

**APPLICATION
EXAMPLES
INCLUDED**



Code 7782

coreBT2

labCORE I/O Module, Bluetooth® Reference Access Point, Version 2

OVERVIEW

coreBT2

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labCORE I/O Module, Bluetooth® Reference Access Point, Version 2

coreBT2 is a hardware / software extension for the multi-channel hardware platform *labCORE*. *coreBT2* enables *labCORE* to become a Bluetooth reference access point. With *coreBT2*, *labCORE* pairs with any Bluetooth capable voice and audio device to perform acoustic and electric measurements.

coreBT2 comprises a dedicated software stack supporting Bluetooth version 5.2 and a USB transceiver with Bluetooth version 5.0. *coreBT2* supports a wide variety of Bluetooth profiles and configuration options to generate arbitrary test cases. Basing it on USB technology allows quick installation as well as changeability on-site.



KEY FEATURES

Pairing as headset / hands-free Bluetooth device, as a gateway or as a universal A2DP source / sink

Audio codecs for classic Bluetooth

Various configuration options and profiles to generate any desired test case

Can enforce desired connection types / settings for the DUT

Quick & easy setup for existing *labCORE* units

APPLICATIONS

Performing electrical & acoustic measurements of Bluetooth devices

DETAILS

With the optional hardware / software extension *coreBT2*, *labCORE* becomes a Bluetooth reference access point. This allows the hardware platform to connect wirelessly to any Bluetooth capable voice and audio device (e.g. mobile phones, headsets, headphones, hands-free devices, loudspeakers etc.). Control, configuration and electric or acoustic measurements of the Bluetooth connection are executed via ACQUA. The utilized USB transceiver works in conjunction with a dedicated software stack.

DESCRIPTION

Bluetooth profiles

Selectable profiles allow *labCORE* to act as any type of Bluetooth connected device:

- › Hands-free audio device (HFP) /
Gateway for a hands-free audio device (HFP-AG)
- › Headset audio device (HSP) /
Gateway for a headset audio device (HSP-AG)
- › Advanced Audio Distribution Profile (A2DP), audio sink/
source device
- › Audio/Video Remote Control Profile (AVRCP)

Connection & Security

coreBT2 is delivered with an USB transceiver CBA-IV-V1 and the antenna cable extension CSM II.10 for flexible positioning of the transceiver, e.g. inside the measurement cabin. The cable has a male SMA connector and a female SMA socket to connect it to the antenna as well as SMA socket of the USB transceiver.

coreBT2 supports a wide variety of configuration options to create any desired test scenario and/or force the device under test (DUT) into desired modes of operation for in-depth testing. Known levels and delays allow precise analysis of device characteristics and behavior. The status of a connection can be retrieved, Bluetooth data packets can be recorded for debugging operations.

The module supports Bluetooth security levels 1-3 and automatically matches with the DUT upon request, e.g.:

- › PIN for the pairing process
- › Man-in-the-middle protection (on / off)
- › Bit encryption length (8 to 128 bit)
- › Security level (encryption/signing)

Codecs

coreBT2 supports various audio codecs:

- › CVSD and mSBC
- › SBC
- › Qualcomm® aptX™ audio codec (A2DP source only)
- › AAC (payable option)
- › LDAC (payable option, A2DP source only)
- › Additionally, supported sample rates as well as parameters can be manually set for each codec.
- › LC3plus (payable option)

Miscellaneous functionalities

coreBT2 also supports the following Bluetooth functions:

- › Communication over control / audio-channels for headset profiles (HSP / HSP-AG) including loudspeaker and microphone volume control
- › Communication over control / audio-channels for hands-free profiles (HFP / HFP-AG) including loudspeaker and microphone volume control
- › Selection of an SCO- and eSCO-link for speech transmission
- › AT command mode
- › Echo Cancellation (EC) and Noise Reduction (NR) can be en-/ disabled in the DUT as desired

