## PDFlib GmbH München, Germany

## www.pdflib.com



General Edition for
Cobol, C, C++, Java, Perl, PHP, Python, RPG, Ruby, and Tcl

Copyright © 1997-2007 PDFlib GmbH and Thomas Merz. All rights reserved.
PDFlib users are granted permission to reproduce printed or digital copies of this manual for internal use.

## PDFlib GmbH

Tal 40, 80331 München, Germany
www.pdflib.com
phone $+49 \cdot 89 \cdot 29164687$
fax $+49 \cdot 89 \cdot 29164686$
If you have questions check the PDFlib mailing list and archive at tech.groups.yahoo.com/group/pdflib
Licensing contact: sales@pdflib.com
Support for commercial PDFlib licensees: support@pdflib.com (please include your license number)
This publication and the information herein is furnished as is, is subject to change without notice, and should not be construed as a commitment by PDFlib GmbH. PDFlib GmbH assumes no responsibility or liability for any errors or inaccuracies, makes no warranty of any kind (express, implied or statutory) with respect to this publication, and expressly disclaims any and all warranties of merchantability, fitness for particular purposes and noninfringement of third party rights.

PDFlib and the PDFlib logo are registered trademarks of PDFlib GmbH. PDFlib licensees are granted the right to use the PDFFib name and logo in their product documentation. However, this is not required.

Adobe, Acrobat, PostScript, and XMP are trademarks of Adobe Systems Inc. AIX, IBM, OS/390, WebSphere, iSeries, and zSeries are trademarks of international Business Machines Corporation. ActiveX, Microsoft, OpenType, and Windows are trademarks of Microsoft Corporation. Apple, Macintosh and TrueType are trademarks of Apple Computer, Inc. Unicode and the Unicode logo are trademarks of Unicode, Inc. Unix is a trademark of The Open Group. Java and Solaris are trademarks of Sun Microsystems, Inc. HKS is a registered trademark of the HKS brand association: Hostmann-Steinberg, K+E Printing inks, Schmincke. Other company product and service names may be trademarks or service marks of others.

PANTONE ${ }^{\oplus}$ colors displayed in the software application or in the user documentation may not match PANTONE-identified standards. Consult current PANTONE Color Publications for accurate color. PANTONE ${ }^{\oplus}$ and other Pantone, Inc. trademarks are the property of Pantone, Inc. © Pantone, Inc., 2003. Pantone, Inc. is the copyright owner of color data and/or software which are licensed to PDFIib GmbH to distribute for use only in combination with PDFIib Software. PANTONE Color Data and/or Software shall not be copied onto another disk or into memory unless as part of the execution of PDFlib Software.

PDFlib contains modified parts of the following third-party software:
ICClib, Copyright © 1997-2002 Graeme W. Gill
GIF image decoder, Copyright © 1990-1994 David Koblas
PNG image reference library (libpng), Copyright © 1998-2004 Glenn Randers-Pehrson Zlib compression library, Copyright (© 1995-2002 Jean-loup Gailly and Mark Adler TIFFlib image library, Copyright © 1988-1997 Sam Leffler, Copyright © 1991-1997 Silicon Graphics, Inc. Cryptographic software written by Eric Young, Copyright © 1995-1998 Eric Young (eay@cryptsoft.com) Independent JPEG Group's JPEG software, Copyright © 1991-1998, Thomas G. Lane Cryptographic software, Copyright © 1998-2002 The OpenssL Project (www.openssl.org) Expat XML parser, Copyright © 1998, 1999, 2000 Thai Open Source Software Center Itd

PDFlib contains the RSA Security, Inc. MD5 message digest algorithm.


Authors: Thomas Merz, Katja Schnelle Romaus
Design and illustrations: Alessio Leonardi
Quality control (manual): Katja Schnelle Romaus, Kurt Stützer
Quality control (software): a cast of thousands

