RasterEdge .NET Imaging SDK

Developer's Guide

RasterEdge.DocImagingSDK 9.8.4

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Introduction

About RasterEdge Document Imaging

RasterEdge Document Imaging is a powerful document imaging SDK and controls. With easy to use document imaging APIs, user can implement functions of loading, saving, converting, annotating and editing documents and images files. Supported Document formats include TIFF, PDF, Microsoft Word, Excel, PowerPoint and DICOM. Png, Jpeg, gif, Bitmap among other commonly used image formats are supported as well. The toolkit also includes a Windows Forms control library, a Zero footprint ASP.NET AJAX-Enabled Server-Side document Viewer, and a Twain library for Twain scanning. Annotation module is embedded in both Windows Form and ASP.NET Web Form controls. Please try our online demo at http://www.rasteredge.com/dotnet-imaging/web-viewer-demo/.

The product feature includes:

- Create document object from file, stream or byte array.
- Create PDF or TIFF using image source obtained from file, data base or scanning process.
- Load and parse Microsoft Word, Excel, and PowerPoint from file, stream
- Display PDF, TIFF, Word, Excel and PowerPoint with customized options.
- Batch conversion from supported documents to various image formats, such as JPEG, PNG, and GIF.
- Convert (print) TIFF, PDF, Microsoft Word, Excel, PowerPoint, and DICOM into PDF file format.
- Generate thumbnails image of document by setting zoom factor or resolution.
- Draw and burn annotations on documents and images.
- Advanced Windows Form control to load, display, annotate, OCR and save above document formats.
- Zero footprint WebForms document viewer controls to load, display, annotate, convert, search and save above document formats with featured AJAX technology.
- Add or scan barcode image from documents.
- Add image (logo or watermark) to specified page in document.
- Document processing like inserting, deleting, and reordering PDF document pages or TIFF pages in multipage TIFF.
- APIs to combine, split, extract TIFF and PDF documents or pages and enable batch operations on document collection.

RasterEdge Document Imaging Libraries

RasterEdge Document Imaging SDK provides two kinds of libraries, one is build based on .NET Framework2.0 and another is based on .NET Framework4.0.
When adding RasterEdge Document Imaging libraries, if your test project or solution is using .NET Framework 4.0 or higher version. Please refer to the libraries under the directory "Bin/DotNet Framework4.0/".
What's more, if you add reference x86 libraries, please configure your project property x86 as follows:
Right click your project -> Properties -> Build -> Platform target: x86.
If you are using x64 libraries, the Platform target will be x64.

Deploy RasterEdge Imaging

Because RasterEgde Imaging toolkit is a collection of assemblies, you need to add reference to specific assemblies in your project to use the APIs provided.

To add reference to RasterEdge Imaging assemblies in your project using Visual Studio:

a. In the Solution Explorer, right-click on **References**, and click **Add Reference**. You download from our server.
b. Click the browse menu tab to locate RasterEdge.DocImageSDK8.x\Bin
c. Choose dlls that you want to use in your project.
d. Add using statement at the top of the code, for example

```
using RasterEdge.Imaging.Basic;
```

Online Demo

Using RasterEdge Document SDK, you can build a project to enable document viewing, annotating, converting, and saving. We develop an online document viewer program to illustrate these features.

You cannot only try using our demo documents but upload your own documents as well.

See the demo at

http://www.rasteredge.com/dotnet-imaging/web-viewer-demo/

Where to seek help

If you have any question, problems or concerns about RasterEdge products, please contact us at support@rasteredge.com or you can leave a message at our forum at forum.rasteredge.com

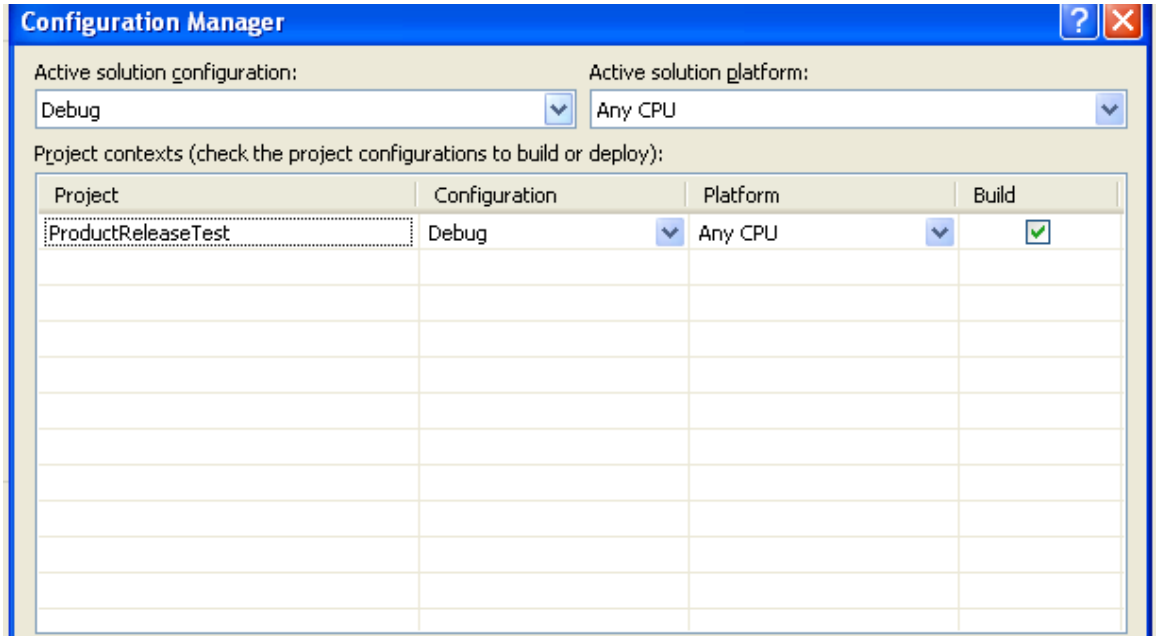
Install SDK

Install

RasterEdge SDK is designed to be easy to use. So no installation process is needed.

F&Q

1. Q: error: Cannot find RasterEdge name space occurs when adding reference
   A: right click on projects, select properties, under application tab, change target framework to frameworks other than Client Profile version. Rebuild you application
2. Q: Exception of assembly discripency occurred.
   A: Please check if your project setting matches the dll you referenced. If you are using an x64 operating system and choose AnyCPU as target platform, you should reference x64 dlls in the SDK Package.

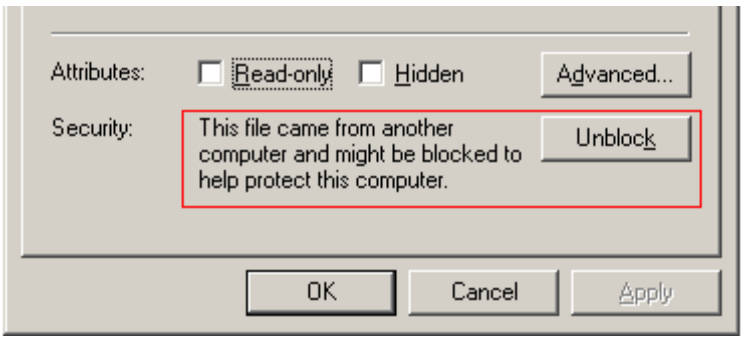


3. Q: Exception of registered error thrown in run time. E.g. Image encoder TIFF is not registered

   A:

   - First please make sure that you download the latest version of the SDK at RasterEdge.com

- Then please add the line of code `WorkRegistry.Reset()` before you use RasterEdge dlls APIs, This code register all RasterEdge dlls referenced to your projects. This code need only to run only once.
- Please make sure that you have already referenced correct dlls to your project. For example if you want to convert word to pdf, you should add both pdf and word dlls to your project.
- If the problem persists, please check if the dll in your bin folder is blocked by your OS. Right click on the dlls, and select properties, then click unblock button.



After unblock all of the dlls you used, make sure to add reference to the unblocked ones and rebuild the project.

- If possible, move your project to hard drive other than C drive where you might not have the authority to read and write assembly files.

If the problem still yet solved, please see the following:
If your project is a console or winform application. Make sure that the dlls you referenced are in the same folder as the .exe application.
Or if it is an asp.net project, please make sure that the dlls you referenced are retrievable in the Bin folder of your asp.net project. Namely the dlls should be located under the path which is the result of this statement.

```
string projectName = HttpRuntime.AppDomainAppPath.Replace("\\", "/") + "/Bin/";
```

If there is no such path/directory existed, please create one and copy paste dlls accordingly.

If you have any other questions or concerns about RasterEdge product, you can contact us atsupport@rasteredge.com.

4. Q: Error load program with incorrect format
   A: This is often caused by incompatibility between platform target property and the dlls build. Right click on projects and select properties. In build tab select proper platform target.

5. Q: In Asp.net project when testing html5 viewer control, get the error:
   Could not load file or assembly 'RasterEdge.Imaging.Annotation' or one of its dependencies. An attempt was made to load a program with an incorrect format.
   A: This is because Visual Studio uses a 32-bit web server internally. You can first debug with x86 HTML5Viewer dlls in Visual Studio which mimic IIS environment. Once done debugging with x86 dlls in Visual Studio, replace the x86withx64 version of dlls and deploy the project to the IIS on the servers.

6. Q: When testing web viewer control, I can't upload document successfully

   A: Don't add reference to HTML5Viewer.dll to your project. Make sure the Default page to start is the Default.aspx. Append*/Default.aspx* in the address bar if necessary

License

Trial License

For users to better evaluate our Document Imaging toolkit, activation of trail license is not needed at user side. The trial license will be automatically expired 45 days after your first trial of the SDK functions. You can then request an extension of another 30 days by contacting us at *support@rasteredge.com*.

Purchase License

After you purchase the Developer License, we will send you a set of activated assemblies.

For more information, please contact us at support@rasteredge.com.

Web Server License

If you want to deploy your projects which use our dlls on a server, you should buy a server license.

For more information, please contact us at support@rasteredge.com.

XDoc. HTML5 Viewer

Overview

RasterEdge XDoc.HTML5 Viewer adopts the latest HTML5 technology and owns strong compatibility with most modern web browser environments. It is a JavaScript based image viewing control that can be created on the client side without additional add-ins and communicates directly with a WebHandler on the service side.

Product Features

- Allow to view, annotate, save, OCR, search and convert various document file formats.
- Flexible annotations enable collaboration at ease.
- Zero footprint viewer no addition plug-in is needed.
- Supported Tiff, PDF, Office Word, Excel, PPT, Dicom among other document and image formats.
- Wide range of web browsers support including IE9+, FireFox, Chrome, Safari, and Opera
- Secured document displaying mechanism. The original document stay safe behind protection in server, and only shallow copy of the documents is transmitted on the network for displaying purpose.
- Cache is implemented to avoid repeated process and transmission of original document files therefore maximizes the throughput of the system. The cached files are cleaned automatically when not needed.
- White label HTML5Viewer control, seamless integration to your own project.

Tutorial

A complete example of XDoc.HTML5 Viewer is included in RasterEdge.DocImageSDK demo projects in download package. You can create web document viewer with your own style. Please see detailed tutorial from: http://www.rasteredge.com/how-to-csharp/xdoc/html5-viewer/.

F&Q

- **When configure IIS to run 500.19 error occurs, it may be caused by:**

1. Not registered the .net framework to the iis. (One of reasons: install a .net framework before the installation of iis.)
2. The site configured in IIS has no permission to operate. (Modify permission)

Here are some solutions:

- ✓ In the command line input

  cd C:\Windows\Microsoft.NET\Framework64\v2.0.50727

  aspnet_regiis.exe –i

- ✓ Right-click the correspond site-> Edit Permissions -> Security -> Group or user names -> Edit -> Add -> Add Everyone usersgiven Full Control permissions.

- **If the uploading document is not successful, please pay attention to the following:**
  1. Make sure the default page is Default.aspx. If not sure, in the address bar, add/Default. aspx.
  2. Don't add HTML5Viewer dll to the project.

- **Q: In Asp.net project when testing web viewer control, I get the error: *Could not load file or assembly 'RasterEdge.Imaging.Annotation' or one of its dependencies. An attempt was made to load a program with an incorrect format.***

  A: This is because Visual Studio uses a 32-bit web server internally. You can firstly debug with x86 HTML5Viewer dlls in Visual Studio mimic IIS environment. Once done debugging with x86 dlls, replace x86 dlls with x64 version of dlls to run in real IIS on server.

WinForm Document Viewer

WinViewer Overview

The WinViewer is a .NET imaging control used for Windows Forms applications, providing professional document solutions for users and making images & documents viewing, manipulation, annotation and saving an easy task. The WinViewer Control supports most common document and image formats (PDF, MS Word, Excel, PPT, Tiff, Png …).

