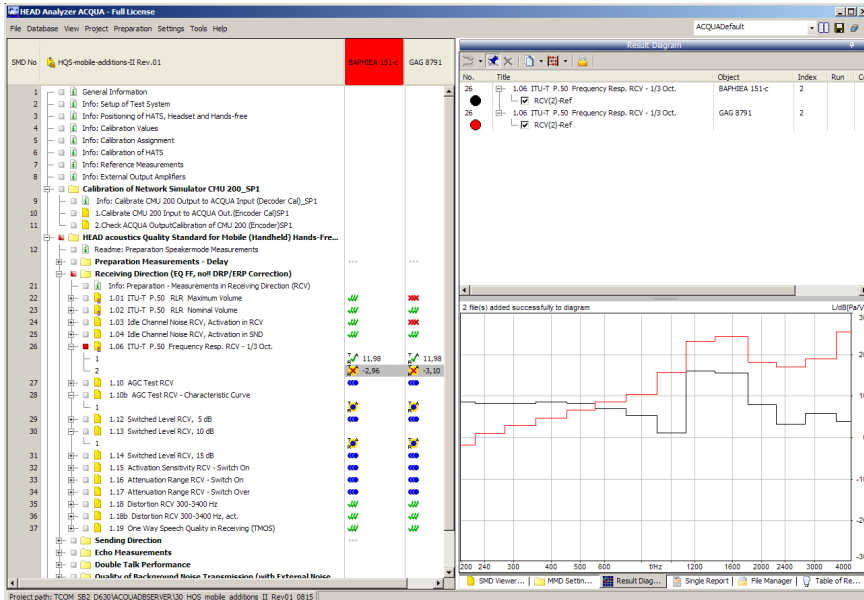


DATA SHEET

HQS-Mobile-Additions-II (Code 60012)

Extension of HQS-Mobile-II
 (Hands-free and MP3 Headsets)



Measurement tree and result diagram for HQS-Mobile-Additions-II in communication analysis system ACQUA

Overview

For tests of mobile phone handsets HEAD acoustics offers the measurement standard HQS-Mobile-II (Code 60011) for the communication analysis system ACQUA.

The optional extension HQS-Mobile-Additions-II (Code 60012) provides additional **measurements for hands-free and MP3 headsets**.

For manufacturers HQS-Mobile-Additions-II provides objective guidelines to optimize their products. For administrations and network providers it offers selection criteria to ensure a high quality level.

DESCRIPTION

The tests implemented in HQS-Mobile-Additions-II cover extended aspects of **conversational speech quality** such as

- delay measurements in sending and receiving direction
- objective speech quality assessment under single talk conditions in sending and receiving direction
- echo tests
- detailed evaluation of quality during double talk
- quality of background noise transmission.

In addition, **recordings using real speech** under single talk, echo and double talk conditions are implemented. Apart from the measured parameters these recordings also provide listening examples which can be used for audio demonstrations. Furthermore, **wideband headset tests** are included which allow the assessment of MP3 audio quality.

For determination of the quality of background noise transmission a standardized arrangement consisting of four loudspeakers and one subwoofer is used in a separate test room setup. It allows a **close-to-reality noise playback** and can be used for all types of background noise.

Some of the measurements check the analyzed results based on current **ITU-T** Recommendations or **ETSI** standards. The main references for HQS-Mobile-Additions-II are:

- **ITU-T P.50**, Artificial Voice
- **ITU-T P.501**, Test Signals for Use in Telephony
- **ITU-T P.502**, Objective analysis methods

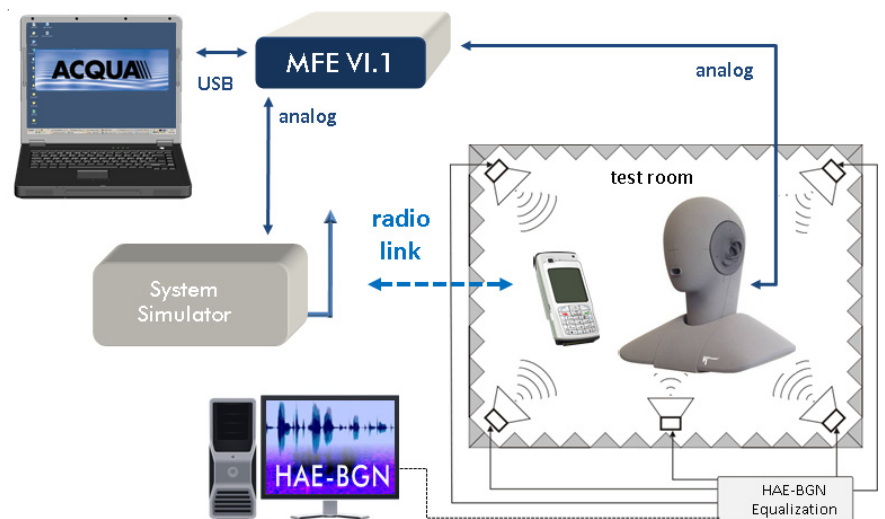
for speech communication systems, using complex test signals