## Frame 3 of the TIFF image

## Contents

o Applying the PDFlib License Key ..... 9
1 Introduction ${ }_{13}$
1.1 Roadmap to Documentation and Samples
1.2 PDFlib Programming 14
1.3 What's new in PDFlib 7? ..... 16
1.4 Features in PDFlib/PDFlib+PDI/PPS 7 ..... 19
1.5 Availability of Features in different Products ..... 21
2 PDFlib Language Bindings ..... 23
2.1 Cobol Binding 23
2.2 COM Binding 24
2.3 C Binding 25
2.4 C++ Binding 27
2.5 Java Binding 28
2.6 .NET Binding 31
2.7 Perl Binding 32
2.8 PHP Binding 34
2.9 Python Binding 36
2.10 REALbasic Binding 37
2.11 RPG Binding 38
2.12 Ruby Binding 41
2.13 Tcl Binding 42
3 PDFlib Programming 43
3.1 General Programming 43
3.1.1 Exception Handling 43
3.1.2 The PDFlib Virtual File System (PVF) ..... 45
3.1.3 Resource Configuration and File Searching 46
3.1.4 Generating PDF Documents in Memory ..... 49
3.1.5 Using PDFlib on EBCDIC-based Platforms 50
3.1.6 Large File Support 51
3.2 Page Descriptions 52
3.2.1 Coordinate Systems 52
3.2.2 Page Size ..... 54
3.2.3 Paths 55
3.2.4 Templates 56
3.3 Working with Color 57
3.3.1 Patterns and Smooth Shadings ..... 57

## Frame 4 of the TIFF image

3.3.2 Spot Colors 57
3.3.3 Color Management and ICC Profiles 60
3.4 Interactive Elements ..... 64
3.4.1 Examples for Creating Interactive Elements ..... 64
3.4.2 Formatting Options for Text Fields ..... 67
4 Unicode and Legacy Encodings ..... 71
4.1 Overview 71
4.2 Important Unicode Concepts ..... 72
4.3 Strings in PDFlib ..... 74
4.3.1 String Types in PDFlib ..... 74
4.3.2 Strings in Unicode-aware Language Binding ..... 74
4.3.3 Strings in non-Unicode-aware Language Bindings ..... 75
4.4 8-Bit Encodings 79
4.5 Encodings for Chinese, Japanese, and Korean Text 83
4.6 Addressing Characters and Glyphs ..... 86
4.6.1 Escape Sequences ..... 86
4.6.2 Character References and Glyph Name References ..... 87
4.6.3 Glyph Checking and Substitution 89
4.6.4 Checking Glyph Availability ..... 90
5 Font Handling 93
5.1 Overview of Fonts and Encodings 93
5.1.1 Supported Font Formats 9 ..... 93
5.1.2 Font Encodings ..... 94
5.2 Font Format Details ..... 96
5.2.1 PostScript Type 1 Fonts ..... 96
5.2.2 TrueType and OpenType Fonts ..... 97
5.2.3 User-Defined (Type 3) Fonts ..... 97
$5 \cdot 3$ Locating, Embedding and Subsetting Fonts ..... 99
5.3.1 Searching for Fonts ..... 99
5.3.2 Host Fonts on Windows and Mac 1 ..... 101
5.3.3 Font Embedding ..... 103
5.3.4 Font Subsetting 104
5.4 Miscellaneous Topics ..... 107
5.4.1 Symbol Fonts and Font-specific Encodings ..... 107
5.4.2 Glyph ID Addressing for TrueType and OpenType Fonts 108
5.4.3 The Euro Glyph 108
5.4.4 Unicode-compatible Fonts ..... 109
5.5 Font Metrics and Text Variations 110
5.5.1 Font and Glyph Metrics 110
5.5.2 Kerning 117
5.5.3 Text Variations 112
5.6 Chinese, Japanese, and Korean Fonts 114