A complete example of WinViewerDemo is included in the RasterEdge.DocImageSDK demo projects in download package. This complete example is implementing default RasterEdge style, if you want to create WinViewerDemo with your own style, please see our "Add a WinViewer to Your Project" below this part for a step-by-step tutorial.

Feature List

- Perfectly work with Microsoft Visual Studio 2005 and above version
- Create high-quality document images. Repaint at zoom operations to maintain high fidelity document imaging
- Automatically Generate thumbnails for document and provide navigation using thumbnails viewer.
- Easy to view, edit, annotate and save document
- Zoom, pan, or select document page with mouse to fit width, height, or both
- Support tiff, pdf, office word, excel, ppt, medical image (dicom) and other commonly used image formats.

Control APIs

The WinViewer control provides developers many APIs to be invoked. The following will give you a broad overview of these functions.

APIs	**Description**
LoadFromFile(String filePath)	Accept the path of the file that you want to open.
SaveFile(String filePath)	Save the file to a specified path.
UpPage	Scroll to previous visible page in the currently open document.
DownPage	Scroll to next visible page in the currently open document.
ZoomIn	Increase current zoom percentage of the WinViewer.

ZoomOut	Decrease current zoom percentage of the WinViewer.
FitWidth	Reset size of the currently displayed page.
FitHeight	
ShowOneToOne	
AddPage	Prior to the currently displayed page to add a blank page.
DeletePage	Delete the currently displayed page.
Roate90	Rotate the currently displayed page 90 degrees clockwise.
Rotate180	Rotate the currently displayed page 180 degrees clockwise.
Rotate270	Rotate the currently displayed page 90 degrees counterclockwise.
DrawText, DrawFreehand DrawLine, DrawPolygonLines DrawFilledRectangle, DrawRectangle, DrawHighLight DrawEllipse, DrawPolygon DrawRubberStamp	Draw the specified type annotation on the page.
BurnAnnotation	Burn all annotations to the page.
DeleteAnnotation	Delete all selected annotations.

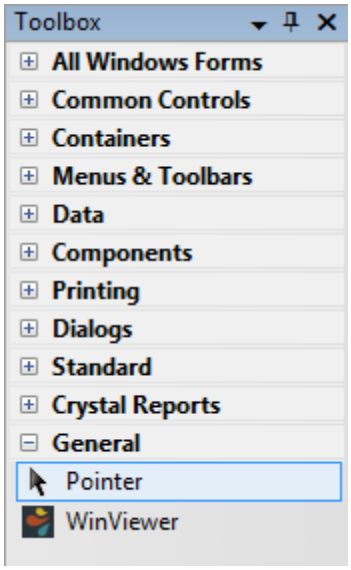
Add a WinViewer to Your Project

This part will guide you to add WinViewer control to your project and invoke APIs of this control. See detailed steps below:

1. Setting Up Your Project
2. Open File From Specified Path
3. Draw Specified Type Annotation on Page

Setting Up Your Project

- In Visual Studio, create a new Windows Forms project called WinViewerDemo. If you already have a Windows Forms Project, this step can be omitted.
- Add control. Right-click on the Toolbox, select “Choose Items…”, locate the **RasterEdge.DocImagSDK6.3\bin** in download package, and browse to find and select **RasterEdge.Imaging.WinformsControl.DocumentViewer.dll**, then WinViewer Control will appear in Toolbox. See as below:

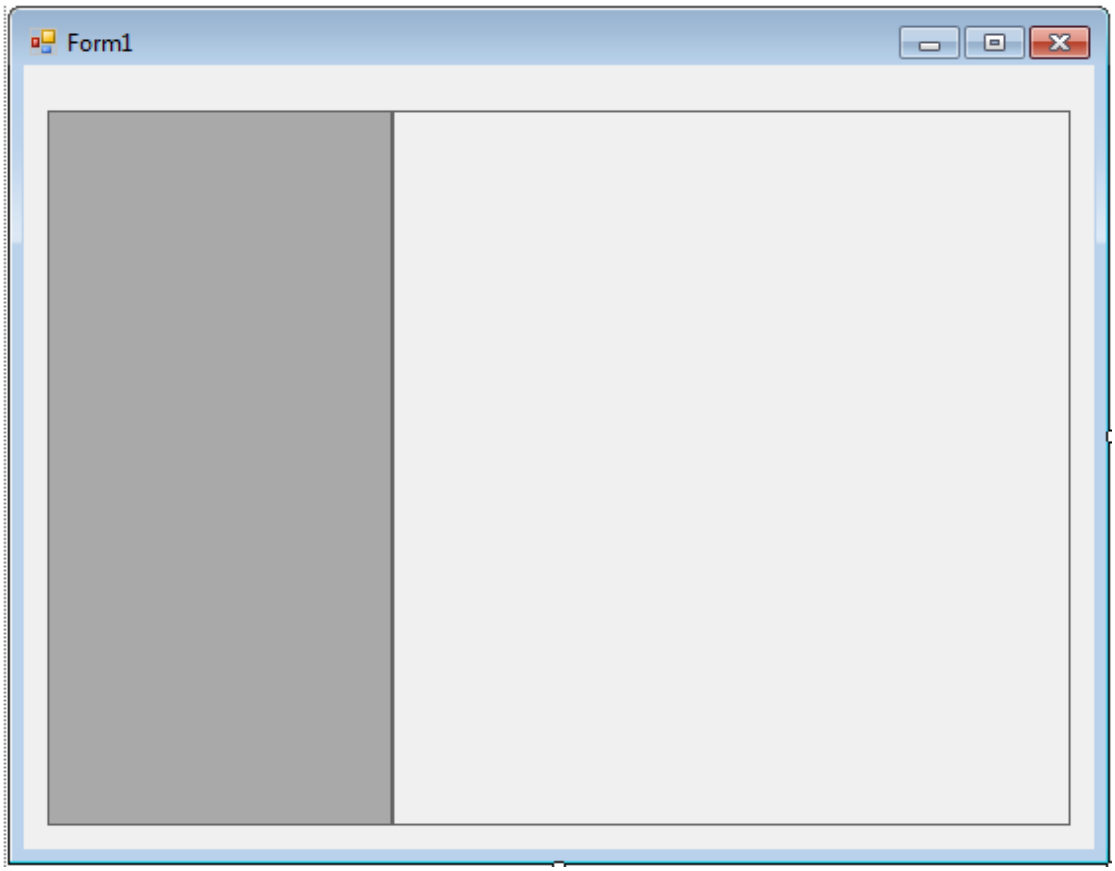


Once you do this, you will find a new reference called RasterEdge.Imaging.WinformsControl.DocumentViewer.dll has been added to your project.

Open File from Specified Path

There may be other elements on your form, but in the following tutorial, we will take a blank form as an example.

Drag a WinViewer control onto your WinForms application, and the form you created should look similar, in the design-time view, to the screen capture shown below.



Now, you only need several lines of C# code to open a document.

The following code presents an open file dialog. You can select a file to be loaded into the WinViewer control. If the file format is not supported by WinViewer control, there will prompt a window “cannot open your file”.

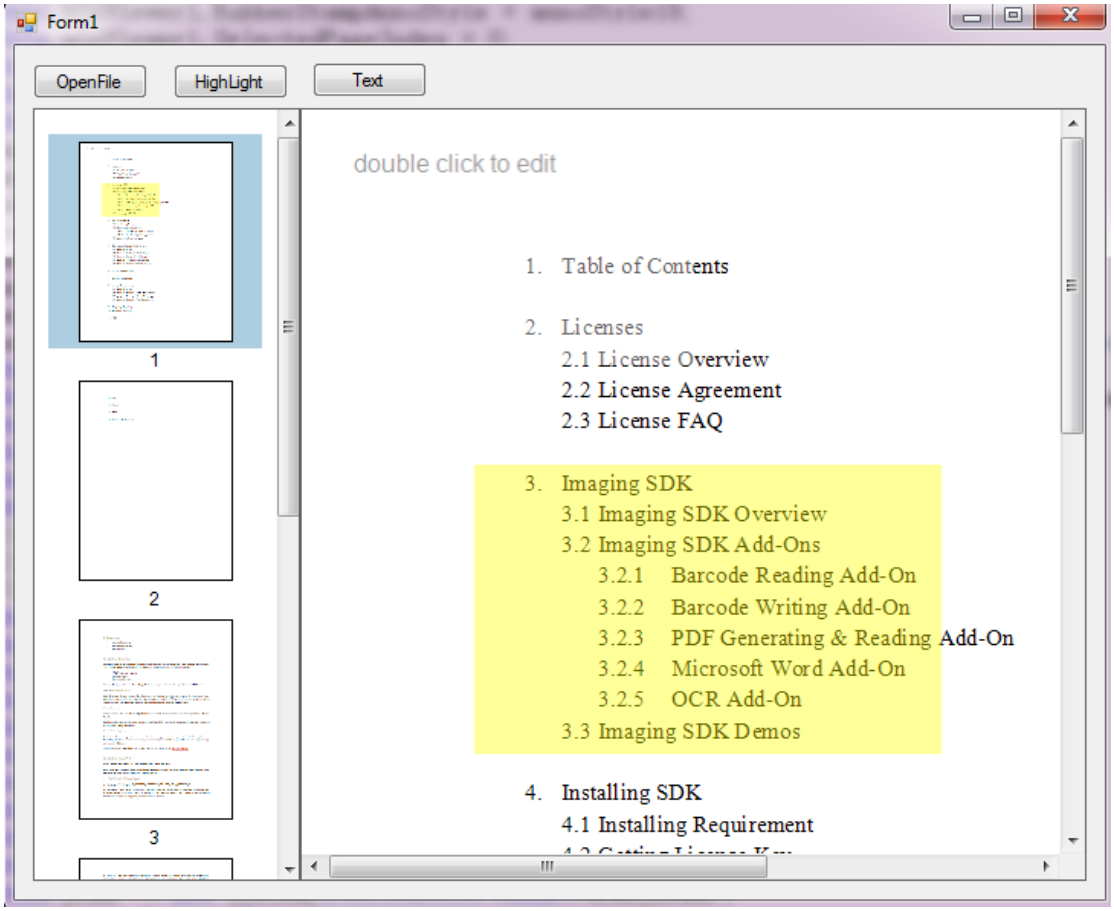
```
private void OpenFile_Click(objectsender, EventArgse)

{

OpenFileDialogofd = new OpenFileDialog();

ofd.Filter = "(*.*)|*.*";

ofd.Multiselect = false;

if (ofd.ShowDialog() == DialogResult.OK)

  {

this.winViewer1.LoadFromFile(ofd.FileName);

  }
```

```
}
```

Draw Specified Annotation on Page

Call a single method for each kind of annotation that you want to support from your toolbar buttons' OnClick events. Resizing, burning, deleting and moving are all built in.

```
private void HighLight_Click(objectsender, EventArgse)

{

this.winViewer1.DrawHighLight();

}

private void Text_Click(objectsender, EventArgse)

{

this.winViewer1.DrawText();

}
```



Right-clicking on the created annotation, you will see the option to burn or delete. If you right-click on the thumbnail, there is the option to “Add new page” or “delete page”. Using this WinViewer, there’s necessary for you to add some buttons to complete these operations.

