HEAD acoustics
Ebertstraße 30a
52134 Herzogenrath, Germany
Tel.: +49 2407 577-0
Fax: +49 2407 577-99
Email: telecom@head-acoustics.de
Web: www.head-acoustics.com

# Data Sheet

## *core*A2B (Code 7790)

**lab*CORE* board for A²B® bus**


Backside of *lab*CORE with *core*A2B extension

## Overview

*core*A2B is a *lab*CORE hardware extension for the Analog Devices Automotive Audio Bus A²B®. With this board, labCORE connects to the A²B® bus in four user-selectable modes.

*core*A2B can operate as a master or a slave node, listen passively (Bus monitor mode) or actively receive and insert user-specified signals from the fully-operational bus (Proxy mode). In this mode, *core*A2B gains full control over any signal on the bus without the need for reconfiguration.

Additionally, *core*A2B can be used as an A²B® evaluation board, allowing to use all capabilities of analyzing and manipulating signals in ACQUA.

Automotive Audio Bus

## Description

The Automotive Audio Bus (A²B®) is a digital bus system for vehicles developed by Analog Devices. With the *lab*CORE extension board *core*A2B, the hardware platform connects to any A²B® bus in four user-selectable modes:

- Master mode
- Slave mode
- Bus monitor mode
- Proxy mode

(see table below for individual requirements and features of each mode)

The board allows to examine, measure, test, manipulate and perform design verification of A²B® buses and devices. With the multiple inputs and outputs of *lab*CORE and ACQUA's capabilities of analyzing, filtering and manipulating signals, *core*A2B is a full-featured test, measurement and development platform for A²B® configurations and devices.

### Proxy mode

Proxy mode is the key competence of *core*A2B. Only in this mode, the board gains full control over all data on the bus, being able to insert and receive audio and configuration data while the bus remains fully operational. *core*A2B doesn't occupy a node position on the bus, thus the mode can also be used on fully equipped buses (master and 10 slaves). The sniffing bit is disregarded as well, so the configuration of the bus doesn't have to be accessible.

### Evaluation board

In conjunction with an adapter cable, *core*A2B can also serve as an evaluation board for the A²B® bus. Setup of the bus is performed via the Analog Devices software tool SigmaStudio™. As an evaluation board, *core*A2B operates in Master mode and allows to use all capabilities of analyzing, filtering and manipulating signals that ACQUA offers.

| ***core*A2B modes** | **Requirements** | | | **Features** | | | |
|---|---|---|---|---|---|---|---|
| | Bus config must be accessible | coreA2B takes node position | Position on bus | Configuration data | | Audio data | |
| | | | | Insert | Receive | Insert | Receive |
| **Master** | Yes | Yes | Replaces master | • | | • | • |
| **Slave** | Yes | Yes | Replaces any slave | | • | • | • |
| **Bus monitor** | Only sniffing bit | No | Arbitrary* | | • | | • |
| **Proxy** | No | No | Arbitrary* | • | • | • | • |
| **Evaluation board** | n/a | Yes | Replaces Master | •** | | • | • |

## Applications

- Testing and design verification of A²B® buses and devices
- Measuring and manipulating data on the A²B® bus
- Inserting and receiving configuration and audio data into/from the A²B® bus
- Developing new A²B® configurations and devices
- Troubleshooting existing A²B® buses and devices

## General Requirements

### Hardware

- ***lab*CORE (Code 7700)**, Modular Multi-channel Hardware Platform
- ***core*BUS (Code 7710)**, *lab*CORE I/O Bus Mainboard

### Software

- **ACQUA (Code 6810)**, ACQUA Standard: Basic Analysis Software, Full-license Version

## Delivery Items

- ***core*A2B (Code 7790)**, *lab*CORE extension board for A²B® bus
  - **Initial equipping:** HEAD acoustics installs *core*A2B to *lab*CORE during production
  - **Retrofitting:** Send in *lab*CORE to HEAD acoustics for installation

*Due to the design of A²B® buses, *core*A2B can only access data of downstream slave nodes. Thus, connection between master and first slave is recommended for accessing all data on the bus.

