Exaprom PDF 2.0 Toolkit

User Manual

PDF Report with iTextSharp 4.1.6 for LabVIEW

by

Jean-Marc Simard

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Exaprom Inc.
Consulting and testing in materials
engineering and sustainable energy

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1. Introduction

I developed this Reports generation toolkit for PDF because I wanted to be able to generate PDF reports, on LabVIEW, without having to buy a license. The choice fell on the open source iTextSharp 4.1.6 library (*Mozilla Public License Version 1.1*). I have developed a series of VIs allowing me to generate PDF reports directly without having to purchase a commercial product. The license chosen:

> "The *BSD (Berkeley software distribution license)* allows proprietary use, and for the software released under the license to be incorporated into proprietary products. Works based on the material may be released under a proprietary license or as closed source software."

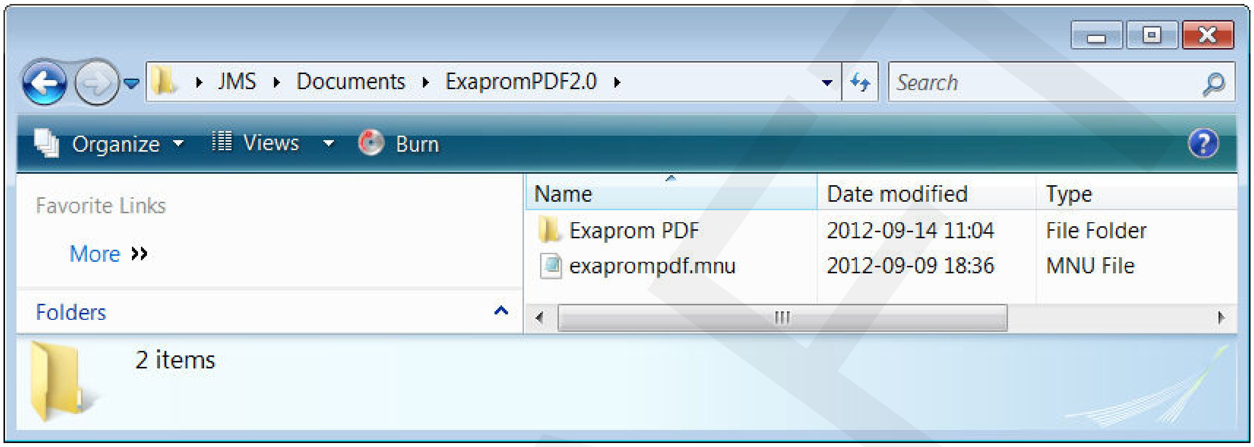
Roughly, you do what you want with those VIs.

The newer version, *iTextSharp 5.X*, is under Affero General Public License and is not free for activities involving the iText software without disclosing the source code of your own applications.

2. Installation

After unzipping "ExapromPDF2.0.ZIP", you have a folder and a file:

1)the folder "Exaprom PDF";
2)and the file "exaprompdf.mnu".

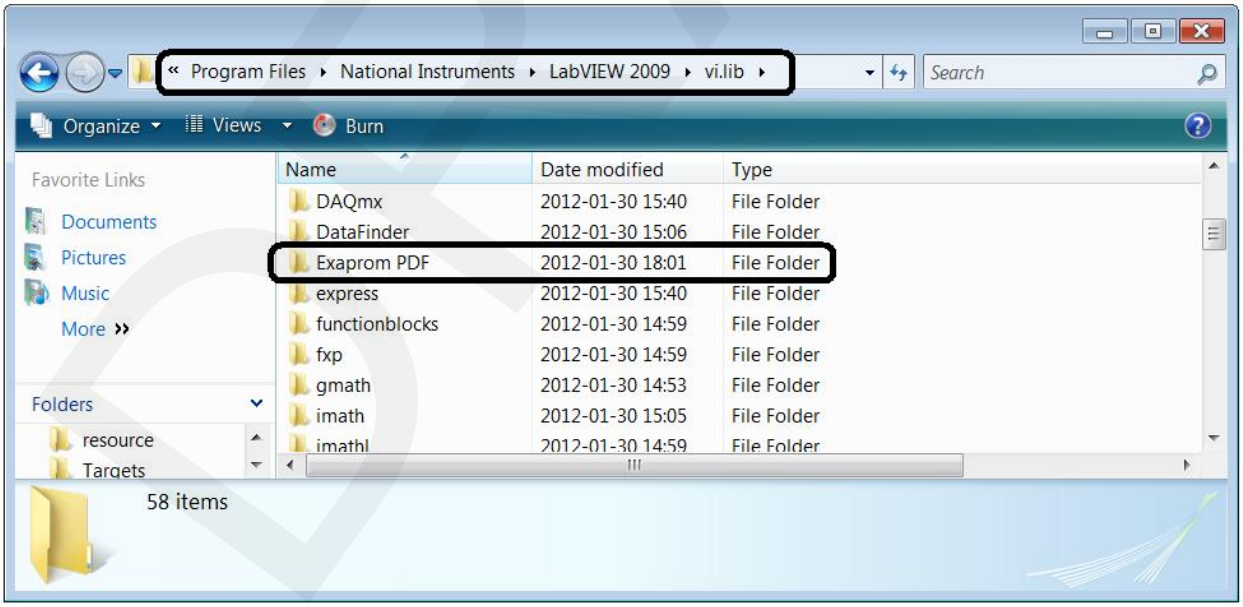


Name	Date modified	Type
Exaprom PDF	2012-09-14 11:04	File Folder
exaprompdf.mnu	2012-09-09 18:36	MNU File

Figure 1: Folder "Exaprom PD2.0" unzipped

The folder "Exaprom PDF" has to be place in (see figure 2):

C:\Program Files\National Instruments\LabVIEW Version\vi.lib\

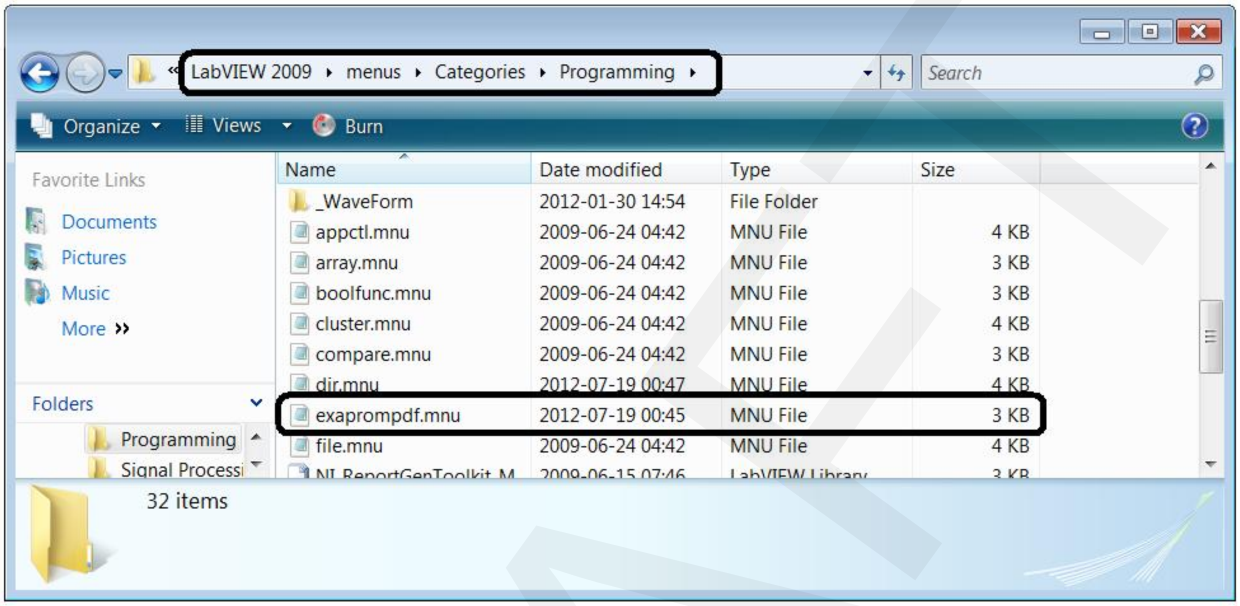


Name	Date modified	Type
DAQmx	2012-01-30 15:40	File Folder
DataFinder	2012-01-30 15:06	File Folder
Exaprom PDF	2012-01-30 18:01	File Folder
express	2012-01-30 15:40	File Folder
functionblocks	2012-01-30 14:59	File Folder
fxp	2012-01-30 14:59	File Folder
gmath	2012-01-30 14:53	File Folder
imath	2012-01-30 15:05	File Folder
imathl	2012-01-30 14:59	File Folder

Figure 2: Folder "Exaprom PDF"

The file "exaprompdf.mnu" have to be place in (see figure 3):

C:\Program Files\National Instruments\LabVIEW Version\
menus\Categories\Programming\



Name	Date modified	Type	Size
_WaveForm	2012-01-30 14:54	File Folder	
appctl.mnu	2009-06-24 04:42	MNU File	4 KB
array.mnu	2009-06-24 04:42	MNU File	3 KB
boolfunc.mnu	2009-06-24 04:42	MNU File	3 KB
cluster.mnu	2009-06-24 04:42	MNU File	4 KB
compare.mnu	2009-06-24 04:42	MNU File	3 KB
dir.mnu	2012-07-19 00:47	MNU File	4 KB
exaprompdf.mnu	2012-07-19 00:45	MNU File	3 KB
file.mnu	2009-06-24 04:42	MNU File	4 KB
NI_ReportGenToolkit_M...	2009-06-15 07:46	LabVIEW Library	3 KB

32 items

Figure 3: File "exaprompdf.mnu"

After restart LabVIEW, the palette "Exaprom PDF 2.0" will appears.

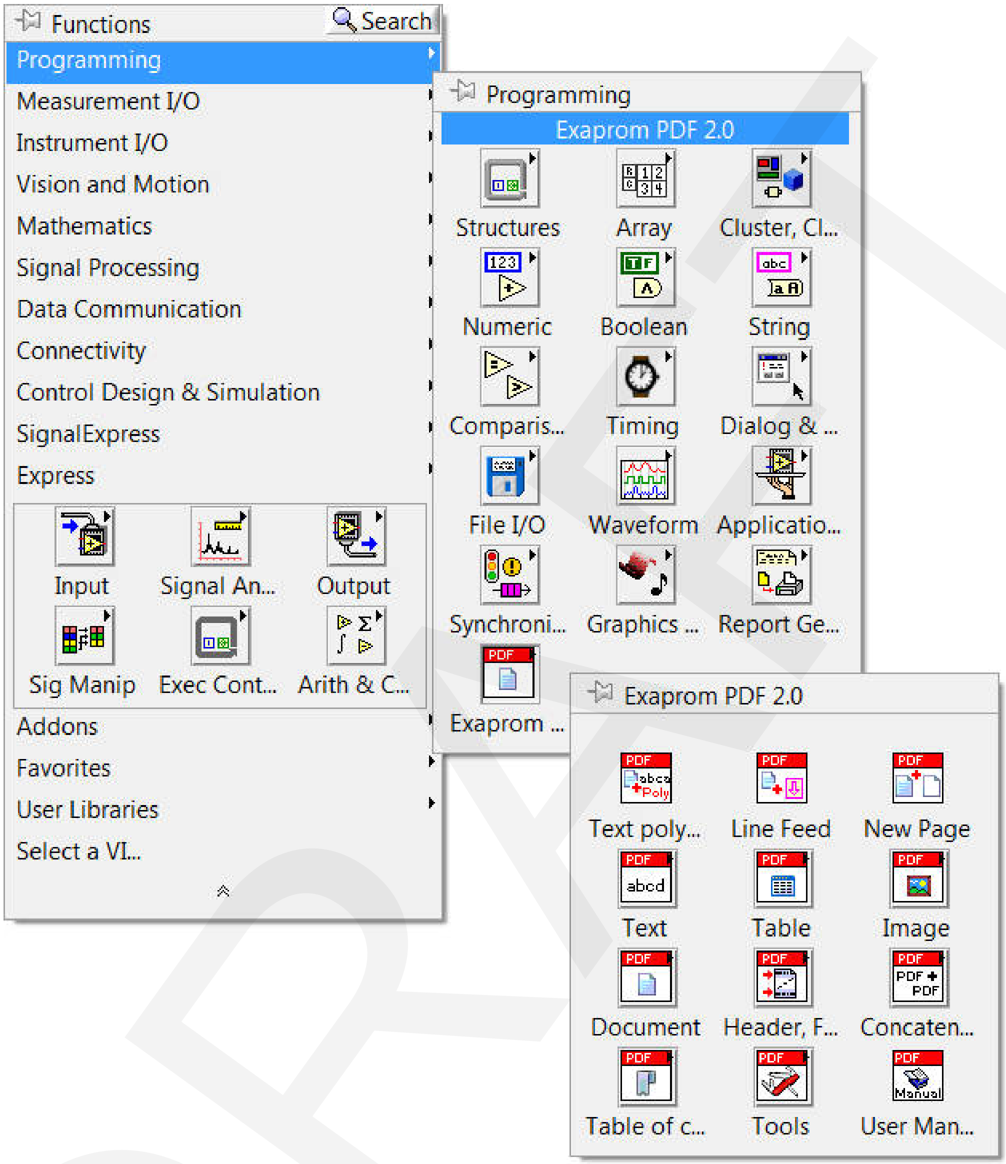


Figure 4: Palette "PDF Exaprom"

Although this toolkit had not intended to replace a word processor, we have produced this document, as an example, with this PDF toolkit . The VI "User Manual.vi" is available in the palette "Exaprom PDF 2.0".

3. PDF Report (simplified)

The production of a PDF report can be divided into four steps:

1) Creating a report (PDF file and default parameters)
2) Adding header, footer and watermark (all optional)
3) Writing of the PDF report which involves the addition of text elements, images (file, control and front panel) and tables;
4) The closure of the PDF report.

In chapter 5, we review the different VI needed to create a PDF report.

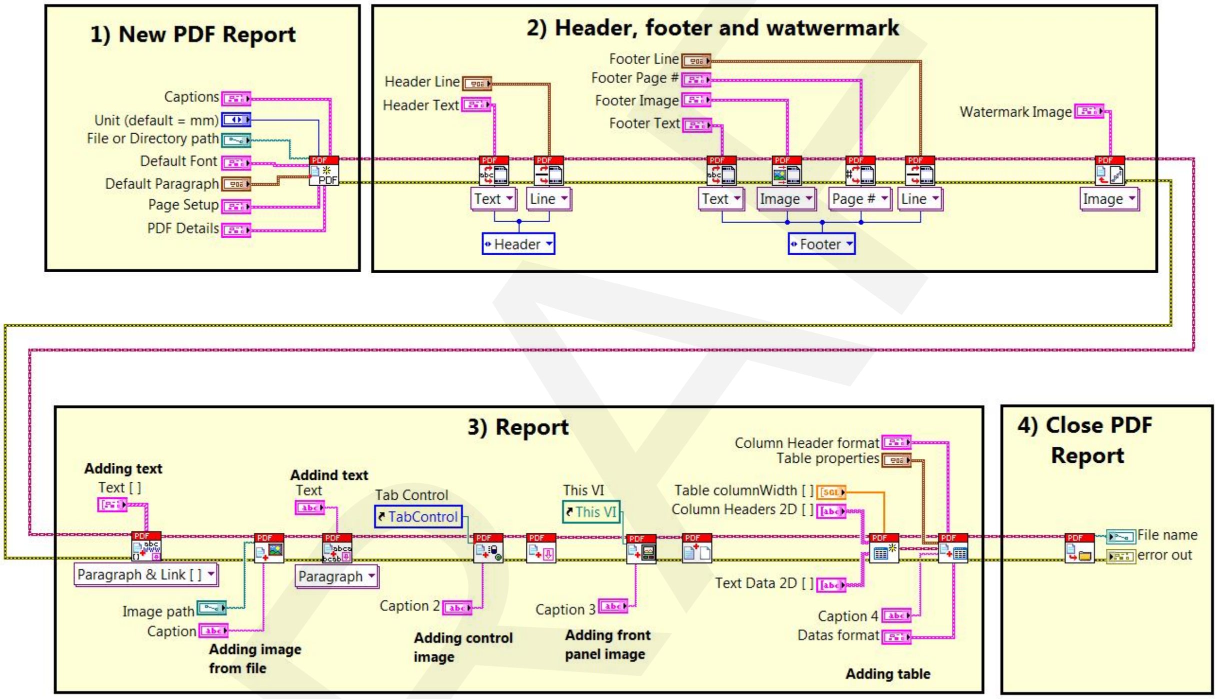


Figure 5: "Bloc Diagram" of a simplified PDF Report

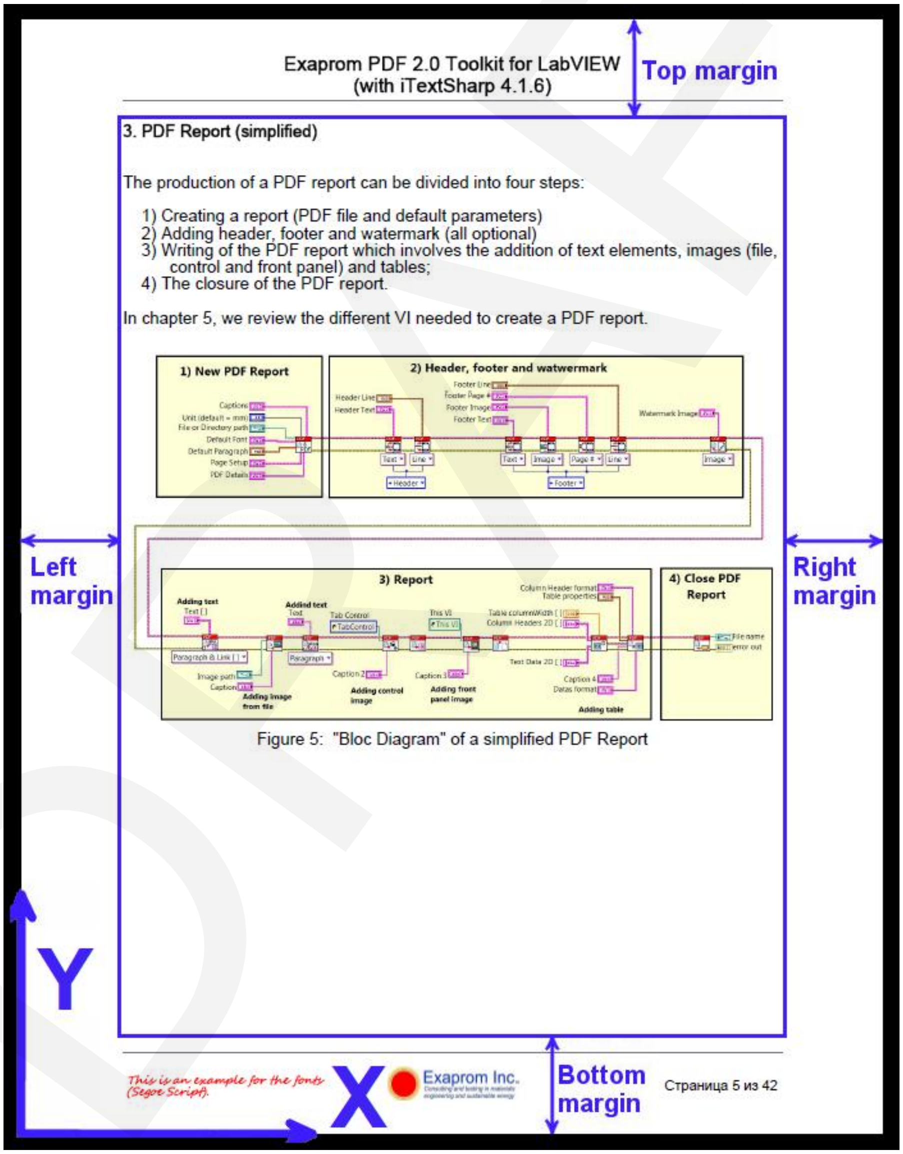
4. General

The library used to generate PDF reports is iTextSharp.

