

# ADSP-BF548 EZ-Kit Lite® Board Support Package (BSP) v1.0.0 Release Notes

Thank you for installing the ADSP-BF548 EZ-Kit Lite Board Support Package (BSP). The BSP provides software and documentation in support of the ADSP-BF548 EZ-Kit Lite.

The ADSP-BF548 EZ-Kit Lite 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](http://www.analog.com/cces). For more on the ADSP-BF548 EZ-Kit Lite, please visit [www.analog.com/BF548EZKit](http://www.analog.com/BF548EZKit).

The ADSP-BF548 EZ-Kit Lite BSP provides comprehensive software support for the ADSP-BF548 EZ-Kit Lite. Specifically, examples and code sketches are included for the following components:

- AD7877 Touch Screen
- Sharp LQ043T1DG01 LCD
- Keypad
- PPI, SPI, UART, SPORT, TWI, Rotary Counter
- DMA, Power, Watchdog, GPIO, STDIO, Timer, RTC

The CCES Help environment provides complete hardware and software documentation.

## 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:

```
ADI_ADSP-BF548_EZKIT-Rel1.0.0.exe /v"/1*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](mailto: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](mailto:processor.support@analog.com) OR
  - [processor.china@analog.com](mailto: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 projects included in the ADSP-BF548 EZ-Kit Lite 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 the ADSP-BF548 EZ-Kit Lite BSP version 1.0.0.

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

- ADSP-BF548 EZ-Kit Lite BSP PCB Revision 1.4, BOM Revision 2.4, Silicon Revision 0.4

## Getting Started

## Adding a Driver to a Project

When adding an ADSP-BF548 EZ-Kit Lite Driver to your project, the IDE will add the sources for the driver to the CCES Project folders, starting at "system/drivers" and "system/services". There will be a folder specific to the driver(s) and service(s) you have added under this folder.

## Creating a project which includes an ADSP-BF548 EZ-Kit Lite 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 ADSP-BF548 EZ-Kit Lite under the "Device Drivers and System Services" category. Within this category you will see "On-chip peripheral drivers" and "System Services".

The "On-chip peripheral drivers" and "System Services" add-in generates a call to `adi_initComponents()`. For more information on `adi_initComponents()`, please refer to the CCES help section:

CrossCore® Embedded Studio 1.0.1 > Integrated Development Environment > System Configuration

## Adding an ADSP-BF548 EZ-Kit Lite 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 any "On-chip peripheral drivers" or "System Services" under the "Device Drivers and System Services" category.

### 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 ADSP-BF548 EZ-Kit Lite 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. ADSP-BF548 EZ-Kit Lite BSP related sketches are provided. To locate the sketches specific to the ADSP-BF548 EZ-Kit Lite BSP, open up the example browser (Help -> Browse Examples) and then select ADSP-BF548 in the "Processor:" pull-down.

### Examples

In addition to the code sketches, the ADSP-BF548 EZ-Kit Lite BSP provides examples which show how to use each of the drivers included in the BSP.

The following examples are available in this release: (For more information on the examples see the README file.)

1. TouchScreen XY Measurement
2. Sharp LQ043T1DG01 LCD
3. Sketchpad (LCD, TouchScreen and Keypad)
4. GPIO Push Button and LED (callback)
5. CharEcho\_UART
6. CTimer\_Periodic
7. Real-Time Clock (RTC) - EachDayAlarm, SetGetDateTime
8. Keypad
9. DMA
10. Rotary Counter
11. Power Service - SetGetFreq
12. STDIO Character Echo
13. Timer\_Callback
14. SPI\_flash\_read
15. Watchdog

- 16. PC28F128P33 Device Programmer Interface App (DPIA)
- 17. M25P16 Device Programmer Interface App (DPIA)

Note:

- Double-clicking on an example from the example browser or the system overview page opens the project in the installation folder without copying it to your workspace. If you want to modify the example in any way, it is recommended that you copy it to your workspace.

## Location

In order to locate the ADSP-BF548 EZ-Kit Lite 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 "ADSP-BF548 EZ-Kit Lite v1.0.0" for a full list of examples. Sketches are found under the ADSP-BF548 Processor selection.
- Import projects located in your ADSP-BF548 EZ-Kit Lite BSP installation folder under the example directory in product installation. (<bf548\_ez\_kit\_installation\_root>\BF548\_EZ-KIT\_Lite\Blackfin\Examples).

## Documentation

Hardware Manual and API documentation for the drivers included in the ADSP-BF548 EZ-Kit Lite BSP can be found in CCES Help.

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

CrossCore® Embedded Studio 1.0.1 > System Run-Time Documentation > System Services and Device Drivers

## Integration with CrossCore Embedded Studio

### System View

CrossCore Embedded Studio provides the System View which is used by the ADSP-BF548 EZ-Kit Lite BSP. Use the System Configuration Overview tab to add ADSP-BF548 EZ-Kit Lite BSP driver sources into a CrossCore Embedded Studio project.

To access the System Configuration Overview tab, do one of the following:

- In a navigation view, double-click the system.svc file of a project. The System Configuration utility appears with the overview tab selected.
- If the utility is already open, select the Overview tab.

As well as being able to add, remove and upgrade add-ins from this window, you will also be provided a list of examples and sketches associated with the selected add-in.

For more information about the System Configuration utility, see the CrossCore Embedded Studio help.

## **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).

## **Unsupported Hardware Peripherals**

- The AD1980 Audio Codec is not supported.
- The Pixel Compositor (PIXC) is not supported.

## **Known issues with the ADSP-BF548 EZ-Kit Lite Board Support Package (BSP)**

None.