



SigmaStudio for SHARC Release Note

Product Information	
Name	SigmaStudio for SHARC
Release Number	2.1.0
Release Date	August-2013
Support	www.analog.com/support

Introduction

This document contains the release notes for SigmaStudio for SHARC version 2.1.0. The following sections describe the release in detail and provide late-breaking or other information that supplements the main documentation.

This is an upgrade release with enhancements. Users of previous releases should check the "Version Compatibility" section below for instructions on how to modify existing Applications for this new release. Please ensure you replace both the library and header files in any existing Application, when upgrading from an older version of the Module.

Your feedback is important to us - please help us make this the best product possible. Keep in mind that we are continuing to work on the SigmaStudio for SHARC and the product may change in the future.

Update Highlights

- Development environment improvements
 - Support to detect CrossCore Embedded Studio versions and provision to select the required version.
 - Support to automatically identify and enumerate versions of the installed Software Module components. Refer to section E of "*SigmaStudio_for_SHARC_Users_Guide.pdf*" for more details.
 - No need for copying SigmaStudio for SHARC DLLs.
 - Enhanced SigmaStudio automation APIs. Refer to "*SigmaStudio_Scripting.pdf*" for more details.
 - Integrated XML export support. Refer to section 4.3.10 of "*SigmaStudio_for_SHARC_HostControllerGuide.pdf*" for more details.

- Pre-build, post-build, pre-export, post-export command support. Refer to section 7.3 of “*SigmaStudio_for_SHARC_Users_Guide.pdf*” for more details.
- Schematic features
 - Support for PCMX Input and Output. Refer to section 8.7 and 8.8 of “*SigmaStudio_for_SHARC_Users_Guide.pdf*” for more details.
 - Provision to set output buffer size for PCMX Modules.
 - New ‘DSP Readback - Generic’ and ‘Control Parse’ Modules added. Refer to section 3 of “*SigmaStudio_for_SHARC_ModuleDetails.pdf*” for more details.
 - Schematic compilation and Loader File booting has been optimized for speed.
- Target Enhancements
 - Target Library API modified to take multiple Input/Output pointers. Refer to section 7.3.6 of “*SigmaStudio_for_SHARC_ReferenceGuide.pdf*” for more details.
 - TDM support in Application framework for ADSP-214xx. Refer to section 4.2 of “*SigmaStudio_for_SHARC_Framework.pdf*” for more details.
 - Provision to configure SPORT buffers, Application Block Size and Application Sampling Rate. Refer to section 3 of “*SigmaStudio_for_SHARC_Framework.pdf*” for more details.
 - New document “*SigmaStudio_for_SHARC_Framework.pdf*” added that gives details for configuring Default Application to meet custom target needs.
- Algorithm Designer Enhancements
 - Provided with default LDF template for Plug-Ins.
 - New document “*SigmaStudio_for_SHARC_Custom_LDR_Migration_for_Plug-Ins.pdf*” added that gives details for configuring Default Applications to meet the memory and Block Size needs for ADI Software Modules.
- Bug fixes. Details given below.

Installation

See the GettingStarted.rtf for full details.

IMPORTANT: You must completely uninstall any previous "developer release" or "early access" version of this product before installing this release. Also manually remove SigmaStudio for SHARC DLLs “SharcpubLib.dll”, “SharcmModules.dll” and “Sharcdesigner.dll from the SigmaStudio folder if they are not automatically removed by the uninstaller.

Pre-requisites

SigmaStudio 3.9 Build 2 or later should be installed in the host machine.

SigmaStudio installer can be obtained through www.analog.com/SS4SHARC

Microsoft .NET Framework: 3.5 SP1 or later.

CrossCore Embedded Studio 1.0.2 or later is required to compile Schematics.

SigmaStudio for SHARC supports all Microsoft Windows versions supported by SigmaStudio tool.

Version Compatibility

This version of the SigmaStudio for SHARC is compatible with version 1.0.3b and later. Schematic generated and saved using 1.0.3b and later versions of the SigmaStudio for SHARC library can be opened with this version.

Version 1.2.0b Schematics containing Plug-Ins cannot be compiled with this version of SigmaStudio. User may open such Schematics in SigmaStudio and replace the Plug-Ins with Plug-Ins generated using the new scheme.

