



AHEAD OF WHAT'S POSSIBLE™

Analog Devices, Inc.

[www.analog.com](http://www.analog.com)

## A2B Release Notes

<b>Document Status:</b>	<b>Approved</b>
<b>Approved By:</b>	<b>Siva S</b>

## Revision List

Table 1: Revision List

Document Revision	Date	Description
V20.1	08-Nov-2016	Updated for Rel13.0.0
V20.2	10-Nov-2016	Incorporated Review comments
V20.3	10-Nov-2016	Incorporated review comments from SQAL
V21.0	10-Nov-2016	Approved and baselined for Rel13.0.0
V21.1	30-Nov-2016	Draft version for Rel 13.1.0 – Updated sections 3, 4.1 and 6.2
V22.0	09-Dec-2016	Approved and baselined for Rel13.1.0
V22.1	17-Jan-2017	Updated features, release contents, for Rel 14.0
V22.2	23-Jan-2017	Addressed review comments. Added workarounds, known problems, notes sections
V23.0	23-Jan-2017	Baselined for Rel14.0.0Beta
V23.1	21-Feb-2017	Updated Section 4.1, 3, and 5.1 for Rel15.0.0.
V23.2	23-Feb-2017	Absorbing review comments
V23.3	28-Feb-2017	Addressing Quality Review comments
V24.0	03-Mar-2017	Baselined for Rel15.0.0
V24.1	09-May-2017	Updated for Rel16.0.0
V24.2	11-May-2017	Updated limitation section
V24.3	12-May-2017	Absorbing review comments
V25.0	12-May-2017	Baselined for Rel16.0.0
V25.1	28-Sep-2017	Updated for Rel17.0.0
V25.2	03-Oct-2017	Addressing review comments
V25.3	05-Oct-2017	Absorbing QA review comments
V26.0	05-Oct-2017	Baselined for Rel17.0.0
V26.1	15-Nov-2017	Updated for Rel18.0.0 Beta
V26.2	01-Dec-2017	Updated the details of BF716 inclusion
V26.3	05-Dec-2017	Absorbing review comments
V27.0	06-Dec-2017	Baselined for Rel18.0.0 Beta
V27.1	07-May-2018	Updates for Rel19.0.0
V27.2	11-May-2018	Review comments incorporated
V27.3	24-May-2018	QA review comments incorporated (Section 2, 3)
V28.0	06-June-2018	Baselined for Rel19.0.0
V28.1	19-Oct-2018	Updates for Rel19.1.0

V28.2	25-Oct-2018	Review comments incorporated
V29.0	31-Oct-2018	Baselined for Rel19.1.0
V29.1	4-Dec-2018	Updates for Rel19.2.0
V29.2	11-Dec-2018	Addressed review comments
V30.0	12-Dec-18	Approved and Baselined for Rel19.2.0
V30.1	30-Apr-19	Updates for Rel19.7.0 Alpha
V30.2	02-May-19	Addressed review comments
V31.0	03-May-19	Baselined version for Rel19.7.0 Alpha (test version)
V31.1	09-July-19	Updates for Rel19.8.0 Alpha
V31.2	16-July-19	Incorporating review comments
V32.0	18-Jul-19	Approved and Baselined for 19.8.0 Alpha
V32.1	19-Aug-19	Updates for 19.3.0 release
V32.2	30-Aug-19	Review comments addressed
V33.0	30-Aug-19	Approved and Baselined for 19.3.0
V34.0	16-Oct-19	Approved and Baselined for 19.3.1

## **Copyright, Disclaimer Statements**

### **Copyright Information**

Copyright (c) 2010-2019 Analog Devices, Inc. All Rights Reserved. This software is proprietary and confidential to Analog Devices, Inc. and its licensors. This document may not be reproduced in any form without prior, express written consent from Analog Devices, Inc.

### **Disclaimer**

Analog Devices, Inc. reserves the right to change this product without prior notice. Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use; nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under the patent rights of Analog Devices, Inc.

### **Software License Agreement**

The recipient of this package must agree to the terms specified in the software license agreement in "*2019-10-09-LWSC-A2B Click Thru SLA.pdf*" included in this package, to use its contents.

**Table of Contents**

**Revision List**..... 2

**Copyright, Disclaimer Statements** ..... 4

**Table of Contents** ..... 5

**List of Figures** ..... 5

**List of Tables** ..... 6

**1 Introduction** ..... 7

    1.1 Purpose ..... 7

    1.2 Scope ..... 7

    1.3 Organization of the document ..... 7

**2 Release Information** ..... 8

    2.1 Release Contents ..... 8

**3 Supported Features** ..... 9

    3.1 Rel19.3.1 ..... 9

    3.2 Features from earlier versions..... 9

**4 Package Details**..... 11

**5 Package Installation**..... 14

    5.1 Windows ..... 14

**6 Performance Figures** ..... 15

**7 Known Issues and Workarounds** ..... 16

    7.1 Limitations..... 16

    7.2 Notes ..... 16

**8 Technical Support**..... 17

    8.1 Contact information..... 17

    8.2 Type of support..... 17

**9 APPENDIX A: Quick Setup Guide**..... 18

**10 APPENDIX B: Integration Guide**..... 19

**Terminology**..... 20

**References**..... 20

**List of Figures**

No table of figures entries found.