- **ITU-T P.340**, Transmission Characteristics and Speech Quality Parameters of Hands-free Telephones
- **3GPP TS 26.131**, Terminal Acoustic Characteristics for Telephony Requirements
- **3GPP TS 26.132**, Narrow band (3.1 kHz) speech and video telephony terminal acoustic test specification
- **ETSI EG 202 396-1**, Speech quality performance in the presence of background noise; Part 1: Background noise simulation technique and background noise database

Other tests determine speech quality parameters to analyze the performance of the equipment under test without reference to ITU-T or ETSI standards. These measurements do not check requirements or limits, but can be used to optimize mobile phones.

APPLICATIONS

- **Automated analysis** of mobile phones (hands-free and MP3 headsets)
- **Experimental development and optimization** of mobile phones with objective evaluation of speech quality



Typical test setup

MEASUREMENTS

The following table lists all measurements that can be performed with HQS-Mobile-Additions-II.

Hands-free	
CMU Calibration Routine	X
Delay SND/ RCV/ Echo	X
Loudness Rating*	RCV, SND
Idle Channel Noise RCV, Activation in RCV	RCV, SND
Idle Channel Noise RCV, Activation in SND	RCV, SND
Frequency Response*	RCV, SND
AGC Test	RCV, SND
AGC Test - Characteristic Curve	RCV, SND
Switched Level*	RCV, SND
Activation Sensitivity - Switch On	RCV, SND
Attenuation Range - Switch On	RCV, SND
Attenuation Range - Switch Over	RCV, SND
Distortion 300-3400 Hz*	RCV
One Way Speech Quality in (TMOS)*	RCV, SND
Minimum Activation Level	SND
Echo Loss (G.122), Single Talk*	X
Convergence (Level vs. Time)	X
Convergence (Spectrography)	X
Echo Level vs. Time*	X
Spectral Echo Attenuation	X
ITU-T P.340 Echo Attenuation DT	X
TU-T P.501 Comparison to Near End Signal	X
ITU-T P.501 Comparison to Far End Signal	X
ITU-T P.340 Attenuation - Double Talk	RCV, SND
ITU-T P.501 Simulated Double Talk	RCV, SND
Sensitivity Double Talk	SND
Direct Sound Sensitivity (Speech)	X
Diffuse Sound Sensitivity	X
Calculation of D-Value	X
Calculation of ANR	X
Background Noise with Near End CSS	X
Background Noise with Far End CSS	X
Comfort Noise: Spectral Adjustment	X
Comfort Noise: Level Adjustment	X
Comfort Noise: Relative Approach	X
Speech - Single Talk	RCV, SND
Speech - Double Talk	RCV, SND
Speech - Single Talk Echo	X

MP3-Headset	
Sound Pressure Level of Headset	RCV
Idle Channel Noise After Act	RCV
Distortion (sinusoidal)	RCV
WB Speech Quality (TMOS)	RCV
Frequency Response WB	RCV

*comprises several measurement variants, e.g. varying application forces

SYSTEM REQUIREMENTS

HQS-Mobile-Additions-II requires the following system components:

- **ACQUA** Communication Analysis System as one of the following variants (versions 3.0.100 or later):
 - Full-license (Code 6810)
 - Workplace (Code 6830, for post-analysis and documentation only)
 - Compact Systems (Code 6860.xx)
- **ACOPT 10** TOSQA2001 Telecommunications Objective Speech Quality Assessment (Code 6820), required for TMOS tests
- **HAE-BGN** Background Noise Simulation (Code 6971), required for background noise tests
- **HQS-Mobile-II** HEAD acoustics Quality Standard, Mobil Phones (Code 60011)
- **HMS II.3** HEAD Measurement System (Code 1230) with pinna type 3.3
- **MFE VI.1** Measurement Frontend (Code 6462) with option **MFEVI-BEQ** (Code 6461)
- **System Simulator** e.g. R&S CMU200 (not delivered by HEAD acoustics)

OPTIONS

- **ACOPT 17** "Relative Approach" Hearing model based analysis of time-variant or spectral components (Code 6839)
- **ACOPT 20** Quality Pie (Code 6843)

DELIVERY ITEMS

- **HQS-Mobile-Additions-II** measurement standard, delivered as ACQUA database on CD (Code 60012)
- **V2C file** (for ACQUA 3.0.100 or later), on CD
- **Manual** as PDF on CD

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