

CRY580 A²B Bus Analyzer

- High Bandwidth
- Low Latency
- Flexible Topology
- Flexible Interfaces
- Clock Synchronization
- Multi-Microphone Input



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The CRY580 A²B Bus Analyzer plays a critical role in automotive audio systems. It converts A²B-transmitted digital audio and control signals into formats that amplifiers, speakers, and other devices can use for playback and processing.

It transmits bidirectional PCM data, clock signals and sync signals over a single differential pair, supporting multi-channel I²S/TDM. It ensures stable communication over node distances of up to 15 meters (49 feet), with 1 to 1 or 1 to many connections enabling shared time-division channels.



Features

- High Bandwidth

Featuring a 50Mbps high-bandwidth digital bus, it meets system needs for transmitting large audio data.

- Low Latency

Minimizes latency caused by bus collisions or packet reconfiguration, typically keeping it below 50µs.

- Flexible Topology

Adopts single-master multi-slave linear topology with daisy-chain support, requiring no extra processor overhead for easy system expansion and layout.

- Flexible Interfaces

Supports multi-channel I²S/TDM audio interfaces for bidirectional A²B network connectivity (input/output).

- Clock Synchronization

Ensures synchronous sampling and data transmission across all system nodes in each frame.

- Multi-Microphone Input

Supports PDM interfaces, with up to 4 PDM mic inputs per node and simultaneous I²S data reception from multiple mics.

Main Application Scenarios

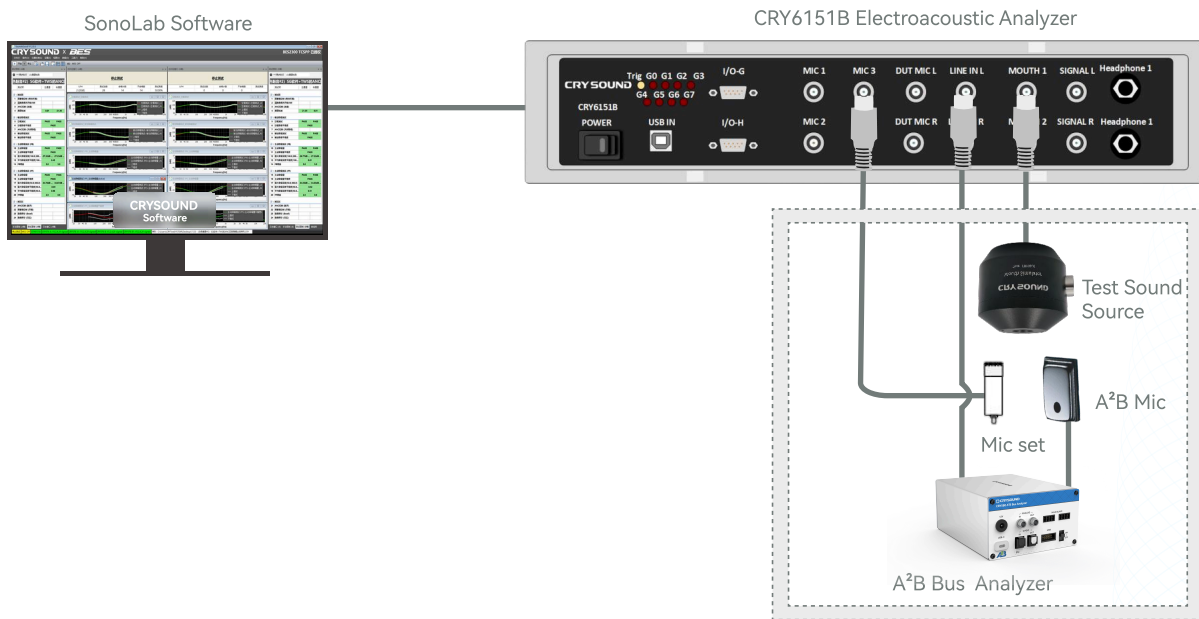
- Automotive Microphone Testing

Through multi-channel connections with automotive microphones, it captures audio data transmitted over the bus while using clock synchronization to ensure data alignment, enabling testing of microphone sensitivity, frequency response, and other performance indicators.