Customize WinViewer Control

Customize Toolbar

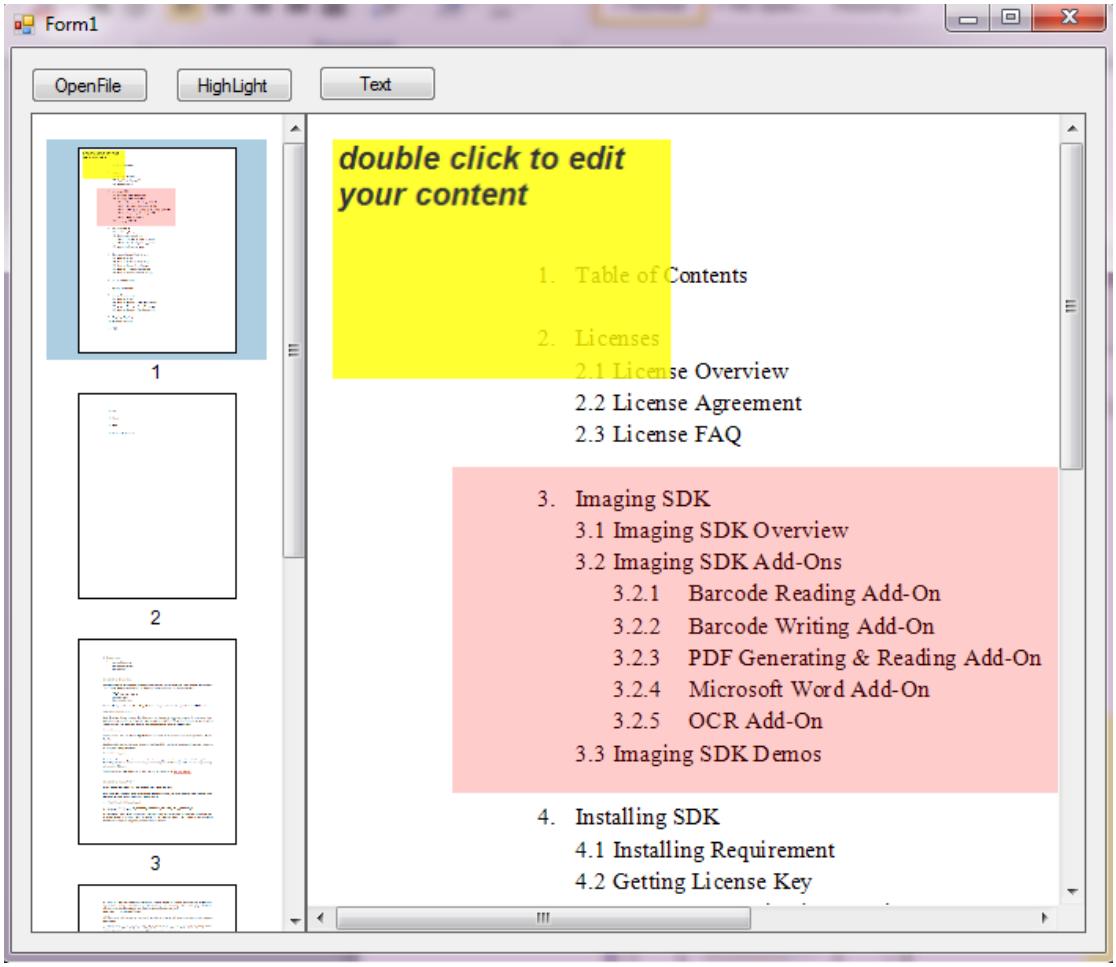
It’s easy to see from the above example. You can customize your toolbar, and the only thing you need to do is call the appropriate API.

Customize Annotation Style

RasterEdge gives you default Annotation Style, but allows you to modify the style according to your preferences.

Here we take the styles modification of HighLight annotation and Text annotation as examples.

```
private void HighLight_Click(objectsender, EventArgse)
{
        this.winViewer1.HighLightAnnoStyle.FillColor = Color.Red;
        this.winViewer1.HighLightAnnoStyle.Transparency = 0.2f;
        this.winViewer1.DrawHighLight();
}
private void Text_Click(objectsender, EventArgse)
{
      this.winViewer1.TextAnnoStyle.FillColor = Color.Yellow;
      this.winViewer1.TextAnnoStyle.AnnoText = "double click to edit your content";
       this.winViewer1.TextAnnoStyle.TextFont = new Font("Arial", 15, FontStyle.Bold |
       FontStyle.Italic);
        this.winViewer1.TextAnnoStyle.Transparency = 0.8f;
        this.winViewer1.DrawText();
}
```



Note: For each annotation, the attributes that can be modified have been listed in the Form1. If not listed, after the annotation property changes, there is no corresponding effect.

Customize the Way Open and Store Files

The WinViewer control offers developers two APIs to LoadFile. One is **LoadFromFile(string filePath)**, and the other is **LoadFromFile(Stream stream)**. Developer can feel free to invoke different APIs.

Here, RasterEdge just provides you sample code on how to load file from local and save file locally. Certainly, you can customize the way to open and store files.

Customize the Drop-down List

There are several events in Form1, for example: OnFileAdded, PageIndexChanged and SelectedIndexChanged, etc. These events are available to be used to customize the drop-down list. If you don't use the drop-down list, please omit these events.

Events	**Description**
OnFileAdded	Mainly in order to obtain the total number of document pages.
PageIndexChanged	Click on thumbnail to change the drop-down list displayed value.
SelectedIndexChanged	According to the value of selected drop-down list to switch pages.

Users can choose to copy different codes according to their needs for project.

XDoc.Converter

Overview

RasterEdge XDoc.Converter is an advanced .NET SDK for developing high performance documents and images conversion applications. Using RasterEdge XDoc.Converter, you are empowered to easily add mature and professional file conversion capabilities to your .NET applications. This .NET file converter SDK supports various commonly used document and image file formats, including Microsoft Office (2003 and 2007) Word, Excel, PowerPoint, PDF, Tiff, Dicom, SVG, Jpeg, Png, Bmp, and Gif.

Product Features

- Built in C# managed code, completely integrated into .NET windows and web projects
- Provide robust and intuitive .NET APIs for easy and fast documents and images conversion
- Support converting to PDF from MS Word, Excel, PowerPoint, Tiff, Dicom, and raster images
- Capable of converting to Tiff file from PDF, Word, Excel, PowerPoint, Dicom, and raster images
- Able to convert and change PDF, Word, Excel, PowerPoint, Tiff and Dicom to raster images
- Allow .NET programmers to convert PDF document to Microsoft Word document
- Easy to deploy and distribute derived works that are compiled with RasterEdge XDoc.Converter

Tutorial

.NET programming examples for all supported functions are provided online. Please see detailed tutorial from: http://www.rasteredge.com/how-to-csharp/xdoc/converter/.

XDoc.PDF

Overview

RasterEdge XDoc.PDF for .NET is a professional .NET PDF solution that provides complete and advanced PDF document imaging features. With simple integration, it can be used to enhance your .NET document imaging application. To be more specific, we develop multiple robust and feasible APIs for implementing high performance PDF manipulations, like PDF document viewing, editing, processing, converting, protecting, signing, etc. In addition, .NET programming examples for all these functions are provided online.

Product Features

- Quick to open or load PDF document from local file or byte array from database
- Create fully functional PDF viewers in HTML5 and .NET Windows Forms applications
- Rapidly render and convert PDF to/from MS Word, Excel, PowerPoint, Tiff, raster images, .NET Graphics, REImage, etc.
- Easily create, merge, append, split, and save PDF document file(s)
- Allow to create, edit and manipulate PDF pages, like insert, delete, move, copy, paste, rotate, etc.
- Support rapid text search in PDF document, as well as text extraction
- Support adding image to PDF file and extracting & removing image from PDF file or its page(s)
- Protect your PDF document by applying password and digital signatures, allowing file permission settings
- Capable of creating, editing and removing bookmark of PDF document
- Able to add and edit various types of annotations on PDF document page
- Capable of editing PDF metadata, like searching, editing, and saving metadata
- Empower to navigate PDF document content quickly via thumbnail
- Support optimizing and compressing your PDF file without sacrificing render quality

Tutorial

.NET programming examples for all supported functions are provided online. Please see detailed tutorial from: http://www.rasteredge.com/how-to/csharp-imaging/pdf-overview/.

XDoc.Tiff

Overview

The Tagged Image File Format (known as TIFF) is a bitmapped and lossless image format, which is often used to store large but high-quality images. RasterEdge XDoc.Tiff for .NET provides the ability to manipulate with Tiff file from various aspects using TIFFDocument and TIFFPage classes located in RasterEdge.XDoc.Tiff namespace.

Here are the features supported by our Tiff SDK.

- Robust .NET SDK that can be used in .NET Framework 2.0, 3.0, 3.5, 4.0 & 4.5
- Able to create or load Tiff file from PC local file, byte array and stream using C#.NET
- Able to save standard Tiff file after manipulation using C#.NET class code
- Offer rich APIs to process Tiff file and its pages, like merge, append, split, extract, create, insert, rotate, sort, etc.
- Free to read, write and modify Tiff metadata and color profile in C#.NET application
- Provide multiple compressing modes to compress Tiff file in C#.NET
- Capable of annotating Tiff file with various text & graphics annotations
- Allow programmers to create modern web and windows Tiff viewers in C#.NET
- Easy to generate image thumbnail or preview for Tiff document at ease
- Convert Tiff file to bmp, gif, png, jpeg, and scanned PDF with high fidelity in C#
- Support converting other files to Tiff, like Word, Excel, PowerPoint, PDF, and images
- Handle large size of Tiff in partition, reducing the resource consumption and enhancing speed performance
- Enable to add XImage.OCR for .NET into C# Tiff imaging application for characters recognition and extraction
- Easy to read & decode over 20+ barcodes from Tiff file in C#.NET application by using barcode reader SDK together
- Free to add standard 1d & 2d barcodes to specified area of Tiff file in C#.NET with the help of barcode generator SDK

Tutorial

.NET programming examples for all supported functions are provided online. Please see detailed tutorial from: http://www.rasteredge.com/how-to/csharp-imaging/tiff-reading/.

XImage.OCR

Overview

RasterEdge provides a powerful & accurate OCR SDK, XImage.OCR for .NET, which allows developers to integrate advanced Optical Character Recognition technology into Visual Studio .NET Framework applications. Versions above Visual Studio 2005 and .NET Framework 2.0 are all compatible with our OCR SDK. It is robust and high-performance recognition software with royalty-free distribution for desktop applications.

RasterEdge XImage.OCR for .NET allows you to easily add and perform the following functions in your .NET OCR application.

- Available in 32-bit and 64-bit binaries for .NET OCR application development
- Easy to integrate into .NET Windows Forms, ASP.NET Web, Silverlight applications, etc.
- Comprehensive C#.NET and VB.NET sample codings are provided online
- Support multiple languages, including English, French, German, Portuguese, Spanish, Russian, Italian, Dutch, Arabic, Korean, etc
- Allow characters recognition and extraction from images captured by digital camera, scanned PDF document and image-only PDF
- Capable of extracting text from facsimiles and photocopies with complex layout
- Support user-defined image and document OCR, like full-page, auto and manual zonal OCR recognition
- Provide flexible .NET APIs to detect file content, like character, word, line size and location
- Able to recognize and get text from black and white, grayscale and color images
- Provide solution for basic processing functions for recognized documents and images
- Output OCR result to memory, text searchable PDF, Word, Text file, etc.

Tutorial

RasterEdge XImage.OCR for .NET provides you with the functions to recognize characters out of images and documents types that are supported by RasterEdge Document Imaging SDK. Please see detailed tutorial online: http://www.rasteredge.com/how-to/csharp-imaging/ocr-sdk/.

Programming with RasterEdge Document Imaging SDK

Overview

Introduction to RasterEdge Document Imaging

RasterEdge Document Imaging SDK features in reliable and straight forward APIs to load, convert, annotate and save document file such as Office Word, Excel, PowerPoint, PDF, TIFF, and DICOM. You can build projects which provide functions of viewing, annotating, collaborating and managing documents at any time and any place. Developers can develop either client software or online ASP.NET application with RasterEdge Document Imaging SDK. You can find an online demo at http://www.rasteredge.com/dotnet-imaging/web-viewer-demo/.

The main features of our product are:

1. Load and create document formats including PDF, TIFF, Dicom, Word, Excel, and PowerPoint.
2. Convert document pages to different image formats including raster images and vector image file such as SVG files which can be viewed directly in web browsers. With customized option such resolution and crop region.
3. Annotate on pages and save the annotation in native file format.
4. Page level processing for multi-page TIFF and PDF document including appending, inserting, deleting and sorting pages.
5. Combine, split or extract pages from PDF or TIFF document.
6. Burn barcode in document page.
7. Scan barcode from documents.
8. Convert documents to PDF, TIFF and SVG file format.

In RasterEdge Document Imaging toolkit, a document and its page content within is represented as a document class object in memory. These document classes of specific document types are all derived from BaseDocument Class which contains common interfaces for document operations. Similarly, Pages in document are represented as page objects derived from BasePage Class.

For example, for PDF we use PDFDocument class object to reference a physical PDF document file or stream. You can construct a PDFDocument using the following constructor.

```
PDFDocument doc = new PDFDocument(@"D:\sample1.pdf");
```

Or construct a word document.

```
DOCXDocument doc = new DOCXDocument(@"D:\BugList\sample1.docx");
```

You can get page from document object using the following code.

```
PDFPage page = doc.GetPage(0);
```

PDFDocument and DOCXDocument Class both implement APIs from BaseDocument, while PDFPage and DOCXPage adapt APIs from BasePage.

Register Process

You need to add the following line of code in the entry point of your project to use functions in the SDK.

```
WorkRegistry.Reset();
```

If you encounter Registry Exception when running the program, please refer to the solutions here.

