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*core*IP-Alexa
(Code 7775)
*lab*CORE Alexa Client Option

Overview

*core*IP-Alexa is a software extension for the multi-channel hardware platform *lab*CORE.

*core*IP-Alexa enables *lab*CORE to become an Amazon Alexa reference client. This allows the hardware platform to emulate an Amazon Alexa remote client and route audio data of Alexa-to-Alexa calls to ACQUA for analysis of speech quality.

*core*IP-Alexa allows conclusive speech quality analysis of arbitrary devices supporting Alex-to-Alexa calling, e.g. as laid out in the Amazon 'Alexa Communication Audio Requirements' (Amazon ACAR).
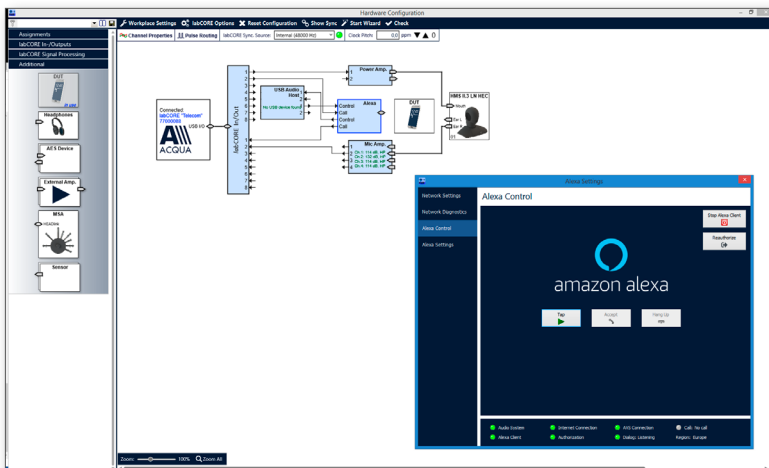
Description

Alexa-to-Alexa calling is one of the services in the Amazon Alexa ecosystem – voice-activated conversations between owners of Alexa-enabled devices. Such devices can be Amazon Echo loudspeakers, but also Alexa-enabled appliances from other manufacturers, e.g. smart speakers, TVs or soundbars.

Technically, Alexa-to-Alexa calls are Voice-over-IP (VoIP) calls between two terminal devices. Due to the hands-free nature, the caller and the called typically are in the far field of their respective device. Thus, Alexa-to-Alexa calls are not only subject to impairments typical for VoIP communication such as delay, jitter and packet loss, but also have to deal with the acoustic challenges of far field voice communication at both ends.

Measurement procedures to determine speech quality in VoIP communication are available. This however requires access to the digital audio data. As the data transfer in Alexa-to-Alexa calls happens solely within the closed Alexa network, access to this network is imperative for conclusive and repeatable analysis of speech quality. The software extension *core*IP-Alexa transforms the HEAD acoustics hardware platform *lab*CORE into an Alexa-enabled reference client to act as the remote terminal device in Alexa-to-Alexa calls. While the call is being handled by the Alexa network like any regular call, *lab*CORE routes its digital audio data through ACQUA. This allows to assess speech quality of the local Alexa-enabled terminal device – the Device Under Test (DUT).

Key Features

- Software extension for *lab*CORE
- Transform *lab*CORE into an Alexa reference client device for speech quality analysis of local devices in Alexa-to-Alexa calls
- Quick and easy control, condition monitoring and diagnostics via GUI in ACQUA

Applications

- Performing speech quality tests of Alexa-enabled devices supporting Alexa-to-Alexa calling, such as:
  – Smart speakers
  – Televisions
  – Soundbars

The hardware block and GUI of *core*IP-Alexa in the ACQUA hardware configuration. The current state of the connection is displayed at the bottom of the GUI window.

*core*IP-Alexa consists of a modified Alexa client running on *lab*CORE. It has access to all functionality of a regular client, e.g. selecting a language, activating confirmation sounds or setting the device to 'do not disturb' mode. By system design, influencing the jitter buffer is not possible.

*core*IP-Alexa is the ideal tool for professional testing of smart devices capable of Alexa-to-Alexa calling. Testing can be performed e.g. as described in the 'Alexa Communications Audio Requirements' (ACAR) issued by Amazon. The document specifies instrumental and auditory tests for devices supporting Alexa-to-Alexa calling to ensure a reasonable level of communication quality for the customer.

In addition to the general requirements cited in this data sheet, a regular (free) Amazon account is mandatory. As with other Alexa clients, the account needs to be linked to the device, in this case *core*IP-Alexa. This is performed in the Alexa menu accessible via the ACQUA hardware configuration.

General Requirements

Hardware

- **labCORE (Code 7700)**, ACQUA*lab* modular multi-channel hardware platform for speech & audio quality testing (Firmware 3.3.13 or newer)

Software

- One of the following **HEAD acoustics Software**:

  – **ACQUA (Code 6810)**
  Advanced Communication Quality Analysis Software, Full-license Version (Version 5.1.100 or newer)

  or

  – **ACQUA Compact (Code 6860)**
  (Version 5.1.100 or newer)

  or

  – **RC-labCORE (Code 6984)**
  (Version 2.1.100 or newer)

Delivery

- **coreIP-Alexa (Code 7775)**,
  *lab*CORE Alexa client option

Configuration example: Measurement Setup for a Smart Speaker

Exemplary test configuration for a surface-supported smart speaker that supports Alexa-to-Alexa calling. The speaker is placed on the motorized turntable HRT I. An artificial head of the HMS II.3 family simulates the user conducting a far-field (1m) Alexa-to-Alexa call.

Background noise is simulated via 3PASS *lab*. In collaboration, *lab*CORE and ACQUA generate, send and receive signals and automatically trigger background noise playback for precise synchronization. Rotation of the speaker as well as changing the echo path according to the test requirements are performed by the rotating turntable HRT I as well as the rotating reflector HRR I to minimize necessary user interaction.