-based Double Talk Analysis

One of the following background noise simulation systems

3PASS *flex* (Code 6995)

- › Advanced background noise simulation system with automated equalization - flex version

HAE-car (Code 6971)

- › Basic background noise simulation system for car cabins with semi-automated equalization

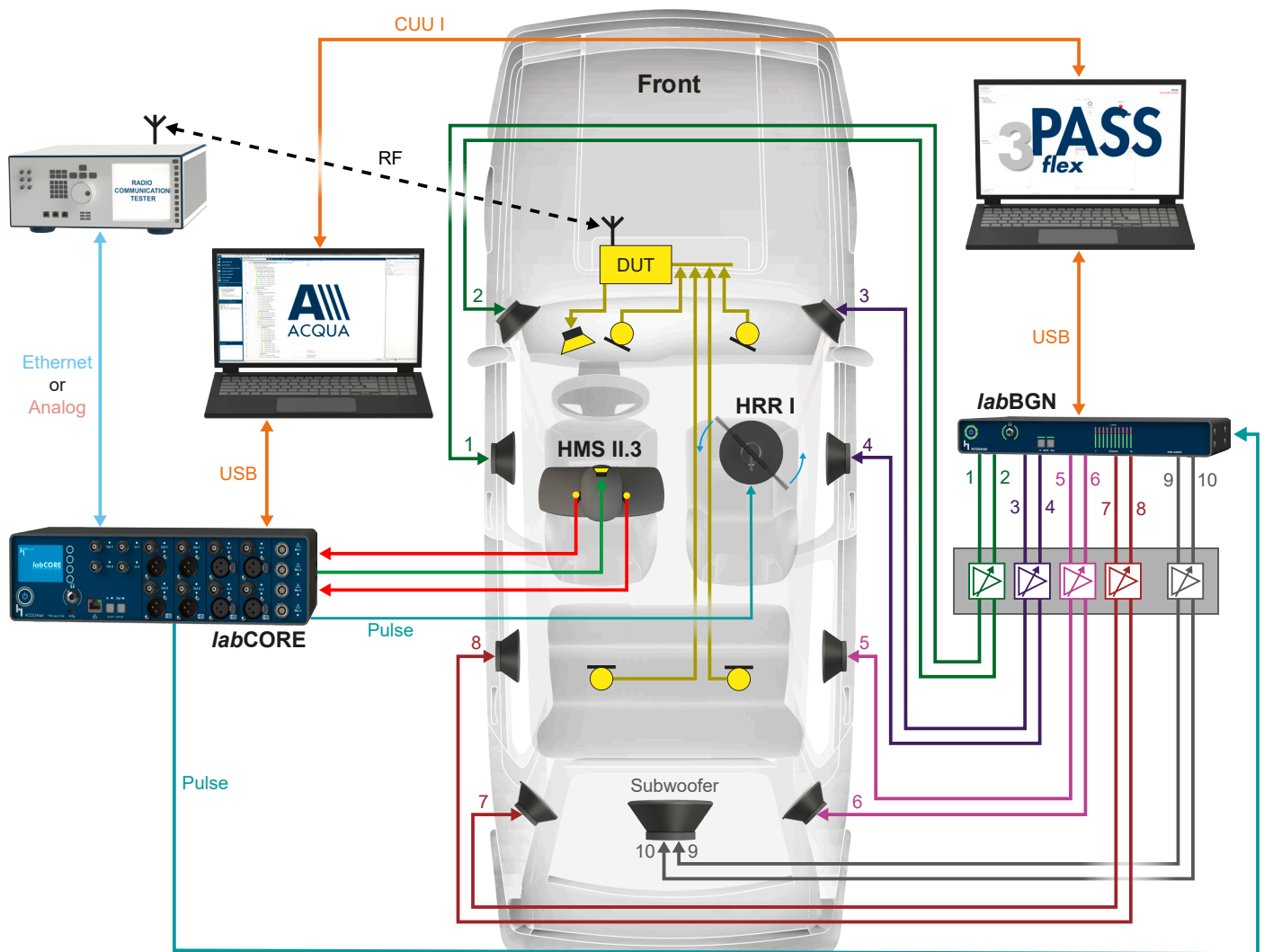
IN PRACTICE

APPLICATION EXAMPLES

Measurements according to Recommendation ITU-T P.1140 (07/2022)