Plug-In Modules that were part of the earlier versions of SigmaStudio for SHARC have been moved to SHARC Audio Toolbox which is a separate package.

The location of SigmaStudio for SHARC DLLs has been moved from SigmaStudio installation folder to *Host/DLL* subfolder inside SigmaStudio for SHARC Software Module folder from this version onwards.

The location of example Schematics and scripts inside SigmaStudio for SHARC Software Module folder has been changed to *Host/Examples* subfolder from this version onwards.

Upgrading from earlier versions

Mandatory changes required in the user's existing Application to migrate to the new library. Refer to section C in the “*SigmaStudio_for_SHARC_ReferenceGuide.pdf*” for more details. Refer to section 7.3 of the same document for the modified APIs.

The macro 'NUM_SAMPLES' used in the Application in release 2.0.0 and earlier has been replaced with the macro 'PROCESSING_BLK_SIZE' in release 2.1.0. Refer to section 3.2 of “*SigmaStudio_for_SHARC_Framework.pdf*” for more details.

Algorithm Designer project files (*.ssg) and wrapper functions created using 1.7.2 or earlier versions of the Algorithm Designer are required to be converted to the new format before they can be used with the current version of the Algorithm Designer. Refer to section 9 in the “*SigmaStudio_for_SHARC_AlgorithmDesigner.pdf*” for more details.

Executing Schematics created using version earlier than 1.7.1

In Default Application for ADSP-21364/369 EZ-Kits, the white and red audio ports have been swapped around from release 1.7.1 onwards. In case of opening old ADSP-213xx Schematics, user will need to either

- (i) swap around the white/red RCA connections for each audio channel pair

OR

(ii) swap around the even/odd input and output channels in the Schematic.

The Default Application for ADSP-214xx EZ-Kits have been built under VISA mode from release 1.7.1 onwards. In case of executing pre 1.7.1 Schematics with the 1.7.3 Default Application on ADSP-214xx EZ-Kits, change the VISA mode to 'Enabled' in the IC Control form before compiling the Schematic.

Using target Loader Files created using SigmaStudio for SHARC 2.0.0

When using a target Loader File that was created using SigmaStudio for SHARC 2.0.0 or earlier versions, the API version in the IC Control window shall be set to "2.0.0". In addition to this, "Bypass Version Check" shall be checked while using Loader Files prior to version 2.0.0.

Executing Schematics with Bit-stream input created with SigmaStudio for SHARC 2.0.0

The "Bit-stream input" Cell has been discontinued in version 2.1.0 and the same functionality is available through "Signal Input" Cell. When using Default Application Loader Files under "Analog\Digital Co-existence (Digital Clock)" mode, the bit-stream data is available through Channel 4 of the 'Signal Input'. The type of the input shall be changed to "BS24". Existing Schematics created using SigmaStudio for SHARC 2.0.0 may continue to use "Bit-stream input" Cell and it is mapped to channel 4. User may replace the "Bit-stream" input with "Signal Input" to choose a different channel mapping.

The "Digital-In" mode supports only Linear PCM input (from 2.1.0 onwards). All Software Module Plug-In Schematics using bit-stream input data shall boot the Loader File in "Analog\Digital Co-existence (Digital Clock)" mode irrespective of the mode mentioned in respective Software Module package. Refer to section 9.4.5 of User's Guide for information on Non-Linear PCM (compressed data) support.

Frozen Schematics created using SigmaStudio for SHARC 2.0.0

Schematics made 'Frozen' using SigmaStudio for SHARC 2.0.0 or earlier versions cannot execute with version 2.1.0 Loader Files. The following steps should be taken with such Schematics:

1. Unfreeze
2. Change the API version to 2.1.0 in the IC Control window
3. Re-compile
4. Freeze

Modules which use PCMxHeaderInfo

The "PCMxHeaderInfo" is modified and all PCMx Module Plug-In DLLs (with input or output PCMx data types), which use the "PCMxHeaderInfo" has to be rebuilt using the latest SigmaStudio for SHARC package. The "PCMxHeaderInfo" structure is defined in *Target/ExtModules/Include/adi_ss_stream.h* file.