This library uses the point (72 points = 1 inch = 25.4 mm), but you will work with the unit you choose (inch or mm - section 5.4) unless the unit "point" is clearly indicated. The font is an exception: the unit is the point.

The origin of the page is the bottom left corner (see the figure below).

The text box is the page minus the margins (blue rectangle in the figure below).



Exaprom PDF 2.0 Toolkit for LabVIEW
(with iTextSharp 4.1.6)

3. PDF Report (simplified)

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Figure 5: "Bloc Diagram" of a simplified PDF Report

This is an example for the fonts (Segoe Script).

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Figure 6: Text zone and origin

5. The different palettes

5.1. The "Text" palette

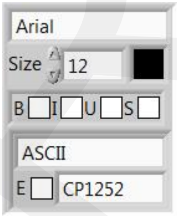
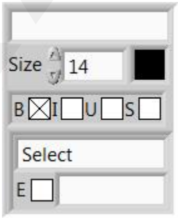
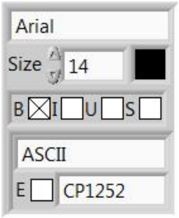
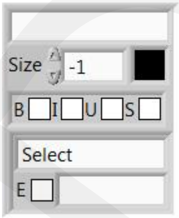
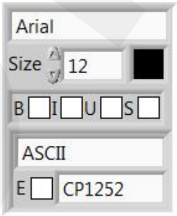
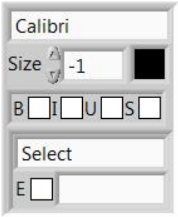
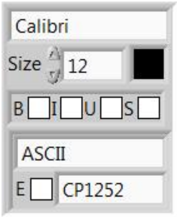
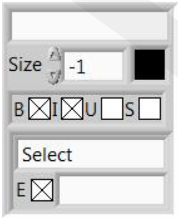
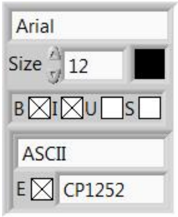
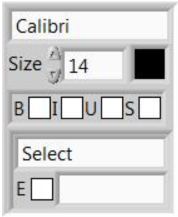
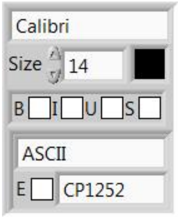
You have access the fonts contained in the directory C: \ Windows \ Fonts (you should check the copyrights). In addition, you have the fonts that come automatically with iTextSharp: Courier, Helvetica, Symbol, Times-Roman and ZapfDingbats.

When the PDF report was created, we have specified that the Default Font was Arial 12 points (bold, italic, underline and strikeout = F), Type&direction = ASCII and character encoding = CP1252 (Latin alphabet). This information is stored in the LV Class "PDF Report". The parameters of the font in all VI of the Text palette are:

- Name = empty string;
- Size = -1;
- Bold, Italic, Underline and Strikeout = F;
- Type&direction = Select;
- E (Embedded) = F;
- Encoding = empty string.

When the name of the font is left empty, the name of the default font is used. When the value of the font size is -1 then the default font size is used. When the value of Type&direction is left to Select, the Type&direction of the default font is used. When the value of the Encoding is left empty, the Encoding of the default font is used.

Table 1: Resulting font if "Default font" is Arial 12 points (bold, underline, Italic and strikeout = false), Type&direction = ASCII with Embedded = F and Encoding = CP1252.

Wired to terminal		In the PDF Report	Wired to terminal		In the PDF Report
nothing	→	 Arial Size 12 ■ B □ I □ U □ S □ ASCII E □ CP1252	 Size 14 ■ B ☒ I □ U □ S □ Select E □	→	 Arial Size 14 ■ B ☒ I □ U □ S □ ASCII E □ CP1252
 Size -1 ■ B □ I □ U □ S □ Select E □	→	 Arial Size 12 ■ B □ I □ U □ S □ ASCII E □ CP1252	 Calibri Size -1 ■ B □ I □ U □ S □ Select E □	→	 Calibri Size 12 ■ B □ I □ U □ S □ ASCII E □ CP1252
 Size -1 ■ B ☒ I ☒ U □ S □ Select E ☒	→	 Arial Size 12 ■ B ☒ I ☒ U □ S □ ASCII E ☒ CP1252	 Calibri Size 14 ■ B □ I □ U □ S □ Select E □	→	 Calibri Size 14 ■ B □ I □ U □ S □ ASCII E □ CP1252

This is an example for the fonts (Segoe Script).

The cluster font could be vertical or horizontal.

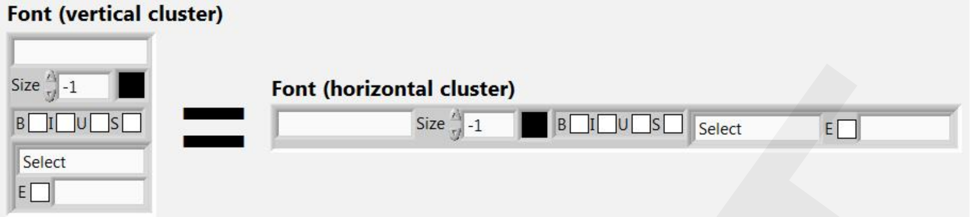


Figure 7: Vertical and horizontal cluster font

The character encoding can be ASCII or Unicode (UTF-16). The writing directions (only for Unicode) are:

- UTF-16 "UTF-16 characters, left to right writing";
- UTF-16 (default) "Use the default run direction";
- UTF-16 (LTR) "Use bidirectional reordering with a left-to-right preferential run direction";
- UTF-16 (RTL) "Use bidirectional reordering with a right-to-left preferential run direction".

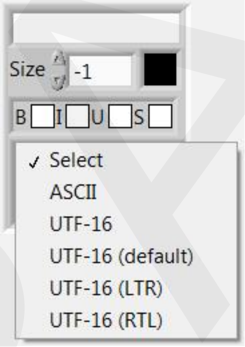
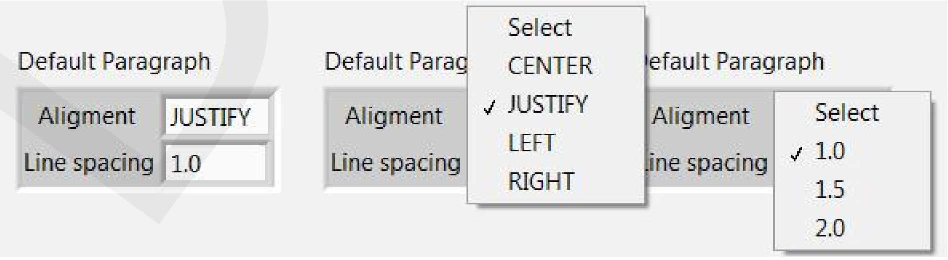


Figure 8: Text Types (ASCII or Unicode) and writing directions

When the PDF Report was created, we specified that the default alignment was "JUSTIFY" and the default line spacing was 1.0. This information is also stored in the LV Class "PDF Report".

When the alignment is left to "Select" than the default alignment is used. When the spacing is left to "Select" than the default line spacing is used.


Default Paragraph

Aligment: JUSTIFY

Line spacing: 1.0

Figure 9: Alignment and line spacing

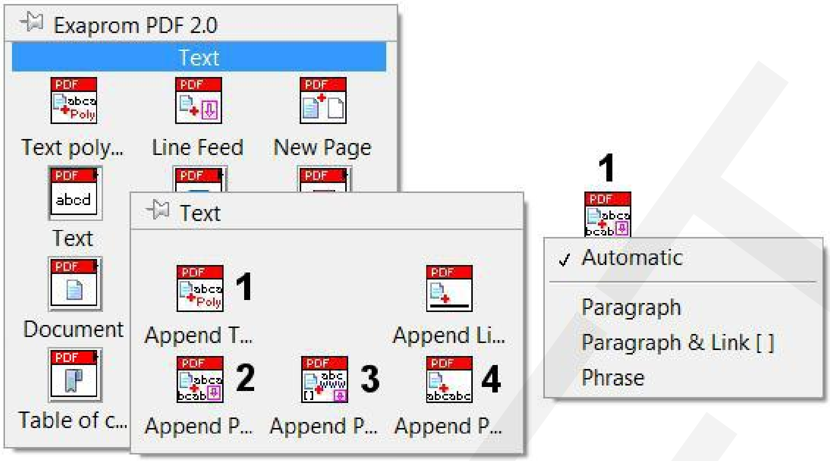


Figure 10: Text palette and the VI "Append Text polymorphic.vi"

There are three VIs to add text, and they are grouped in the VI "Append Text polymorphic.vi" (number "1" in the previous figure).

With the first, "Append Paragraph.vi" (number "2"), you can add text as paragraphs and the text is automatically terminated with a line feed.

The second or "Append Paragraph & Link [ ]. Vi" (number "3"), adds a sequence of paragraphs with the particularity that it is possible to associate a link (http://www.mywebsite.com/ ou mailto:name@example.com) with the text, placed between the tags < a> </ a>.

Furthermore, it is possible with "Append Paragraph.vi" and "Append Paragraph & Link [ ]. Vi" to insert images in a paragraph with the tag <img src="Image name"/>. This tag allows you to insert the image "Arrow.jpg" like this ➡. To insert the image "Logo E.jpg" with a link Exaprom Inc. Consulting and testing in materials engineering and sustainable energy you should use "Append Paragraph & Link [ ].vi". All these paragraphs are automatically terminated with a line Feed.

The third one, "Append Phrase.vi" (number "4"), adds a phrase but without a line feed and with a left alignment. In addition, except for "Append Phrase.vi", it is possible to have a paragraph indentation (left and right).

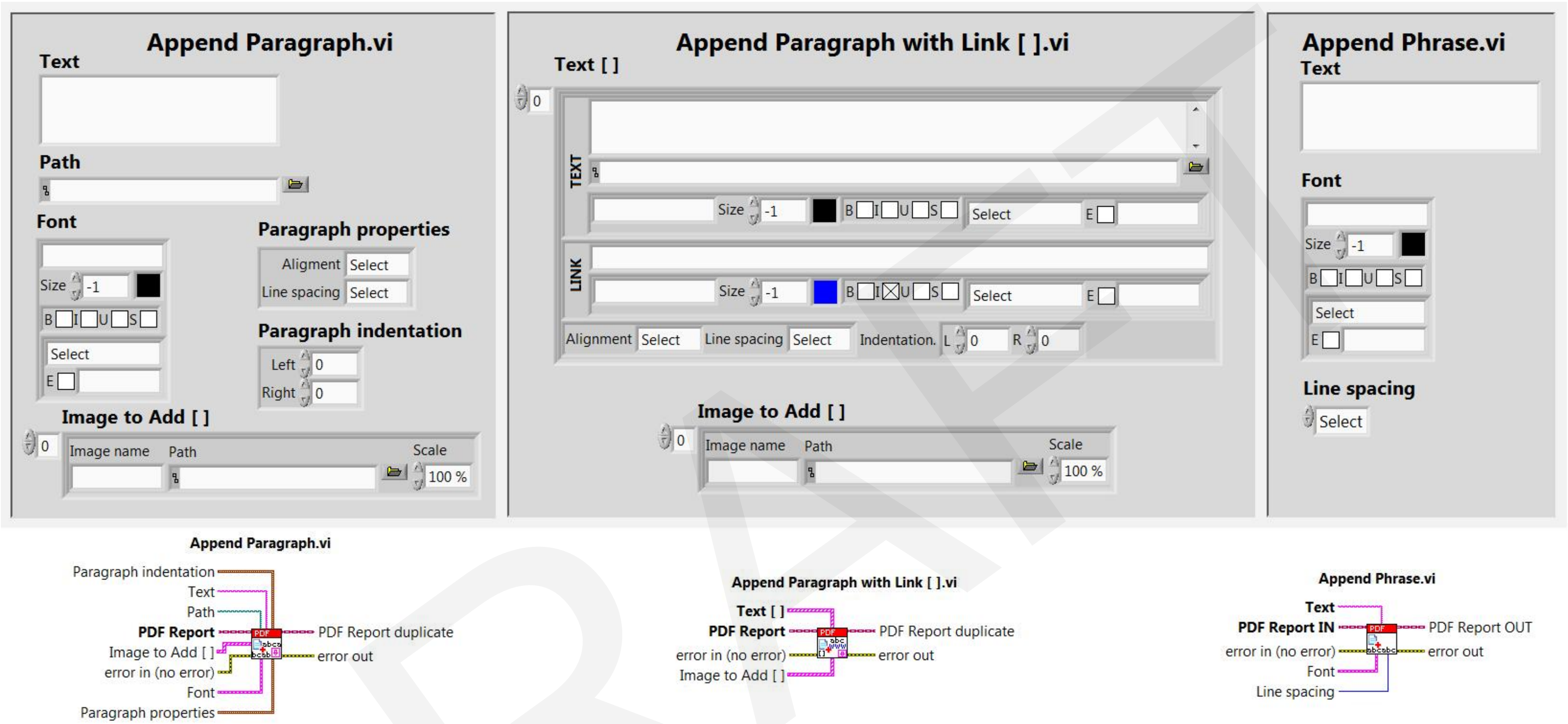


Figure 11: The main variables for the different VIs of "Append Text polymorphic.vi"

5.2. The "Image" palette

Images placed in the PDF can be reduced or enlarged, but it's only a matter of view: they will always occupy the same space in the PDF file.

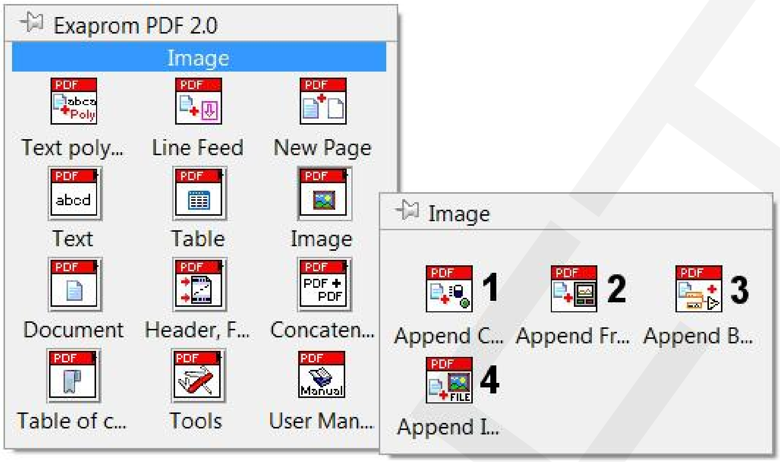


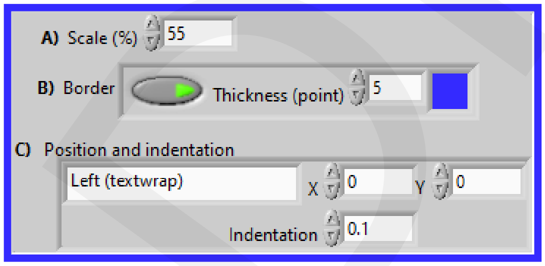
Figure 12: The VIs to insert images in PDF documents (this image was added with "Append Image.vi")

The Image palette has 4 VIs :

1)"Append Control Image.vi ";
2)"Append Front Panel Image.vi".
3)"Append Block Diagram Image.vi ";
4)"Append Image File.vi".

We have at the following figure the controls for the properties of the image (this image has been added with "Append Control Image.vi). We can reduce or enlarge the size of the image (Scale percent). If the image is bigger than the text zone (page size minus the margins), the size will be adjusted automatically to fit.

We can choose the horizontal position of the image, as long as we have not added a caption, because in this case, it is always centered horizontally.



