Overview

The Automotive Audio Bus® provides a multichannel, I²S/TDM link over distances of up to 10 meters between nodes. It embeds bidirectional synchronous data, clock, control data, and a power supply onto a single, differential wire pair. A²B® supports a direct point-to-point connection and allows multiple daisy-chained nodes at different locations to contribute or consume time division multiplexed channel content. A²B is a single master, multiple slave system where the transceiver chip at the host controller is the master. It generates clock, synchronization, and framing for all slave nodes. The master A²B chip is programmable over a control bus (I²C) for configuration and readback. An extension of this control bus is embedded in the A²B data stream, allowing direct access of registers and status information on slave transceivers as well as I²C-to-I²C communication over distance.

Target Applications Include

- Audio ECU communication links
- Active noise cancellation (ANC)
- Microphone arrays for hands-free and in-car communications systems

Hands-Free and ANC: Two Approaches

- Traditional approach: analog audio; many expensive cables and connectors.
- New approach: digital audio; single, low cost, unshielded twisted pair (UTP) wire transports audio, control, clock, and power.

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Features and Benefits

- High bandwidth (50 Mbps) digital bus
- Support for up to 32 upstream and downstream audio channels
- Data, control, clock, plus power on a single wire pair
- System cost reduction using low cost, UTP cable
- Single master, multiple slave, line topology
- Daisy-chaining supported with zero processor overhead
- Phantom power capability
- Eliminates the need for local power supplies
- Embedded diagnostics
- Easy system-level fault detection and correction
- Fully configurable via SigmaStudio™ graphical design environment
- Fast time to market

SigmaStudio Graphical Design Environment

- Visual bus setup and configuration
- Graphical user interface to view and configure all registers
- Bus bandwidth utilization calculation
- Bit error rate test (BERT)
- Line diagnostics
- Firmware driver generation

Multifunction Evaluation Systems

- Proof of concept
- Test and verification
- Debug, EMC testing

Product Comparison Guide

<table>
<thead>
<tr>
<th>Feature</th>
<th>AD2401WCCSZ¹,²</th>
<th>AD2402WCCSZ¹,²</th>
<th>AD2410WCCSZ¹,²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master capable</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Functional TRX blocks</td>
<td>A only</td>
<td>A and B</td>
<td>A and B</td>
</tr>
<tr>
<td>FS/TDM support</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>PDM microphone inputs</td>
<td>4 mics</td>
<td>4 mics</td>
<td>4 mics</td>
</tr>
<tr>
<td>Maximum node-to-node cable length</td>
<td>10 m</td>
<td>10 m</td>
<td>10 m</td>
</tr>
</tbody>
</table>

Ordering Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVAL-AD2410WBZ</td>
<td>Phantom power slave evaluation board; stereo in, stereo out, and stereo microphone</td>
</tr>
<tr>
<td>EVAL-AD2410WCZ</td>
<td>Phantom power slave evaluation board with three microphones</td>
</tr>
<tr>
<td>EVAL-AD2410WDZ</td>
<td>Master evaluation board with SigmaDSP® ADAU1452</td>
</tr>
<tr>
<td>EVAL-AD2410WFZ</td>
<td>Master evaluation board with SHARC® ADSP-21489</td>
</tr>
<tr>
<td>EVAL-AD2410WGZ</td>
<td>Local power slave evaluation board; stereo in, stereo out</td>
</tr>
</tbody>
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¹ Z = RoHS compliant part.
² W = qualified for automotive applications.

To learn more about the breakthrough Automotive Audio Bus technology, watch the video at www.analog.com/en/education/education-library/videos/3832751027001.html