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DATA SHEET

*core*USB-DR (Code 7705)

_lab_CORE I/O Module, USB Device Reference

Overview

*core*USB-DR is a hardware extension module for the multi-channel hardware platform *lab*CORE. *core*USB-DR enables *lab*CORE to simulate a USB audio device (e.g. a headset) to an external USB audio host (e.g. a smartphone) for performing measurements without the need for an acoustic interface.

*core*USB-DR comprises an internal hardware module which extends the capabilities of the front side USB Type-C connector of *lab*CORE. It supports a wide variety of configuration options to generate arbitrary test cases.

Key Features

- Hardware extension module for *lab*CORE
- Allows *lab*CORE to act as a USB audio device for testing of USB hosts without the need for audible playback
- Various configuration options and profiles to generate any desired test case
- Can enforce desired connection settings for the DUT

Applications

- Performing electrical measurements of USB hosts such as:
  - Smartphones
  - Tablets
  - Computers (e.g. running conferencing software)

Description

By default, labCORE can act as a USB host for audio devices that connect directly via USB, e.g. headsets, headphones or loudspeakers. Measurements of these devices can then be performed with ACQUA, e.g. with the HEAD acoustics Quality Standard HQS-ANC-Headset.
With the optional hardware extension module *core*USB-DR, *lab*CORE gains the additional capability to act as a reference device for any voice and audio host that connects via USB, e.g. smartphones, tablets or computers (with conferencing software etc.). This allows purely electrical measurements of USB hosts with ACQUA, e.g. as described in release 17.1 of 3GPP TS 26.131-32, without any acoustic interface. The lack of audible playback waives the need for an artificial head and an appropriate acoustic environment (e.g. anechoic room).
In combination, *lab*CORE equipped with *core*USB-DR and ACQUA allow to create arbitrary test scenarios for suitable USB hosts. *core*USB-DR supports the following settings and functions:

- USB audio device (playback & capture)
- USB Full-Speed (12 Mbit/s) with USB Audio Class (UAC) 1 & 2
- Sample rates between 8 kHz and 96 kHz
- 1 or 2 channels per direction
- Bit depth: 16/24/32 bit
- Product ID and vendor ID can be set manually

Settings can be chosen as desired within the technical scope of the connection[1].

General Requirements

Hardware

- ***lab*CORE (Code 7700)**, ACQUA*lab* modular multi-channel hardware platform for speech & audio quality testing

Software

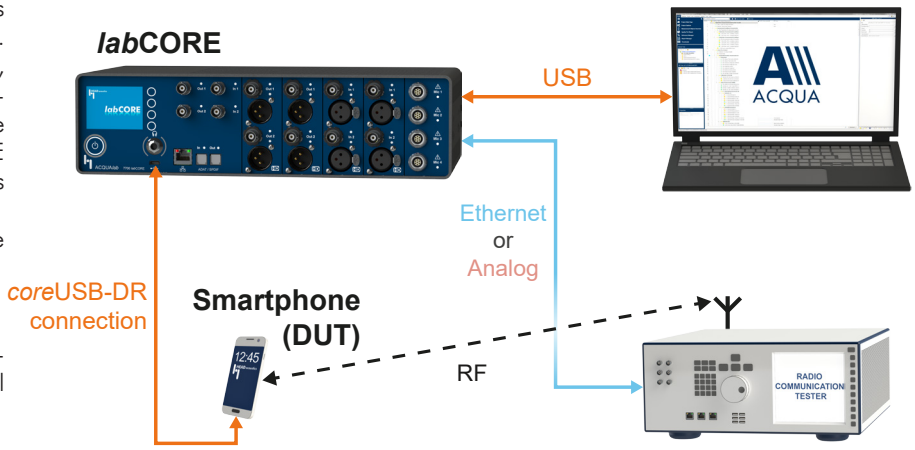
- **ACQUA (Code 6810 etc.)**, Advanced Communication Analysis System