Word

Introduction to Word Functions

With RasterEdge.XDoc.Word.dll, you can do the following.

- Load an existing Word(docx, doc) file
- Convert the pages of Word file to image
- Convert word file to PDF, TIFF or SVG file
- Annotate on word file, and save changes in native file format

Prerequisite for using these functions is to reference our Word processing dll (RasterEdge.XDoc.Word.dll) to you project.

.docx and .doc file formats

RasterEdge Word SDK support .docx and .doc word file formats.

.doc is the older format of the word files supported by 2003 or earlier version of MS Word

.docx is the spreadsheet supported by 2007 or later version of MS Word

Here is a table showing two file formats and their corresponding RasterEdge Programming Class.

.docx	.doc
DOCXDocument	DOCDocument
DOCXPage	DOCPage

Because two kinds of programming Classes inherit the same Supper Classes (BaseDocument and BasePage), the APIs are identical. Thus all the demo code snippets in the following sections are applicable to both docx and doc files. Please choose corresponding programming class with respect to different file formats.

Load and Save Word Document

About Word Programming Classes

Word document assembly provides two Word document processing classes, which are DOCXDocument and DOCXPage.

- DOCXDocument: This class refers to Word document file represented in memory and it contains all document information of a Word file. It is an extension of BaseDocument.

- DOCXPage: This class refers to Word document page contained in DOCXDocument. It uses BasePage as prototype.

Word Document Object

DOCXDocument represents the main structure of a document and the pages it contains. When a DOCXDocument object is created, you can obtain information about the pages and other document structures.

Load Word document

The example that follows shows how to load a Word file into DOCXDocument.

Generate a DOCXDocumentobject from stream.

```
DOCXDocument doc = new DOCXDocument(Stream s);
```

```
Or for file with .doc suffix
```

```
DOCDocument doc = new DOCDocument(Stream s);
```

Generate a DOCXDocument object from local file path.

```
DOCXDocumentdoc = new DOCXDocument(@"D: \sample1.docx");
```

```
Or for file with .doc suffix
```

```
DOCDocumentdoc = new DOCDocument(@"D: \sample1.doc");
```

Once you have created a document object, you can obtain information about this document, and get page object out of it by calling ***GetPage(int pageIndex).***

C#

```
public int GetPageCount(Stream s)
        {
DOCXDocumentdocument = new DOCXDocument(s);
return document.GetPageCount();
        }
```

Save Word Document

You can save DOCXDocument to file after modifications, like adding annotations on Word.

Related APIs:

void Save(String fileName)
void SaveToStream(Stream stream)
byte[] SaveToBytes()

Get Preview of Word Document

RasterEdge document imaging sdk provide you with APIs to get a Bitmap of the first page in the word document file. You are able to get a preview of this word document without load and process the entire document in memory.

Related APIs:

static Bitmap GetPreviewImage(string file， Size targetSize)
static Bitmap GetPreviewImage(byte[] data,Size targetSize)
static Bitmap GetPreviewImage(Stream s,Size targetSize)

Annotations on Word Document

You can add different types of annotations onto DOCXPage object and save the changes back in .docx file format.

You can find an online annotation demo at http://www.rasteredge.com/dotnet-imaging/web-viewer-demo/.

To use functions above, the required assemblies are:

RasterEdge.XDoc.Word.dll
RasterEdge.Imaging.Annotation.dll
RasterEdge.Imaging.Basic.dll

Sample code:

```
// generate the annotation object
// create a line annotation starting at point (0.0) and end with point(100,100).
      AnnotationHandler anno = AnnotationGenerator.CreateLineAnnotation(new
     RasterEdge.Imaging.Annotation.Basic.LinePoint(0, 0), new
     RasterEdge.Imaging.Annotation.Basic.LinePoint(100, 100));

// load Word document
DOCXDocument doc = new DOCXDocument(@"c:\sampleword.docx");

DOCXPage page = (DOCXPage)doc.GetPage(0);
// add the line at point (100,100) on Word page. The position is measured at //default 96
 resolution with respect to word image. And therefore subject to the change of //the size of
 Word image
page.AddAnnotation(anno);
// save the modified Word back to file
doc.Save(@"c:\annotatedSample.docx");
```

See also Annotation

Word Rendering and Conversion

RasterEdge XDoc.Converter supports converting Word document to various image and document types with customized options. Besides, Word conversion from PDF is also supported. To be specific, you can convert Word document to PNG, JPEG, BMP, and GIF image formats. You can also convert Word document to other document types including TIFF, PDF and SVG.SVG is a vector image format that is supported by HTML5 standard and therefore can be viewed at most of the up to date web browsers. Please see more how to articles online: http://www.rasteredge.com/how-to-csharp/xdoc/converter/.

Create Barcode in Word

RasterEdge Barcode processing dll offers comprehensive functions for developers to generate and design both 1d & 2d barcode images on word file.

Sample Code:

```
    public static void CreateBarcodeInWord()
        {
//generate a code39 barcode
Linear linearBarcode = new Linear();
linearBarcode.Type = RasterEdge.Imaging.Barcode.Creator.BarcodeType.CODE39;

            linearBarcode.Data = "123456789";
            linearBarcode.Resolution = 96;
```

```
            linearBarcode.Rotate = Rotate.Rotate0;

// load word document, you can also load document like tiff, pdf, excel, ppt
DOCXDocument doc = new DOCXDocument(@"c:\sample.docx");
// get the first page
BasePage page = doc.GetPage(0);

// generate reimage of this barcode
REImage barcodeImage = linearBarcode.ToImage();

//add barcode image to the first page
page.AddImage(barcodeImage, new System.Drawing.PointF(100f, 100f));
// save changes to the word
doc.Save(@"c:\sample.docx");

        }
```

See Also Barcode Create

Read Barcode from Word

You can read barcode information from Word document.

Sample code:

```
   public static void ReadBarcodeFromWord(string filename, int pageIndex)
        {
//generate word document
DOCXDocument doc = new DOCXDocument(filename);
//get the page you want to read barcode from
            BasePage page = doc.GetPage(pageIndex);
//set reader setting
ReaderSettings setting = new ReaderSettings();
setting.AddTypesToRead(RasterEdge.Imaging.Barcode.Scanner.BarcodeType.Code39);
// read out barcode information
Barcode[] barcodes = BarcodeReader.ReadBarcodes(setting, page);
//output barcode information
foreach (Barcode barcode in barcodes)
{
Console.WriteLine(barcode.DataString);
}
        }
```

See also Barcode Read

How to's

How to: Create Thumbnail of DOCXDocument

You can convert DOCXDocument to image files with a zoom factor suitable for thumbnail image.

```
// load word document
DOCXDocument doc = new DOCXDocument(@"c:\sample.docx");

// compute zoom out factor
// get the first page as sample page
DOCXPage page =(DOCXPage)doc.GetPage(0);
// the original height and width are measured at 96 dpi

float originalWidth = page.GetWidth()*96;

// assume you want a thumbnail size of 500 pixel in width and compute the zoomfactor

float zoomFactor = 500f/originalWidth;
string directory = @"c:\Thumbnail";
// construct thumbnail image under the directory with a file name thumail01.png, thumnail02.png
doc.ConvertToImages(ImageType.PNG,zoomFactor,directory,"thumbnail");
```

Excel

Introduction to Excel Functions

With RasterEdge.XDoc.Excel.dll, programmers are provided with APIs to do the following:

- Load an existing Excel (xlsx and xls) file
- Convert the pages of Excel file to image
- Convert Excel file to PDF, TIFF or SVG file
- Annotate on Excel file, and save changes in native file format

Prerequisite for using these functions is to reference our Excel processing dll (RasterEdge.XDoc.Excel.dll) to your project.

.xlsx and .xls file formats

RasterEdge Excel SDK support .xlsx and .xls Excel file formats.

.xls is the older format of the spreadsheet supported by 2003 or earlier version of MS Excel

.xlsx is the spreadsheet supported by 2007 or later version of MS Excel

Here is a table showing two file format and their corresponding RasterEdge Programming Class.

.XLSX	.XLS
XLSXDocument	XLSDocument
XLSXPage	XLSPage

Because two kinds of programming Classes inherit the same Supper Classes (BaseDocument and BasePage), the APIs are identical. Thus all the demo code snippets in the following sections are applicable to both xlsx and xls files. Please choose corresponding programming class with respect to different file formats.

About Excel Programming Classes

Excel document assembly provides two document processing classes, which are XLSXDocument/XLSDocument and XLSXPage/XLSPage.

- XLSXDocument/XLSDocument: This class refers to Excel document and it contains all document information of Excel file. It is an extension of BaseDocument.
- XLSXPage: This class refers to Excel sheet contained in XLSXDocument/XLSDocument and uses BasePage as prototype.

Excel Document Object

XLSXDocument/XLSDocument represents the main structure of an xls/xlsx file and the sheet/pages it contains. When an XLSXDocument/XLSDocument object is created, we can easily extract information about the pages/sheet and other document structures.

Load Excel Document

The example that follows shows how to load an Excel file into XLSXDocument/XLSDocument.

Generate an XLSXDocument/XLSDocument object from stream.

```
XLSXDocument doc = new XLSXDocument (Stream s);

XLSDocument doc = new XLSDocument (Stream s);
```

Generate an XLSXDocument/XLSDocument object from file path.

```
XLSXDocument doc = new XLSXDocument(@"D:\BugList\sample1.xlsx ");

XLSDocument doc = new XLSDocument(@"D:\BugList\sample1.xlsx ");
```

Once you have created a document object, you can obtain information about this document, and get page object out of it by calling ***GetPage(int pageIndex)***.

C#

```
   public int GetPageCount(Stream s)
        {
XLSXDocument document = new XLSXDocument(s);
return document.GetPageCount();
        }
```

Save Excel Document

You can save XLSXDocument to file after modifications like adding annotations have been done.

Related APIs:

void Save(String fileName)
void SaveToStream(Stream stream)
byte[] SaveToBytes()

Get preview of Excel Document

RasterEdge excel-add on provide you with APIs to get a Bitmap of the first page/sheet in the excel document file. You are able to get a preview of this excel document without load and process the entire document in memory. Note that for excel sheet/page in large size, the image may be cropped for better presentation.

Related APIs:

static Bitmap GetPreviewImage(string file， Size targetSize)
static Bitmap GetPreviewImage(byte[] data,Size targetSize)
static Bitmap GetPreviewImage(Stream s,Size targetSize)

Annotations on Excel Document

You can add different types of annotations onto XLSXPage object and save the changes back in .xlsx native file format.

You can find an online annotation demo at http://www.rasteredge.com/dotnet-imaging/web-viewer-demo/.

To use functions above, the required assemblies are:

RasterEdge.XDoc.Excel.dll
RasterEdge.Imaging.Annotation.dll
RasterEdge.Imaging.Basic.dll

Sample code:

```
// create a line annotation starting at point (0.0) and end with point(100,100).
AnnotationHandler anno = AnnotationGenerator.CreateLineAnnotation(new
RasterEdge.Imaging.Annotation.Basic.LinePoint(0, 0), new
RasterEdge.Imaging.Annotation.Basic.LinePoint(100, 100));

// load excel document
XLSXDocument doc = new XLSXDocument(@"c:\sample.xlsx ");

XLSXPage page = (XLSXPage)doc.GetPage(0);
// add the line at point (100,100) on the excel page. The position is measured at default 96
```

```
resolution with respect to the excel page image. And therefore subject to the change of the size
of the excel image
page.AddAnnotation(anno);
// save the modified excel back to file
doc.Save(@"c:\annotatedSample.xlsx");
```

Excel Rendering and Conversion

RasterEdge XDoc.Converter supports converting Excel document to various image and document types with customized options. You can convert Excel document to PNG, JPEG, BMP, and GIF image formats. You can also convert Excel document to other document types including TIFF, PDF and SVG. SVG is a vector image format that is supported by HTML5 standard and therefore can be viewed at most of the up to date web browsers. Please see more how to articles online: http://www.rasteredge.com/how-to-csharp/xdoc/converter/.

Create Barcode in Excel

RasterEdge Barcode processing dll offers comprehensive functions for developers to generate and design both 1d & 2d barcode images on Excel file.

Sample Code:

```
//generate a code39 barcode
            Linear linearBarcode = new Linear();
            linearBarcode.Type = RasterEdge.Imaging.Barcode.Creator.BarcodeType.CODE39;

            linearBarcode.Data = "123456789";
            linearBarcode.Resolution = 96;

            linearBarcode.Rotate = Rotate.Rotate0;


 // load excel document, you can also load document like tiff, word, excel, ppt
            XLSXDocument doc = new XLSXDocument(@"c:\sample.xlsx");
            // get the first page
            BasePage page = doc.GetPage(0);


  // generate reimage of this barcode
            REImage barcodeImage = linearBarcode.ToImage();

 //add barcode image to the first page
            page.AddImage(barcodeImage, new System.Drawing.PointF(100f, 100f));
    // save changes to the excel
            doc.Save(@"c:\sample.xlsx");
```

See Also Barcode Create

Read Barcode from Excel

You can read barcode information from Excel document.