**List of Tables**

Table 1: Revision List.....	2
Table 2: Release Contents .....	8
Table 3: Supported Features .....	9
Table 4: Features for Previous Release.....	9
Table 5: Package Details.....	12
Table 6: Target Directory .....	12
Table 7: Memory Requirements.....	15
Table 8: Terminology .....	20
Table 9: References .....	20

# 1 Introduction

The Automotive Audio Bus (A2B) is a proprietary bidirectional audio bus from Analog Devices that provides physical connectivity to devices like microphones, speakers and processing ECUs in a car. The A2B topology is cost effective because of its twisted pair connectivity and its ability to provide single point connection to the head unit or the ECU. It is also capable of transferring multichannel audio across devices like microphones and speakers.

## 1.1 Purpose

Software package contains A2B Stack and plugins to SigmaStudio. A2B Stack is a highly portable and flexible framework for developing and deploying A2B networks in automotive environments. Plugins enable graphical programming of A2B network using SigmaStudio.

## 1.2 Scope

A2B Stack and sample applications are provided in source form. SigmaStudio plugins are Dynamic Link Libraries (DLLs).

## 1.3 Organization of the document

Section 1 to 8 details about the content of the releases, the changes or the features which got added and other known issues/ problems in the release.

Section 9 talks about setting up the hardware and perform a quick demo with the example application.

Section 10 is intended for the integrator where the software deliverable shall be integrated and ported to custom platform.

## 2 Release Information

### 2.1 Release Contents

Table 2: Release Contents

Sl. No	Release Item	Description	Details
1	A2B Stack Target Software (source code)	Version	V19.3.0
		Supported Hardware platform	A2B Evaluation Boards EVAL-AD2428WD1BZ Rev 1.1 (Master) EVAL-AD2425WDZ Rev1.3 (Master), EVAL-AD2425WFZ Rev1.1 (Master), EVAL-AD2425WBZ Rev1.4 (Slave), EVAL-AD2425WCZ Rev1.4 (Slave) EVAL-AD2425WGZ Rev1.1 (Slave) EVAL-AD2428WB1BZ Rev2.0 (Slave), EVAL-AD2428WC1BZ Rev2.1 (Slave) ADSP-SC584 EZ-Board BOM Rev 2.2
		Supported AD24xx Silicon revision	<b>AD2410, AD2401, AD2402, AD2403:</b> R1.0, R2.0, R2.1 <b>AD2425, AD2421, AD2422:</b> R0.0, R0.1, R0.2 <b>AD2428, AD2427, AD2426:</b> R0.0, R0.1 <b>AD2429, AD2420:</b> R0.0
		Supported OS Platforms	Cross platform support Embedded Main-loop (e.g. no OS) Embedded OS
2	Sample A2B Stack Application	Supported target platforms	BF-527 ADSP-21489 ADSP-SC58x
		Supported tool version	CrossCore Embedded Studio v2.8.3 or later
3	SigmaStudio Plugin for A2B (Library file)  A2B.dll A2BStack.dll	Version	V19.3.0
		Supported SigmaStudio version	SigmaStudio Version <b>4.4</b> or higher <b>Note: Rel19.3.0 DLLs are not compatible with earlier versions of SigmaStudio</b>



## 3 Supported Features

### 3.1 Rel19.3.1

Table 3: Supported Features

Release Number	Release Date	Features Supported
Rel19.3.1	16-Oct-19	<ul style="list-style-type: none"> <li>Broad market release for AD2428 A2B Transceivers</li> </ul>

### 3.2 Features from earlier versions

Table 4: Features for Previous Release

Sl. No	Release No./ Build Version	Release Date	Changes/Enhancements from previous release
1	18.0.0	06-12-2017	Support for AD2428, AD2427 and AD2426 A2B transceiver variants added.
2	19.0.0	07-06-2018	<p>Supports Aardvark I2C Host Adapter for network configuration (Alternative to USBi I2C adapter)</p> <p>Scripting support to automate A2B system verification</p> <p>Compression option to encode Bus Configuration File (BCF.c)</p> <p>Added A2B Mailbox Communication software module and an example application</p> <p>Example schematic and application for EVAL-AD2428WD1BZ Rev 1.0</p> <p>Added a fix for USBi download issue. Refer section 7.1 of [3] for details</p>
3	19.1.0	31-10-2018	<p>Added workflow &amp; example application for multi-master use case</p> <p>Supports optimized auto configuration of bus from the EEPROM connected to ECU</p> <p>Added example application and platform abstraction layer for QNX</p> <p>Note: QNX application &amp; drivers are available as separate package. Please contact ADI representative for more details</p>

4	19.2.0	12-Dec-18	Supports AD2429 & AD2420 A2B Transceivers
5	19.3.0	03-Sep-19	Supports for 0.1 rev silicon of AD2428.

