

RELEASE NOTES

LabVIEW™ Embedded Module for Analog Devices Blackfin Processors

Version 1.0

Contents

Introduction	1
System Requirements.....	2
Installing the Embedded Module for ADI Blackfin.....	2
Installing the EZ-KIT Lite or Emulator	3
Embedded Module for ADI Blackfin Features	3
Where to Go from Here	4

Introduction

The LabVIEW Embedded Module for Analog Devices Blackfin Processors is a comprehensive graphical development environment for embedded design. Jointly developed by Analog Devices and National Instruments, this module seamlessly integrates the LabVIEW development environment and Blackfin embedded processors.

This module builds on NI LabVIEW Embedded technology, which facilitates dataflow graphical programming for embedded systems and includes hundreds of analysis and signal processing functions, integrated I/O, and an interactive debugging interface. With the Embedded Module for ADI Blackfin, you can enable cache, optimize linking, and view live front panel updates via JTAG, serial, or TCP/IP, as well as use VisualDSP++ compiler options through LabVIEW. The Embedded Module for ADI Blackfin includes the LabVIEW C Code Generator, which generates C code from the LabVIEW block diagram.

Engineers and scientists can achieve faster development times, lower development costs, yet still deliver a high performance embedded processing solution.

System Requirements

The Embedded Module for ADI Blackfin has the following requirements:

- A desktop computer with Windows 2000/XP
- LabVIEW 7.1 Embedded Edition (included)
- EZ-KIT Lite for Analog Devices ADSP-BF537 Blackfin Processor (included) or EZ-KIT Lite for Analog Devices ADSP-BF533 (not included)
- Analog Devices VisualDSP++ for LabVIEW Embedded (included)

Refer to the *LabVIEW Release Notes*, available by selecting **Start»Programs»National Instruments»LabVIEW 7.1 Embedded Edition»LabVIEW Manuals** and opening `relnote.pdf`, for standard LabVIEW development system requirements.

Installing the Embedded Module for ADI Blackfin

Complete the following steps to install the Embedded Module for ADI Blackfin.

1. On Windows 2000/XP, log in as an administrator or as a user with administrator privileges.
2. Insert the LabVIEW 7.1 Embedded Edition installation CD and select to install the software.



Note LabVIEW 7.1 Embedded Edition is a special edition of LabVIEW 7.1 that installs in a separate directory and does not interfere with LabVIEW 7.1 Base, Full, or Professional development systems.

3. Insert the LabVIEW Embedded Module for Analog Devices Blackfin Processors 1.0 installation CD and follow the instructions on the screen.
4. Insert the Analog Devices VisualDSP++ for LabVIEW Embedded installation CD and follow the instructions on the screen to install VisualDSP++.
5. Use the NI License Manager to activate the Embedded Module for ADI Blackfin. Select **Start»All Programs»National Instruments»NI License Manager** to launch the NI License Manager. Refer to the *National Instruments License Manager* help,

available by selecting **Help»Contents** in the NI License Manager, for more information about activating National Instruments products.

Installing the EZ-KIT Lite or Emulator



Caution Be careful when removing the board from the package and handling the board to avoid the discharge of static electricity, which may damage some components.

The EZ-KIT Lite or USB-based ICE board is designed to run as a stand-alone unit. You do not have to open the computer case. Complete the following steps to install the EZ-KIT Lite or USB-based ICE.

1. Plug the power supply for the board into a surge-protected outlet. Connect the USB assembly for the board to the USB port on the host computer using the provided USB cable. On the board, the power LED illuminates, and you might see other visible activity, such as blinking LEDs. The connection activates the Windows Found New Hardware Wizard.
2. From the Welcome page of the wizard, click the **Next** button two times. The installation takes a few seconds to complete. A Windows message about the new device being ready for use completes the hardware installation.
3. Verify that the yellow USB monitor LED is lit. The LED is in close proximity to the USB connector. This signifies that the board is communicating properly with the host computer and is ready to run.
4. For a USB-based ICE, attach the JTAG cable to the emulation target. Refer to the emulator documentation for more information about USB-based ICE.

Embedded Module for ADI Blackfin Features

The Embedded Module for ADI Blackfin builds on the LabVIEW Embedded technology and provides an easy, out-of-the-box experience for programming Analog Devices Blackfin processors. The Embedded Module for ADI Blackfin offers the following features:

- Support for Analog Devices ADSP-BF533 and ADSP-BF537 EZ-KIT Lite.
- The Call Library Function Node calls functions in Blackfin `.dll` library files.
- The Inline C Node adds inline C code to the block diagram and provides low overhead access to C and assembly code.

- Device drivers for the following:
 - EZ-KIT Power and LED functions
 - AD1854
 - AD1871
 - AD1836
 - AD7266
 - AD7476A
 - PPI
 - SPI
 - SPORT
 - UART
- A range of debugging techniques, including front panel updates, probes, breakpoints, and side-by-side debugging with VisualDSP++.
- Memory mapping to map particular code segments to particular memory addresses on the processor so you can assign VIs and global variables to different memory addresses.
- The LabVIEW C Generator, which supports the following C code optimizations:
 - Serial only
 - C-style function calls
 - Guard code removal
 - Stack variables
- A library of highly optimized Blackfin-specific math and signal processing VIs.

Where to Go from Here

National Instruments provides many resources to help you succeed with your NI products. Use the following related documentation as you start exploring LabVIEW and the Embedded Module for ADI Blackfin.

- The *Getting Started with the LabVIEW Embedded Module for Analog Devices Blackfin Processors* manual, available by selecting **Start»All Programs»National Instruments»LabVIEW 7.1 Embedded Edition»LabVIEW Manuals** and opening `Blackfin_Getting_Started.pdf`, contains a tutorial that walks you through creating, building, downloading, running, and debugging a Blackfin application.
- *LabVIEW Help*, available by selecting **Help»VI, Function, & How-To Help** in LabVIEW, provides information about LabVIEW

programming, step-by-step instructions for using LabVIEW, and reference information about LabVIEW VIs, functions, palettes, menus, and tools. Refer to the **Embedded Module for ADI Blackfin** book on the **Contents** tab of the *LabVIEW Help* for information specific to the Embedded Module for ADI Blackfin and Blackfin applications.

- Context help provides brief descriptions of VIs and functions with a link to the complete reference for a VI or function. Select **Help»Show Context Help** to open the **Context Help** window.
- Examples are available in the `labview\embedded\examples\lvemb\Blackfin` directory and can help you get started creating Blackfin VIs.
- The readme file, available by selecting **Start»All Programs»National Instruments»LabVIEW 7.1 Embedded Edition»Readme** and opening `readme_BLACKFIN.html`, contains known issues and last-minute information.
- The *Getting Started with ADSP-BF537 EZ-KIT Lite* manual, available in the EZ-KIT box, familiarizes you with the hardware capabilities of the EZ-KIT.
- The *ADSP-BF537 EZ-KIT Lite Evaluation System Manual*, available in the EZ-KIT box, describes the operation and configuration of the board components and provides a schematic for reference.
- The *DAQ Adapter User Guide* describes how to install the National Instruments DAQ Adaptor and provides pinout information. The NI DAQ Adaptor comes in the EZ-KIT box.

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