A) Scale (%) 55

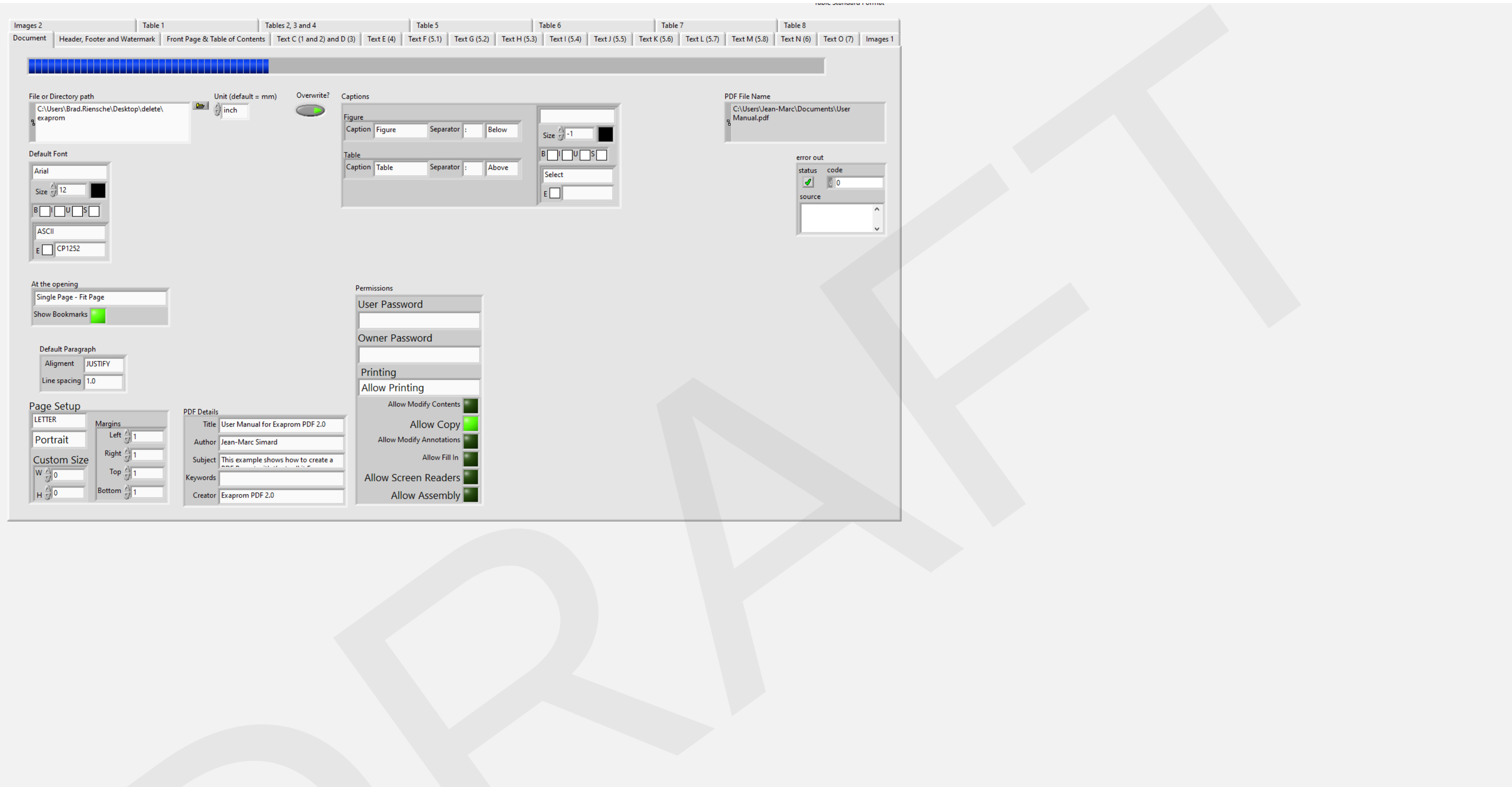
B) Border Thickness (point) 5

C) Position and indentation

Left (textwrap) X 0 Y 0

Indentation 0.1

The available choices are:
1) Absolute (X, Y) in mm;
2) Left;
3) Center;
4) Right;
5) Left (TextWrap)
6) Right (TextWrap).
"Left (TextWrap)" means the image is placed left and the text is placed to the right. "Right (TextWrap)" means that the image is placed to the right, and the text is placed to the left. The indentation works only with "TextWrap" and it is the horizontal space that we leave between the image and the text. We can also choose to put a border to the image.



File or Directory path: C:\Users\Brad.Riensche\Desktop\delete\exaprom

Unit (default = mm): inch

Overwrite? ●

Captions

Figure — Caption: Figure | Separator: : | Below

Table — Caption: Table | Separator: : | Above

Size: -1 ■

B □ I □ U □ S □

Select

E □

PDF File Name: C:\Users\Jean-Marc\Documents\User Manual.pdf

error out

status	code
✓	0

source

Default Font

Arial

Size: 12 ■

B □ I □ U □ S □

ASCII

E □ CP1252

At the opening: Single Page - Fit Page

Show Bookmarks 🟩

Permissions

User Password

Owner Password

Printing: Allow Printing

Allow Modify Contents ■

Allow Copy 🟩

Allow Modify Annotations ■

Allow Fill In ■

Allow Screen Readers ■

Allow Assembly ■

Default Paragraph

Aligment: JUSTIFY

Line spacing: 1.0

Page Setup

LETTER

Portrait

Custom Size

W: 0

H: 0

Margins

Left: 1

Right: 1

Top: 1

Bottom: 1

PDF Details

Title: User Manual for Exaprom PDF 2.0

Author: Jean-Marc Simard

Subject: This example shows how to create a

Keywords:

Creator: Exaprom PDF 2.0

Figure 13: Font Panel Image (this image was added with "Append Front Panel Image.vi")

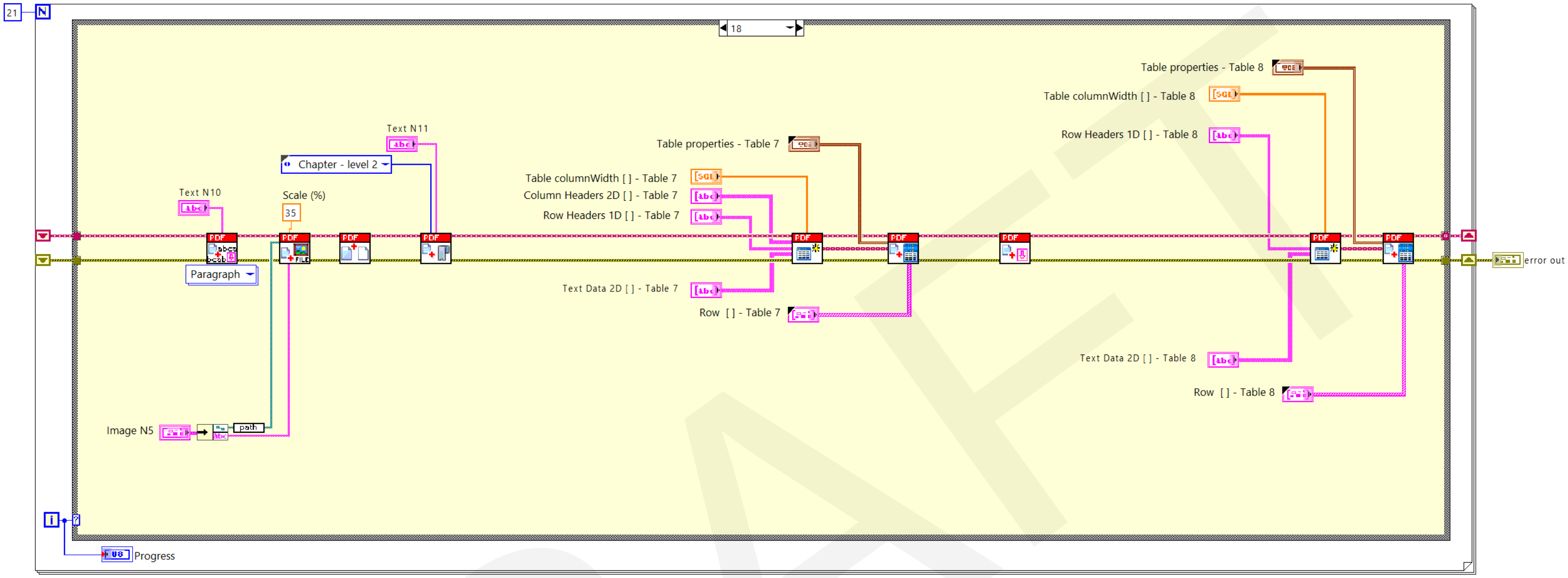

21
N
18
Table properties - Table 8
Table columnWidth [ ] - Table 8
Row Headers 1D [ ] - Table 8
Text N11
Table properties - Table 7
Chapter - level 2
Table columnWidth [ ] - Table 7
Column Headers 2D [ ] - Table 7
Row Headers 1D [ ] - Table 7
Text N10
Scale (%)
35
PDF
Paragraph
error out
Text Data 2D [ ] - Table 7
Row [ ] - Table 7
Text Data 2D [ ] - Table 8
Row [ ] - Table 8
Image N5
path
i
Progress

Figure 14: Block Diagram Image (this image was added with "Append Block Diagram Image.vi")

5.3. The "Table" palette

Adding a table is done in two steps: first, create the table with "Create Table.vi" and then add the table with "Append Table.vi" or "Append Customized Table.vi".

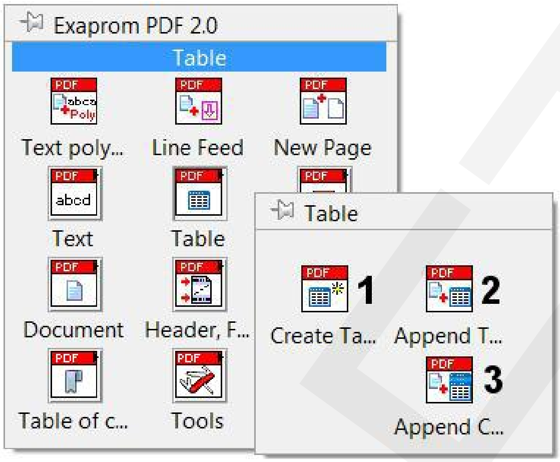


Figure 15: The three VIs to create a table

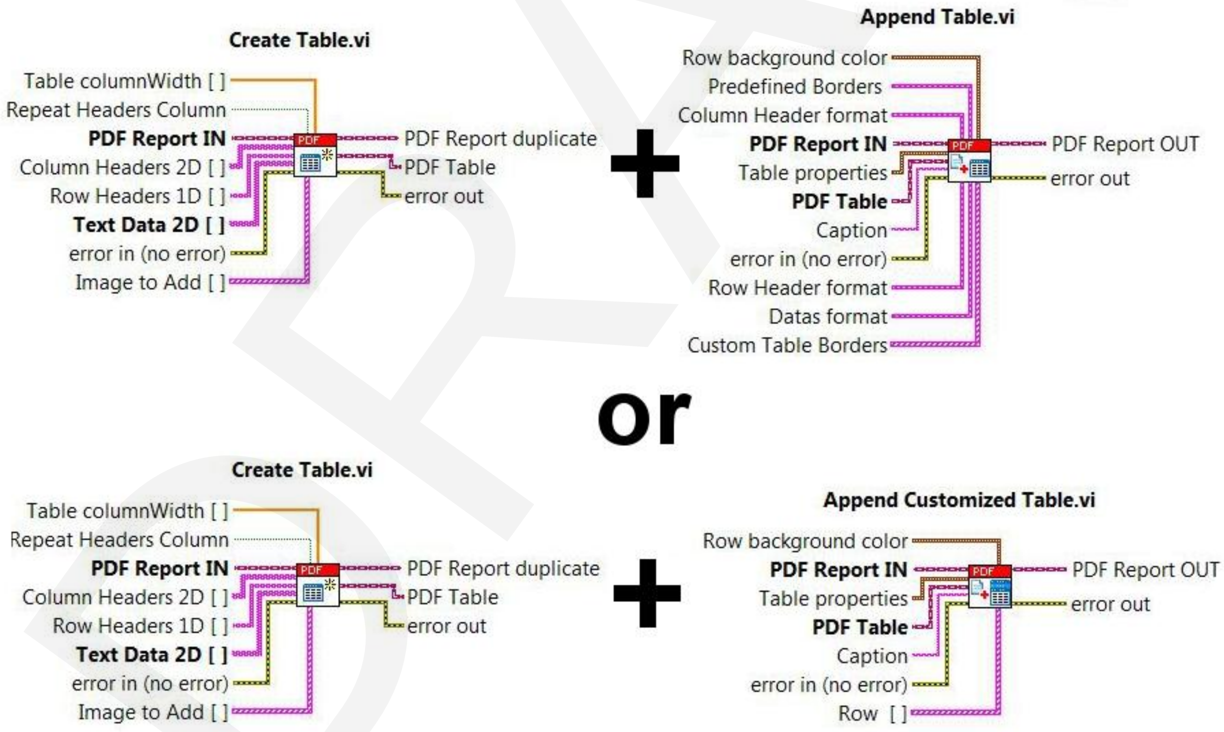


Figure 16: Table creation

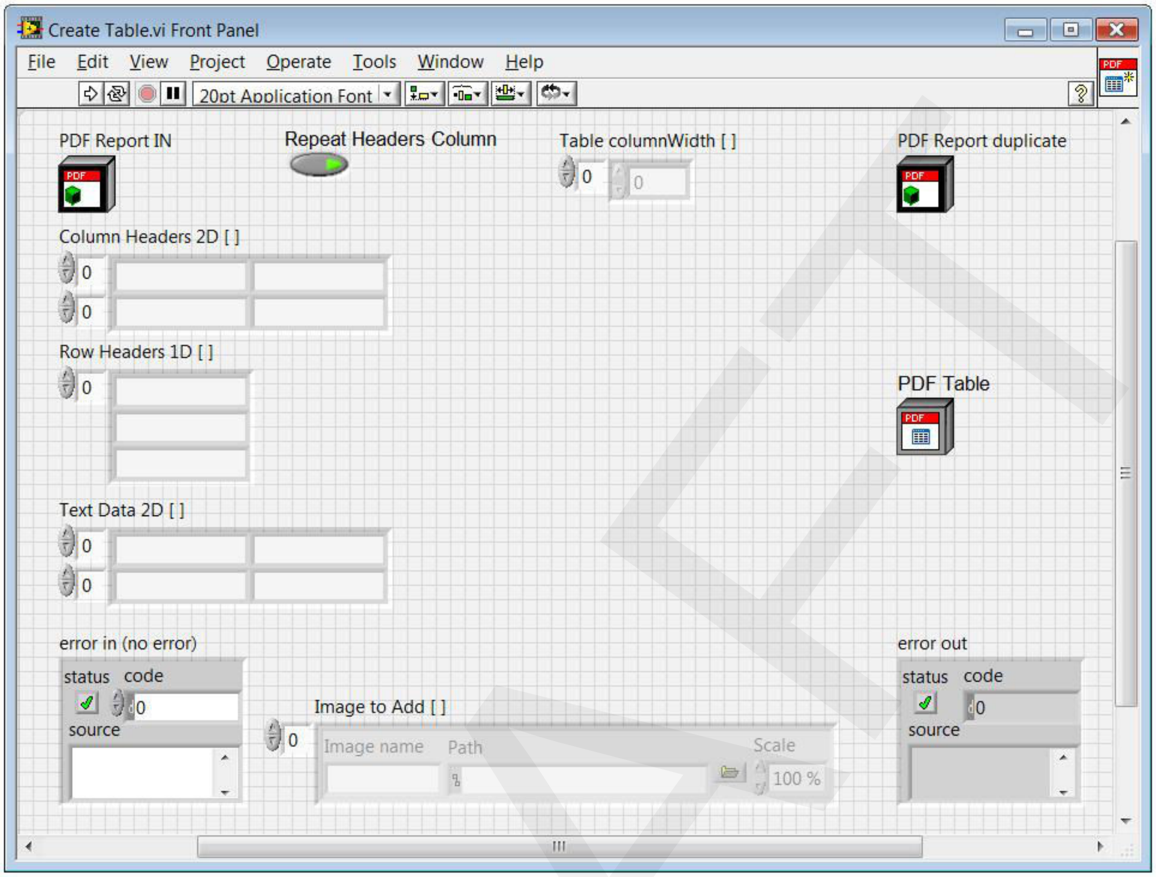


Figure 17: Create Table.vi and default values

To create a table, there are six variables, including five optional:

1) Table columnWidht [ ] (optional);
2) Repeat Headers Column (optional)
3) Column Headers 2D [ ] (optional);
4) Row Headers 1D [ ] (optional);
5) Text Data 2D [ ] (required);
6) Image to Add [ ] (optional).

The first specifies the width of each column. The second offers the possibility, if the table has more than one page, to repeat the column headers on each new page.   The third is the column headers. The fourth is the row headers. The fifth is the text datas while the last one allows you to insert images in a table cell. It should be noted that a cell can contain either text or an image, but not both.

The number of columns is defined by the number of columns after "Column Headers 2D [ ]", "Row Headers 1D" and "Text Data 2D [ ]" are concatenated.

If the variable "Table columnWidht [ ]" is not wired, then the width of each column will be identical and equal to the width of the page (minus the margins) divided by the number of columns (Table 2 versus Table 3 at page 21). If the variable "Table columnWidht []" has more elements than the number of columns, only the first elements will be used. If the variable "Table columnWidht [ ]" has fewer elements than the number of columns,

columns of 25 mm will be added.