## 4 Package Details

The release package contains folder structure as shown below.

ADI\_A2B\_Software\_Rel19.3.1

```
|
|
\---GUI
|   |---x86_x64
|       |---A2B.dll
|       |---A2BStack.dll
|   |---plantuml.jar
|   |---postProcessUML.exe
\---Target
|   |---a2bstack
|       |---a2bstack
|       |---a2bplugin-master
|       |---a2bplugin-slave
|       |---a2bstack-protobuf
|   |---examples
|       |---demo
|           |--- a2b-adsp-sc58x
|           |--- a2b-bf
|           |--- a2b-sharc
|           |--- app-plugin
|           |---advanced-app
|           |--- bert
|           |--- mboxcommch
|           |--- multimaster
|   |---a2b-commandlist
|   |---a2bcommchannel
|   |---tools
\---Schematics
|   |---BF
```

```

| |--SC58x
| |--SH
\---Docs
| |--AE_09_A2B_Stack_UserGuide.pdf
| |--AE_09_A2B_SigmaStudio_UserGuide.pdf
| |--AE_09_A2B_QuickStartGuide.pdf
| |--AE_09_A2B_Stack_API_Reference.chm
| |--AE_09_A2B_Scripting_Guide.pdf
| |----CommCh
| |----AE_09_A2B_CommChannel_IntegrationGuide.pdf
\--- 2019-10-09-LWSC-A2B Click Thru SLA.pdf
\--- AE_09_A2B_ReleaseNotes.pdf
\--- GettingStarted.rtf

```

The below section explains the different folders and their purpose in the current release

**Table 5: Package Details**

Folder Name	Purpose
GUI	This folder contains the SigmaStudio A2B DLL and A2B Stack built as a DLL for 32 and 64-bit windows.
Target	This folder contains the A2B software stack target related files. Refer to Table 6 for more detailed explanation for each of the folders under Target directory.
Schematics	This folder contains the example A2B and SigmaDSP schematics for BF, SHARC and SC58x platforms
Docs	This folder contains the documents such as quick start guide, user guide etc., which helps in integration of A2B Stack to the required platform.

The below table explains the different folders under Target directory and their purpose.

**Table 6: Target Directory**

Folder Name	Purpose
a2bstack	The generic or target agnostic portions of the A2B Software Stack.
a2bplugin-master	The sources for the A2B Software Stack master node plugin. The A2B network discovery algorithms and line fault diagnostics are encapsulated within these sources.
a2bplugin-slave	The sources for a simple A2B Software Stack slave node plugin. These sources are a trivial example of a slave plugin for use as a launching pad for developing custom plugins.

a2bstack-protobuf	The Google Protobuf implementation called Nanopb. This also include the BCF to BDD parsing routines such as master/slave node configuration, master/slave pin muxing etc.
demo/a2b-bf	This folder contains the source files for PAL, application and CCES example A2B demo project for BlackFin (ADSP-BF527)
demo/a2b-sharc	This folder contains the source files for PAL, application and CCES example A2B demo project for SHARC.
demo/a2b-adsp_sc58x	This folder contains the source files for PAL, application and CCES example A2B demo project for SC58x.
advanced-app/mboxcommch	This folder contains the source files for PAL, application and CCES example A2B projects on ADSP-SC584 and ADSP-21489, demonstrating communication channel application using A2B mail box
advanced-app/multimaster	This folder contains the source files for PAL, application and CCES example A2B project on ADSP-SC584 demonstrating multi master use case
advanced-app/bert	This folder contains the source files for PAL, application and CCES example A2B project on BF527 demonstrating Bit error rate test application
a2b-commandlist	This folder contains an example application to use the exported command list from SigmaStudio
a2bcommchannel	This folder contains source files for communication channel module (using A2B Mailbox)

## **5 Package Installation**

### **5.1 Windows**

Double click the A2B Software package (executable) to install. The package is installed into "C:\Analog Devices\ADI\_A2B\_Software-RelX.Y.Z"

## 6 Performance Figures

The following table captures the Memory requirements (in bytes) for A2B Stack and Sample application (Memory measured on BF527 for 3-node sample demo network).