Certifications

The transceiver delivered with coreBT2 has the following certifications:

- › Anatel (Brazil)
- › Bluetooth SIG (UK)
- › BTK (Turkey)
- › CE RED (Europe)
- › EAC (Russia)
- › Enacom (Argentina)
- › FCC (United States)
- › IC (Canada)
- › ICASA (South Africa)
- › IDMA (Singapore)
- › KCC (Korea)
- › Kominfo (Indonesia)
- › MoC (India)
- › NCC (Taiwan)
- › NBTC (Thailand)
- › NOM & NYCE (Mexico)
- › NTC (Phillipines)
- › PTA (Pakistan)
- › QAS SIRIM (Malaysia)
- › RCM (Australia & New Zealand)
- › SRRC (China)
- › Telec (Japan)
- › TRA (United Arab Emirates)
- › Vietnam

OPTIONAL CODECS AND PROTOCOLS

Advanced audio codec (AAC)

The AAC codec is available with coreBT2-AAC-LDAC. AAC supports a sampling rate up to 96 kHz and has a maximal bit rate of 320 kbps.

LDAC codec

The LDAC codec is available with coreBT2-AAC-LDAC. LDAC supports a sampling rate up to 96 kHz and high bit rates.

LC3plus codec

The LC3plus codec is available with coreBT2-LC3plus-A2DP. LC3plus supports a sampling rate up to 96 kHz and a bit rate adaption up to 500 kbps per channel. It allows high speech- and audio transmission quality (super-wideband) and has an increased robustness against transmission errors.

HID protocol

The HID functionality is available with coreBT2HID. It enables labCORE to act as a human interface device. Thus, labCORE can send control commands via Bluetooth to a connected device, e.g. volume control commands.

OPTIONS

coreBT2-AAC-LDAC (7783)

- › *labCORE* Bluetooth AAC & LDAC codec option

coreBT2-LC3plus-A2DP (Code 7784)

- › *labCORE* Bluetooth LC3plus option for A2DP

coreBT2HID (Code 7786)

- › *labCORE* Bluetooth Human Interface Device

GENERAL REQUIREMENTS

Hardware

labCORE (Code 7700)

- › ACQUA*lab* modular multi-channel hardware platform for speech & audio quality testing

Software

One of the following HEAD acoustics Software:

ACQUA (Code 6810)

- › Advanced Communication Quality Analysis Software, Full-license Version (Version 6.0.100 or newer)

or

ACQUA Compact (Code 6860)

- › (Version 6.0.100 or newer)

or

RC-*labCORE* (Code 6984)

- › (Version 2.0.200 or newer)

SCOPE OF DELIVERY

coreBT2 (Code 7782)

- › *labCORE* I/O Module, Bluetooth Reference Access Point, Version 2

CBA IV-V1 (Code 6599-V1)

- › Bluetooth Transceiver for *labCORE* Module coreBT2 (USB-based, includes antenna)

CSM II.10 (Code 6115-10)

- › Antenna cable, SMA plug <> SMA socket, RG 174, 10 m

Software stack (embedded in *labCORE* firmware)