Using CrossCore Embedded Studio Add-ins for Plug-In Creation

If a new CrossCore Embedded Studio project is being created for the SigmaStudio for SHARC Plug-Ins, ensure that the “Startup Code/LDF” Add-In is not added to the project. Note that the “Startup Code/LDF” Add-In is enabled in all new projects by default and must be removed. Refer to section 4.2.1 in “*SigmaStudio_for_SHARC_AlgorithmDesigner.pdf*” for more details.

If an existing CrossCore Embedded Studio project is being modified for creating a Plug-In, ensure that the “Startup Code/LDF” Add-in is removed from the project. Refer to section 4.2.1 in “*SigmaStudio_for_SHARC_AlgorithmDesigner.pdf*” for more details.

CrossCore Embedded Studio projects for Plug-Ins created with SigmaStudio for SHARC version 2.0.0 will be prompted to upgrade the Add-in. Refer to section 4.2.1 in “*SigmaStudio_for_SHARC_AlgorithmDesigner.pdf*” for details on upgrading the Plug-In. Note that the upgrade supplied is for backward compatibility with SigmaStudio for SHARC version 2.0.0, and does not have the features of the new Add-in, such as addition of the basicops library and providing an example LDF.

Issues Addressed in this Release

- SS4SH export parameters are duplicated for few Modules.
- SigmaStudio does not behave properly when the compilation of one of the IC in a 3 SSn Schematic fails.
- Back-channel packet with CRC 0 is being ignored by the host.
- The GlobalTable section for Plug-Ins needs to be at least dual word aligned when placed in Memory.
- Error message while booting the Loader File.
- Cut-Copy-Paste of Modules does not function if the DLL to which the Module belongs to is added from a non SigmaStudio folder.
- Value in pSSnBuf pointer of ADI_SS_SSNPROPERTIES structure is wrong when CMD5 packet is received.

Known Issues and Workarounds

SigmaStudio Host

- Bitstream and PCMX pins cannot be connected to the ‘Hierarchy Input’ and ‘Hierarchy Output’ pins.
Workaround: Select the Module to be part of the hierarchy board, then right click and select ‘Create Board’.

- Undo or Ctrl+Z operation on the Schematic design panel might result in Schematic connections and layout getting distorted.
Workaround: Do not use Undo or Ctrl+Z operation. Always revert back all Schematic modifications manually.
- General 2nd Order filters might oscillate and audio gets muted when the frequency is brought down to very low values (0Hz, 1Hz etc.).
Workaround: The filter will recover by itself when the frequency is increased.
- Param-Look-up filter crashes when General high pass filter cut-off frequency is set to 0Hz.
Workaround: Do not set the cut-off frequency to 0Hz.
- The 'Q' and 'Frequency' parameters on Peaking and Notch filters (Gen 2nd Order) should be chosen in such a way that the band-width will not exceed half the Schematic Sampling Rate.
Workaround: Design the filter such that Freq/Q is less than Fs/2.
- Dynamic Processor Cell supports addition of more points on the graph to shape the scale plot. There will be inconsistent behaviour when more points are added.
Workaround: Not more than 20 points should be added on to the Dynamic Processor graph.
- Triangle and Saw Tooth generators may show instability when the frequency is above 3 kHz.
Workaround: Restrict the frequency below 3 kHz.
- If an instance of the 'DC Input' Module is created by copy/paste from another instance, DC value entered does not exceed 16.
Workaround: Remove the Module and insert a new one from the toolbox.
- Mute (with Slew) Algorithm will not completely mute the audio.
Workaround: Cascade 2 such Modules to increase the attenuation level.
- Cut/Copy and Paste changes the parameters to the default values on Buffer Gate and Zero Comparator.
Workaround: Change the parameters after paste.
- An exception may be seen when the output side growth on a Module with 2D growth is reduced by a number greater than 1.
Workaround: Reduce the growth in multiple steps by reducing one at a time.
- The color bar on the 'USBi' may remain as 'Red' even after connecting the 'USBi' to the PC.
Workaround: Change the SPI selection on the dropdown and restore the original selection.
- CrossCore Embedded Studio 1.0.2 or a later version is required to compile non-frozen Schematics containing Software Module Plug-Ins or user-created Plug-Ins. SigmaStudio for SHARC may not display a meaningful message when such Schematics are compiled.