**Table 7: Memory Requirements**

<b>Modules</b>	<b>L1-Code (Bytes)</b>	<b>L3-Code (Bytes)</b>	<b>L1-Data (Bytes)</b>	<b>L3 Data (Bytes)</b>	<b>Remarks on memory usage</b>
Stack	7882	3726	174	1	Application and Platform <b>independent</b> .
Master-Plugin	17156	1190	4667	0	Application and Platform <b>independent</b>
Slave-Plugin	978	1142	3117	6000	Application <b>dependent</b>
PAL	5970	1596	14	6240	Platform <b>dependent</b>
App	1184	152	15468	0	Application <b>dependent</b>
BCF* (3-Node demo)	0	8358	0	10636	Application <b>dependent</b>

\*Depends on the number of A2B nodes and programmable peripherals used in the network

---

## 7 Known Issues and Workarounds

### 7.1 Limitations

The following are some of the important limitations known at the time of this release.

- Master in EVAL-AD2425WFZ (SHARC platform) and SC584 Ez Board has been tested for TDM Mode 2, 4 and 8 only
- Audio playback from EVAL-AD2425WFZ is not feasible, when tracing is enabled in sample demo application for SHARC platform.
- Allow Real-Time A/B Testing' feature of SigmaStudio is not supported for A2B schematics

### 7.2 Notes

- Line fault BP short to GND may not be detected after discovery for AD242x master.
- Line fault BN short to GND may not be detected after discovery, unless bit errors indicate that there is an issue, e.g. because of a noisy GND or other electromagnetic interferences.
- Line fault 'BP short to GND' and 'BN short to Vbat' are not consistently identified in all the discovery modes except Simple discovery flow.
- The location of Line fault 'BP and BN together short to GND' is not detected correctly.



## **8 Technical Support**

### **8.1 Contact information**

If you have a technical problem and you can't find a solution, you can contact for Technical Support at:

<mailto:a2bsoftwaresupport@analog.com>

### **8.2 Type of support**

All technical queries, bug reporting, issues and feedbacks addressed to the above-mentioned contact shall be processed and responded accordingly based on the nature of the support required.

## **9 APPENDIX A: Quick Setup Guide**

The document 'AE\_09\_A2B\_QuickStartGuide.pdf' (available at [1]) provides build instructions to run the sample application on ADI platforms.

## 10 APPENDIX B: Integration Guide

- Integrating A2B Stack and porting the stack to a custom platform is described in the document '*AE\_09\_A2B\_Stack\_UserGuide.pdf*' (available at [2]). The document provides code examples on PAL initialization, Interrupt call-back function, Power and Line Fault diagnostic call-back function and others.
- To understand the A2B stack at the function level, refer '*AE\_09\_A2B\_Stack\_API\_Reference.chm*' (available at [5])
- To customize A2B schematics and diagnose the A2B network using SigmaStudio, refer to document '*AE\_09\_A2B\_SigmaStudio\_UserGuide.pdf*' (available at [3])
- To use SigmaStudio's test automation(scripting) interface for A2B, refer to document '*AE\_09\_A2B\_Scripting\_Guide.pdf*' (available at [6])
- Refer to '*AE\_09\_A2B\_CommChannel\_IntegrationGuide.pdf*' (available at [7]) document for A2B communication channel usage for inter-processor communication over A2B

## Terminology

**Table 8: Terminology**

Term	Description
A2B	Automotive Audio Bus
BERT	Bit error rate test
CCES	CrossCore Embedded Studio
GUI	Graphical User Interface
MISRA	Motor Industry Software Reliability Association
VDSP	Visual DSP++
DLL	Dynamic Link Library
USB	Universal Serial Bus
I2C	Inter-IC
I2S	Inter –IC-Sound
BF	Blackfin
SH	SHARC
PAL	Platform Abstraction Layer
GND	Ground
BCF	Bus Configuration File
TDM	Time Division Multiplexing

## References

**Table 9: References**

Reference No.	Description
[1]	./ADI_A2B_Software-RelX.Y.Z/Docs/AE_09_A2B_QuickStartGuide.pdf
[2]	./ADI_A2B_Software-RelX.Y.Z/Docs/AE_09_A2B_Stack_UserGuide.pdf
[3]	./ADI_A2B_Software-RelX.Y.Z/Docs/AE_09_A2B_SigmaStudio_UserGuide.pdf
[4]	./ADI_A2B_Software-RelX.Y.Z/Docs/AE_09_A2B_Stack_Linux_UserGuide.pdf
[5]	./ADI_A2B_Software-RelX.Y.Z/Docs/AE_09_A2B_Stack_API_Reference.chm
[6]	./ADI_A2B_Software-RelX.Y.Z/Docs/scripting/AE_09_A2B_Scripting_Guide.pdf
[7]	./ADI_A2B_Software-RelX.Y.Z/Docs/CommCh/AE_09_A2B_CommChannel_IntegrationGuide.pdf