Release Notes for HDMI Audio EI3 EZ-Extender Board Support Package 1.0.0

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Contents

Thank you for installing the HDMI Audio EI3 EZ-Extender Board Support Package (BSP). The BSP provides software and documentation in support of the HDMI Audio EI3 EZ-Extender board.

This BSP is designed for use with CrossCore® Embedded Studio (CCES) for Analog Devices Processors software development tools. The CCES development environment aids advanced application code development and debug, such as:

- Create, compile, assemble, and link application programs written in C++, C, and assembly;
- Load, run, step, halt, and set breakpoints in application programs;
- Read and write data and program memory;
- Read and write core and peripheral registers;
- Plot memory.

For more details on CCES, please visit www.analog.com/cces.

The HDMI Audio EI3 EZ-Extender BSP provides comprehensive software support for the HDMI Audio EI3 EZ-Extender board. Specifically, drivers, examples and code sketches are included for the following components:

- ADV7625 HDMI Transceiver with crosspoint and splitter capabilities
- AD1939 4 ADC/8 DAC with PLL, 192 kHz, 24-Bit Codec
- FIFO Buffer Manager

The BSP also provides comprehensive examples which demonstrate the on-chip drivers and services.

The CCES Help environment provides complete hardware and software documentation.

1 Release Dependencies

Requires CrossCore® Embedded Studio version 2.3.0.

2 Release Testing

The BSP has been tested with the HDMI Audio EI3 EZ-Extender version 1.1, BOM 1.3.

3 License Checking

The BSP software does not perform any license checking. Use of the BSP software is subject to the Software License Agreement presented during installation.

4 Installation Logging

The installer does not create a log file by default. If you encounter installation issues, you can generate an installation log file by running the installer from the command prompt, as follows:

1. Open a command-line window;
2. Change to the directory containing downloaded installer executable;
3. Run the following command from the command prompt:

```
ADI_HDMI_Audio_EI3_EZExtender-Rel1.0.0.exe /v"/l*v c:
\temp\installer.log"
```

5 Getting Started

5.1 Adding a Driver to a Project

When adding an HDMI Audio EI3 EZ-Extender Driver to your project, the IDE will add the sources for the driver to the CCES Project folders, starting at "system". There will be a folder specific to the driver(s) or service(s) you have added under this folder.

5.2 Creating a project which includes an HDMI Audio EI3 EZ-Extender driver/service

In order to create a project, follow the instructions provided in the CrossCore® Embedded Studio help. As part of the project creation, the page "Add-in selection" contains a list of all the available add-ins for the project that you are creating, based on the installed products and the project's chosen processor and type. You can see the drivers that support the HDMI Audio EI3 EZ-Extender under the "Device Drivers and System Services" category. Within this category you will see "HDMI Audio EI3 EZ-Extender Board Drivers" which contains the drivers for the on-board peripherals (ADV7625 and AD1939) and "HDMI Audio EI3 EZ-Extender Board Services" contains the services (FIFO Buffer Manager). The on-chip peripheral drivers will be listed in "On-chip peripheral drivers" folder and the system services are listed in the "System Services" folder.

The HDMI Audio EI3 EZ-Extender add-in generates a call to adi_initComponents(). For more information on adi_initComponents(), please refer to the CCES help.

5.3 Adding an HDMI Audio EI3 EZ-Extender driver to an existing project

Every CrossCore® Embedded Studio project contains a System Configuration file called `system.svc` which is located in the root of the project. The file is the IDE's interface for managing the various pre-written software components used in the "system" implemented by a project. Double-clicking any `system.svc` file in a navigation view opens that file in the System Configuration Utility which allows you to see the add-ins that you currently have in your project. Click on "Add..." and select the HDMI Audio EI3 EZ-Extender Drivers add-in which is under the "Device Drivers and System Services" for the on-board ADV7625/AD1939 drivers and HDMI Audio EI3 EZ-Extender Services add-in for FIFO Buffer Manager. For adding on-chip peripherals drivers select the "On-chip peripheral drivers" and for the system services select the "System Services".

Notes:

- If the IDE detects that `adi_initComponents()` is not yet present in `main()`, it prompts you to add it and offers to insert it for you.