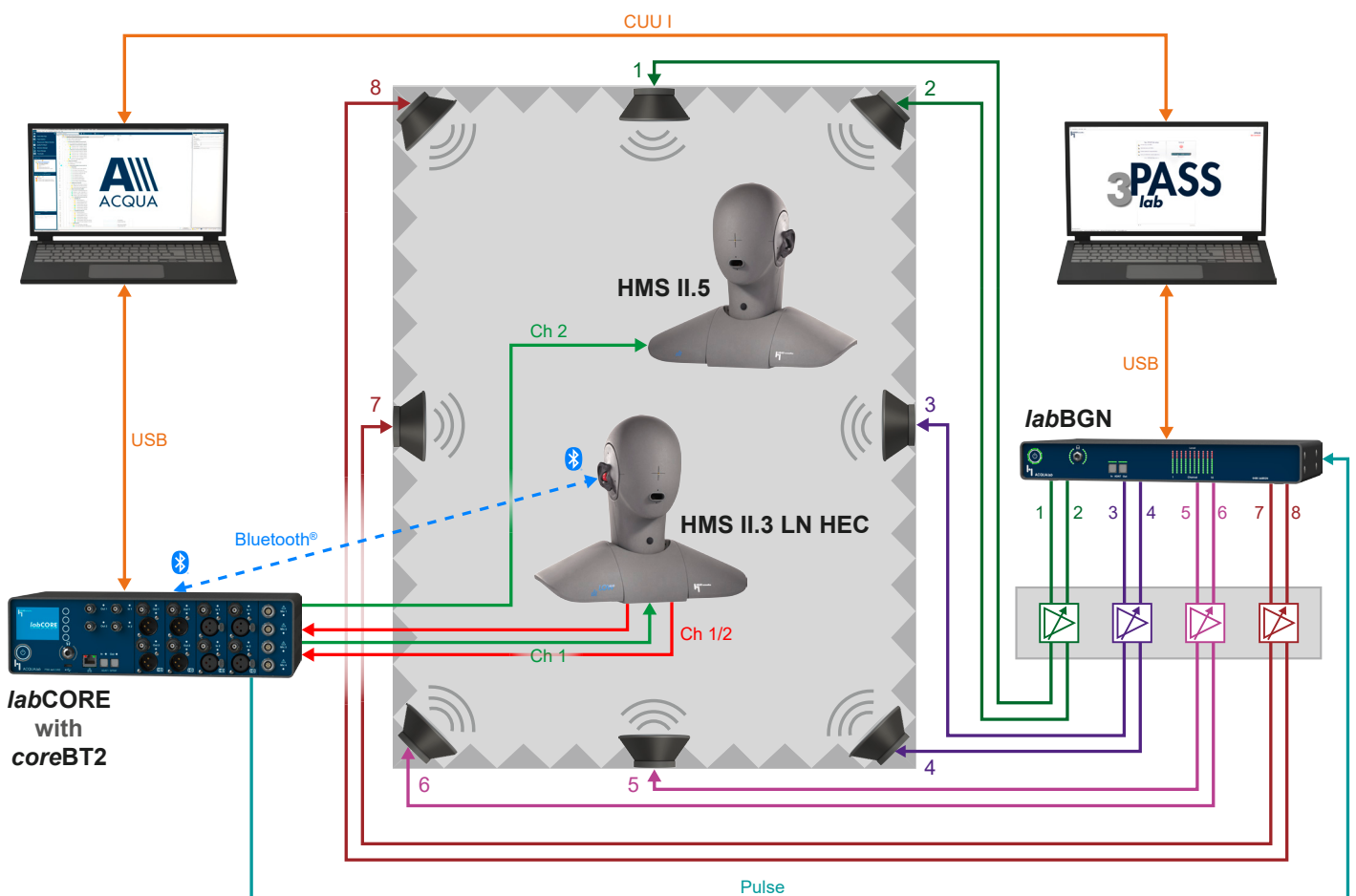
IN PRACTICE

APPLICATION EXAMPLE

Measurement of Bluetooth True Wireless in-ear headset with a second talker

This exemplary test scenario depicts testing of a wireless in-ear with coreBT2. HMS II.3 LN HEC wears the device under test. HMS II.5 simulates a second talker to test performance with external speech.

labCORE connects to the in-ear via coreBT2. Background noise is simulated with 3PASS lab. For full repeatability of measurements, background noise playback is synchronized by labCORE through a pulse connection to the hardware platform labBGN. ACQUA operates as the central software tool to generate, receive and analyze signals.



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<https://www.iis.fraunhofer.de/audio>: Low Complexity Communication Codec for High-Resolution mode by Fraunhofer IIS and Ericsson.



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