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Sigma Studio A2B Quick Start Guide

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Introduction

This A2B Quick Start Guide supplements the ADI A2B Documentation and provides specific guidance for quickly building A2B networks in SigmaStudio suitable for incorporation into embedded target firmware.

A usage summary of the supplied SAM demo is also provided.

Installing the software

Download and install SIgmaStudio version from here:

SigmaStudio®

Download and install the A2B Bare Metal plugin for SigmaStudio from here:

https://www.analog.com/en/gated/a2b/a2b-technology.html

This is a restricted link and permission may need to be obtained from ADI for access.

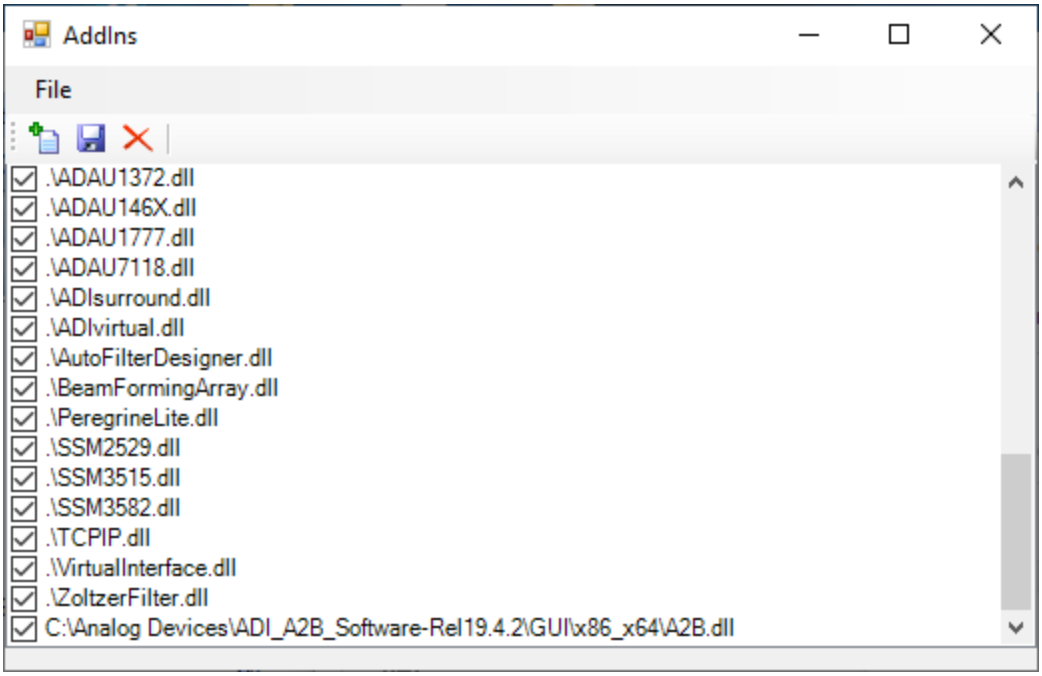
For AD242x based networks, it is advised to install SigmaStudio version 4.5 and A2B Plugin version 19.4.2.

For AD243x based networks, it is advised to install SigmaStudio version 4.6 and A2B Plugin version 19.9.0.

These version combinations can be installed simultaneously without conflict. If installing support for both network types, install both SigmaStudio 4.5 and 4.6 first, then install the plugins. The 19.9.0 plugin is compatible with SigmaStudio version 4.6 and higher.

When installing the plugin do not allow the plugin installer to install the plugin into the SigmaStudio installation directory. This step will be done manually for better control.

Once everything has been installed, start SigmaStudio, and select **Tools -> Add-ins Browser.** Add the **A2B.dll** plugin located in the **GUI\x86_x64** of the appropriate plugin installation directory.



More detailed instructions for these steps can be found in section 4.1.1 the ADI A2B Quick Start Guide (AE_09_A2B_QuickStartGuide.pdf) located in the **Docs** directory of the installed plugin.

Restart SigmaStudio when the plugin installation is complete.