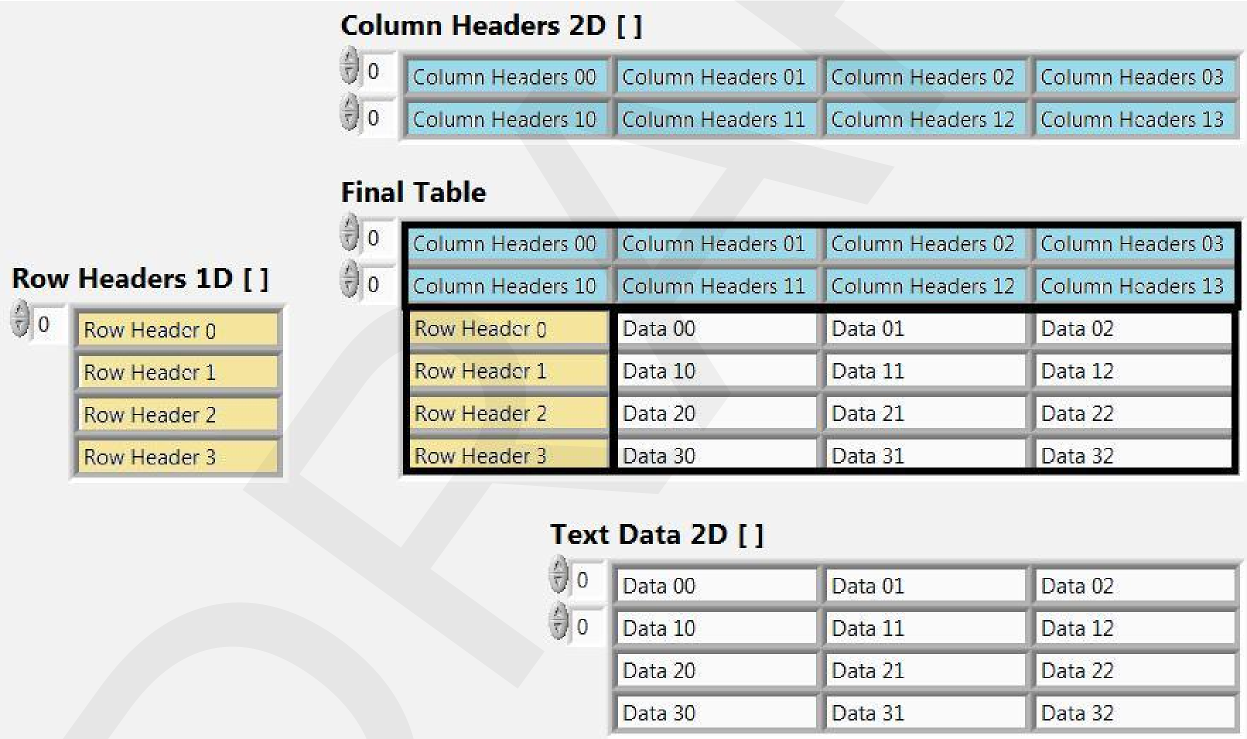
If the total width of the table is larger than the width of the text zone, then the width of each column will be proportionately reduced so that the table width equals the width of the text zone.

Like for images, we can choose the horizontal position if we have not added any caption, because in this case, the table is always centered horizontally.

If the total width of the table is larger than the width of the text zone, then the width of each column will be proportionately reduced so that the table width equals the width of the text zone.

Like for images, we can choose the horizontal position if we have not added any caption, because in this case, the table is always centered horizontally.

The final table generated with "Column Headers 2D [ ]", "Row Headers 1D [ ]" and "Text Data 2D [ ]" appears at the following figure.



Column Headers 2D [ ]

Column Headers 00	Column Headers 01	Column Headers 02	Column Headers 03
Column Headers 10	Column Headers 11	Column Headers 12	Column Headers 13

Final Table

Column Headers 00	Column Headers 01	Column Headers 02	Column Headers 03
Column Headers 10	Column Headers 11	Column Headers 12	Column Headers 13
Row Header 0	Data 00	Data 01	Data 02
Row Header 1	Data 10	Data 11	Data 12
Row Header 2	Data 20	Data 21	Data 22
Row Header 3	Data 30	Data 31	Data 32

Row Headers 1D [ ]

Row Header 0
Row Header 1
Row Header 2
Row Header 3

Text Data 2D [ ]

Data 00	Data 01	Data 02
Data 10	Data 11	Data 12
Data 20	Data 21	Data 22
Data 30	Data 31	Data 32

Figure 18: Final table generated

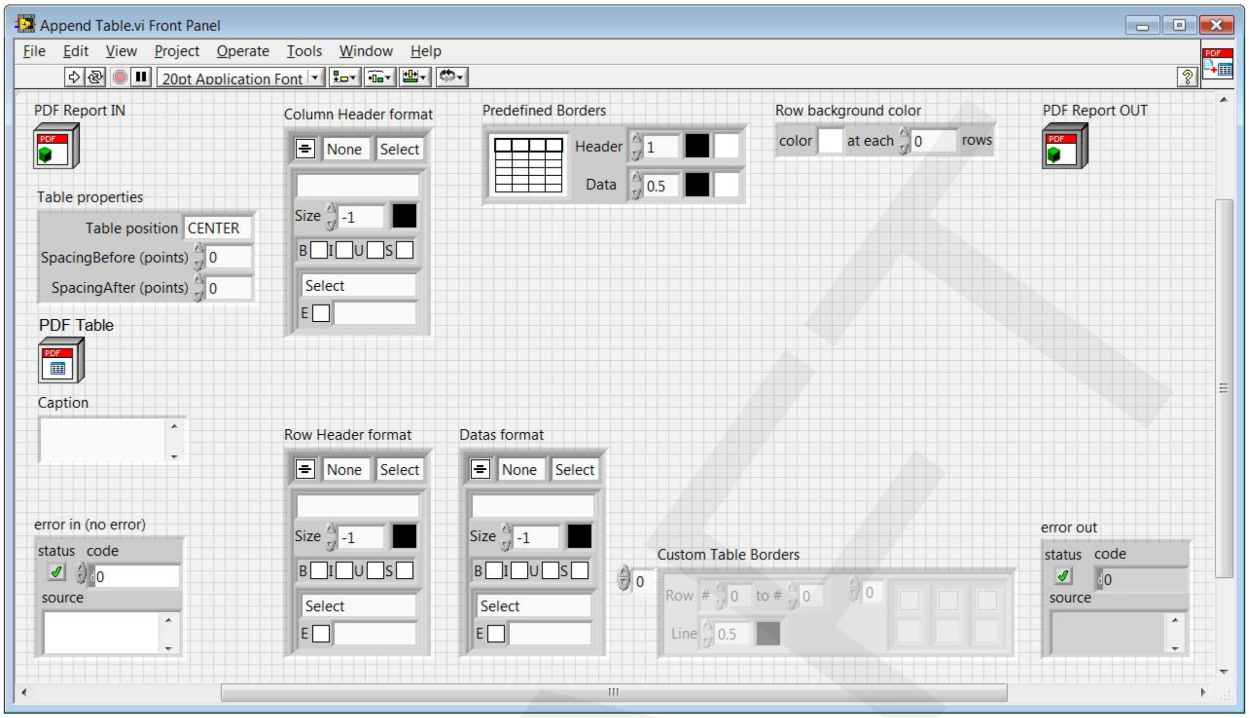


Table properties
Table position CENTER
SpacingBefore (points) 0
SpacingAfter (points) 0

Predefined Borders: Header 1; Data 0.5

Row background color: color, at each 0 rows

Column Header format / Row Header format / Datas format: Size -1

Custom Table Borders: 0; Row # 0 to # 0; 0; Line 0.5

error in (no error): status ✓, code 0

error out: status ✓, code 0

Figure 19: Append Table.vi and default values

When we add the table to the document with "Append Table.vi" we have , if we exclude "PDF Table", eight variables (all optional):

1) Row background color
2) Predefined Borders;
3) Column Header Format;
4) Table properties;
5) Caption;
6) Row Header Format;
7) Datas Format;
8) Custom Table Borders.

The first offer the possibility to add a background color at each X row. The second offers a choice for types of borders available: predefined and custom. If the custom type is chosen, then it must use the variable "Custom Table Borders" to define the borders of table cells.

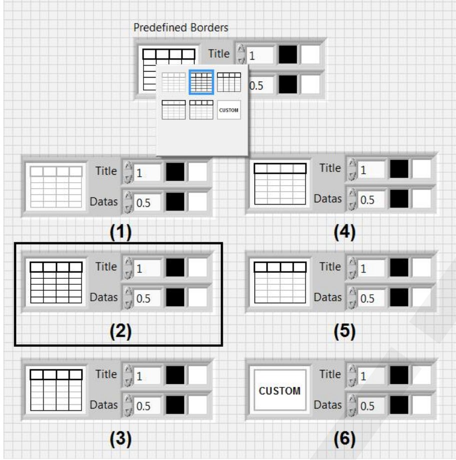


Figure 20: Choice of table borders (the default is framed).

The third, the sixth and the seventh are the cell format for the column headers, the row headers and the data respectively.

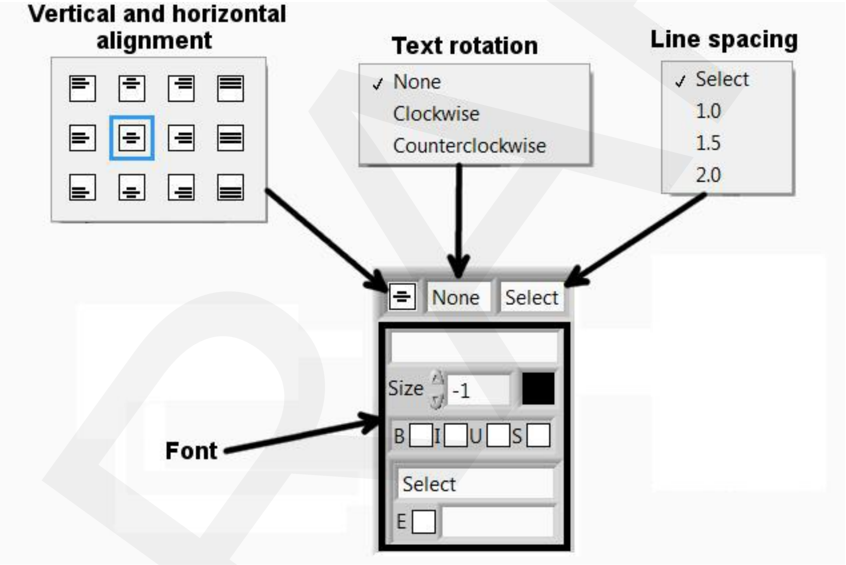


Figure 21: Cell format for the column headers, the row headers and the data

The variable "Costum Borders", column by column, defines the type of border for each cell. In iTextSharp there are 16 options, ranging from no line to a line on all four sides. We can also define the background color of each cell.

The variable Row # 0 to # 0 is used to format the table, row by row. A value of -2 indicates the penultimate row. For example, Row # 0 to # -2 iindicates that formatting is applied to row 0 to the penultimate row. A value of -1 indicates the last row. For example, Row # -1 to # -1 indicates that formatting is applied to the last row.

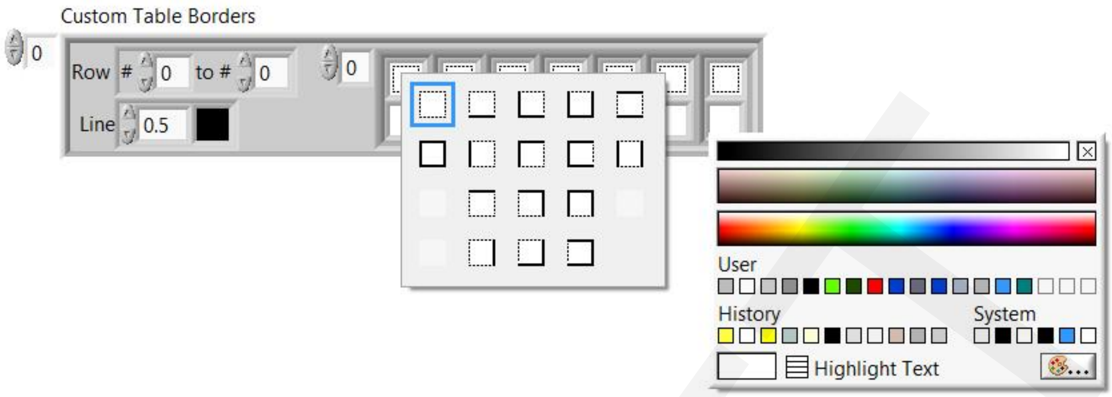
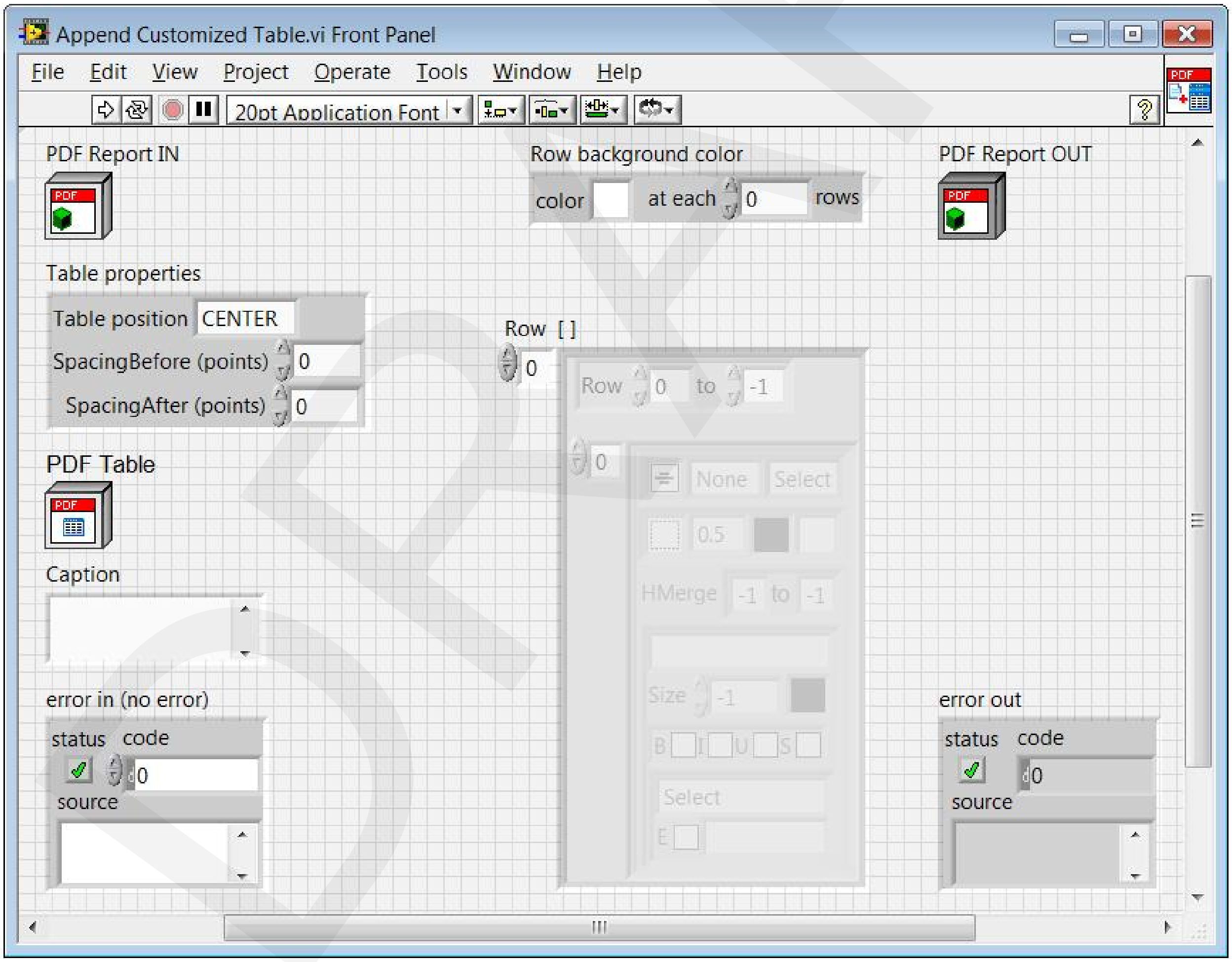


Figure 22: Custom borders

We can also append a table with "Append Customized Table.vi". It is not really intuitive, but you have more flexibility like horizontal merging (see table 5).



Row background color: color □ at each 0 rows

Table properties

Table position CENTER

SpacingBefore (points) 0

SpacingAfter (points) 0

Row [ ] 0: Row 0 to -1; 0; 0.5; HMerge -1 to -1; Size -1

error in (no error): status ✓ code 0 source

error out: status ✓ code 0 source

Figure 23: Append Customized Table.vi and default values

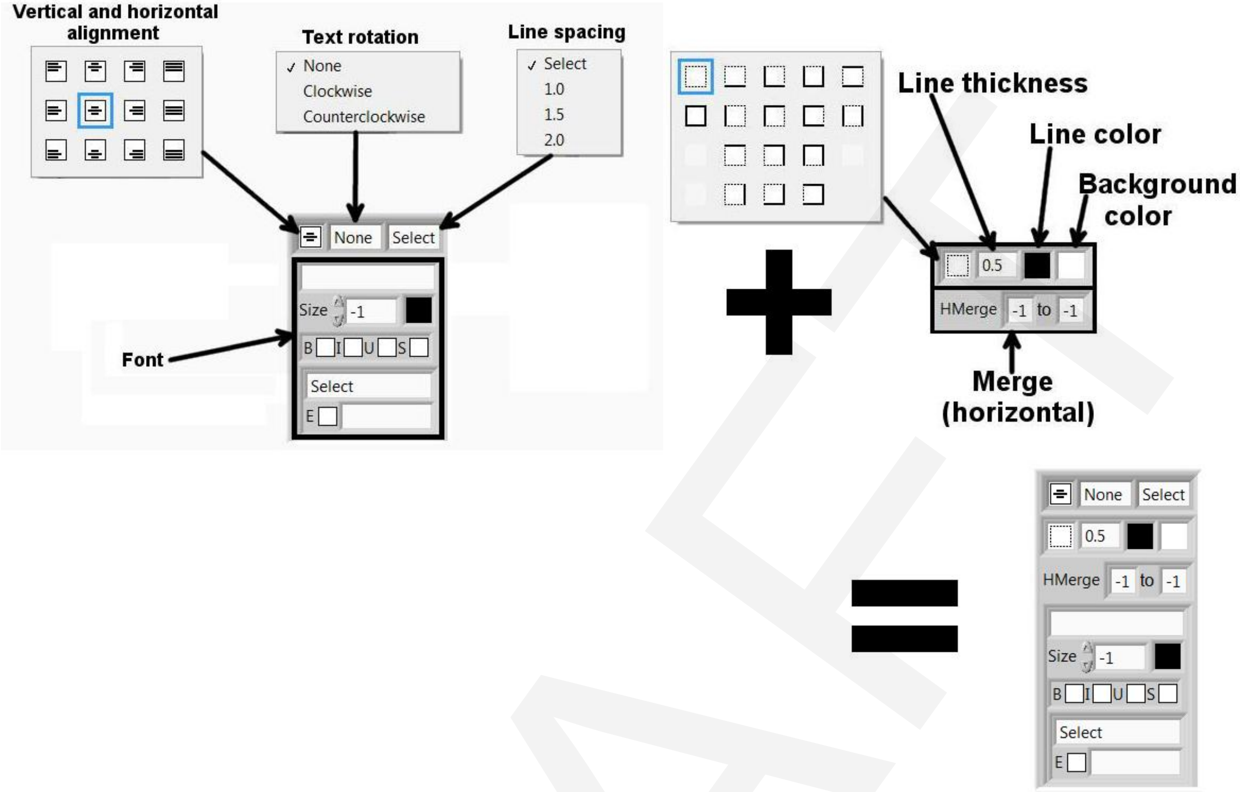


Figure 24: Specific control for "Append Customized Table.vi" at the right bottom

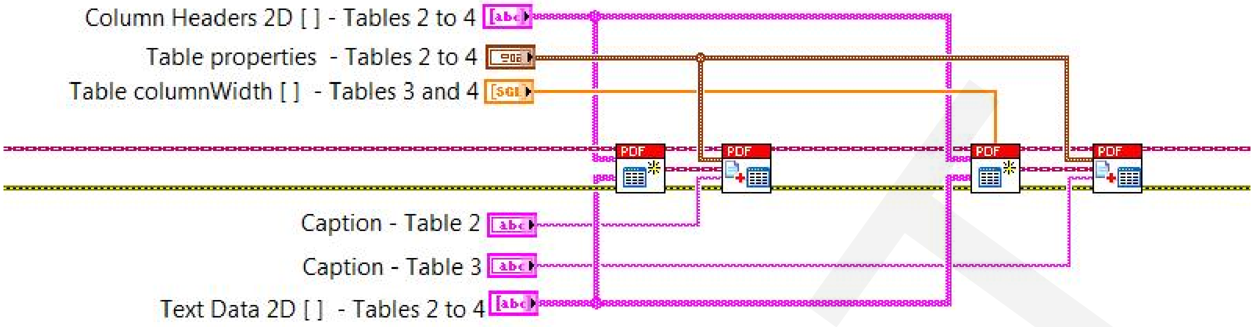

Column Headers 2D [ ] - Tables 2 to 4
Table properties - Tables 2 to 4
Table columnWidth [ ] - Tables 3 and 4
Caption - Table 2
Caption - Table 3
Text Data 2D [ ] - Tables 2 to 4
PDF
PDF
PDF
PDF

