Blackfin A-V EZ-Extender Board Support Package (BSP) v1.0.0 Release Notes

Thank you for installing the Blackfin A-V EZ-Extender Board Support Package (BSP). The BSP provides software and documentation in support of the Blackfin A-V EZ-Extender.

The Blackfin A-V EZ-Extender 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. For more on the Blackfin A-V EZ-Extender, please visit http://www.analog.com/AV EZ-Extender.

The Blackfin A-V EZ-Extender BSP provides comprehensive software support for the Blackfin A-V EZ-Extender. Specifically, drivers, examples and code sketches are included for the following components:

- AD1836A audio codec.
- ADV7179 video encoder
- ADV7183B video decoder.

The BSP also provides comprehensive examples which demonstrates the off-chip drivers. It is used in conjunction with the the following EZ-KIT's

- ADSP-BF527 EZ-KIT Lite®.
- ADSP-BF537 EZ-KIT Lite®.
- ADSP-BF548 EZ-KIT Lite®.

The CCES Help environment provides complete hardware and software documentation.

License Checking

There are no license requirements for the Blackfin A-V EZ-Extender BSP.

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.

Change to the directory containing downloaded installer executable and run the following from the command prompt:

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

Support and Assistance

There are several options for contacting support:

- Submit your questions online at:

  http://www.analog.com/support

- E-mail your Processor and DSP software and development tools questions from within CrossCore Embedded Studio:

  Go to "Help->E-mail Support…". This will create a new e-mail addressed to processor.tools.support@analog.com, and will automatically attach your CrossCore Embedded Studio version information (ProductInfo.html).

- E-mail your Processors and DSP applications and processor questions to:
  - processor.support@analog.com OR
  - processor.china@analog.com (Greater China support)

- Post your questions in the Processors and DSP online technical support community in Engineer Zone at:

  http://ez.analog.com/community/dsp

Software Requirements

To build the example projects included in the Blackfin A-V EZ-Extender BSP, CrossCore Embedded Studio version 1.0.1 or later is required.

Test Configurations

The software versions used to test are:

CrossCore® Embedded Studio version 1.0.1 with Blackfin A-V EZ-Extender BSP version 1.0.0.

At the time of release, the tested hardware revisions include:

- ADSP-BF527 EZ-KIT Lite® PCB Revision 2.2, BOM Revision 3.3, Silicon Revision 0.2.
- ADSP-BF537 EZ-KIT Lite® PCB Revision 2.2, BOM Revision 4.0, Silicon Revision 0.3.
- ADSP-BF548 EZ-KIT Lite® PCB Revision 1.4, BOM Revision 2.4, Silicon Revision 0.4.
- Blackfin A-V EZ-Extender PCB Revision 2.1, BOM Revision 2.2

Getting Started

Adding a Driver to a Project

When adding an Blackfin A-V 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.

Creating a project which includes a Blackfin A-V EZ-Extender driver

In order to create a project you should 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 in support of the Blackfin A-V EZ-Extender under the "Device Drivers and System Services" category. Within this catgeory you will see "Blackfin A-V EZ-Extender" which contains the drivers for the on-board and off-board peripherals. 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 Blackfin A-V EZ-Extender add-in generates a call to adi_initComponents(). For more information on adi_initComponents(), please refer to the CCES help section:

CrossCore® Embedded Studio 1.0.0 > Graphical Development Environment > System Configuration

Adding a Blackfin A-V 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 Blackfin A-V EZ-Extender Drivers add-in which is under the "Device Drivers and System Services".

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.

Configuration

There are no Blackfin A-V EZ-Extender driver configuration options available in the IDE.

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.

Sketches and Examples

Sketches

CrossCore Embedded Studio provides a mechanism by which small code fragments, called 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 Blackfin A-V EZ-Extender are provided in the BSP. To locate the sketches specific to the Blackfin A-V EZ-Extender BSP, open up the example browser (Help -> Browse Examples) and then select Blackfin A-V 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.

Examples

In addition to the code sketches, the Blackfin A-V EZ-Extender BSP provides the following examples.

EXAMPLES FOR OFF-CHIP DRIVERS:

1. With the ADSP-BF527 EZ-KIT Lite®, Video display to demonstrate video display via the ADV717driver.
2. With the ADSP-BF527 EZ-KIT Lite®, Video display with class driver to demonstrate video display via the ADV717x video class driver.
3. With the ADSP-BF537 EZ-KIT Lite®, Audio loop back to demonstrate audio streaming via the AD1836a in TDM mode.
4. With the ADSP-BF537 EZ-KIT Lite®, Audio loop back to demonstrate audio streaming via the AD1836a in I2S mode.
5. With the ADSP-BF537 EZ-KIT Lite®, Video capture to demonstrate video capture via the ADV7183 driver.
6. With the ADSP-BF537 EZ-KIT Lite®, Video capture with class driver to demonstrate video capture via the the ADV7183 video class driver.
7. With the ADSP-BF537 EZ-KIT Lite®, Video display to demonstrate video display via the ADV717driver.
8. With the ADSP-BF537 EZ-KIT Lite®, Video display with class driver to demonstrate video display via the ADV717x video class driver.
9. With the ADSP-BF548 EZ-KIT Lite®, Audio loop back to demonstrate audio streaming via the AD1836a in TDM mode.
10. With the ADSP-BF548 EZ-KIT Lite®, Audio loop back to demonstrate audio streaming via the AD1836a in I2S mode.
11. With the ADSP-BF548 EZ-KIT Lite®, Video loopback to demonstrate video capture via the ADV7183 driver and video display via the ADV717x driver.
12. With the ADSP-BF548 EZ-KIT Lite®, Video loopback with class driver to demonstrate video capture via the ADV7183 video class and driver video display via the ADV717x video class driver.

Location

In order to locate the Blackfin A-V EZ-Extender BSP examples and sketches, you can use the following:

- Open CrossCore Embedded Studio's Example Browser which can be found in CrossCore Embedded Studio under Help. Select in the Product section "Blackfin A-V EZ-Extender v1.0.0" for a full list of examples and sketches.
- Import projects located in your Blackfin A-V EZ-Extender BSP installation folder under the example directory in product installation
(`<AV_EZ_Extender_installation_root>\AV_EZ_Extender\Blackfin\Examples`).

Documentation

API documentation for the drivers included in the Blackfin A-V EZ-Extender BSP can be found in CCES Help.

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

MISRA-C Support

MISRA C is a software development standard for the C programming language developed by the Motor Industry Software Reliability Association (MISRA). Its aims are to facilitate code safety, portability, and reliability in the context of embedded systems, specifically those systems programmed in ANSI C. The compiler detects violations of the MISRA rules at compile-time, link-time, and run-time.

System Services and Device Driver Thread Safety

All system services and device drivers (SSDD) use mutexes and semaphores to ensure thread-safety. If an RTOS is present then the SSDD will use the RTOS mutex and semaphores. If an RTOS is not present then the SSDD will use a non-RTOS implementation of mutexes and semaphores (spin locks).

Known issues with the Blackfin A-V EZ-Extender Support Package (BSP)

- With the ADSP-BF548 EZ-KIT Lite® Video loopback and ADSP-BF548 EZ-KIT Lite® Video loopback with class driver examples, a failure in accessing the ADV717x device occurs sporadically. This problem is currently under investigation and will be corrected in the coming releases. When this occurs, cycle the power and re-run the example.