More detailed documentation from ADI can be found in the **Docs** directory of the plugin installation. The **AE_09_A2B_SigmaStudio_UserGuide.pdf** details the A2B specific instructions and can fill in any gaps in this document. Disregard section 4.1 related to BCF files since the A^2B Bridge uses the Command List output.

Building a network

Start a new project

1. Select File, New Project

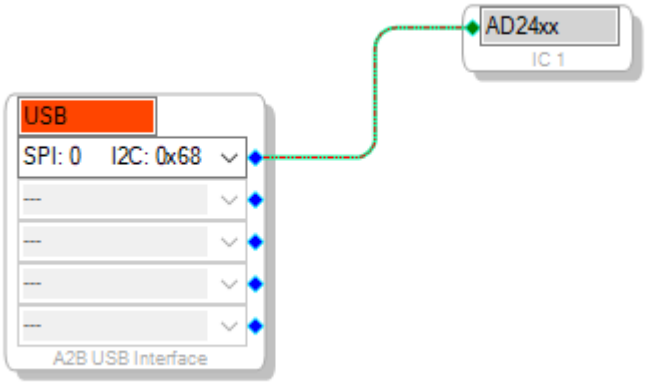
Wiring nodes

Hardware Configuration Tab

1. Drag and drop an A2B-USBi and AD24xx component into the workspace

2. Connect these two components with a wire

The result will look like this:

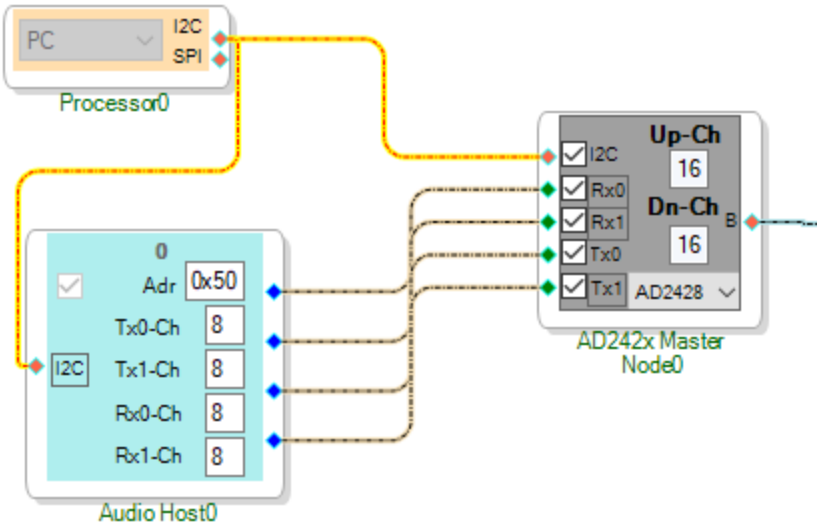


Schematic Tab

New Host / Master Node

1. Select (IC 1 AD24xx), A2B, A2B, Target processor
2. Drag the Target processor into the workspace
3. Select (IC 1 AD24xx), A2B, A2B, Transceiver, AD242x Master node
4. Drag the Master node into the workspace
5. Connect the Processor's I2C to the Master Node's I2C
6. Enable Rx0, Rx1, Tx0, Tx1 depending on the hardware configuration
7. Select (IC 1 AD24xx), A2B, A2B, Peripheral Device, Host
8. Drag the Host into the workspace
9. Connect Host Tx to Master Node Rx and vice-versa
10. Connect the Host I2C to the Processor I2C

The schematic should look like this when complete:



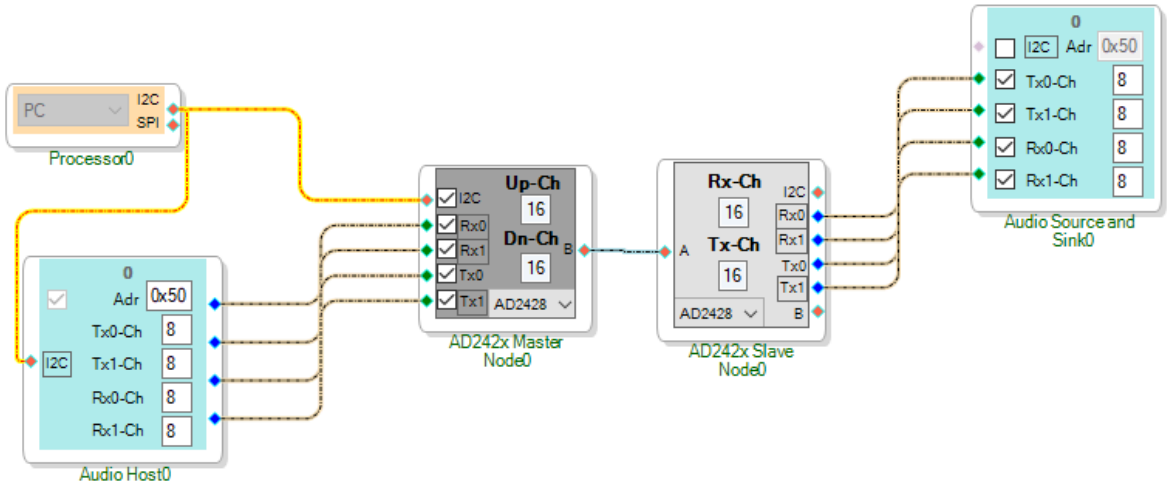
The configuration above uses all available I2S/TDM pins for maximum full-duplex audio bandwidth. The configuration in SigmaStudio should always match the actual hardware.

New Slave Node

1. Select (IC 1 AD24xx), A2B, A2B, Transceiver, AD242x Slave node
2. Drag the slave node into the workspace
3. Connect Master Node "B" to Slave Node "A"
4. Select (IC 1 AD24xx), A2B, A2B, Peripheral Device, Source and Sink (or other appropriate device)
5. Enable Rx0, Rx1, Tx0, Tx1 depending on the hardware configuration
6. Connect AD242x Slave Node Rx to Source/Sink Tx and vice-versa
7. Optionally connect the I2C pins and set the I2C address if the Peripheral Device requires I2C configuration.
8. To configure I2C commands on a peripheral, right click on the peripheral, select "Peripheral Properties". Set the "Peripheral programming file" and check "Program during discovery". Start with an existing or blank template .XML file as shown below.

```
<?xml version="1.0" standalone="no"?>
<ROM>
 <page modetype="Mode 0">
 </page>
</ROM>
```

The schematic should now look like this when complete:



To add more Slave nodes, repeat the steps above connecting the "B" side of an existing slave to the "A" side of the new slave.

Audio I2S/TDM configuration

1. Right click on Master Node, select Device Properties
2. In General View, select each subtab and configure as required. The "Config and Control" and "Audio Config" tabs are particularly important. The remaining tabs can be left at default unless specifically required otherwise.
3. Repeat this process for each slave node. Do not configure the Slot Config tab. This will be done in the next step.

Audio Routing

These instructions utilize the "Stream" based audio routing approach in SigmaStudio.

1. Right click on Processor
2. Select stream config
3. Create streams in "Audio Stream Definition"
4. Connect streams in "Audio Stream Assignment"
5. Select "Auto Slot Calculate" and press "Calculate Now"

Network Validation

It is important to validate the network prior to exporting. To validate the network:

1. Right click on Processor
2. Select "View Validation Report..."

Exporting Networks

At this point the network is fully prepared and ready for export. Save the project and create an "export" directory under the directory where the project was saved. Use the following instructions to export the network design:

1. Right click on Processor
2. Select "Export System Config Files..."
3. Select the "Command List Export" tab
4. Set the XML and/or .h file for export as desired
5. It is useful to use a relative path to the project (i.e. ".\export\<file>.xml"). This way both the project and exported files can be stored together in version control or zipped together for easy relocation.
6. Select OK to save, Select Cancel to close the dialog

If two or more A2B transceivers are located on the same I2C bus, the exports can be merged in the "Command List Merge" subtab.