## Frame 5 of the TIFF image

5.6.1 Standard CJK Fonts ..... 114
5.6.2 Custom CJK Fonts 11
6 Importing Images and PDF Pages ..... 119
6.1 Importing Raster Images ..... 119
6.1.1 Basic Image Handling 119
6.1.2 Supported Image File Formats $\mathbf{1 2 0}$
6.1.3 Clipping Paths ..... 122
6.1.4 Image Masks and Transparency ..... 123
6.1.5 Colorizing Images ..... 125
6.1.6 Multi-Page Image Files ..... 126
6.1.7 OPI Support 126
6.2 Importing PDF Pages with PDI (PDF Import Library) ..... 128
6.2.1 PDI Features and Applications ..... 128
6.2.2 Using PDI Functions with PDFlib ..... 128
6.2.3 Acceptable PDF Documents ..... 130
7 Formatting Features ..... 131
7.1 Placing and Fitting Single-Line Text 13
7.1.1 Simple Text Placement 131
7.1.2 Positioning Text in a Box 132
7.1.3 Fitting Text into a Box 133
7.1.4 Aligning Text at a Character ..... 135
7.1.5 Placing a Stamp 136
7.1.6 Using Leaders 136
7.2 Multi-Line Textflows 138
7.2.1 Placing Textflows in the Fitbox ..... 139
7.2.2 Paragraph Formatting Options ..... 141
7.2.3 Inline Option Lists and Macros 1 ..... 141
7.2.4 Tab Stops 144
7.2.5 Numbered Lists and Paragraph Spacing ..... 145
7.2.6 Control Characters, Character Mapping, and Symbol Fonts ..... 146
7.2.7 Hyphenation ..... 149
7.2.8 Controlling the Linebreak Algorithm 150
7.2.9 Wrapping Text 153
7.3 Placing Images and Imported PDF Pages 156
7.3.1 Simple Object Placement ..... 156
7.3.2 Positioning an Object in a Box 156
7.3.3 Fitting an Object into a Box 157
7.3.4 Orientating an Object 158
7.3.5 Rotating an Object ..... 160
7.3.6 Adjusting the Page Size 161
7.4 Table Formatting 162
7.4.1 Placing a Simple Table 163
7.4.2 Contents of a Table Cell 165
7.4.3 Table and Column Widths 166

## Frame 6 of the TIFF image

7.4.4 Large Table Example ..... 167
7.4.5 Table Instances ..... 172
7.5 Matchboxes 175
7.5.1 Decorating a Text Line ..... 175
7.5.2 Using Matchboxes in a Textflow 17
7.5.3 Matchboxes and Images 1 ..... 177
8 The pCOS Interface ..... 181
8.1 Simple pCOS Examples 181
8.2 Handling Basic PDF Data Types ..... 183
8.3 Composite Data Structures and IDs ..... 184
8.4 Path Syntax 185
8.5 Pseudo Objects 187
8.6 Encrypted PDF Documents ..... 193
9 Generating various PDF Flavors ..... 195
9.1 Acrobat and PDF Versions ..... 195
9.2 Encrypted PDF ..... 197
9.2.1 Strengths and Weaknesses of PDF Security ..... 197
9.2.2 Protecting Documents with PDFlib ..... 198
9.3 Web-Optimized (Linearized) PDF ..... 201
9.4 PDF/X for Print Production 202
9.4.1 The PDF/X Family of Standards ..... 202
9.4.2 Generating PDF/X-conforming Output ..... 202
9.4.3 Importing PDF/X Documents with PDI ..... 205
9.5 PDF/A for Archiving ..... 207
9.5.1 The PDF/A Standards 207 ..... 207
9.5.2 Generating PDF/A-conforming Output ..... 207
9.5.3 Importing PDF/A Documents with PDI ..... 210
9.5.4 Color Strategies for creating PDF/A 212
9.5.5 PDF/A Validation ..... 213
9.6 Tagged PDF ..... 214
9.6.1 Generating Tagged PDF with PDFlib 214
9.6.2 Creating Tagged PDF with direct Text Output and Textflows ..... 216
9.6.3 Activating Items for complex Layouts ..... 217
9.6.4 Using Tagged PDF in Acrobat 220
10 Variable Data and Blocks223
10.1 Installing the PDFlib Block Plugin ..... 223
10.2 Overview of the PDFlib Block Concept ..... 225
10.2.1 Complete Separation of Document Design and Program Code ..... 225
10.2.2 Block Properties ..... 226
10.2.3 Linking multiple Textflow Blocks ..... 227

## Frame 7 of the TIFF image

10.2.4 Why not use PDF Form Fields? 228
10.3 Creating PDFlib Blocks 230
10.3.1 Creating Blocks interactively with the PDFlib Block Plugin 230
10.3.2 Editing Block Properties 232
10.3.3 Copying Blocks between Pages and Documents 233
10.3.4 Converting PDF Form Fields to PDFlib Blocks 235
10.4 Standard Properties for Automated Processing 238
10.4.1 General Properties 238
10.4.2 Text Properties 240
10.4.3 Image Properties 244
10.4.4 PDF Properties 244
10.4.5 Custom Properties 245
10.5 Querying Block Names and Properties with pCOS 246
10.6 PDFlib Block Specification 248
10.6.1 PDF Object Structure for PDFlib Blocks 248
10.6.2 Generating PDFlib Blocks with pdfmarks 250

## A Revision History ${ }_{253}$

Index ${ }_{255}$