Sample code:

```
public static void ReadBarcodeFromExcel(string filename, int pageIndex)
    {
//generate excel document
XLSXDocument doc = new XLSXDocument(filename);
//get the page you want to read barcode from
BasePage page = doc.GetPage(pageIndex);
//set reader setting
ReaderSettings setting = new ReaderSettings();
setting.AddTypesToRead(RasterEdge.Imaging.Barcode.Scanner.BarcodeType.Code39);
// read out barcode information
Barcode[] barcodes = BarcodeReader.ReadBarcodes(setting, page);
//output barcode information
foreach (Barcode barcode in barcodes)
          {
Console.WriteLine(barcode.DataString);
          }
    }
```

See also Barcode read

How to's

How to: Create Thumbnail of Excel

You can convert Excel document to image files with a zoom factor suitable for thumbnail image.

```
// load excel document
XLSXDocument    doc = new XLSXDocument(@"c:\sample.xlsx");

// create thumbnail image of target size 100*130
// the original height and width are measured at 96 dpi

for (int i = 0; i < doc.GetPageCount(); i++)
{
BasePage page = doc.GetPage(i);
// create a thumbnail image that is cropped from the original image
```

```
REImage img = page.CropImage(new Rectangle(0, 0, 100, 130), new Size(100, 130));

img.Save(ImageType.PNG, @"c:\thumbnail" + i + ".png");

}
```

PowerPoint

Introduction to PowerPoint Functions

With RasterEdge.XDoc.PowerPoint.dll, programmers are provided with APIs to do the following:

- Load an existing power point file (pptx, ppt)
- Convert the pages of PowerPoint file to images
- Convert PowerPoint file to PDF, TIFF or SVG file
- Annotate on PowerPoint file, and save changes in native file format

Prerequisite for using these functions is to reference our PowerPoint processing dll (RasterEdge.Imaging. MSPPT.dll) to your project.

.pptx and.ppt file formats

RasterEdge Excel SDK support .pptx and .ppt Excel file formats.

.pptx is the older format of the PowerPoint file supported by 2003 or earlier version of

MS PowerPoint

.ppt is the PowerPoint supported by 2007 or later version of MS PowerPoint

Here is a table showing two file format and their corresponding RasterEdge Programming Class

.pptx	.ppt
PPTXDocument	PPTDocument
PPTXPage	PPTPage

Because two kinds of programming Classes inherit the same Supper Classes (BaseDocument and BasePage) the APIs are identical. Thus all the demo code snippets in the following sections are applicable to pptx and ppt files. Please choose corresponding programming class with respect to different file formats.

About PowerPoint Programming Classes

PowerPoint document assembly provides two document processing classes, which are PPTXDocument and PPTXPage.

- PPTXDocument: This class refers to PowerPoint document and it contains all document information of PowerPoint file. It is an extension of BaseDocument.
- PPTXPage: This class refers to PowerPoint document page contained in PPTXDocument and uses BasePage as prototype.

PowerPoint Document Object

PPTXDocument represents the main structure of a document and the pages it contains. When a PPTXDocument object is created, we can easily extract information about the pages and other document structures.

Load PowerPoint Document

The example that follows shows how to load a pptx file into PPTXDocument.

Generate a PPTXDocument object from stream.

```
PPTXDocument doc = new PPTXDocument (Stream s);
```

Generate a PPTXDocument object from file path.

```
PPTXDocument doc = new PPTXDocument (@"c:\sample.pptx");
```

or for file with .ppt suffix

```
PPTDocument doc = new PPTDocument (@"c:\sample.ppt");
```

Once you have created a document object, you can obtain information about this document, and get page object out of it by calling ***GetPage(int pageIndex)***.

C#

```
public int GetPageCount()
    {
        PPTXDocument doc = new PPTXDocument (@"c:\sample.pptx");
         doc.GetPageCount();

    }
```

Save PowerPoint Document

You can save PPTXDocument to file after modifications for example adding annotations have been done.

Related APIs:

void Save(String fileName)
void SaveToStream(Stream stream)
byte[] SaveToBytes()

Get Preview of PowerPoint Document

RasterEdge powerpoint add-on provides you with APIs to get a Bitmap of the first page/slide in the powerpoint document file. You are able to get a preview of this powerpoint document without load and process the entire document in memory.

Related APIs:

static Bitmap GetPreviewImage(string file， Size targetSize)
static Bitmap GetPreviewImage(byte[] data,Size targetSize)
static Bitmap GetPreviewImage(Stream s,Size targetSize)

Annotations on PowerPoint Document

You can add different types of annotations onto PPTXPage object and save the changes back in .pptx native file format.

You can find an online annotation demo at http://www.rasteredge.com/dotnet-imaging/web-viewer-demo/.

To use functions above, the required assemblies are:

RasterEdge.XDoc.PowerPoint.dll
RasterEdge.Imaging.Annotation.dll
RasterEdge.Imaging.Basic.dll

Sample code:

```
// create a line annotation starting at point (0.0) and end with point(100,100).
AnnotationHandler anno = AnnotationGenerator.CreateLineAnnotation(new
```

```
RasterEdge.Imaging.Annotation.Basic.LinePoint(0, 0), new
RasterEdge.Imaging.Annotation.Basic.LinePoint(100, 100));

// load powerpoint document
PPTXDocument doc = new PPTXDocument(@"c:\sample.pptx");

PPTXPage page = (PPTXPage)doc.GetPage(0);
//add the line at point (100,100) on the powerpoint page.
//The position is measured at default 96 resolution with respect to the powerpoint page rendered
            as image.
            page.AddAnnotation(anno);
// save the modified pptx back to file
            doc.Save(@"c:\annotatedSample.pptx");
```

PowerPoint Rendering and Conversion

RasterEdge XDoc.Converter supports converting PowerPoint document to various image and document types with customized options. You can convert PowerPoint document to PNG, JPEG, BMP, and GIF image formats. You can also convert PowerPoint document to other document types including TIFF, PDF and SVG. SVG is a vector image format that is supported by HTML5 standard and therefore can be viewed at most of the up to date web browsers. Please see more how to articles online: http://www.rasteredge.com/how-to-csharp/xdoc/converter/.

Create Barcode in PowerPoint

RasterEdge Barcode processing dll offers comprehensive functions for developers to generate and design both 1d & 2d barcode images on power point file.

Sample Code:

```
// generate a code39 barcode
Linear linearBarcode = new Linear();
            linearBarcode.Type = RasterEdge.Imaging.Barcode.Creator.BarcodeType.CODE39;

            linearBarcode.Data = "123456789";
            linearBarcode.Resolution = 96;

            linearBarcode.Rotate = Rotate.Rotate0;


// load ppt document, you can also load document like tiff, word, excel, pdf
PPTXDocument doc = new PPTXDocument(@"c:\sample.pptx");
// get the first page
BasePage page = doc.GetPage(0);


// generate reimage of this barcode
REImage barcodeImage = linearBarcode.ToImage();
```

```
//add barcode image to the first page
            page.AddImage(barcodeImage, new System.Drawing.PointF(100f, 100f));
// save changes to the powerpoint
            doc.Save(@"c:\sample.pptx");
```

See Also Barcode Create

Read Barcode from PowerPoint

You can read barcode information from powerpoint document.

Sample code:

```
public static void ReadBarcodeFromPPT(string filename, int pageIndex)
        {
//generate powerpoint document
PPTXDocument doc = new PPTXDocument(filename);
//get the page you want to read barcode from
BasePage page = doc.GetPage(pageIndex);

//set reader setting
ReaderSettings setting = new ReaderSettings();
            setting.AddTypesToRead(RasterEdge.Imaging.Barcode.Scanner.BarcodeType.Code39);
// read out barcode information
Barcode[] barcodes = BarcodeReader.ReadBarcodes(setting, page);
//output barcode information
foreach (Barcode barcode in barcodes)
            {
Console.WriteLine(barcode.DataString);
            }
        }
```

See also Barcode read

How to's

How to: Create Thumbnail of PowerPoint Document

You can convert PowePoint document to image files with a zoom factor suitable for thumbnail image.

```
        // load Power Point document
PPTXDocument doc = new PPTXDocument(@"c:\sample.pptx");

// compute zoom out factor
```

```
// get the first page as sample page
PPTXPage page = (PPTXPage)doc.GetPage(0);
// the original height and width are measured at 96 dpi

float originalWidth = page.GetWidth() * 96;

// assume you want a thumbnail size of 100 pixel in width and compute the zoom factor

float zoomFactor = 100f / originalWidth;
string directory = @"c:\Thumbnail";
// construct thumbnail image under the directory with files name of the pattern thumail01.png,
thumnail02.png
            doc.ConvertToImages(ImageType.PNG, zoomFactor, directory, "thumbnail");
```

DICOM

DICOM Overview

DICOM (Digital imaging and Communications in Medicine) is an international standard (ISO 12052) respective to medical imaging and its related workflow & data management. It defines the file format that can be used for data exchange in clinical circumstances demand. Among tens of thousands of medical imaging devices, DICOM is one of the most widely used medical information standards. In 1993, ACR-NEMA Joint Commission released the third version of DICOM standard (DICOM 3.0) which is regarded as the international standard in the field of medical imaging informatics. It covers almost all information exchange protocols for medical digital image, like image acquisition, archiving, communication, display and search. The implementation of DICOM standard greatly **simplifies the exchange of medical image information and promotes the research and development of** teleradiology system and image management and communication system (PACS). In addition, openness and connectivity of DICOM makes it possible to be integrated with other medical application systems (HIS, RIS).

Programming with DICOM

There are two important classes in DICOM programming, DCMDocument and DCMPage. Every Dicom file is represented as a DCMDocument object, and the images and related information is represented as DCMPage object.

Load DICOM File

You can load a file, stream or byte[] containing a Dicomdocument as a DCMDocument object.

```
DCMDocument doc = new DCMDocument(@"c:\a.dcm");
```

DICOM Rendering and Conversion

RasterEdge XDoc.Converter supports converting Dicom image to various image and document types with customized options. You can convert Dicom image to PNG, JPEG, BMP, and GIF image formats. You can also convert Dicom image to other document types including TIFF and PDF. Please see more how to articles online: http://www.rasteredge.com/how-to-csharp/xdoc/converter/.

JBIG2

JBIG2 Codec Overview

RasterEdge Image JBIG2 codec can be used to decode and encode JBIG2 images using the Microsoft .NET Framework. JBIG2 compression is an open standard and can compress bitonal images 2-5 times more than the same image compressed with the industry standard TIFF CCIT Group4 compression. This codec is available as a plug-in that integrates with RasterEdge Image seamlessly.

Feature List

- Able to decode any page from a 1-bit JBIG2 image
- Encode a single or multi-page document as JBIG2 image(s) or image only PDF document
- Support lossless and lossy compressions
- Support encoding and decoding from any stream
- Read a specified region from an existing JBIG2 image stream
- Generate image only PDF document with embedded JBIG2 image(s)
- Integrated with RasterEdge PDFEncoder to encode PDF images with other compression formats.

How to Decode an JBIG2 Image

Sample Code:

```
// invoke this method only once in the beginning of your code register all assemblies you
referenced to your project
WorkRegistry.Reset();
//decode image in jbig2 format
REImage img = new REImage(@"c:\sample.jb2", ImageType.JBIG2);
// save the image in png format
img.Save(ImageType.PNG, @"c:\sampleModified.png");
```

JPEG 2000

JPEG 2000 Codec Overview

RasterEdge JPEG 2000 codec can be used to decode and encode JPEG 2000 images using the Microsoft .NET Framework. It uses wavelet compression technology to compress photo graphic images further than any other available compression schemes. This codec is available as a plug-in and integrates with RasterEdge seamlessly.

Feature List

- Able to decompress JPEG2000 images stored in any compatible jp2, j2k or code stream
- Support decoding JPEG2000 directly to 8-bit grayscale, 24-bit RGB, 16-bit grayscale, and 48-bit RGB
- Lossless compression

How to Decode a JPEG 2000 Image

Sample Code:

```
// invoke this method only once in the beginning of your code register all assemblies you
referenced to your project
WorkRegistry.Reset();
//decode image in jpeg2000 format
REImage img = new REImage(@"c:\sample.jpx", ImageType.JPEG2000);
// save the image in png format
img.Save(ImageType.PNG, @"c:\sampleModified.png");
```

RasterEdge REImage

REImage Overview

RasterEdge Imaging SDK provides you functions to operate on over 100 raster image formats. You can load, convert, process and save different image formats.