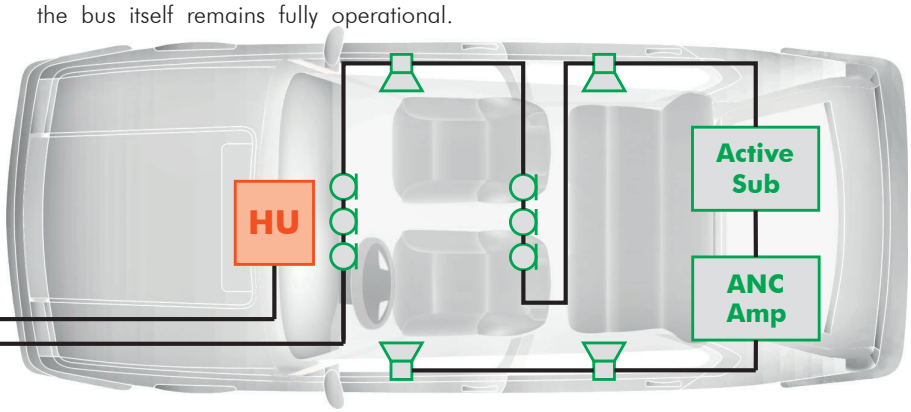
**Via Analog Devices software tool SigmaStudio™.

## Proxy mode

This is the most skillful, important mode of *core*A2B. The board connects anywhere on the bus (preferably between master and first slave), tapping into its audio and I²C data. The bus doesn't need reconfiguration (sniffing bit is ignored) and *core*A2B doesn't occupy the master or any slave node position.

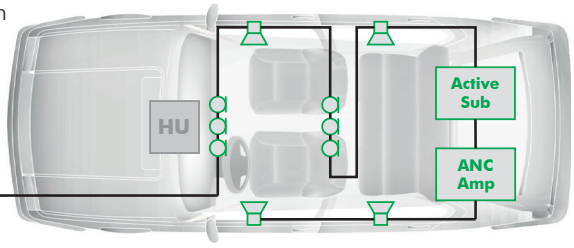
All of the digital data on the bus (configuration and audio) between the master and all slaves behind *core*A2B passes through *lab*CORE and can be manipulated in ACQUA as the user desires. Only this mode allows to record, process and send user-defined audio data from and to any channel and any node while the bus itself remains fully operational.

In conjunction with *lab*CORE and ACQUA, proxy mode enables *core*A2B to receive, mix and insert arbitrary signals to the bus without interference with the original, unaltered signal.

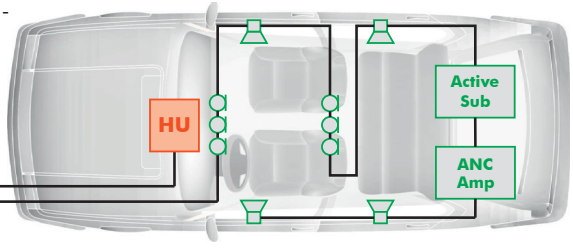

## Master mode

In this mode, *core*A2B replaces the original master (e.g. head unit) and acts as the new master for the bus. Up to 10 slave devices can be connected to *core*A2B. Setup is performed via a configuration file exported from the Analog Devices software tool SigmaStudio™. Bus-powered slaves will be powered from *core*A2B, externally powered slaves may need manual triggering to power on.


## Slave mode

This mode enables *core*A2B to act as a slave node on an existing bus. The master's configuration file has to be accessible to add *core*A2B to the bus as a new slave node. In this mode, *core*A2B can send and receive audio data as well as receive configuration data. It can be inserted at any arbitrary position on the bus, taking one of the 10 slave node positions.


## Bus monitor mode

This mode is for analyzing data traffic on the bus without interference, e.g. when troubleshooting an existing bus. The board acts as a "neutral entity", sniffing out audio as well as configuration data on any arbitrary point on the bus (preferably between master and first slave). The sniffing bit must be set to allow *core*A2B to receive audio. As *core*A2B only "listens" to the bus, it does not occupy a node position.