Delivery

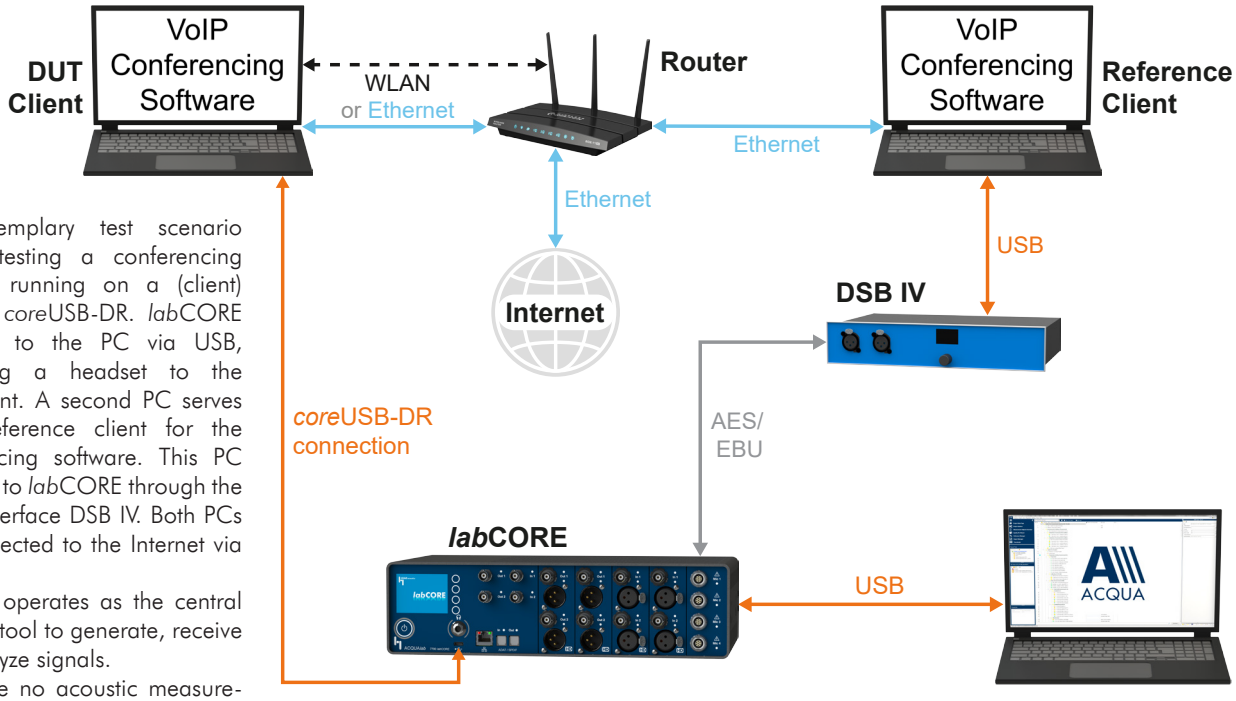
- ***core*USB-DR (Code 7705)**, *lab*CORE I/O module, USB device reference
  - **Initial equipping:** *core*USB-DR is installed to *lab*CORE during production
  - **Retrofitting:** *lab*CORE must be sent to HEAD acoustics for installation

Configuration Example 1: Measurement of a Smartphone with *core*USB-DR

This exemplary test scenario depicts testing a smartphone with *core*USB-DR. *lab*CORE connects to the phone via USB, simulating a headset. A radio tester simulates a local mobile network for the device under test (DUT) to connect to. *lab*CORE can therefore send and receive signals from/to the DUT for testing.
ACQUA operates as the central software tool to generate, receive and analyze signals.
There are no acoustic measurements when utilizing *core*USB-DR in this application, thus acoustic interfaces (e.g. artificial head, test room) are not needed.



Configuration Example 2: Measurement of Conferencing Software with *core*USB-DR



This exemplary test scenario depicts testing a conferencing software running on a (client) PC with *core*USB-DR. *lab*CORE connects to the PC via USB, simulating a headset to the DUT client. A second PC serves as a reference client for the conferencing software. This PC connects to *lab*CORE through the audio interface DSB IV. Both PCs are connected to the Internet via a router.
ACQUA operates as the central software tool to generate, receive and analyze signals.
There are no acoustic measurements when utilizing *core*USB-DR in this application, thus acoustic interfaces (e.g. artificial head, test room) are not needed.

1) The total bandwidth resulting from the combination of the number of channels, bit depth and sample rate can not exceed the USB Full-Speed bandwidth of 12 Mbit/s for technical reasons.