Figure 25: Block diagram for table 2 and 3

Table 2: Example of a table with the variable columnWidth [ ] "not wired

Time	Thermocouple 1 (°C)	Thermocouple 2 (°C)	Thermocouple 3 (°C)
09:59:42	214.8	212.3	216.1
09:59:52	215.0	212.4	217.8
10:00:02	215.0	212.0	217.7
10:00:12	214.1	211.6	217.2
10:00:22	214.2	212.6	217.3
10:00:32	214.6	212.5	217.8
10:00:42	214.6	212.5	217.8
10:00:52	214.8	212.5	216.3
10:01:02	215.6	211.7	216.7
10:01:12	214.6	211.1	218.0

Table 3: Example of a table with the variable columnWidth [ ] "wired

Time	Thermocouple 1 (°C)	Thermocouple 2 (°C)	Thermocouple 3 (°C)
09:59:42	214.8	212.3	216.1
09:59:52	215.0	212.4	217.8
10:00:02	215.0	212.0	217.7
10:00:12	214.1	211.6	217.2
10:00:22	214.2	212.6	217.3
10:00:32	214.6	212.5	217.8
10:00:42	214.6	212.5	217.8
10:00:52	214.8	212.5	216.3
10:01:02	215.6	211.7	216.7
10:01:12	214.6	211.1	218.0

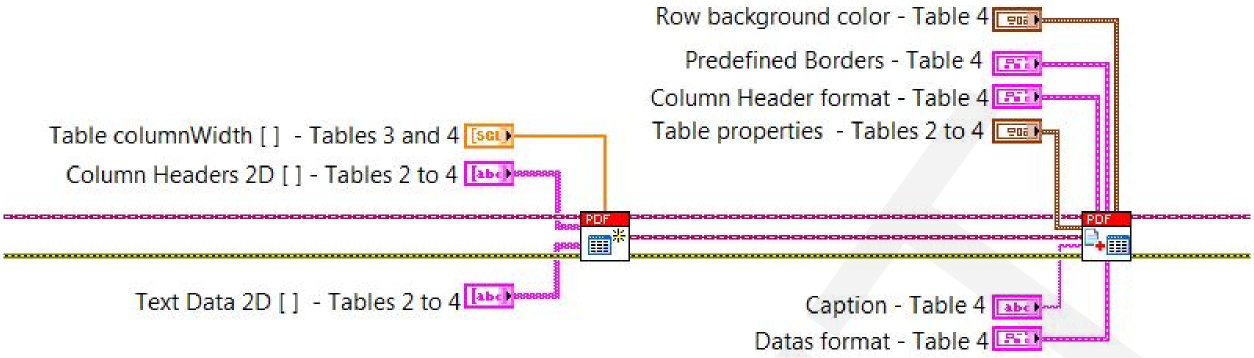

Row background color - Table 4
Predefined Borders - Table 4
Column Header format - Table 4
Table properties - Tables 2 to 4
Table columnWidth [ ] - Tables 3 and 4
Column Headers 2D [ ] - Tables 2 to 4
Text Data 2D [ ] - Tables 2 to 4
Caption - Table 4
Datas format - Table 4
PDF
PDF

Figure 26: Block diagram for table 4

Table 4: Example with Row Background color

Time	Thermocouple 1 (°C)	Thermocouple 2 (°C)	Thermocouple 3 (°C)
09:59:42	214.8	212.3	216.1
09:59:52	215.0	212.4	217.8
10:00:02	215.0	212.0	217.7
10:00:12	214.1	211.6	217.2
10:00:22	214.2	212.6	217.3
10:00:32	214.6	212.5	217.8
10:00:42	214.6	212.5	217.8
10:00:52	214.8	212.5	216.3
10:01:02	215.6	211.7	216.7
10:01:12	214.6	211.1	218.0

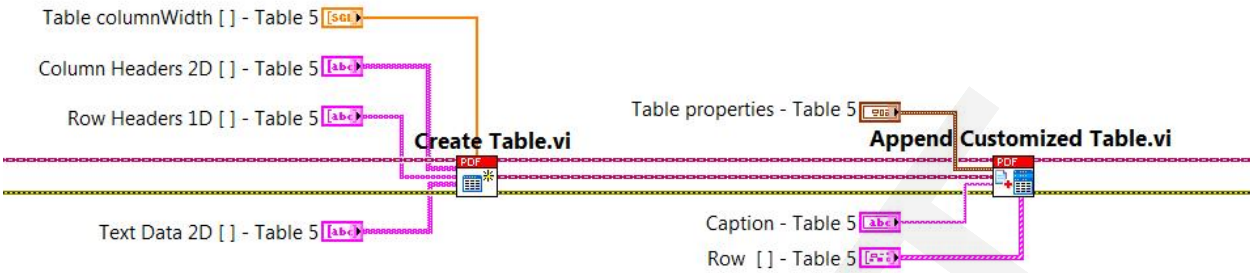


Table columnWidth [ ] - Table 5
SGL
Column Headers 2D [ ] - Table 5
abc
Row Headers 1D [ ] - Table 5
abc
Create Table.vi
PDF
Text Data 2D [ ] - Table 5
abc
Table properties - Table 5
Append Customized Table.vi
PDF
Caption - Table 5
abc
Row [ ] - Table 5

Figure 27: Block diagram for table 5

Table 5: Example with merge cell

	Furnace (°C)			Crucible (°C)		
	Thermocouple 1	Thermocouple 2	Thermocouple 3	Thermocouple 4	Thermocouple 5	Thermocouple 6
Test 1	722.2	753.0	714.6	647.7	649.3	644.9
Test 2	722.9	751.2	711.4	646.4	652.7	646.9
Test 3	721.8	753.0	713.0	645.3	652.5	645.4
Test 4	724.2	750.9	711.6	648.9	651.1	644.0
Test 5	723.7	752.4	710.7	648.4	650.6	645.3
Test 6	723.9	753.8	712.2	645.3	648.9	646.8
Test 7	722.6	754.1	710.5	645.7	651.0	645.8
Test 8	724.6	751.2	713.8	648.8	648.6	644.4
Test 9	722.9	750.7	710.8	645.7	649.7	647.2
Test 10	721.8	755.0	713.7	646.8	652.2	644.5
Mean	**723.1**	**752.5**	**712.2**	**646.9**	**650.7**	**645.5**

5.4. The "Document" palette

Document palette consists of 6 VIs:

a)New PDF.vi;
b)Close PDF.vi;
c)Append New Page.vi;
d)Set Page Size.vi;
e)Set Default Font.vi;
f)Print PDF.vi.

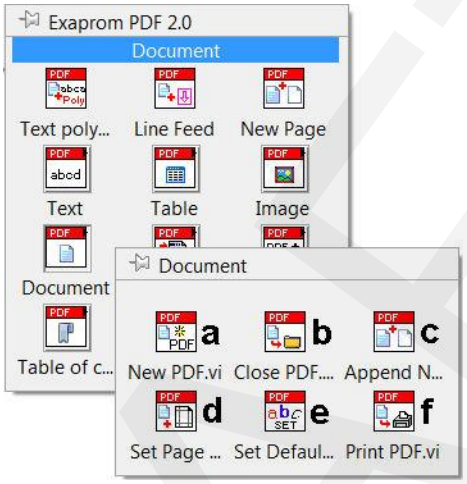


Figure 28: VIs of "Document" palette

a) Creating a new PDF report with "New PDF.vi"

The first step is to create a new PDF report. The variables in the PDF report are:

i) generic names for captions of figures and tables;
ii) the unit used;
iii) the directory or file name (full path) to use;
iv) the default font of the document;
v) the line spacing and the default alignment of the document;
vi) the format of the page;
vii) the metadata about the PDF file created;
viii) the file permissions;
ix) the opening of the PDF file generated.

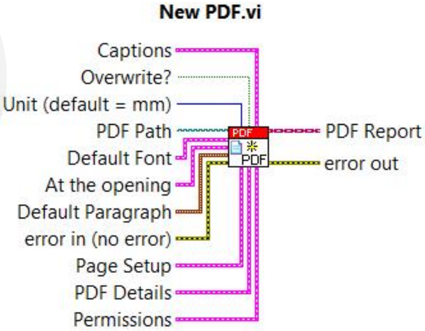
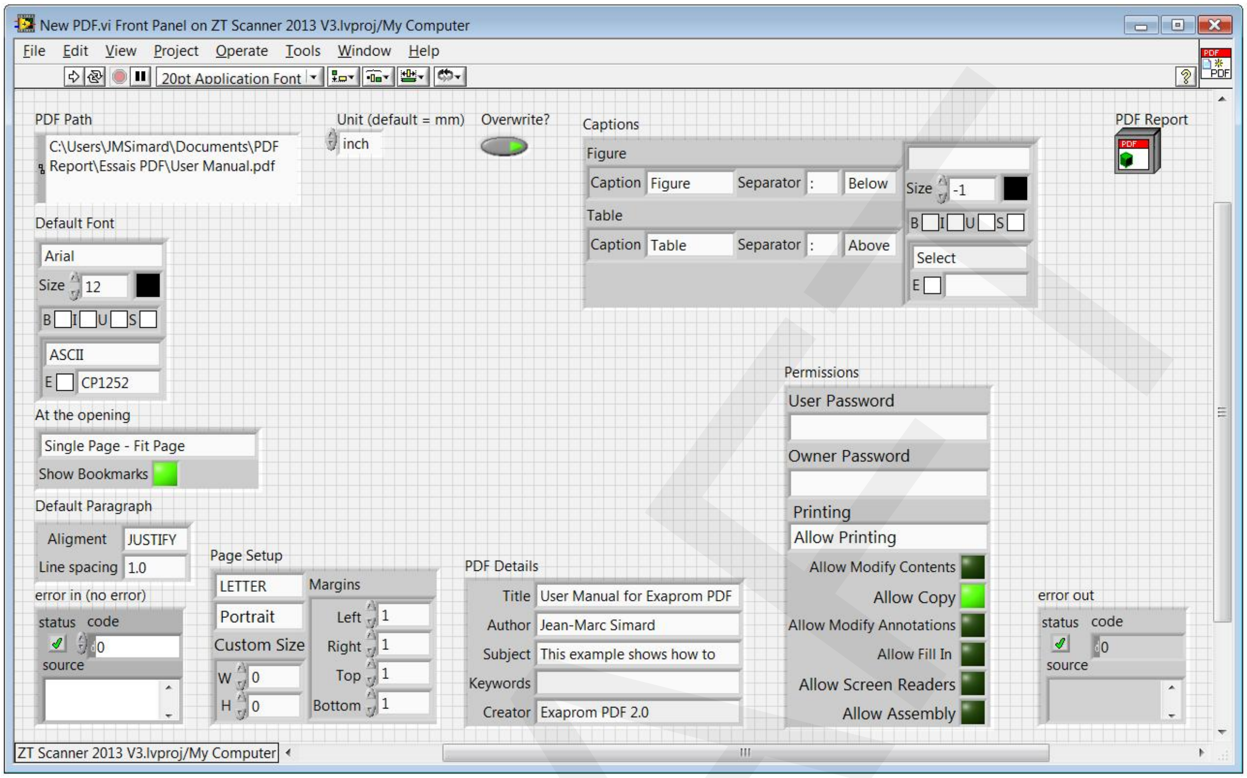


Figure 29: Variables for a new PDF report



New PDF.vi Front Panel on ZT Scanner 2013 V3.lvproj/My Computer

PDF Path: C:\Users\JMSimard\Documents\PDF Report\Essais PDF\User Manual.pdf

Unit (default = mm): inch

Overwrite?

Captions
Figure: Caption Figure, Separator :, Below
Table: Caption Table, Separator :, Above
Size -1
B □ I □ U □ S □
Select
E □

PDF Report

Default Font
Arial
Size 12
B □ I □ U □ S □
ASCII
E □ CP1252

At the opening
Single Page - Fit Page
Show Bookmarks

Default Paragraph
Aligment JUSTIFY
Line spacing 1.0

error in (no error)
status code 0
source

Page Setup
LETTER
Portrait
Custom Size
W 0
H 0
Margins
Left 1
Right 1
Top 1
Bottom 1

PDF Details
Title User Manual for Exaprom PDF
Author Jean-Marc Simard
Subject This example shows how to
Keywords
Creator Exaprom PDF 2.0

Permissions
User Password
Owner Password
Printing
Allow Printing
Allow Modify Contents
Allow Copy
Allow Modify Annotations
Allow Fill In
Allow Screen Readers
Allow Assembly

error out
status code 0
source

ZT Scanner 2013 V3.lvproj/My Computer

Figure 30: New PDF.vi and his default values

i) The generic name for captions

You can specify a generic name for figure captions and tables. If you write in Figure.Caption "Figure" and in Figure.Separator ":" then for each picture (or pictures) that you add a caption, it will be written into the PDF document: "Figure 1: Caption of Figure 1", " Figure 2: Caption of Figure 2" and so on. The numbering is automatic.
ii) Unit (default = mm)

The basic unit used throughout the PDF report (mm or inch)

iii) File path or directory

If you only specify the directory, a dialog box will appear when the program runs, asking for the file name to use.

iv) Default Font

This is the font (name, color, size and style) used in the document when no other font is specified. The font name is a string. The fonts available are those that appear in the directory "C: \ Windows \ Fonts". If you specify a font that is not available or misspelled, the font "Helvetica" will be substituted.

v) The line spacing and text alignment

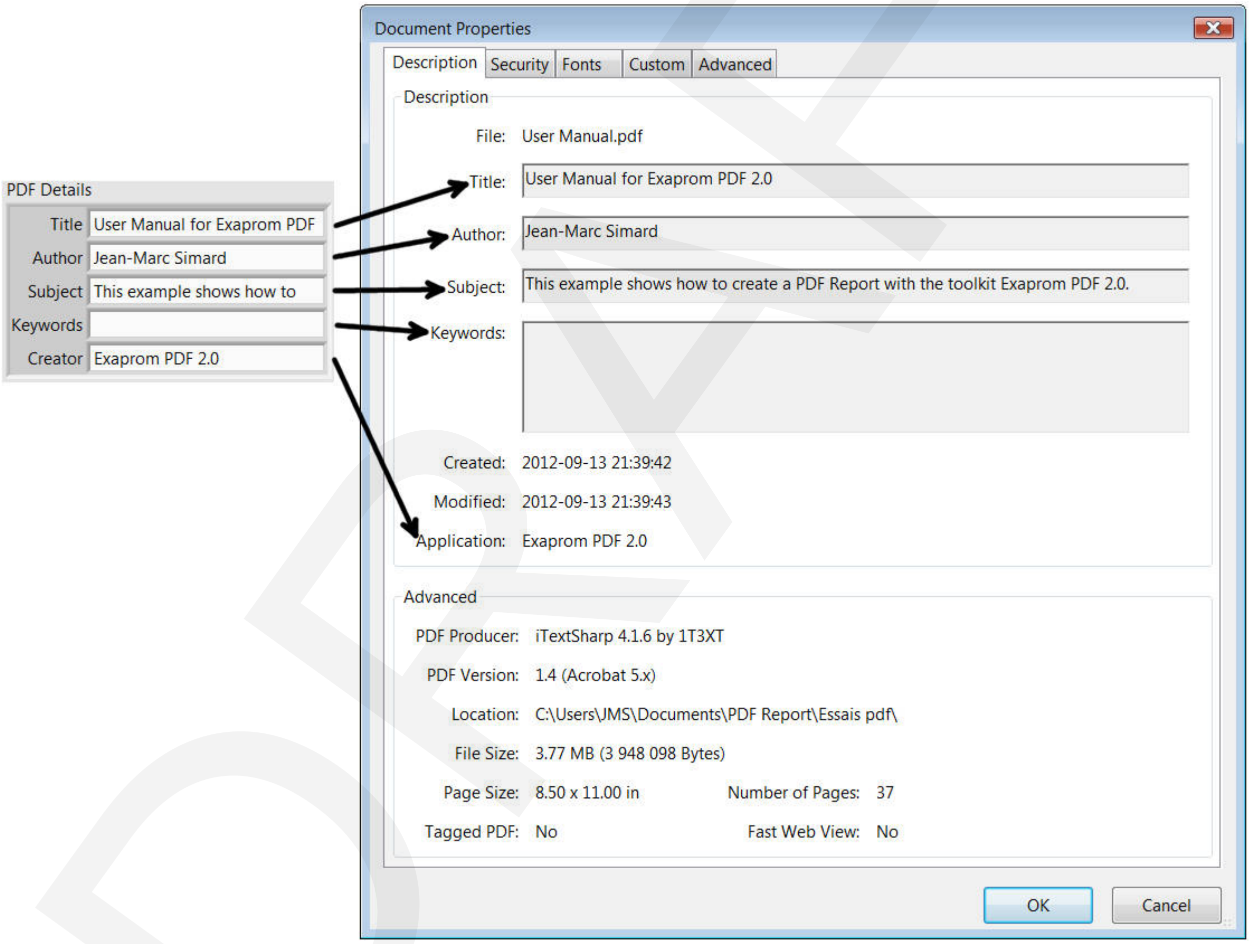
You have the choice of line spacing 1.0, 1.5 and 2.0. Text alignment can be: centered, justify, left or right.

vi) Page Setup

You choose the page size (default or not), orientation and margins. If the chosen format is "Custom", then you must specify the width X (mm or inch) and height Y (mm or inch). This format will be used in the document as you will not change the page size.

vii) The metadata of the PDF (PDF Details)

This is metadata that you see when you look after the properties from the PDF file that you created (File>>Properties and Description tab).