Technical Specifications

Topology	Single-master multiple-slave linear topology
3.5mm Audio Interface	Supports analog audio output
S/PDIF Interface	Supports digital audio output
A ² B MAIN/SLAVE Interface	Supports 4 high-dynamic-range microphone inputs
USBi Interface	Hardware Programming
Bandwidth	50 Mbps
Transmission Distance	15 meters
Rated Voltage	12 V (DC)
Rated Current	1.5 A
Operating Temperature	-10 to 40°C

System Composition



During testing, SonoLab software controls the CRY6151B Electroacoustic Analyzer to generate specific audio signals. These signals are converted into sound via a test source, while a reference microphone set ensures measurement accuracy. The DUT Mic on the A²B bus captures the sound, communicates with the A²B Bus Analyzer, which decodes the signal and outputs analog audio to the analyzer for further analysis.



• Instruments

Includes CRY6151B Electroacoustic Analyzer, microphone or acceleration sensor, test sound source, A²B Bus Analyzer, connecting cables, etc. The CRY6151B Electroacoustic Analyzer measures microphone, headphone, and speaker parameters such as sensitivity, distortion, and impedance. With 8-in/4-out channels and 192kHz sampling, it's built for lab-grade audio measurement.



• Software

Perform data post-processing on the collected signals. It offers a range of robust algorithms for abnormal sound analysis, such as significant frequency analysis, loudness analysis, FFT (Fast Fourier Transform) analysis, etc.

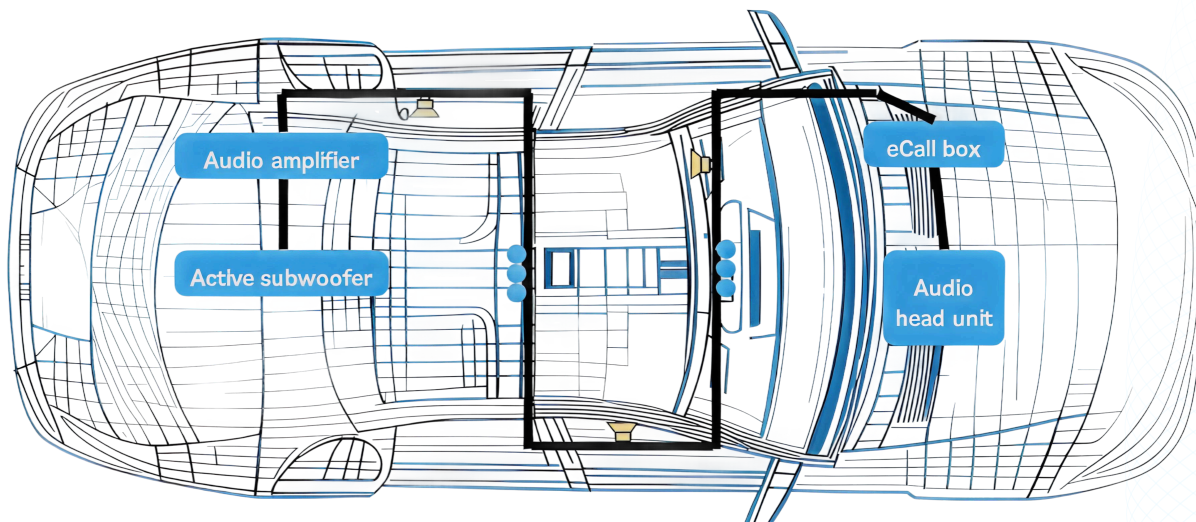


• Testing Environment

Shielding Boxes, Soundproof Boxes, and Anechoic Chambers.

Introduction to A²B

The A²B (Automotive Audio Bus), developed by ADI, is a digital networking technology designed for automotive audio systems. It addresses challenges like complex wiring and high costs in traditional audio transmission, offering a streamlined, efficient solution for in-vehicle audio applications.



Features

Specialized Data Encoding

The bus data uses Manchester encoding. Testing requires external devices to decode A²B data into analog audio (3.5mm jack) or digital audio (S/PDIF).

Flexible Topology

Supports point-to-point, daisy-chain, and branching for flexible networking.

Simple Transmission Medium

Transmits audio data, control signals, clock, and power over a low-cost unshielded twisted pair (UTP) cable.

Multi-Channel Bidirectional Transmission

Supports up to 32 audio channels on upstream/downstream buses for bidirectional multi-channel data transfer.

Benefits

Reduce Costs and Weight

The A²B bus significantly reduces cabling, cutting wiring weight by 75%.

Low Latency with Tight Synchronization

Deterministic operation with <50μs latency.

High Bandwidth

50Mbps bandwidth supports high-quality audio & control data.

Strong Noise Immunity

All-digital interface eliminates DAC/ADC conversion, ensuring audio integrity.