

1 INTRODUCTION

Thank you for purchasing VisualDSP++™, Analog Devices® project management software for Digital Signal Processor (DSP) applications. With the release of VisualDSP++ 2.0, Analog Devices offers a tool set that enables implementation of a DSP-based project from start to finish within a single interface.

VisualDSP++ 2.0 provides you with the following:

- An Integrated Development and Debugging Environment (IDDE) with a simulation target
- An optimizing C/C++ compiler with the math, DSP, and C/C++ run-time libraries
- A Real-Time Operating System, VisualDSP++ Kernel (VDK™) with the API library
- An assembler program with an easy-to-use algebraic syntax
- A linker, loader, splitter, archiver, and conversion utilities
- Task-oriented context-sensitive online Help
- Online access to all documentation for this and related products through PDF files

VisualDSP++ 2.0 introduces VisualDSP++ Kernel, an RTOS executive integrated with the rest of VisualDSP++. The VDK incorporates state-of-the-art scheduling and resource allocation techniques tailored specially for the memory and timing constraints of DSP programming. The

kernel facilitates development of fast-performance structured applications using frameworks of template files.

The Kernel is specially designed for effective operations on Analog Devices DSPs. The first release of VisualDSP++ for 16-bit fixed-point processors offers the Kernel support for ADSP-2192-12 DSPs.

This manual is designed so that you can quickly learn about the Kernel internal structure and operation.

For Additional Information About Analog Products

Analog Devices is online on the internet at www.analog.com. Our web pages provide information about our broad range of products: analog integrated circuits, amplifiers, converters, and digital signal processors. For information on our digital signal processors, visit our website at www.analog.com/dsp. Our web pages provide access to technical information and documentation, product overviews, and product announcements. You may also obtain additional information about Analog Devices and its products in any of the following ways:

- FAX questions or requests for information to 1(781) 461-3010 (North America) or 089/76 903-557 (Europe Headquarters)
- Access the Digital Signal Processor Division File Transfer Protocol (FTP) site at [ftp ftp.analog.com](ftp://ftp.analog.com) or [ftp 137.71.23.21](ftp://137.71.23.21) or <ftp://ftp.analog.com>

For Technical or Customer Support

You can reach our DSP Tools Customer Support in the following ways:

- E-mail questions to dsptools.support@analog.com
- Phone questions to 1800-ANALOGD
- Visit our World Wide Web site at www.analog.com/dsp

- Telex questions to 924491, TWX: 710/394-6577
- Cable questions to ANALOG NORWOODMASS
- Contact your local ADI sales office or an authorized ADI distributor
- Send questions by mail to:

Analog Devices, Inc.
DSP Division
One Technology Way
P.O. Box 9106
Norwood, MA 02062-9106
USA

Purpose of this Manual

The *VisualDSP++ Kernel (VDK) User's Guide* provides information about Analog Devices Real-Time Operation System, including interface between Integrated Development and Debugging Environment and the VDK. This manual provides detailed descriptions of the Kernel's components and operations. The manual also leads you through the process of using API library routines in your VDK-based applications.

Intended Audience

Programmers who are familiar with Analog Devices DSPs are the primary audience for this manual. This manual assumes that the audience has a working knowledge of Analog Devices DSP architecture and DSP instruction set.

DSP programmers who are unfamiliar with Analog Devices DSPs can use this manual, but should supplement this manual with other texts (such as a chip user's manual) describing the Analog Devices DSP architecture and DSP instruction set.

Manual Contents Description

For information about the VisualDSP++ Kernel software, see the following chapters:

Chapter 2 — [“Operating System Kernel Concepts”](#)

Concentrates on concepts, motivation, and general architectural principles of the VDK software.

Chapter 3 — [“Configuring a Project to Use the VDK”](#)

Covers procedures for using the kernel’s components and operations in a VDK-instrumented project.

Chapter 4 — [“Using the VDK”](#)

Describes the VDK internal structure and components. The components covered include threads, interrupt service routines, scheduler, synchronizing signals, and device flags.

Chapter 5 — [“Data Types”](#)

Describes built-in data types supported in the current release of the operating system kernel software.

Chapter 6 — [“API Reference”](#)

Describes the VDK library functions and macros included in the current release of the kernel software.

Appendix A — [“Glossary”](#)

Provides definitions of VDK-related terms and abbreviations.

What's New in this Manual

This is the first edition of the *VisualDSP++ Kernel (VDK) User's Guide*. The manual documents VisualDSP++ Kernel version 1.5.

Related Documents

For information about Analog Devices DSPs and DSP development software, see the following publications:

- *DSP Hardware Reference*
- *DSP Instruction Set Reference*
- *VisualDSP++ 2.0 Getting Started Guide*
- *VisualDSP++ 2.0 User's Guide*
- *VisualDSP++ 2.0 C/C++ Compiler and Library Manual*
- *VisualDSP++ 2.0 Assembler and Preprocessor Manual*
- *VisualDSP++ 2.0 Linker & Utilities Manual*

Your VisualDSP++ software distribution CD-ROM includes this and all of the related to your design DSP publications. To access these publications within VisualDSP++, use the **Help Topics** command on the VisualDSP++'s **Help** menu, click the **Reference book** icon, and select the **Online Manuals** topic. From the **Help** topic, you can open any of the manuals, which are in Adobe Acrobat PDF format. If not using VisualDSP++, you can manually access the PDF files from the CD-ROM using Adobe® Acrobat®.

Conventions

The following are conventions that apply to all chapters. Note that additional conventions, which apply only to specific chapters, may appear throughout this document.

Table 1-1. Notation Conventions

Example	Description
Close command (File menu)	Titles in reference sections indicate the location of an item within the VisualDSP++'s menu system (for example, the Close command appears on the File menu)
{this that}	Alternative items in syntax descriptions appear within curly brackets and separated by vertical bars; read the example as <i>this</i> or <i>that</i> . One or the other is required.
[this that]	Optional items in syntax descriptions appear within brackets and separated by vertical bars; read the example as an optional <i>this</i> or <i>that</i> .
[this,...]	Optional item lists in syntax descriptions appear within brackets delimited by commas and terminated with an ellipse; read the example as an optional comma-separated list of <i>this</i> .
VDK_	C applications use callable function names prefixed by “VDK_” to clearly distinguish VDK library functions from user functions.
VDK::	C++ callable functions are located in the “VDK” namespace, thus function names are preceded by “VDK::”.
GetThreadType()	Functions, directives, keywords, and feature names are in text with letter gothic font.
<i>filename</i>	Non-keyword placeholders appear in text with <i>italic</i> style format.
	A note, providing information of special interest or identifying a related DSP topic.

Table 1-1. Notation Conventions (Cont'd)

	A caution, providing information on critical design or programming issues that influence operation of the DSP.
Click Here	In the online version of this document, a cross reference acts as a hypertext link to the item being referenced. Click on blue references (Table, Figure, or section names) to jump to the location.