PDF Details

Title	User Manual for Exaprom PDF
Author	Jean-Marc Simard
Subject	This example shows how to
Keywords	
Creator	Exaprom PDF 2.0

Document Properties

Description | Security | Fonts | Custom | Advanced

Description

File: User Manual.pdf

Title: User Manual for Exaprom PDF 2.0

Author: Jean-Marc Simard

Subject: This example shows how to create a PDF Report with the toolkit Exaprom PDF 2.0.

Keywords:

Created: 2012-09-13 21:39:42

Modified: 2012-09-13 21:39:43

Application: Exaprom PDF 2.0

Advanced

PDF Producer: iTextSharp 4.1.6 by 1T3XT

PDF Version: 1.4 (Acrobat 5.x)

Location: C:\Users\JMS\Documents\PDF Report\Essais pdf\

File Size: 3.77 MB (3 948 098 Bytes)

Page Size: 8.50 x 11.00 in   Number of Pages: 37

Tagged PDF: No   Fast Web View: No

Figure 31: Metada (PDF Details)

viii) The file permissions

In the following table, you have the file permissions you can set with an owner password. The user password is for the opening of the file.

Table 6: Permissions from "Document management — Portable document format — Part 1: PDF 1.7 (PDF 32000-1:2008, page 61)"

Permission	Bit position	Meaning
Allow Degradated Printing	3	Print the document. Print the document (possibly not at the highest quality level, depending on whether bit 12 is also set).
Allow Modify Contents	4	Modify the contents of the document by operations other than those controlled by bits 6, 9, and 11.
Allow Copy	5	Copy or otherwise extract text and graphics from the document, including extracting text and graphics (in support of accessibility to users with disabilities or for other purposes). Copy or otherwise extract text and graphics from the document by operations other than that controlled by bit 10.
Allow Modify Annotations	6	Add or modify text annotations, fill in interactive form fields, and, if bit 4 is also set, create or modify interactive form fields (including signature fields).
Allow Fill In	9	Fill in existing interactive form fields (including signature fields), even if bit 6 is clear.
Allow Screen Readers	10	Extract text and graphics (in support of accessibility to users with disabilities or for other purposes).
Allow Assembly	11	Assemble the document (insert, rotate, or delete pages and create bookmarks or thumbnail images), even if bit 4 is clear.
Allow Printing	12	Print the document to a representation from which a faithful digital copy of the PDF content could be generated. When this bit is clear (and bit 3 is set), printing is limited to a low-level representation of the appearance, possibly of degraded quality.

ix) the opening of the PDF file generated

How the PDF file will open.

b) Closing the PDF report with "Close PDF.vi"

This VI is used to complete the writing of the report PDF. He closes various references needed to write a PDF file, it writes the header, footer and watermark (if needed) and closes the PDF.

c) Adding a page break with "Append New Page.vi"

This VI adds a page break in PDF document.

d) Adding a section break (new page) by changing the properties of the page with "Page Set Size.vi"

This VI adds a page break in PDF document and can change the properties of the new page. These new properties apply to all new pages as long you will not use "Set Page Size.vi.

e) Change the default font with "Set Default Font.vi"

This VI changes the default font.

f) Printing of the PDF report with "Print PDF.vi"

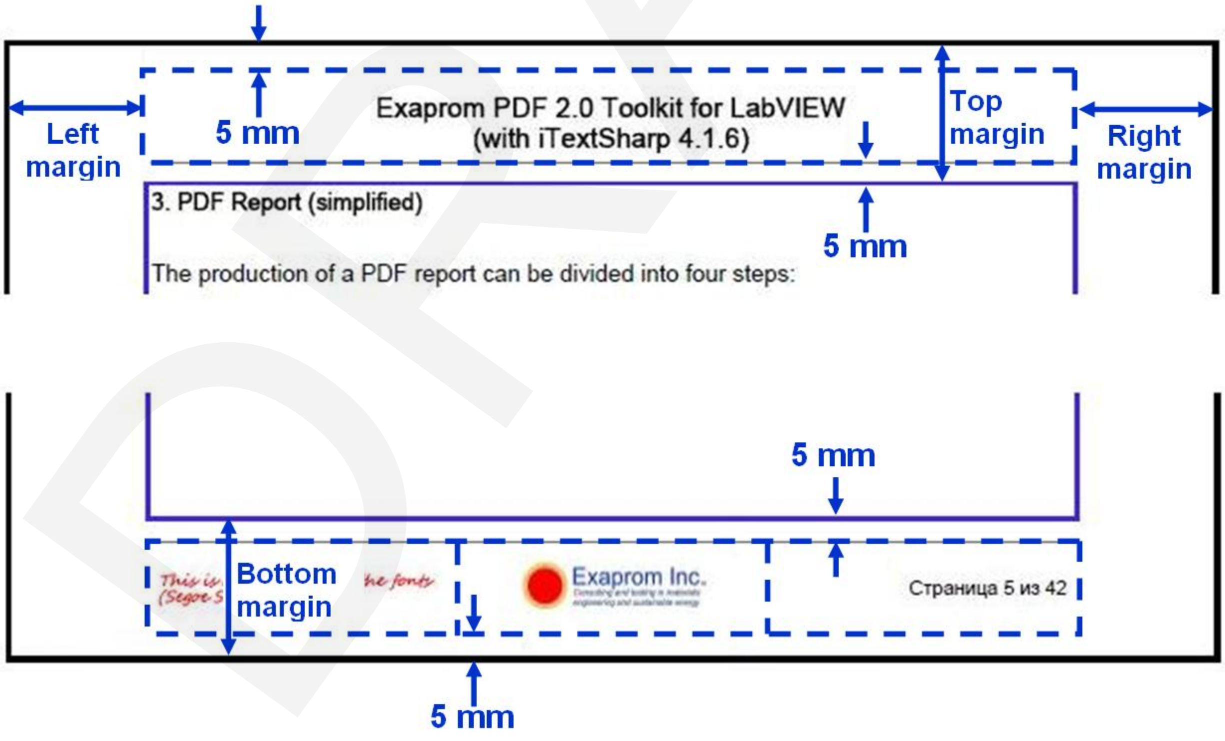
This VI is not based on the iTextSharp library.

5.5. The "Header, Footer and Watermark" palette

The header, footer and watermark can be added anywhere during the creation of the report because they are written at the end with "Close PDF.vi". For reasons of clarity, we put them immediately after the creation of new PDF report.

A header or footer is a table with one row and a maximum of three columns of equal widths. The number of elements added to a header or a footer (text, image or page number) gives the number of columns for the table.

The total width of the header (or footer) is the text zone (page width minus the left margin and the right margin). The height of the header (or footer) is the margin (top or bottom) minus 10 mm (0.394"). The header or the footer is centered vertically.



The production of a PDF report can be divided into four steps:

Figure 32: Header and footer

Blocks of the header or footer are added with "Header or Footer polymorphic.vi" and the watermark with "Append Watermark.vi".

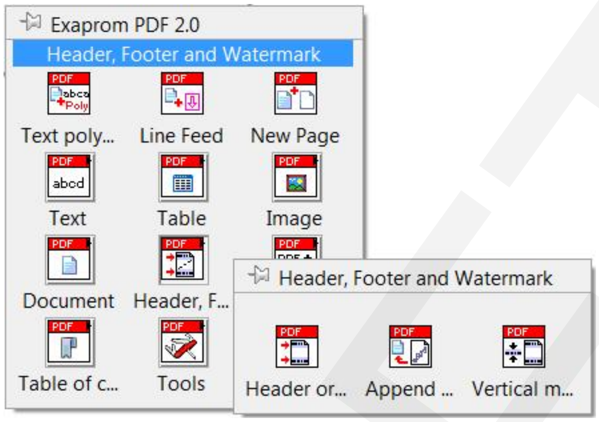


Figure 33: Header, Footer and Watermark palette

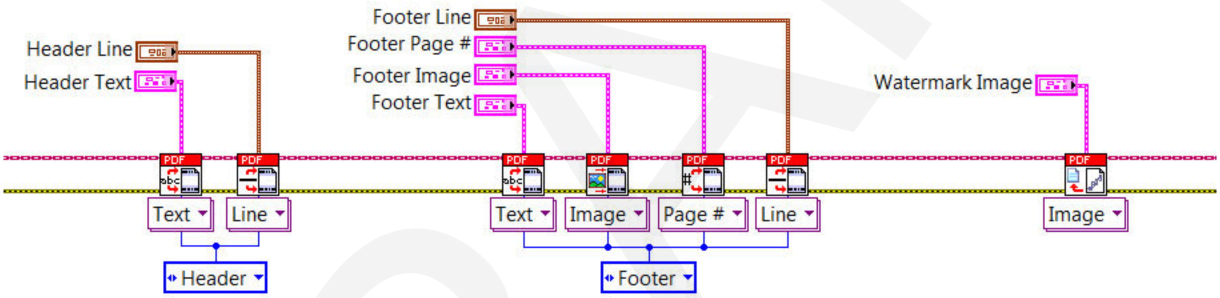


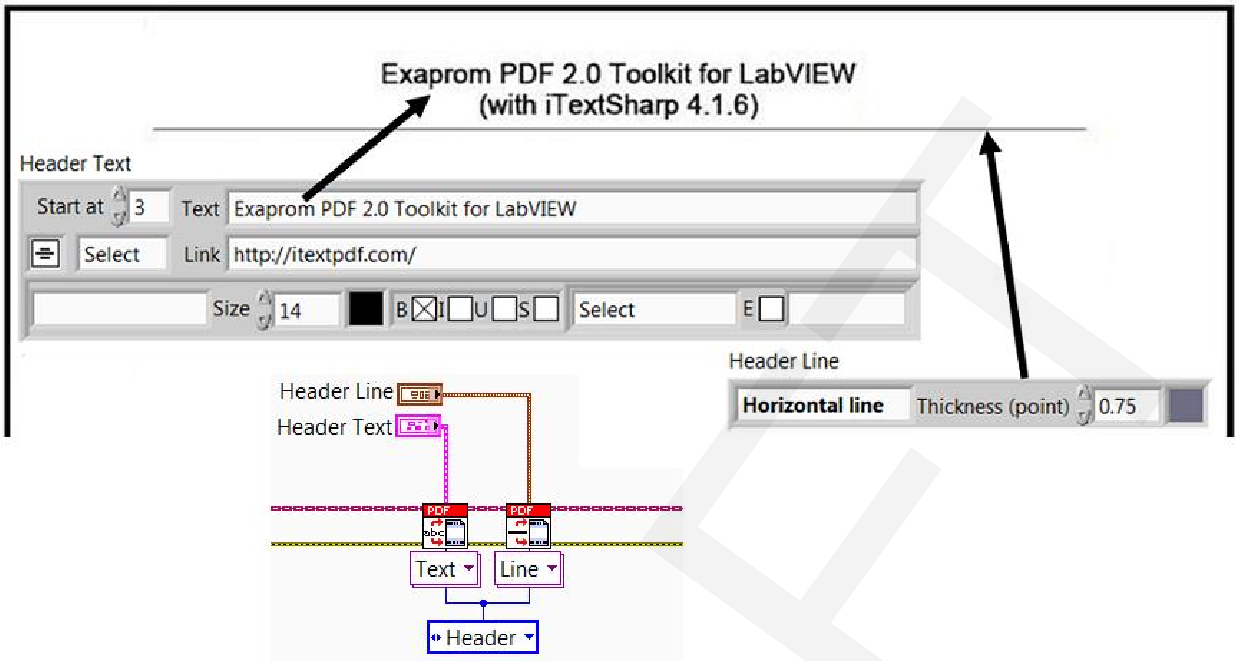
Figure 34: Block Diagram for Header, Footer and Watermark

Header

In the previous figure, we see that we added one block to the header. It follows that we will have a table consisting of a single column. If we look at the controls "Header Text", we can see that the variables are as follows:

- Start Page;
- Text (the text in question: PDF report generation toolkit for LabVIEW...);
- Link (hyperlink optional - http://itextpdf.com/);
- The vertical and horizontal alignment ("CENTER-top" is selected);
- The font (Arial, 14 points bold).

Moreover, we can add a horizontal line to separate the header or the footer from the text.



Header Text

Start at 3 Text Exaprom PDF 2.0 Toolkit for LabVIEW

Select Link http://itextpdf.com/

Size 14 B ☒ I □ U □ S □ Select E □

Header Line

Horizontal line Thickness (point) 0.75

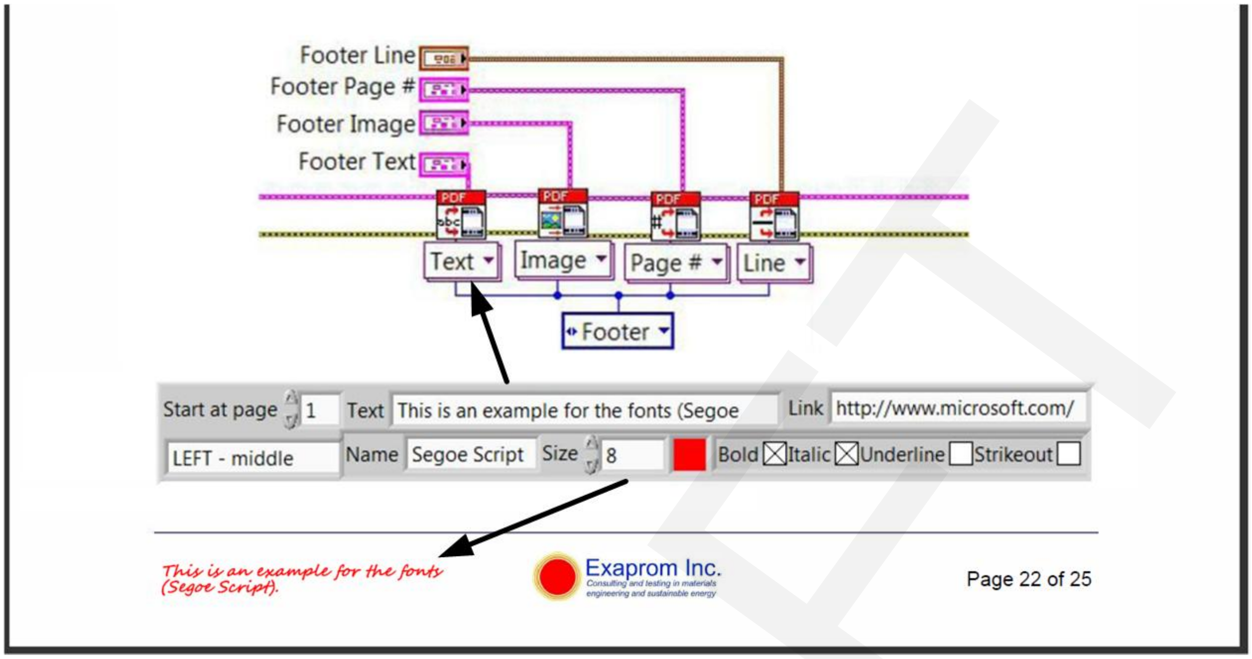
Figure 35: Horizontal line and block Text of the Header

Footer

We have added three blocks to the footer. It follows that we will have a table consisting of three columns. The addition of the blocks is done from left to right:

- the first block, block "Text" is located to the left;
- the second block, block "Image" is located in the center;
- the last block, the block "Page #" is located right.

In all cases, we need to specify at which page this block begins to appear (and the vertical and horizontal alignment). The hyperlink is always optional. If an image is too large to fit into the space provided, the dimensions are automatically reduced.



Start at page 1 | Text This is an example for the fonts (Segoe | Link http://www.microsoft.com/

LEFT - middle | Name Segoe Script | Size 8 | 🟥 | Bold ☒ Italic ☒ Underline □ Strikeout □

This is an example for the fonts (Segoe Script).