Requirements

The APIs related to RasterImage are located under:

Assemblies:

RasterEdge.XImage.Raster.dll

RasterEdge.XImage.Raster.Core.dll

NameSpace:

RasterEdge.XImage.Raster

About REImage Programming Classes

- RasterImage Object: This class will provide more Image Processing methods.
- ConvertHandler: Provide several static methods for image conversion. (Support over 100 image formats).
- ImageProcess: Provide static methods for image processing, such as rotate, crop, resize, trim, append, monochrome, quantizeColor, transformColorSpace, transformCompressin and so on.
- LoadOption: To provide specific instructions when loading an image from file, byte array, bitmap or from stream. If no load options are specified, Raster will use default values when loading the image.
- SaveOption: Prior to saving an image, specify the image's save options, by setting the save option's properties.

Convert Image

RasterEdge Imaging.Raster provides reliable encoding and decoding function for raster images of different formats. With APIs provided, you can convert between different image formats with ease. C# Sample Code:

```
WorkRegistry.Reset();
// Convert png format to gif format according to file input path and output file path
//program can recognize file format according path
ConvertHandler.Convert(@”input.png”, @”output.gif”);
// Convert GIF image format to PNG image format.
Byte[] FileData = File.ReadAllBytes(@”input.GIF”);
ConvertHandler.Convert(inputStream, @”output.png”);
```

And more methods are provided.
Input support: Image file path, image data bytes, image stream
Output support: Image data bytes, Stream, output file, and so on.
Related APIs:

public static void ConvertImage(ImageType targetType, Stream srcStream, Stream targetStream)
public static void ConvertImage(ImageType targetType, String sourcePath, String targetPath)
public static byte[] ConvertToBytes(byte[] inputBytes, String ext)
public static byte[] ConvertToBytes(Stream inputStream, String ext)
public static byte[] ConvertToBytes(String inputFilePath, String ext)
public static Stream ConvertToStream(byte[] inputBytes, String ext)
public static Stream ConvertToStream(Stream inputStream, String ext)
public static Stream ConvertToStream(String inputFilePath, String ext)
public static int Convert(byte[] inputBytes, String outputFilePath)
public static int Convert(Stream inputStream, String outputFilePath)
public static int Convert(String inputFilePath, String outputFilePath)

Other:

RasterEdge XDoc.Converter provides reliable encoding and decoding functions for raster images of different formats. With APIs provided, you can convert between different image formats with ease. C# Sample Code:

```
WorkRegistry.Reset();
String inputFilePath = @"***.***";
String outputFilePath = @"***";

// convert to a BMP
ImageConverter.ToImage(inputFilePath, outputFilePath + ".bmp", FileType.IMG_BMP);
// convert to a GIF
ImageConverter.ToImage(inputFilePath, outputFilePath + ".gif", FileType.IMG_GIF);
// convert to a JPEG
ImageConverter.ToImage(inputFilePath, outputFilePath + ".jpg", FileType.IMG_JPEG);
// convert to a PNG
ImageConverter.ToImage(inputFilePath, outputFilePath + ".png", FileType.IMG_PNG);
// convert to a SVG
```

```
ImageConverter.ToImage(inputFilePath, outputFilePath + ".svg", FileType.IMG_SVG);
```

Related APIs:

public static FileType GetImageType(String filePath)
public static FileType GetImageType(Stream fileStream)
public static ConvertResult ToImage(String srcFilePath, String desFilePath, FileType fileType)
public static ConvertResult ToImage(String srcFilePath, String desFilePath, ImageSaveOption option)
public static ConvertResult ToImage(Stream srcStream, Stream desStream, FileType fileType)
public static ConvertResult ToImage(Stream srcStream, Stream desStream, ImageSaveOption option)
public static ConvertResult ToDocument(String srcFilePath, String desFilePath, FileType fileType)
public static ConvertResult ToDocument (String srcFilePath, String desFilePath, DocumentSaveOption option)
public static ConvertResult ToDocument (Stream srcStream, Stream desStream, FileType fileType)
public static ConvertResult ToDocument (Stream srcStream, Stream desStream, DocumentSaveOption option)

Load Image

Load image from byte array, stream and file path. Load option is provided to provide specific instructions

C#

```
//Construct a RasterImage
REImage raster= new REImage(@"C:\input.tif");

//Construct a RasterImage, Use LoadOption, Load the image as thumbnail
LoadOption loadOption = new LoadOption();
 // not preserve the aspect ratio
loadOption.MaintainAspectRatio = false;

 loadOption.ThumbnailSize = ThumbnailSize.OneQuarter;

REImage raster = new REImage(@"F:\input.png", loadOption);



//Construct a RasterImage, Use LoadOption
 LoadOption loadOption = new LoadOption();

// not preserve the aspect ratio

 loadOption.MaintainAspectRatio = false;
```

```
//resize image without antialias, it's much faster than with antialias
loadOption.LoadResizeAntiAlias = false;

//When more than one of these operations is requested, the order is:
//Crop, Resize, Rotate
loadOption.CropRectangle = new Rectangle(10, 10, 50, 50);

//target image size
 loadOption.Resize = new Size(500, 500);

//rotate target image
loadOption.RotateAngle = RotateAngle.Rotate90;

REImage raster = new REImage(@"C:\input.png", loadOption);
```

Related APIs:

```
public REImage(String filePath);
public REImage(String filePath, LoadOption loadOption)
public REImage(Stream stream);
public REImage(Stream stream, LoadOption loadOption)
public REImage(byte[] fileData);
public REImage(byte[] fileData, LoadOption loadOption)
public REImage(String filePath, ImageType sourceType);
public REImage(Stream stream, ImageType sourceType)
public REImage(byte[] fileData, ImageType sourceType)
```

Save Image

Save image to byte array, stream and filePath. SaveOption is under development. Currently, only TIFF and BMP is supported.

C# Sample Code:

```
//Use saveOption to save file
REImage raster = new REImage (@"C:\input.gif");
SaveOption saveOption = new SaveOption();
//Set the output file's image format to tif
saveOption.ImageFormat = RasterEdge.XImage.Raster.ImageFormat.TIFF;
//Set output.tif file's colorSpace
saveOption.Tiff.ColorSpace = RasterEdge.XImage.Raster.Inner.ColorSpace.GRAY;
//Set output.tif file's compression
saveOption.Tiff.Compression = Compression.Group4;
//If multiPage = true, only save the first page to tif. Otherwise, save the whole file
saveOption.Tiff.MultiPage = true;
 //Save the output.tif file
raster.Save(@"C:\output.tif", saveOption);
```

SampleCode2:

```
REImage raster = new REImage(@"F:\input.png");

SaveOption saveOption = new SaveOption();

saveOption.ImageFormat = RasterEdge.XImage.Raster.ImageFormat.BMP;

 //RLECompression only support the bmp which colors less than 256
saveOption.Bmp.Compression = Compression.RLE;

raster.Save(@"F:\output.bmp", saveOption);
```

Related APIs:
public byte[] SaveToBlob(REImageFormat format);
public override void Save(ImageType targetType, String filePath)
public void Save(String filePath, SaveOption saveOption)
public override void Save(ImageType targetType, Stream stream)
public void Save(Stream stream, SaveOption loadOption)
public override byte[] Save(ImageType targetType)
public byte[] Save(SaveOption saveOption)

Image Process

Trans Image processing class, you can resize, flip, mirror, rotate, distort, shear and transform images, adjust image colors, and apply various special effects.

C# Sample Code:

```
 //Reduce image's color to specific num
REImage raster = new RasterImage(@"C:\input.png");
 //Use FloydSteinbergDitherMethod to reduce the color,and set the output file's colorSpace to Grayscale
ImageProcess processor = new ImageProcess(img);
processor.QuantizeColor(256, DitherMethod.FloydSteinbergDitherMethod,
RasterEdge.XImage.Raster.Inner.ColorSpace.GRAY);
raster.Save(@"C:\output.png");

//Transform image's color space
REImage raster = new REImage (@"C:\input.tif");
ImageProcess processor = new ImageProcess(img);
processor.TransformColorspace(RasterEdge.XImage.Raster.Inner.ColorSpace.CMYK);
raster.Save(@"C:\output.tif");

//Transform image's compression
REImage raster = new REImage (@"C:\input.tif");
ImageProcess processor = new ImageProcess(img);
processor.TransformCompression( Compression.JPEG);
raster.Save(@"C:\output.tif");
```

```
//BlurImage
REImage raster = new REImage(@"C:\input.png");
//Setting radius to 0, you will get an appropriative Gaussian radius; set the sigma to 0.7. The larger this value is, the more blurry the image would be.
ImageProcess processor = new ImageProcess(img);
processor.BlurImage( 0, 0.7);
raster.Save(@"C:\output.png");

//Gammacorrect image
REImage raster = new REImage (@"F:\24RGB_0.png");
ImageProcess processor = new ImageProcess(img);
processor.GammaImage( 0.7);
raster.Save(@"F:\Test.tif");

//Append image: direct = 0, append direction is Horizontal; direct = 1, append direction is Vertical. input.tif is a multi page file.
REImage raster = new REImage(@"C:\input.tif");
ImageProcess processor = new ImageProcess(img);
processor.AppendImages(raster, 1);
raster.Save(@"C:\output.tif");

//Merge Image, place the child image on the parent image. The x coordinate is 30,y coordinate is 50
REImage parent = new REImage(@"C:\parent.png");
REImage child = new REImage(@"C:\child.png");
ImageProcess processor = new ImageProcess(img);
processor.MergeImage(child, MergeType.Colorize, 30, 50);
parent.Save(@"C:\output.png");

//Add Comment to the image
REImage raster = new REImage(@"C:\input.jpg");
ImageProcess processor = new ImageProcess(img);
processor.AddComment(raster, "Hello Word");
raster.Save(@"C:\output.jpg");

//Select an Area to process. Define a part of the image to process, by specifying a rectangle(10,10,50,100).Must set API "AreaProcessEnd" to true when specified processing are all completed.
REImage raster = new RasterImage(@"C:\input.jpg");
raster.SetArea = new Rectangle(10, 10, 50, 100);
ImageProcess processor = new ImageProcess(img);
processor.SwirlImage(raster,30);
raster.AreaProcessEnd = true;
raster.Save(@"F:\output.jpg");
```

Related APIs:

public void AddNoiseImages(RasterImage image, NoiseType noise);

public void AdaptiveResizeImages(RasterImage imge, int width, int height);
public void AppendImages(RasterImage image, int direction);
public void BlurImages(RasterImage image, double radius, double sigma);
public void CropImage(RasterImage image, Rectangle rect, int pageindex);
public void FlipImages(RasterImage image);
public void GammaImages(RasterImage image, double gamma);
public void MonochromeImages(RasterImage image);
public void QuantizeColor(RasterImage image, int num, REDitherMethod ditherMehod, REColorSpaceType colorspace);
public void RotateImages(RasterImage image, double degree);
public void ReSizeImages(RasterImage imge, int width, int height, REInterpolateMethod polateMethod);
public void ShadowImages(RasterImage image, double percentOpacity, double sigma, int x, int y);
public void SharpenImages(RasterImage image, double radius, double sigma);
public void SolarizeImages(RasterImage image, double factor);
public void TrimImages(RasterImage image);
public void TransformColorspace(RasterImage image, REColorSpaceType colorSpace);
public void TransformCompression(RasterImage image, RECompression compression);
*****

Programming with Images

Overview

RasetEdge Image toolkit is a powerful imaging solution for your desktop or web server side application. With a collection of controls for ASP.NET and Windows, you can integrate a light and powerful solution into your document imaging and image processing project. Licensing is straightforward and runtime royalty free on desktop. All RasterEdge imaging related assemblies are available as managed components and are natively built as .NET2.0 assemblies. Therefore, it is compatible for .NET 2.0 and higher platforms. And there are several add-on modules to meet your specific requirements.

RasterEdge Imaging basic assembly(Core SDK)	Including Codecs for basics image formats (Bitmap, GIF, PNG and JPEG) and image processing.
PDF SDK	Fast and powerful Codec, imaging, annotating and editing for document of PDF format.
TIFF SDK	Fast and powerful Codec, imaging, annotating and editing for document of TIFF format.
Barcode Reader SDK	Read barcode from an image (or document page) obtained.
Barcode Generator SDK	Write barcode to specific image (or document page).
DICOM Codec SDK	Codecs for DICOM image format.
JBIG2 Codec SDK	Codecs for JBIG2 image format.
JPEG2000 Codec SDK	Codecs for JPEG2000 image format.