SigmaStudio might even throw an exception in this scenario.

Workaround: Install CrossCore Embedded Studio 1.0.2 or a later version when using non-frozen Schematics containing Software Module Plug-Ins or user-created Plug-Ins.

- If the "Block Schematic" tab of a Schematic is active and the Schematic is changed to non-frozen, the "Schematic" tab continues to remain in frozen state. Similarly "Block Schematic" will remain in frozen state if "Schematic" tab is active while unfreezing.
Workaround: Always keep the "Block Schematic" tab in case of a Block Processing Schematic, or "Schematic" tab in case of a Sample Processing Schematic, as the active tab while unfreezing the Schematic.
- CrossCore Embedded Studio 1.0.2 or a later version is required to compile frozen Schematics, if the Schematic was created using SigmaStudio for SHARC 2.0.0, and the Schematic contains Software Module Plug-Ins or user-created Plug-Ins which make use of global tables or global variables in the source code. Such Schematics will compile and download to the target, but will not function as expected.
Workaround: Unfreeze the Schematic and compile it on a system in which CrossCore Embedded Studio 1.0.2 or a later version is installed. Freeze and save the Schematic after a successful compilation.
- SigmaStudio will throw an exception when a Schematic, having a Plug-In built in either of the two VISA/Non-VISA modes, is compiled in the other mode.
Workaround: Close the exception message box. Change the VISA selection to the supported mode and recompile the schematic.
- SigmaStudio for SHARC may not store the tool-chain information in the Schematic. When a Schematic without tool-chain information is opened, it will not use the previously used tool-chain for Schematic compilation
Workaround: Before the Schematic is saved, open Settings window, go to "SHARC" tab, manually select the required tool-chains (even if it's already selected) and press "OK".
- Newly added Plug-Ins will be disabled (checkbox against the Plug-In DLL will be unticked in AddIns window) by default when Evaluation version of a Software Module is installed.
Workaround: Enable the Plug-Ins by manually ticking the checkboxes.
- There will not be any error message if the 'API Version' selected in the IC control window does not match with the Loader File used in the target. Frozen projects will save and load the value of the 'API Version' silently.
Workaround: Change the 'API Version' to match the Loader File. To change the 'API Version' of a Frozen Schematic, the project needs to be first made non-frozen.
- Relative path for Loader File in Symbol XML cannot be used on Windows Vista and Windows 7 systems.
Workaround: Replace relative path with the absolute path when working on a Windows Vista or Windows 7 systems.

Algorithm Designer

- Growth of Algorithm control is not supported when 2 dimensional growth is enabled.

- The position index of 'Label' and 'CheckBox' control will get incremented by 3,3 every time a ssg file is opened.
Workaround: Reduce the indices by 3, 3 before saving the Schematic.
- Value on 'Slider' and 'NumericTextBox' will get modified when the ssg file containing these controls is reopened.
Workaround: Manually enter the values on 'Slider' and 'NumericTextBox' controls after opening a ssg file.
- If there are multiple source files, in the project that builds a DYN file, which includes the header file 'adi_ss_extmod.h', there will be an error during DYN generation caused by multiply defined symbol.
Workaround: Define `SS4SH_EXCLUDE_VERSION_INFO` above `#include "adi_ss_extmod.h"` in all but one source files.
- Algorithm Designer will throw error message boxes with the message "Arithmetic Operation resulted in an overflow" when Plug-In DLLs for some of the Software Module Plug-Ins or user-created Plug-Ins are generated on Windows 7 x64 systems.
Workaround: Ignore this error message and continue.
- BiquadCascade supplied as an example Plug-In will not function as expected.
Work Around: Make the following changes in the source file `./Target/ExtModules/BiquadCascade/adi_biquadCascade.c` and rebuild the Plug-In.

```
pfSSnModule = (void (*)(AMF_Biquad * restrict instance,float * restrict * buffers,int tickSize))pSymbol[1];
should be changed to
pfSSnModule = (void (*)(AMF_Biquad * restrict instance,float * restrict * buffers,int tickSize))pSymbol[0];
```

