Preface

The LabVIEW Style Book is a comprehensive reference on recommended LabVIEW development practices. It contains style rules designed to optimize the ease of use, efficiency, readability, maintainability, robustness, simplicity, and performance of LabVIEW applications. The book provides thorough explanations of each rule, including examples and illustrations. The material leverages the work of the early pioneers of the LabVIEW community[1], has evolved from many years of use by Bloomy Controls[2], and has been reviewed by esteemed representatives of the LabVIEW community. I invite you to learn from the experiences of myself and the staff at Bloomy Controls, Inc., by reading *The LabVIEW Style Book.* I hope you enjoy reading it as much as I enjoyed writing it!

Intended Reader

Intended readers include developers, managers, and organizations that develop or use LabVIEW applications. You must have a working knowledge of fundamental LabVIEW principles and terminology, as instructed in a LabVIEW Basics I and II hands-on course[3], and experience developing and deploying applications. Experienced beginners can use this book to form good programming habits early in their LabVIEW careers. Intermediate developers, who have mastered the fundamentals and are ready to take their skills to the next level, will learn the most from this material. No doubt you have experienced the power and flexibility of LabVIEW and are ready to concentrate on style. Advanced developers will strongly identify with the contents, reinforce their knowledge and experience, and have a useful reference to share with colleagues. You might use *The LabVIEW Style Book* to

help reduce the training and support burden you might have within your organization. **Managers** and **Organizations** that employ multiple developers and users can gain maximum benefit by standardizing on these style rules across the organization. This approach ensures quality and consistency throughout an organization and helps satisfy industry quality standards.

Organization

The chapters of *The LabVIEW Style Book* present style rules and examples organized by topic. Chapter 1, "The Significance of Style," discusses the relationship between style and ease of use, efficiency, readability, maintainability, robustness, simplicity, and performance. Chapter 2, "Prepare for Good Style," presents considerations that influence style before you begin programming, including specifications, configuration of the LabVIEW environment, and project and file organization. Additionally, it presents a specialized standard for LabVIEW project specifications. Chapter 3, "Front Panel Style"; Chapter 4, "Block Diagram"; and Chapter 5, "Icon and Connector," present the basics for VI layout and development. Chapter 3 provides rules for layout, text, color, and navigation. It distinguishes separate rules for the front panels of GUI VIs and subVIs, where appropriate. Chapter 4 presents rules for layout, wiring, and data flow, along with techniques for optimizing data flow. Chapter 5 discusses good icon development practices and editing shortcuts, and covers standard connector terminal patterns, assignments, and conventions.

Chapter 6, "Data Structures," provides rules on data type selection and array and cluster development. A methodology is integrated with several useful reference tables for simplifying data type selection and configuration. Rules and examples for optimizing VIs involving complex data structures also are presented in this chapter. Chapter 7, "Error Handling"; Chapter 8, "Design Patterns"; and Chapter 9, "Documentation," expand upon the basics. Chapter 7 presents comprehensive rules for thorough error handling, along with special considerations for error handling within subVIs. Chapter 8 discusses common VI architectures that promote good style, beginning with simple subVI design patterns and progressing to single and multiple loop design patterns. It also describes several variations of the LabVIEW state machine. Additionally, Chapter 8 presents three complex application frameworks, including a dynamic framework that uses plug-ins, a multiple-loop framework, and a modular multiple-loop framework that uses loop-subVIs. Chapter 9 presents rules for documenting your source code, including the front panel, block diagram, and icon and VI description. Additionally, the generation and integration of online documents is discussed. Chapter 10, "Code Reviews," presents several methods of reviewing source code and enforcing style rules, including self-reviews utilizing a manual checklist, automated self-reviews utilizing the LabVIEW VI Analyzer Toolkit, and peer reviews. An application is evaluated using each of these techniques.

Appendixes include a glossary and a style rules summary. Appendix A, "Glossary," provides a list of terms and definitions; many LabVIEW and software industry terms are evolutionary and context sensitive. Any term that seems specialized or ambiguous is defined where it first appears within the book and used consistently in successive chapters. The definitions are repeated in the glossary for ease of reference. Appendix B, "Style Rules Summary," lists the style rules presented in each chapter.

Style Rules Priority Convention: Throughout *The LabVIEW Style Book*, two priority levels are applied to the rules and distinguished as bold or plain italic. High priority rules are laws that should almost always be followed with very few exceptions. They are denoted by bold italics as follows:

Rule 2.2 Write a requirements specification document

Normal priority rules are recommendations that are generally considered as good practices, but are either not as critical as the high-priority rules, or more exceptions exist. They are denoted by plain italic as follows:

Rule 2.3 Maintain good LabVIEW style throughout the proof of concepts

Endnotes

1. See the "Acknowledgments" section for a list of reviewers, contributors, and people who have helped advance the science of LabVIEW Style.
2. Bloomy Controls is a National Instruments Select Integration Partner with offices in Windsor, Connecticut; Milford, Massachusetts; and Fort Lee, New Jersey. Information is available at `www.bloomy.com`.
3. LabVIEW Basics I and II is a one-week hands-on course offered by NI Certified Training Centers. More information is available from `http://www.ni.com/training`.