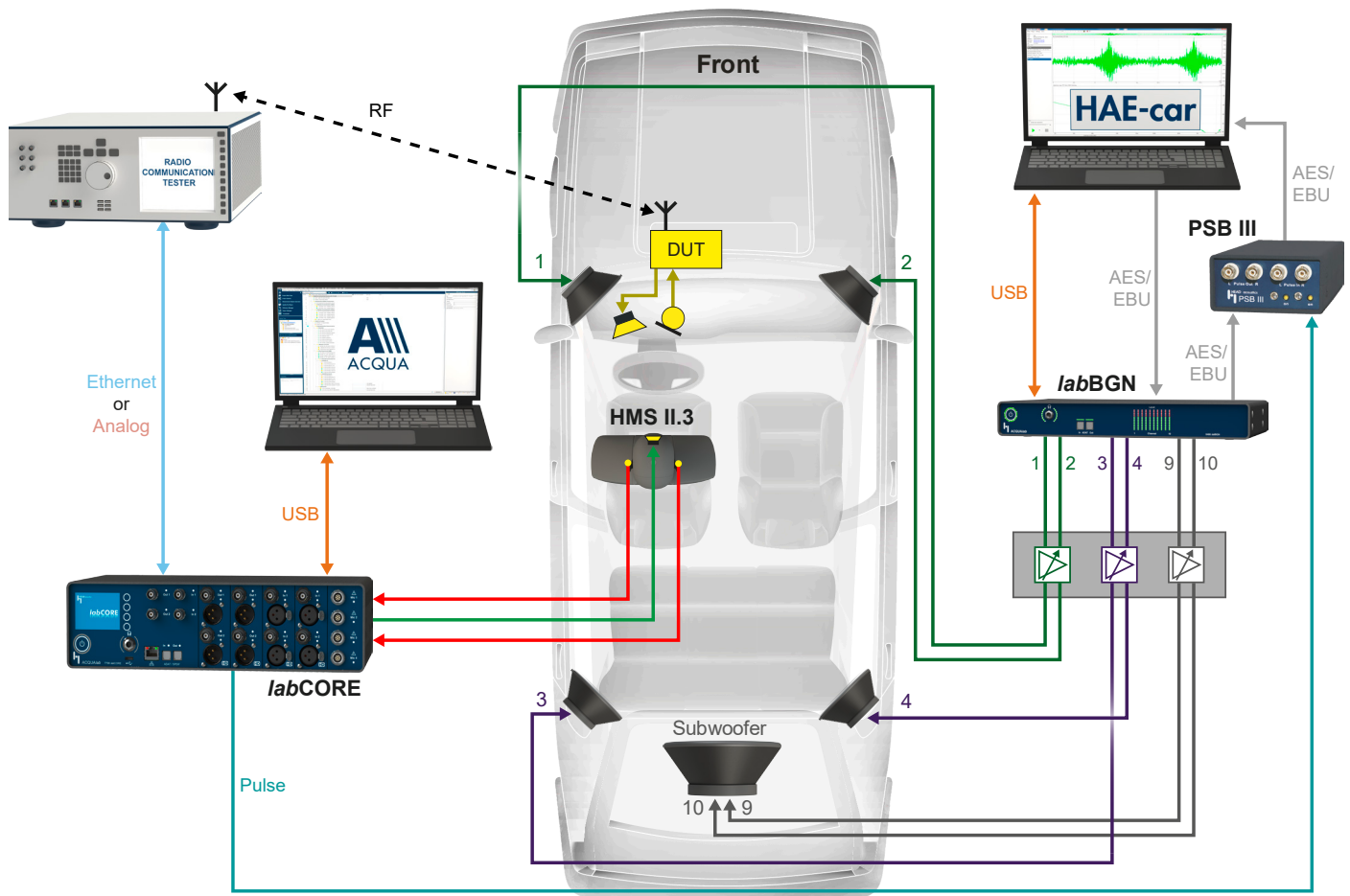
Exemplary test configuration for compliance testing according to Recommendation ITU-T P.1140 (07/2022). The device under test is a car with a built-in eCall system. A radio communication tester establishes the RF connection to the head unit. HMS II.3 simulates the user conducting a narrowband hands-free emergency call.

HRR I provides a time-variant echo path. 3PASS *flex* simulates background noise. In collaboration, *labCORE* and ACQUA generate, send and receive signals and automatically trigger background noise playback for precise synchronization.



Measurements according to UNECE AECS-02-02-Rev.8

Exemplary test configuration for compliance testing according to UNECE AECS-02-02-Rev.8 (based on P.1140 06/2015). The configuration is almost similar to the configuration for Recommendation ITU-T P.1140 (07/2022). The main differences are a simpler microphone arrangement of the vehicle's eCall system and the use of HAE-car as the background noise simulation system as defined in AECS-02-02-Rev.8.



1. This standard requires an artificial head according to ITU-T P.58. When equalized, HMS II.6 & HMS II.7 can be treated as P.58-compliant for far-field measurement purposes.

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