Image Concept

REImage, the Core Programming Class for Images

In RasterEdge Imaging SDK we represent a raster image which is described in sample or pixel as REImage. It is similar to the concept of Bitmap in .Net programming. Before discussing REImage Class in details, we would like to provide you with some optional knowledge that may help you understand the theory behind raster images. You can skip this section and learn REImage in programming.

Image Data

Image data contains color information for every pixel in image. REImage provides a property of ImageData from which you can use unsafe code to change/set image data directly.

Image Compressions

When you add images to certain file format, you may select different image compression schemes to reduce file size.

Why Compression

In a raw state, images can occupy a rather large amount of memory both in RAM and in storage. Image compression reduces the storage space required by an image and the bandwidth needed when streaming that image across a network.

Types of Compression

Compression Types

There are two types of compression algorithms, namely lossless and lossy. Lossless compression grants the integrity of data which means the decompressed image is the same as the original, with no data lose. For lossy compression, some data in image will be lost during compression, so the resulting image is not identical to original one.

Compression Methods

The following compression methods are available in RasterEdge Image.JPEG Compression.

- Deflate/PNG Compression
- LZW Compression
- CCIT Group 4 / Group 3 Compression
- RLE(Run Length Encoding) Compression
- JPEG2000 Compression
- JBIG2 Compression

RasterEdge Imaging toolkit provides a number of codecs to encode and decode image in various compression modes. Different document types may support different compression schemes.

Image Codecs

An Image codec is a program that can encode and decode an image in specific format.

REImage can read and write most common image formats. Images are read and written with BaseDecoders and BaseEncoders for specific type, for example PNGEncoder and PNGDecoder for encoding and decoding PNG images. Plug-ins for JPEG2000 and some other codecs are available separately.

Supported Formats

REImage natively supports image (document) formats listed in the table below. This table also shows the location of these codecs in particular assembly or plug-in.

ImageType	ImageDecoder	ImageEncoder	Assembly
Jpeg	JPEGDecoder	JPEGEncoder	RasterEdge.Imaging.Basic.codec
Png	PNGDecoder	PNGEncoder	RasterEdge.Imaging.Basic.codec
Bmp	BMPDecoder	BMPEncoder	RasterEdge.Imaging.Basic.codec
Gif	GifDecoder	GifEncoder	RasterEdge.Imaging.Basic.codec
JBIG2	JBIG2Decoder	JBIG2Encoder	RasterEdge.Imaging.Basic.codec
Jpeg2000	Jpeg2000Decoder	JpegEncoder	RasterEdge.Imaging.JPEG2000
Dicom	DicomDecoder	DicomEncoder	RasterEdge.Imaging.DICOM

REImage the Core Image Class in RasterEdge Imaging SDK

Introduction

In RasterEdge Imaging SDK we represent raster image which is described in sample or pixel as REImage. It is similar to the concept of Bitmap in.Net programming and you can get bitmap object from a REImage object.

Rasteredge Imaging sdk provides straightforward APIs to load, modify, convert, and save REImage object which encapsulate the concept of encoder or decoder. Below are example codes for loading and saving REImage from/to various image formats. Please note that you can

make full use of REImage class when combined with functionalities from Document Imaging SDK. One typical example is to convert document page to REImage. Try our online demo at http://www.rasteredge.com/demo/online-document-viewer/ for more detailed information.

Note: RasterEdge Document Imaging SDK represents PDF, TIFF, Dicom, Office Word, Excel, and PowerPoint as document object. You can get REImage from BaseDocument and BasePage. See Document Imaging for more Information.

Requirements

The APIs related to REImage are located under:

Assemblies: RasterEdge.Imaging.Basic.dll

NameSpace: RasterEdge.Imaging.Basic;

How to Create REImage

Create REImage from Image File, Stream & Byte Array

Create REImage from image file, stream & byte array that contain the image. Sample APIs in REImage Class are listed below.

public REImage(String fileName, ImageType sourceType)
public REImage(Stream stream, ImageType sourceType)
public REImage(byte[] fileData,ImageType sourceType)

The parameter type ImageType can be chosen for any supported image format mentioned in previous section. You can also let your program choose the ImageType automatically using similar API as follows:

public REImage(String filename)

Demo code to construct an image source:

```
        List<REImage> tmpImgList = new List<REImage>();

DirectoryInfo d = new DirectoryInfo(filepath);

foreach (FileInfo file in d.GetFiles())
            {
// construct image source from jpeg and png images
                if (file.Extension.ToLower().Contains("jpeg") ||
                file.Extension.ToLower().Contains("png"))
```

```
                {
REImage img = new REImage(file.FullName);
                    tmpImgList.Add(img);

                }

            }
REImage[] ImageSource =  tmpImgList.ToArray();
```

Create Image from Bitmap

publicREImage (Bitmap image)

Annotate on REImage

You can draw different kinds of predefined annotations onto REImages, and save them to file or stream. Below is the sample code:

```
publicstaticvoid TestREImageAnnotation()
        {


            // invoke this method only once at the start of your project to register all
            assemblies you referenced to your project
WorkRegistry.Reset();
//Load an PNG file to REImage object
REImage img = new REImage(@"c:\samplePNG.png", ImageType.PNG);

        // create a line annotation starting at point (0.0) and end with point(100,100), note
        that only the relative position of the start and end point is used.
            LineAnnotation anno = AnnotationGenerator.CreateLineAnnotation(new LinePoint(0, 0),
        new LinePoint(100, 100));



// set line stroke color and style

            anno.LinePen = PenGenerator.CreateLinePen(new REColor(255, 0, 0, 255), 5.0F);

            anno.LinePen.StartCap = new LineCap();
            anno.LinePen.StartCap.Cap_Width = 2.0f;
            anno.LinePen.StartCap.CapStyle = LineCapStyle.Diamond;


            anno.SetTransparency(0.4f);

            // draw line annotation on the REImage, The position is measured at default 96
        resolution with respect to the image. And therefore it is subject to the change of the
        size of the tiff image
```

```
            img.DrawAnnotation(new Point(100, 100), anno);

            img.Save(ImageType.PNG, @"c:\samplePNGAnnotated.png");

        }
```

[See also Annotation]

Save REImage

You can save REImage to file, stream and byte array with specified image type. Useful APIs in REImage Class:

void Save(ImageType targetType, String fileName)
void Save(ImageType targetType, Stream stream）
byte[] Save(ImageType targetType)

ImageProcessing

RasterEdge Imaging provides you with the ability to perform operations on existing REImage object to create a new REImage object. These functions are located under RasterEdge.Imaging.Processing Assmebly. Generally speaking, there are three kinds of image processing operations available for you.

Category	Illustration
Channels Processing	Operate on images with multiple components, like color images
Effects Processing	Perform visual effects on images like mosaic or beveling
Filters	Perform mathematical filtering like high or low pass filtering
Transforms	Perform coordinate transforms or depth transforms like rotate or ripple

APIs to perform these operations are in the ImageProcessing Class located in RasterEdge.Imaging.Processing assembly.

Annotations

Introduction to Annotations

RasterEdge Annotation is a managed .NET Assembly that can perform annotation capabilities to mark, draw, and visualize objects on an image or document. Annotation objects include primitive shapes (lines, rectangle, polygon and ellipse), text, callout, rubber stamp, hotspot, freehand, signature, arrow, embedded images and hot spots. You can set properties of these annotations, and add these annotations onto REImage and Document.

With Windows Forms viewer control or ASP.NET AJAX driven HTML5Viewer, these annotations can be independently resized, moved, rotated, and placed on different layers. Annotation can be imported or exported from/to an xml file. Try our online Demo at http://www.rasteredge.com/demo/online-document-viewer/ for more detailed information.

Features of Annotation Assembly

- Draw an arbitrary number of annotation objects to an image or document
- Object Oriented Design for every annotation object
- Annotation objects can be moved, resized, and rotated independently from image or document
- GDI+ graphics allows any object to be rendered at variable transparency
- Save or load annotations as a separate XML file
- Annotations can be rotated along with image in 90 degree increments
- Individual points from annotations supporting points (Freehand, Polygon, etc.) can be repositioned
- Able to change shape of annotation object
- Annotations can be burned onto image with a single method
- Render annotation object to REImage for further operation
- Various properties can be set when creating an annotation object

Following is a list of supported annotations by RasterEdge Annotation assembly.

- Rectangle
- Ellipse
- Line
- Freehand
- Freehand Lines
- Text
- Rectangular HotSpot
- Freehand HotSpot
- Embedded Image

- Referenced Image
- Polygon
- Lines
- RubberStamp
- CalloutAnnotation
- ArrowAnnotation
- SignatureAnnotation

Requirements

Assemblies you need:

RasterEdge.Imaging.Annotation.dll

RasterEdge.Imaging.Basic.dll

Namespace:

```
using RasterEdge.Imaging.Annotation;
using RasterEdge.Imaging.Basic;
```

Generate an AnnotationObject

You can generate an Annotation object programmatically without using a graphics interface.

When generating an annotation, a number of properties can be set. Following is an example of generating a hotspot annotation object.

Note: In RasterEdge Imaging, Annotation is represented as an Annotation object derived from the supper class AnnotaionBasic. Since some APIs are inherited from this super class, a type conversion may be needed.

First, add reference to `RasterEdge.Imaging.Annotation`.

Example Code:

```
using RasterEdge.Imaging.Annotation
```

How to Generate an Annotation Object Programmatically

C#

```
// set annotation size
// set x and y coordinate of the right top vertex of this annotation rectangle
```

```
// the actual shape of rubber stamp is contained in this rectangle
float x = 120.0f;
float y = 120.0f;
float width = 300.0f;
float height = 100.0f;

string text = "this is RubberStamp annotation";
Font font = new Font("Arial", 12.0F, FontStyle.Italic);

AnnotationBrush fontBrush = new AnnotationBrush();
            fontBrush.FillType = FillType.Solid;
            fontBrush.Solid_Color = REColor.FromArgb(System.Drawing.Color.Blue.ToArgb());

RubberStampAnnotation anno = AnnotationGenerator.CreateRubberStampAnnotation(x, y, width, height,
text, font, fontBrush);

            anno.OutLine = new LinePen();
            anno.OutLine.Brush = new AnnotationBrush();
            anno.OutLine.Brush.FillType = FillType.Solid;
            anno.OutLine.Brush.Solid_Color = new REColor(255, 10, 100, 100);
            anno.OutLine.Width = 2.0f;

            anno.Fill = new AnnotationBrush();
            anno.Fill.FillType = FillType.Solid;
            anno.Fill.Solid_Color = new REColor(255, 20, 20, 20);

            anno.CornerRadius = 1000f;
//set the overall transparency. This value has an overall impact on all
//colors related to this annotation. Note, the default value is 1 which
// is complete transparency
            anno.SetTransparency(0.4f);
```

Burn Annotation to Document or Image

Once you generate an Annotation object, you can add and burn it onto documents like PDF, TIFF and Word, and then save it in native file format. You can also burn annotation on to documents using REImage objects.

How to Burn Annotation Object to Document (PDF, TIFF, WORD, EXECEL, PPT)

Example Code:

```
        public static void TestPDFAddAnnotation()
        {
//use code in previous section to generate a rubber stamp annotation
RubberStampAnnotation anno = TestAnnotation.addRubberStampAnnotation();
//load a PDF Document
PDFDocument doc = new PDFDocument(@"c:\REImage.pdf");
// add this annotation in the first page
            doc.GetPage(0).AddAnnotation(new PointF(100f, 100f), anno);
```

```
// save this annotated PDF to file
            doc.Save(@"c:\annotated.pdf");

        }

        public static void TestWordAnnotation()
        {
//use code in previous section to generate a rubber stamp annotation
RubberStampAnnotation anno = TestAnnotation.addRubberStampAnnotation();
//load an Word Document
DOCXDocument doc = new DOCXDocument(@"c:\TestWord.docx");
Console.WriteLine(doc.GetPageCount());
// add this annotation in the first page
            doc.GetPage(0).AddAnnotation(new PointF(100f, 100f), anno);
// save this annotated Word to file
            doc.Save(@"c:\annotated.docx");



        }

        public static void TestTIFFAnnotation()
        {

//use code in previous section to generate a rubber starmp annotaion
RubberStampAnnotation anno = TestAnnotation.addRubberStampAnnotation();
//load a Tiff Document
TIFFDocument doc = new TIFFDocument(@"c:\sampleTiff.tiff");
Console.WriteLine(doc.GetPageCount());
// add this annotation in the first page of the Tiff document
            doc.GetPage(0).AddAnnotation(new PointF(100f, 100f), anno);
// save this annotated Tiff to file
            doc.Save(@"c:\annotated.Tiff");

        }
```

See Also PDF Annotation

See Also TIFF Annotation

See Also WORD Annotation

How to Burn Annotations on Images

Once you get a REImage object and an annotation object, you can draw annotations onto it and save it to different image types.