The function call

```
pfSSnModule(pBlockBiquadCascade, apBlockPtrs, nBlockSize);
```

should be changed to

```
pfSSnModule(pBlockBiquadCascade, &apBlockPtrs[nInd2 & 0x01], nBlockSize);
```

- Building the SigmaStudio for SHARC Plug-In projects for Dolby Digital (AC-3) 5.1 Decoder for SHARC release 4.0.0 and DTS 5.1 Decoder for SHARC release 4.0.0 fail
Workaround: For Dolby Digital (AC-3) 5.1 Decoder for SHARC release 4.0.0, add the following line to the file "adi_ss_extmod_ac3d.h" after the definition of "AC3D_MODULE_NUMBER" and rebuild the project
`#define MAXIMUM(a,b) (((a)>(b))? (a):(b))`

For DTS 5.1 Decoder for SHARC release 4.0.0, add the following line to the file "adi_ss_extmod_dtsd.h" after the definition of "DTSD_MODULE_NUMBER" and rebuild the project

```
#define MAXIMUM(a,b) (((a)>(b))? (a):(b))
```

Target Library and Application

- The ADSP-21469, ADSP-21479 and ADSP-21489 Default Applications do not support S/PDIF output when ‘Analog-In’ mode is enabled.
Workaround: Use ‘Digital-In’ mode when S/PDIF output is used.
- Only 48 kHz Application Sampling Rate is supported by the Application for the target processor when the option ‘Analog/Digital Coexistence’ is selected.
- When ADSP-21469, ADSP-21479 or ADSP-21489 target is being loaded with a Loader File built with optimization disabled (debug build), the subsequent booting of a Loader File may have issues.
Workaround: Power down the EZ-BOARD and restart it before the next booting operation.
- **CCES-3382:** Compiler's sequence for restoring loop stacks can go trigger a h/w problem if an interrupt happens. Application features such as TDM and Plug-Ins such as decoders may not function as expected.
Workaround: A workaround for this anomaly may be supplied in <http://www.analog.com/softwareanomalies>
- The S/PDIF digital output from the EZ-KIT may not be detected with the Default Application Loader File by some S/PDIF receivers.
Workaround: Enable “DIT_AUTO” mode for these cases. Refer to annexure C of the framework document for more details.
- The application may hang if the following conditions are satisfied:
 - 1) Schematic produces NAN (Not-A-Number) output values.
 - 2) The schematic contains Plug-Ins having their state information such as handle in the SSn state memory*Workaround:* Disable NAN handling from the application. To do this comment the following lines in function CheckNaNInf() in file app.c and rebuild the application.


```

if (bIsNanInfInd)
{
    for (i = 0; i < nInBufSize; i++)
    {
        adi_ss_mem4[i] = 0;
    }
}

```
- The peak MIPS value reported by the SigmaStudio GUI may be different in release 2.1.0 of SigmaStudio for SHARC due to differences in buffer management scheme in the Default Application compared to the 2.0.0 Default Application.
- The LDF regeneration mechanism is disabled in the Default Applications and the LDF files are not under the control of “Startup Code/LDF” CrossCore Embedded Studio Add-in anymore. The entire LDF file is now user-modifiable.

SHARC Audio Toolbox 2.0.0 when used with SigmaStudio for SHARC 2.1.0

- SHARC Audio Toolbox Plug-In SharcAudioToolBox.dll may not get copied to SigmaStudio 3.9 folder after SHARC Audio Toolbox installation.
Workaround: The DLL can be found inside ‘SoftwareModules/SigmaStudioFiles’ folder.
- SharcAudioToolBox.dll will not get automatically listed in SigmaStudio ‘AddIns’ window. When attempted to manually add SharcAudioToolBox.dll, SigmaStudio throws an error message “SharcAudioToolBox.dll is not a valid SigmaStudio Plugin”
Workaround: If SharcAudioToolBox.dll is located inside SigmaStudio 3.9 folder, move it from this folder to any other path. From the path (other than SigmaStudio 3.9) manually add the Plug-In to SigmaStudio ‘AddIns’ using the ‘Add’ button in the ‘AddIns’ window.