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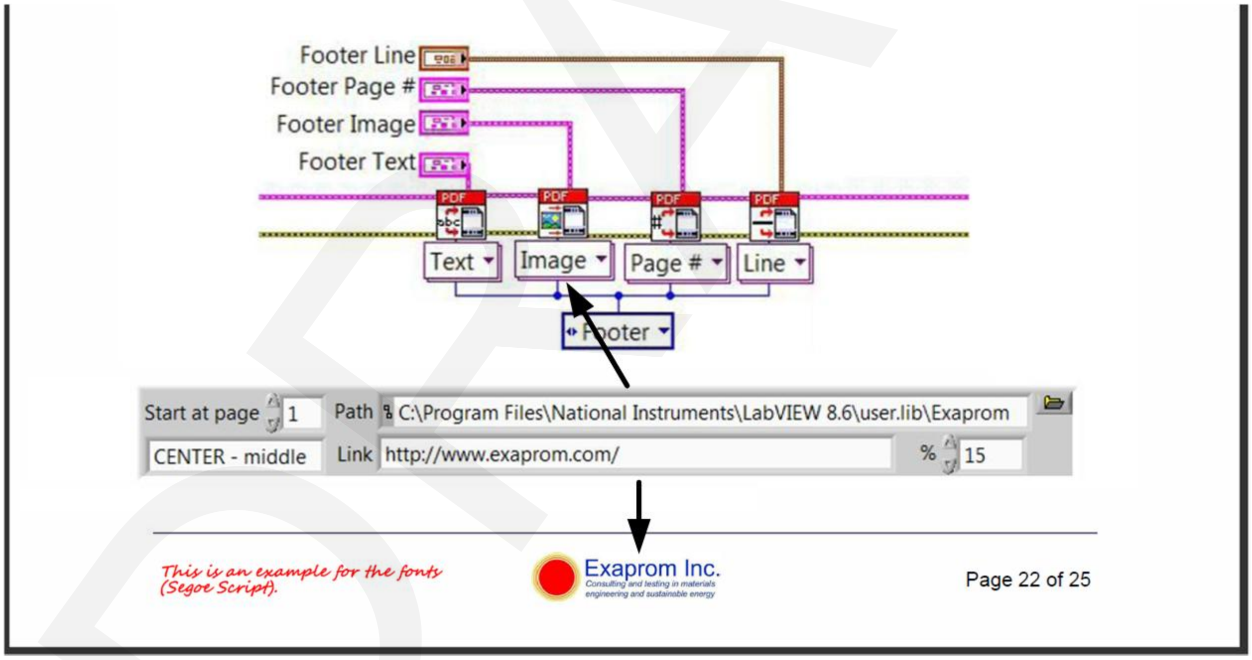
Figure 36: Footer Text block



Start at page 1 | Path C:\Program Files\National Instruments\LabVIEW 8.6\user.lib\Exaprom

CENTER - middle | Link http://www.exaprom.com/ | % 15

This is an example for the fonts (Segoe Script).

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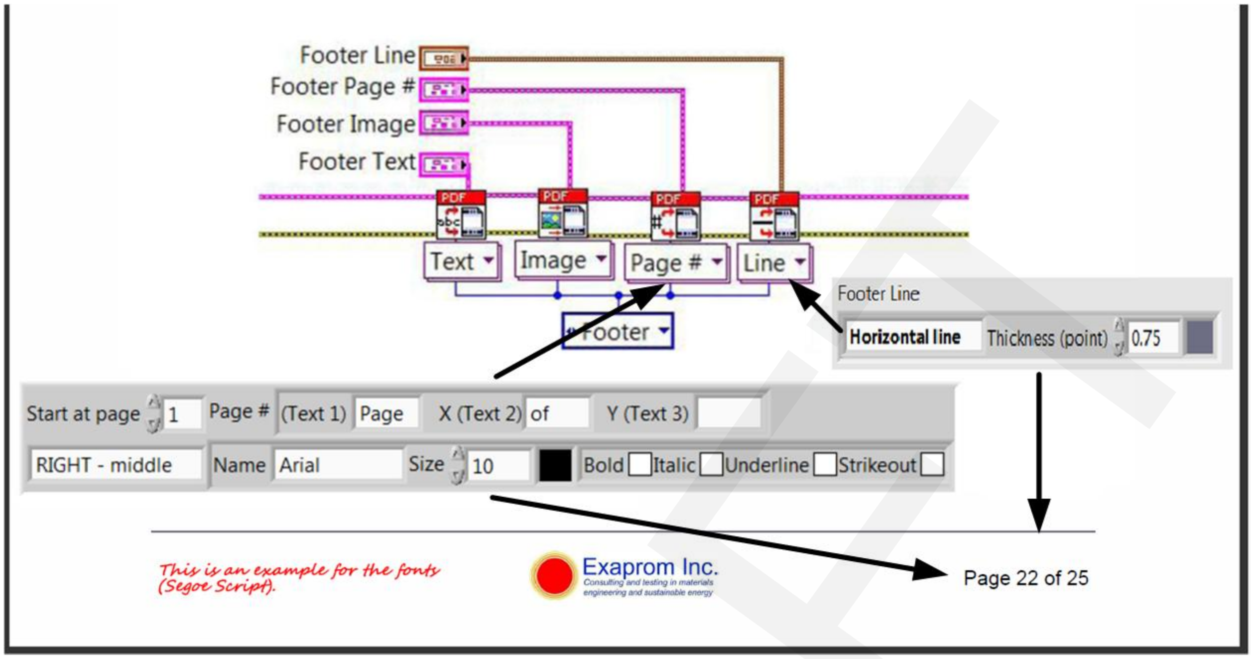
Figure 37: Footer Image block


Footer Line
Footer Page #
Footer Image
Footer Text
PDF
Text
Image
Page #
Line
Footer
This is an example for the fonts (Segoe Script).
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Page 22 of 25

Footer Line

Horizontal line | Thickness (point) 0.75

Start at page 1 | Page # (Text 1) Page | X (Text 2) of | Y (Text 3)

RIGHT - middle | Name Arial | Size 10 | Bold □ Italic □ Underline □ Strikeout □

Figure 38: Footer Page number block

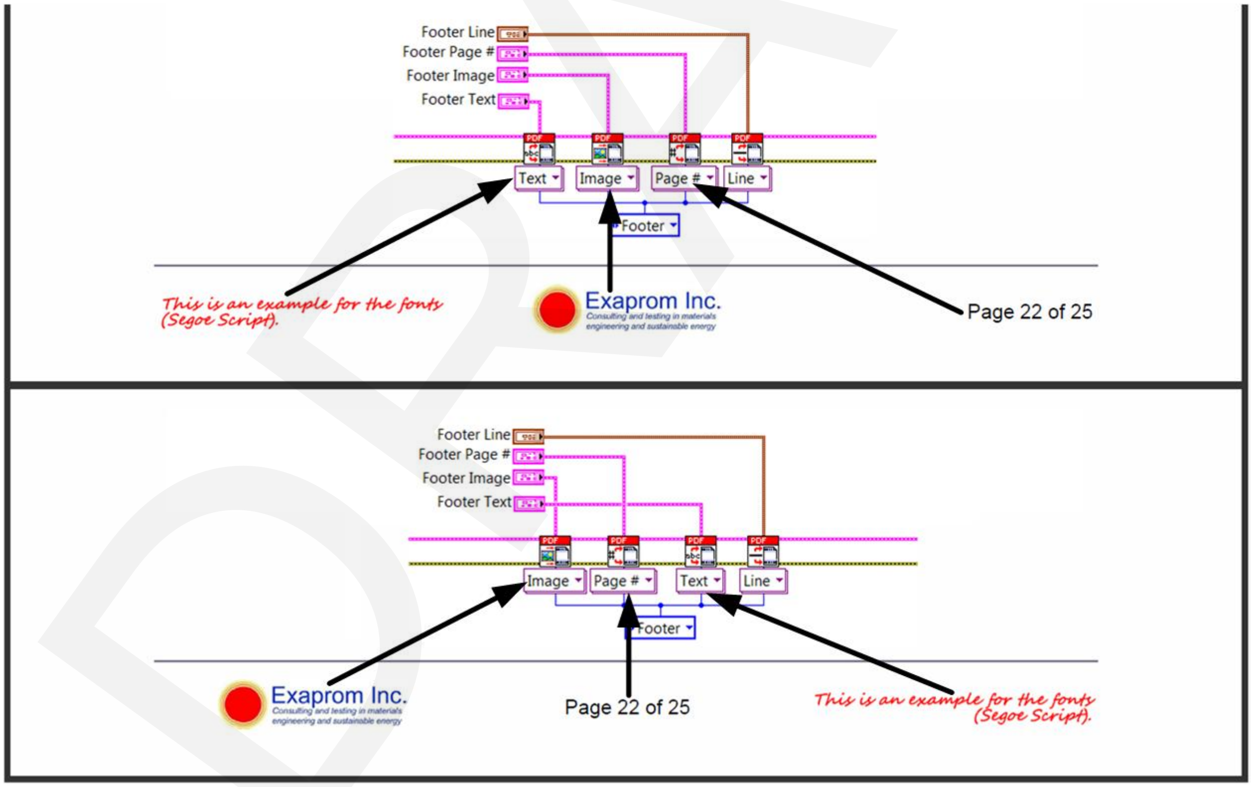

Footer Line
Footer Page #
Footer Image
Footer Text
PDF
Text
Image
Page #
Line
Footer
This is an example for the fonts (Segoe Script).
Exaprom Inc.
Consulting and testing in materials engineering and sustainable energy
Page 22 of 25
Footer Line
Footer Page #
Footer Image
Footer Text
PDF
Image
Page #
Text
Line
Footer
Exaprom Inc.
Consulting and testing in materials engineering and sustainable energy
Page 22 of 25
This is an example for the fonts (Segoe Script).

Figure 39: Change the order of VIs

Watermark

The first element in the cluster watermark is the cluster name "General", it consists of:

- Type (Text, Text auto and Image);
- Opacity (%);
- The angle of rotation (Rotate (°))
- The position (Absolute, Center on page and Center on text section);
- Absolute position (X (mm or inch) and Y (mm or inch)).

The type defines the element that we add (Text, Text auto et Image). In the case of " Text auto ", the angle of rotation is automatically calculated so that the text is placed on the diagonal of the area (the whole page or text zone), and the font size is maximized.

Because the watermark is placed into the foreground, you must specify its opacity. When you select "Text" or "Picture", we can specify the rotation of the text box or image.

Position "Absolute" applies only to the type "Text" or "Picture". When this position is selected then the point (0,0) is the lower left corner of the page.

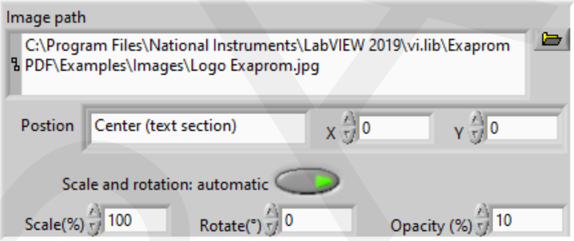


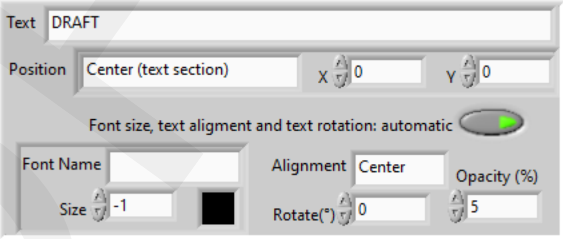
Image path: C:\Program Files\National Instruments\LabVIEW 2019\vi.lib\Exaprom PDF\Examples\Images\Logo Exaprom.jpg

Postion: Center (text section)
X: 0
Y: 0

Scale and rotation: automatic

Scale(%): 100
Rotate(°): 0
Opacity (%): 10

Figure 40: Image Watermark control



Text: DRAFT

Position: Center (text section)
X: 0
Y: 0

Font size, text aligment and text rotation: automatic

Font Name:
Size: -1
Alignment: Center
Rotate(°): 0
Opacity (%): 5

Figure 41: Text Watermark control

For the watermark, it is impossible to change the style of a font (bold, italic, underline and strikeout) and Watermark supports only ASCII characters.

5.6. The "Concatenate" palette

You could append a PDF file in the PDF Report with "Append PDF files to PDF Report.vi". You have to take care if the Report has header or footer because it is added as an exact copy (the footer, and the header could be written over a part of the text you added). The last page of this manual is added with this VI. I also include a standalone VI to concatenate PDF files.

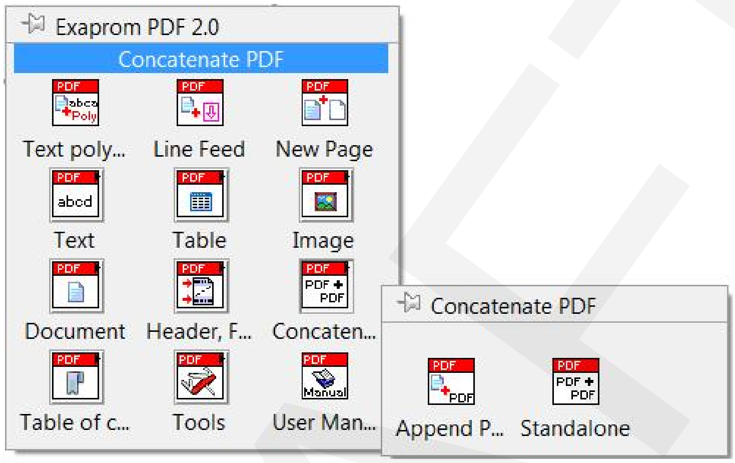
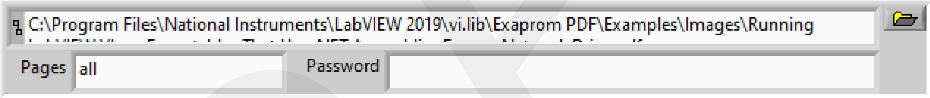


Figure 42: VIs of "Concatenate" palette



C:\Program Files\National Instruments\LabVIEW 2019\vi.lib\Exaprom PDF\Examples\Images\Running

Pages all

Password

Figure 43: Variable of "Append PDF file to PDF Report .vi"

The general syntax for the range that is used looks like this: [!][o][odd][e][even]start-end. You can have multiple page ranges separated by commas. The ! modifier removes pages from what is already selected. The range changes are incremental—numbers are added or deleted as the range appears. The start or the end can be omitted. If you omit both, you need at least o (odd; selects all odd pages) or e (even; selects all even pages):

"all" : complete PDF document
"o": selects all odd pages
"e": selects all even pages
"1-4, 6-8, !7": selects pages 1, 2, 3,4, 6, and 8 ("!" excluded page 7)

If a PDF file is not protected, then Password = empty string. If the PDF file is protected you need to provide:

- the owner password (if protected with a user and an owner password);
- the owner password (if protected with only an owner password);
- the user password (if protected with only a user password).

5.7. The "Table of Contents" palette

You could add auto numbering bookmark (Append Chapter bookmark.vi) and you could add a Table of Contents (Append a Table of Contents.vi).

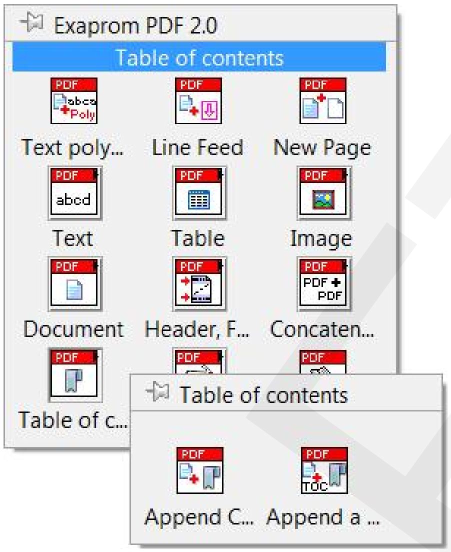
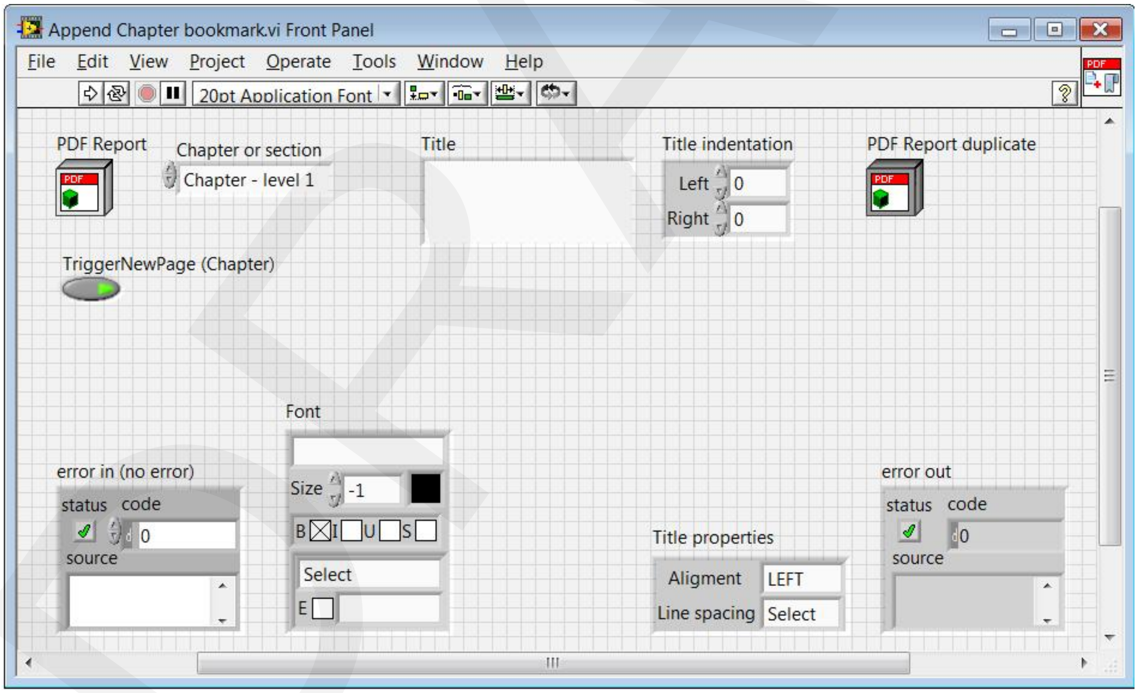


Figure 44: VIs of "Table of Contents" palette



PDF Report

Chapter or section: Chapter - level 1

Title

Title indentation: Left 0, Right 0

PDF Report duplicate

TriggerNewPage (Chapter)

Font

Size -1

B ☒ I □ U □ S □

Select

E □

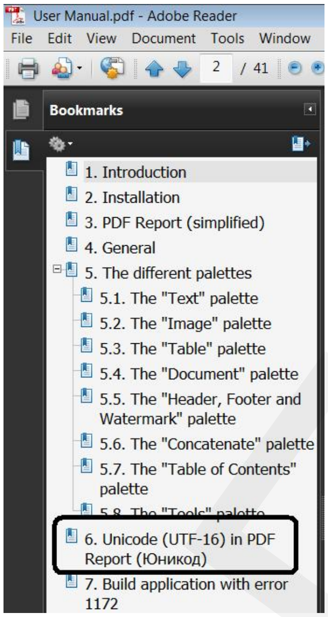
error in (no error): status ✓ code 0, source

Title properties: Aligment LEFT, Line spacing Select

error out: status ✓ code 0, source

Figure 45: Append Chapter bookmark.vi

Append Chapter bookmark.vi works with UTF-16 characters like you can see in this manual.