5.4 Configuration

There are no HDMI Audio EI3 EZ-Extender driver configuration options available in the IDE.

5.5 Interrupts

CrossCore Embedded Studio provides a coherent interrupt management mechanism which allows for the same interface to be used in RTOS and non-RTOS applications. This means that interrupt service routines in all applications must be written in C and use the adi_int interface. Any thread-safety requirements or interactions with tasks are handled by the adi_int interface. For more information on the adi_int API, in CrossCore Embedded Studio go to Help > Search and enter adi_int.

Examples of the usage of this interrupt management mechanism are the System Services and Device Drivers provided with CrossCore Embedded Studio. By using the adi_int interface, the same services and drivers can be used in all applications regardless of whether an operating system is used.

6 Code Sketches and Examples

6.1 Code Sketches

CrossCore® Embedded Studio provides a mechanism by which small code fragments, called code sketches, can be generated with parameterized input provided by the user. The resulting code can then be copied and pasted to a project. Sketches for the on-board peripherals on the HDMI Audio EI3 EZ-Extender are provided in the BSP. To locate the sketches specific to the HDMI Audio EI3 EZ-Extender BSP, open up the example browser (Help -> Browse Examples) and then select HDMI Audio EI3 EZ-Extender product in the "Product:" pulldown. The sketches for the on-chip drivers and system services can be located by selecting the CrossCore® Embedded Studio product in the "Product" pulldown.

6.2 Examples

6.2.1 Power_On_Self_Test:

This example allows the user to test the peripherals of the HDMI Audio EI3 EZ-Extender. Tests include:

- TWI register readback of the ADV7625;
- SPI register write/ read to/from AD1939 codec A & B & C;
- AD1939 audio loopback for codec A & B & C;
- HDMI interface video splitter pass through test;

6.2.2 Examples for Drivers:

1. "Analog In Analog Out": This example performs audio loopback to demonstrate how to receive uncompressed audio stream over AD1939 ADC channels and play the audio samples over AD1939 DAC channels.
   Depending upon the EZ-Board connected, the example supports one or all three AD1939 Audio Codec on the HDMI Audio EI3 EZ-Extender Board.
2. "Digital In Analog Out": This example demonstrates how to receive uncompressed and compressed digital audio stream over HDMI via ADV7625 transceiver and playback uncompressed audio samples using AD1939 Audio Codec.

6.3 Location

In order to locate the HDMI Audio EI3 EZ-Extender BSP examples and sketches, open CrossCore® Embedded Studio's Example Browser which can be found in CrossCore® Embedded Studio under Help. Select in the Product section "HDMI Audio EI3 EZ-Extender v1.0.0" for a full list of examples and sketches.

7 Documentation

General information on the driver model can be found in CCES help under

- CrossCore® Embedded Studio 2.1.0 > System Runtime Documentation > Device Drivers Users Guide

API documentation for the off-chip drivers (controllers populated on the EZ-Extender, ADV7625 and AD1939) in a future version of the BSP will be found under

- HDMI Audio EI3 EZ-Extender Board Support Package 1.0.0 > HDMI Audio EI3 EZ-Extender API Reference

8 Contacting Technical Support

Please contact processor.support@analog.com.

9 Known issues with the HDMI Audio EI3 EZ-Extender Board Support Package (BSP)

- When the HDMI Audio EI3 EZ-Extender board is connected to ADSP-SC584/SC589 EZ-Boards with 0.1 silicon, it is highly recommended to power cycle the hardware before loading the executable files. This is to ensure that the processor registers are set to default reset values.
- Connecting or removing HDMI or Audio cables while the hardware is powered-up may occasionally reset the hardware.
- In case of Digital In Analog Out example, When the HDMI Audio EI3 EZ-Extender board is connected to ADSP-SC573 EZ-Board, audio extracted from a video source through HDMI will not be audible on J2 DAC1 and J2 DAC2.
- In case of Digital In Analog Out example, audio output ceases if the video source word length is changed from 16 bits to 24 bits. This problem is only seen if the REDIRECT_STDOUT_TO_UART macro was defined when building the example.
- Digital In Analog Out example does not support 176.4KHz (16 bit), 192KHz (16 bit) and 192KHz (24 bit) audio output.