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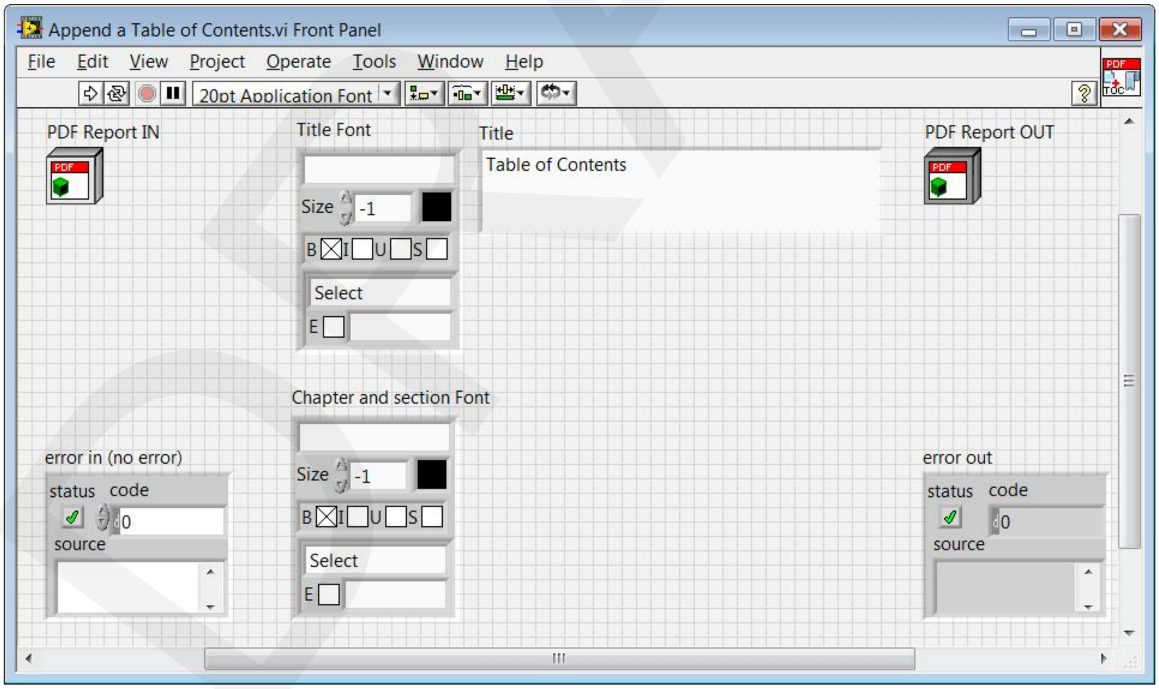
Bookmarks

- 1. Introduction
- 2. Installation
- 3. PDF Report (simplified)
- 4. General
- 5. The different palettes
  - 5.1. The "Text" palette
  - 5.2. The "Image" palette
  - 5.3. The "Table" palette
  - 5.4. The "Document" palette
  - 5.5. The "Header, Footer and Watermark" palette
  - 5.6. The "Concatenate" palette
  - 5.7. The "Table of Contents" palette
  - 5.8. The "Tools" palette
- 6. Unicode (UTF-16) in PDF Report (Юникод)
- 7. Build application with error 1172

Figure 46: Bookmarks ot this User Manual

You could also add a table of contents with "Append a Table of Contents.vi". Bookmarks you set (with "Append Chapter bookmark.vi") are then used to generate the table of contents. If you left click on the text of the table of content you will jump to the corresponding section for ASCII text, but you will not jump for UTF-16 text.



Append a Table of Contents.vi Front Panel

File Edit View Project Operate Tools Window Help

20pt Application Font

PDF Report IN

Title Font: Size -1; B ☒ I □ U □ S □; Select; E □

Title: Table of Contents

PDF Report OUT

Chapter and section Font: Size -1; B ☒ I □ U □ S □; Select; E □

error in (no error): status ✓ code 0; source

error out: status ✓ code 0; source

Figure 47: Append a Table of Contents.vi

5.8. The "Tools" palette

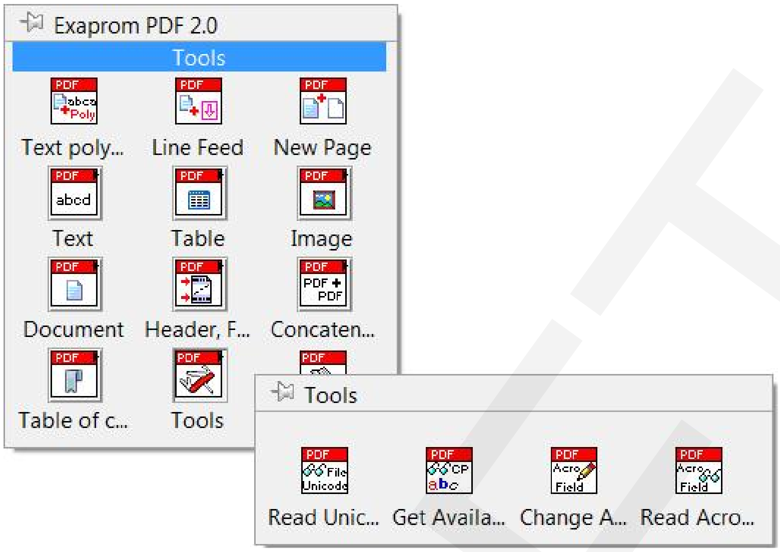


Figure 48: VIs of "Tools" palette

All the VIs in this palette are standalone.

The first two VIs ("Read Unicode File.vi" and "Get Available Font Encoding [ ].vi") will be discussed in the next section of the document.

The third VI "Change AcroField Value (String).vi" allows to change the value of an AcroField (string) of a PDF form.

The fourth VI "Read AcroFields.vi" allows to read the list of AcroFields in a PDF form.

6. Unicode UTF-16 (Basic Multilingual Plane) in PDF Report (Юникод)

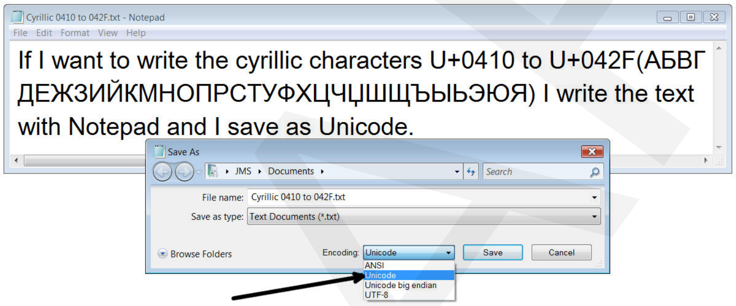
Warning: Unicode is not officially supported by LabVIEW.

6.1. How to write Unicode text in a string

You have access to the characters U+0000 to U+FFFF (what is in the "Character Map" of Windows). I know two methods to write Unicode text in a LabVIEW string:

1) enable Unicode support by adding the following setting in the LabVIEW.ini "UseUnicode=True" (see "*A List of Tips and Tools for using Unicode in LabVIEW*") and write directly in the string control.
2) read an Unicode text file and copy it in a string.

I stopped to use the first method because I often had unexpected LabVIEW crash or strange things have happened (like what JackDunaway has reported in *post 657*). If I want to use Unicode I write the text in Notepad and I save with the encoding Unicode.


Cyrillic 0410 to 042F.txt - Notepad

If I want to write the cyrillic characters U+0410 to U+042F(АБВГДЕЖЗИЙКМНОПРСТУФХЦЧЦШЩЪЫЬЭЮЯ) I write the text with Notepad and I save as Unicode.

Save As

File name: Cyrillic 0410 to 042F.txt

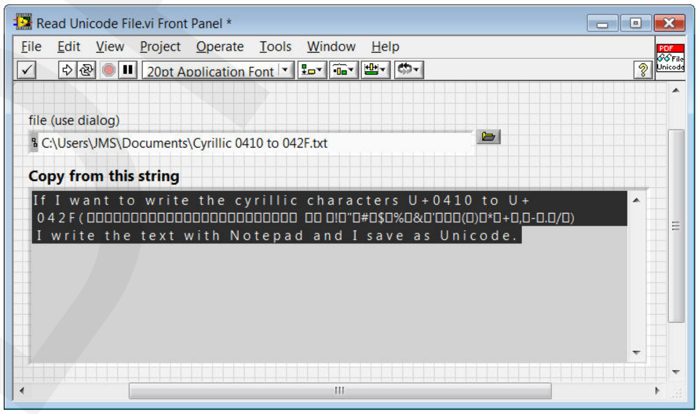
Save as type: Text Documents (*.txt)

Encoding: Unicode

Figure 49: Notepad and Unicode

Then I read the file with "Read Unicode File.vi" (in the tools palette) and I copy the text from "Copy from this string" in the string of the PDF Report.

Because we have not enabled Unicode support, and we don't want to activate that support, then what you see in the normal display is not shown correctly, but the hexagonal values from the string are correct.


Read Unicode File.vi Front Panel *

file (use dialog)

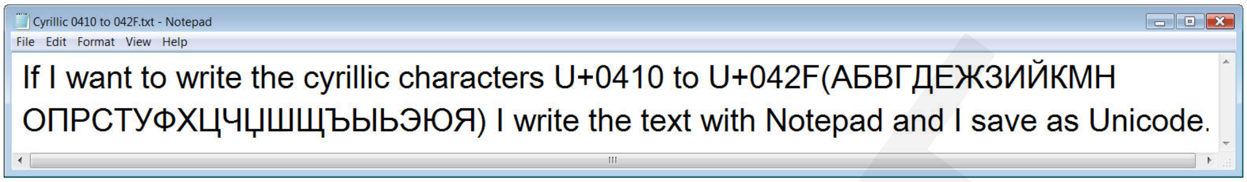
C:\Users\JMS\Documents\Cyrillic 0410 to 042F.txt

Copy from this string

```
If I want to write the cyrillic characters U+0410 to U+
042F(□□□□□□□□□□□□□□□□□□□□□□□□□□□ □□ □!□"□#□$□%□&□'□□□(□)□*□+□,□-□.□/□)
I write the text with Notepad and I save as Unicode.
```

Figure 50: Copy the text from "Read Unicode File.vi" and paste in the string of the PDF Report

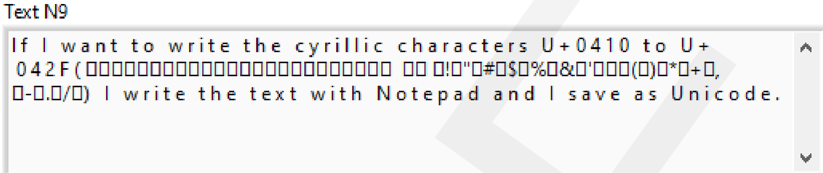
Here is the original text saved in Notepad (as Unicode).


Cyrillic 0410 to 042F.txt - Notepad
File Edit Format View Help

If I want to write the cyrillic characters U+0410 to U+042F(АБВГДЕЖЗИЙКМН ОПРСТУФХЦЧЦШЩЪЫЬЭЮЯ) I write the text with Notepad and I save as Unicode.

Figure 51: Original text in Notepad

Here is the text copied in the string of the PDF Report.



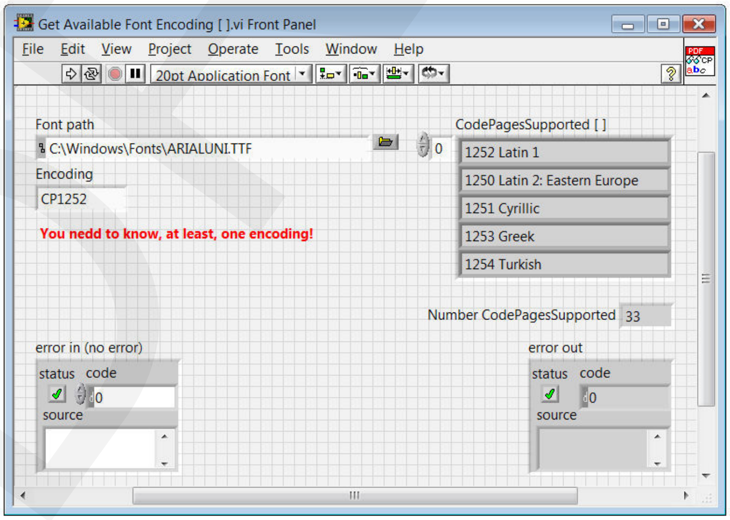
```
If I want to write the cyrillic characters U+0410 to U+
042F(□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ □□ □!□"□#□$□%□&□'□□□(□)□*□+□,
□-□.□/□) I write the text with Notepad and I save as Unicode.
```

Figure 52: String in the PDF Report (not shown correctly, but the hexagonal values from the string are correct)

Here is the string in the PDF Report with font = "Arial Unicode MS", Bold = True, Encoding = CP1251 (cyrillic) and type = unicode:

If I want to write the cyrillic characters U+0410 to U+042F(АБВГДЕЖЗИЙКМН ОПРСТУФХЦЧЦШЩЪЫЬЭЮЯ) I write the text with Notepad and I save as Unicode.

If you want to know the different encoding supported by a font you can use "Get Available Font Encoding [ ].vi" from the tools' palette (you need at least to know one supported encoding).



Font path: C:\Windows\Fonts\ARIALUNI.TTF

Encoding: CP1252

You nedd to know, at least, one encoding!

CodePagesSupported [ ]: 0

- 1252 Latin 1
- 1250 Latin 2: Eastern Europe
- 1251 Cyrillic
- 1253 Greek
- 1254 Turkish

Number CodePagesSupported: 33

error in (no error): status ✓ code 0 source

error out: status ✓ code 0 source

Figure 53: Get Availaible Font Encoding [ ].vi for "Arial Unicode MS" (ARIALUNI.TTF)

6.2. Which VIs support Unicode

	ASCII	UTF-16	UTF-16 (deault)	UTF-16 (LTR)	UTF-16 (RTL)
Text palette					
Append Phrase.vi	■	■	▨	▨	▨
Append Paragraph.vi	■	■	▨	▨	▨
Append Paragraph with Link [ ].vi	■	■	░	░	░
Table palette					
Caption for table (not a VI)	■	■	▨	▨	▨
Append Table.vi	■	■	▨	▨	▨
Append Customized Table.vi	■	■	▨	▨	▨
Image palette					
Caption for image (not a VI)	■	■	▨	▨	▨
Header, Footer and Watermark palette					
Append Text HF.vi	■	■	▨	▨	▨
Append Page number HF.vi	■	■	▨	▨	▨
Append Watermark Text.vi	■	░	░	░	░
Table of Contents palette					
Append Chapter bookmark.vi	■	■	░	░	░
Append a Table of Contents.vi	■	■	░	░	░

░	Not supported
▨	Not tested
■	Tested

7. Build application with error 1172

Error 1172

If the built application is running from a Network Drive take a look at: *Running LabVIEW VIs or Executables That Use .NET Assemblies From a Network Drive*. This text is at the next page of the manual.

For the built application:

“Properties>>Source Files>>Always included” add “itextsharp.dll”

iTextSharp.dll is located at:

C:\Program Files\National Instruments\LabVIEW XXXX\vi.lib\Exaprom PDF\DLL\itextsharp.dll

NATIONAL INSTRUMENTS

Hello Jean-Marc

2 ratings: **4.5** out of 5 Rate this Document

Running LabVIEW VIs or Executables That Use .NET Assemblies From a Network Drive

Primary Software: LabVIEW Development Systems>>LabVIEW Base Package
Primary Software Version: 8.5
Primary Software Fixed Version: N/A
Secondary Software: N/A

Problem:
I have created a LabVIEW executable that uses .NET assemblies and placed this executable on a network drive. When I attempt to run this executable, I receive error 1172. How do I solve this problem?

Solution:
.NET provides several layers of security for .NET applications. The .NET Common Language Runtime (CLR) grants varying levels of trust to code based on evidence attributes (i.e application directory, publisher, site, URL and Zone) that the code possesses. One of these layers is very similar to the Zone concept in Internet Explorer.

When an assembly is loaded into .NET, access is dependent on the file location. By default, if the assembly is loaded from the local disk, it is assumed to be fully trusted. However, if it comes from the network (even a mapped drive), it is not.

If you try and access a LabVIEW VI, EXE, or LabVIEW project that uses .NET assemblies from a network drive, you should receive a System.Security.SecurityException exception that says Request failed.

There are several ways to fix this problem using .NET Framework tools such as the Code Access Secuirty Policy Tool or the .NET Framework Configuration Tool.

The Code Access Security Policy Tool creates security policy settings that tell .NET to consider a given network drive to have full trust. For example, suppose that your code was located on your E: drive, which happens to be a network mapped drive. You can add it to the trusted list by saying:

```
caspol -q -machine -addgroup 1 -url file://e:/* FullTrust -name "E Drive"
```

The .NET Framework Configuration Tool allows you to manage and configure assemblies in the GAC, adjust code access security policies, and adjust remoting services. Using this tool, you can increase your assemblies trust to full trust and thus allowing LabVIEW to run the code. Refer to the .NET Framework Configuration Tool link below for instructions and steps for increasing assembly trust.

Related Links:
KnowledgeBase 2XSBFPHM: LabVIEW and .NET Exceptions
MSDN: .NET Framework Configuration Tool (Mscorcfg.msc)
MSDN: Code Access Security Policy Tool (Caspol.exe)

Attachments:

Report Date: 09/08/2004