Example Code:

```
public static void TestREImageAnnotation()
        {
        // invoke this method only once at the beginning of your code to register all assemblies
        you referenced to your project
        WorkRegistry.Reset();

// load an PNG file to REImage object
REImage img = new REImage(@"c:\samplePNG.png", ImageType.PNG);

            // create a line annotation starting at point (0.0) and ending with point(100,100).
        Note that, only the relative position of the start and end point is used
            LineAnnotation anno = AnnotationGenerator.CreateLineAnnotation(new LinePoint(0, 0),
            new LinePoint(100, 100));



// set line stroke color and style

            anno.LinePen = PenGenerator.CreateLinePen(new REColor(255, 0, 0, 255), 5.0F);

            anno.LinePen.StartCap = new LineCap();
            anno.LinePen.StartCap.Cap_Width = 2.0f;
            anno.LinePen.StartCap.CapStyle = LineCapStyle.Diamond;


            anno.SetTransparency(0.4f);

            // draw line annotation on the REImage. The position is measured at default 96
        resolution with respect to the image. Therefore, it is subject to the change of the size
        of the Tiff image
            img.DrawAnnotation(new Point(100, 100), anno);

            img.Save(ImageType.PNG, @"c:\samplePNGAnnotated.png");


        }
```

Annotations on ASP.NET DocumentViewer or Windows Form DocumentViewer

Using our ASP.NET or Windows Form Document Viewer, you can annotate on a document with graphics interface. RasterEdge.XDoc.HTML5Viewer assembly contains web controls that you can embed in your ASP.NET project by copying a couple of lines of JavaScript. Try our online demo at http://www.rasteredge.com/demo/online-document-viewer/ for more detailed information. For WinForm project, there are controls located in RasterEdge.Imaging.WinControl assembly and you can add to your own project.

Annotation Assemblies

To implement full functions of RasterEdge Imaging Annotation, three assemblies are needed.

Assembly	Description
RasterEdge.Imaging.Annotation.dll	Annotation Classes, all you need to generate an Annotation object programmatically.
RasterEdge.XDoc.HTML5Viewer.dll	Include Web controls that you can integrate into your own ASP.NET project. You can draw, add, and burn annotations to document or image using graphics interface powered by JavaScript.
RasterEdge.Imaging.WinControl.dll	Include Windows Form viewer controls that you can integrate into your own WinForm project. You can draw, edit, and burn annotations to document or image using graphics interface provided in these viewer controls.

See Also Web Viewer

Metadata

BaseMetadata Class

This class can be used as a collection of Metadata. For detailed usage, please see corresponding Metadata SampleCode.

BaseMetadataItem class

As an abstract class, it is used to record the implementation of each element of Metadata. And each Metadata type will be illustrated in detail.

There's a limitation to the supportive Metadata types. You may use BaseMetadataType to check whether your desired Metadata is supported or not.

Introduction to Metadata

Metadata is data that describes other data. RasterEdge Imaging allow viewing and manipulation of metadata stored in an image.

The RasterEdge.Imaging.Codec namespace contains classes that handle image metadata.

Metadata is a convenient way to store textual information in an image. RasterEdge Image allows this information to be accessed and manipulated. For example, it is possible to store the metadata information in a database, build a metadata viewer application, and to add your own metadata in the form of EXIF, IPTC, XMP, or COM markers. See the Metadata Demo installed with RasterEdge Image for an example of metadata use.

Supported Metadata Types

RasterEdge Image supports the following metadata types.

- EXIF tags
- IIM(IPTC)
- XMP data
- TIFF Tags

In JPEG images, metadata is stored in "APPn markers". EXIF information is stored in an"APP1 marker", and IPTC and Photoshop Resource information is stored in an "APP13"marker. These markers are created automatically when a JPEG image is encoded. Alternatively, you can use a method to copy metadata without re-compressing JPEG images.

Image Formats Supporting Metadata

The following Image Formats support Metadata.

Metadata types	Operations	Image Format
EXIF		JPEG/Exif/TIFF
XMP		GIF89a/JPEG/JPEG2000/PNG/TIFF/ProstScript/SVG/PDF/ Html/DNG/Adobe Illustrator
IIM(IPTC)		JPEG/Exif/TIFF/Jpeg2000/PNG

EXIF Metadata

Parse Exif Metadata from TIFF File

Exchangeable image file format (officially Exif, not EXIF according to JEIDA/JEITA/CIPA specifications) is a standard that specifies the formats for images, sound, and ancillary tags used by digital cameras (including smartphones), scanners and other systems handling image and sound files recorded by digital cameras.

Embed Exif to TIFF

So far, embedding Exif information into TIFF file is supported. If you have a TIFFDocument object and want to embed Exif information, you may do as follows.

Parse & Update Exif from File

Support parsing Exif Tag from TIFF file and modifying Exif value. We represent Exif Tag as EXIFDefine. For more Tag information, please refer to the International Standard Exif 2.0 or visithttp://www.awaresystems.be/imaging/tiff/tifftags/privateifd/exif.html.

You can get the accurate Exif information from a TIFDocument with the following method.

```
EXIFMetadata exif = (EXIFMetadata)doc.GetEXIFMetadata(1);//Get EXIF information of the first TIF page
```

```
Console.WriteLine(metadata[0].ExifItemValue.Values[0]);//Have access to specific Tag value
```

Below is the method to add an EXIF.

```
TIFFTag tag = (TIFFTag)0x8888;
TIFFField field = new TIFFField(tag, TIFFDataType.ASCII);
Field.Value.Add(new TIFFAscii( "RasterEdge" );
EXIFMetadataItem item = new EXIFMetadataItem(field);
Metadata.Add(item);
Doc.AddEXIFMetadataItem(item, 1);
```

Then, EXIF information is successfully embedded into TIFF file (more image formats are also supported). You can freely customize your own data as well. Certainly, the deletion of EXIF is easy to achieve.

XMP

Extract XMP from supportive file format as Stream or byte[] array.

We currently support getting XMP data from TIFF, TIFFEP, and DNG files, and you can use the following code.

```
TIFFDoucment doc = (TIFFDocument)REFile.OpenDocuemntFile(@"1.tif", new TIFDecoder());
String xmp = doc.GetXMPMetadata(0);//0 represents XMPData of the first page
```

Another method:

```
Byte[] xmp = doc. GetXMPMetadataAsArray(1);
```

Barcode Read

Developed as powerful linear & 2d barcodes recognition SDK, this Barcode Reader Add-on can be easily combined with .NET Imaging SDK and available in any .NET applications. It supports detecting and reading barcodes from .NET project images or documents. More than 20 linear and 2d barcodes are supported.

Linear Barcodes				**2DBarcodes**
Australia Post	EAN-13	ISSN	POSTNET	Data Matrix
Codabar	Identcode	ITF-14	RM4SCC	PDF-417
Code 39	Intelligent Mail	Leitcode	UPC-A	QR Code
Code 128	Interleaved 2 of 5	Patch Code	UPC-E	
EAN-8	ISBN	PLANET		

If you want to test our Barcode Reader Add-on in .NET, C#, VB.NET applications, please firstly do as follows:

- Integrate package dlls into Visual Studio (2005 or later) project by adding reference;

  In all, you need these dlls: RasterEdge.Imaging.Basic.dll, RasterEdge.Imaging.Basic.Codec.dll, and RasterEdge.Imaging.Barcode.Scanner.dll.

- Now, you may easily read barcodes in C# and VB.NET Classes.

How to's

How to: Read Barcode from Image

To read barcode from image file, you may directly refer to the following demo codes in C# and VB.NET. In details, codes below allow you to load an image file containing barcode into a REImage object and read barcode information out of that REImage object. Also, you can set and scan a specific region of REImage. If you want to read a barcode image file, our barcode reader add-on can also help with that.

In C# Class

Demo Code:

```
public static void ReadBarcodeFromImage(string filename)
      {
        // invoke this static method only once at the beginning of codes

        WorkRegistry.Reset();
//load an image containing the barcode image on it.
REImage reImage = new REImage(filename);
// set reader setting
ReaderSettings setting = new ReaderSettings();
// read qr code
         setting.AddTypesToRead(BarcodeType.QRCode);
// read also code128
         setting.AddTypesToRead(BarcodeType.Code128);

// read image
Barcode[] barcodes = BarcodeReader.ReadBarcodes(setting, reImage);

foreach (Barcode barcode in barcodes)
         {
//output barcode data onto the screen
Console.WriteLine(barcode.DataString);
         }
      }
```

In VB.NET Class

Demo Code:

```
Public Shared Sub ReadBarcodeFromImage(filename As String)
      WorkRegistry.Reset()
' invoke this static method only once at the beginning of codes
'load an image containing the barcode image on it.
 Dim reImage As New REImage(filename)
 ' set reader setting
Dim setting As New ReaderSettings()
   ' read qr code
      setting.AddTypesToRead(BarcodeType.QRCode)
 ' read also code128
      setting.AddTypesToRead(BarcodeType.Code128)

   ' read image
Dim barcodes As Barcode() = BarcodeReader.ReadBarcodes(setting, reImage)

For Each barcode As Barcode In barcodes
' output barcode data onto the screen
 Console.WriteLine(barcode.DataString)
Next
End Sub
```

How to: Read Barcode from Document

Besides images, RasterEdge .NET barcode reader add-on also empowers you to read barcodes from several document files, like TIFF, PDF, Word and Excel. In the following parts, you will get the demo codes for barcode reading from these documents. Please note that, for each document barcode scanning, you also need to add corresponding dll into your project, including RasterEdge.Imaging.TIFF.dll, RasterEdge.Imaging.PDF.dll, RasterEdge.XDoc.Word.dll, and RasterEdge.XDoc.Excel.dll.

In C# Class

Demo Code: For Barcode Reading from PDF

```
public static void ReadBarcodeFromPdf(string filename, int pageIndex)
      {
        // invoke this static method only once at the beginning of codes

WorkRegistry.Reset();          //generate pdf document
BaseDocument doc = new PDFDocument(filename);
//get the page you want to read barcode from
BasePage page = doc.GetPage(pageIndex);
//set reader setting
ReaderSettings setting = new ReaderSettings();
         setting.AddTypesToRead(BarcodeType.Code39);
// read out barcode information
Barcode[] barcodes = BarcodeReader.ReadBarcodes(setting, page);
//output barcode information
foreach (Barcode barcode in barcodes)
         {
Console.WriteLine(barcode.DataString);
         }
      }
```

In VB.NET Class

Demo Code: For Barcode Reading from PDF

```
Public Shared Sub ReadBarcodeFromPdf(filename As String, pageIndex As Integer)
      WorkRegistry.Reset()
' invoke this static method only once at the beginning of codes
'generate pdf document
Dim doc As BaseDocument = New PDFDocument(filename)
'get the page you want to read barcode from
Dim page As BasePage = doc.GetPage(pageIndex)
'set reader setting
Dim setting As New ReaderSettings()
      setting.AddTypesToRead(BarcodeType.Code39)
' read out barcode information
Dim barcodes As Barcode() = BarcodeReader.ReadBarcodes(setting, page)
'output barcode information
For Each barcode As Barcode In barcodes
          Console.WriteLine(barcode.DataString)
 Next
End Sub
```

Advanced ReaderSettings

Below is a table list of settings that you can control in .NET barcode reading applications.

Parameters in ReaderSettings	**Description**
Direction	Used to control the direction of whole barcode reading process. Valid values: BottomToTop, LeftToRight, RightToLeft, TopToBottom, Undefined.
NumberOfBarcodeToRead	Used to define the numbers of barcodes that you want to read from image or document. This can be used to save barcode scanning time. For instance, there's one barcode on your image, you may set this to be 1. Then our reader will scan it only and save time from scanning the whole image.
ReadingQuality	Used to determine which is the priority, speed when set to false or quality of reading when set to true.
RegionOfInterest	Used to define a rectangle for specific area barcode reading. To achieve this, you can set the region of interest as (start point horizontal, start point vertical, stop point horizontal, stop point vertical). Please note that, the points values should be in percentage. For example, (0, 0, 50, 50) means to scan left top quarter of the image.
ScanInterval	Used to control intervals between two scans.
SkipValidation	Used to validate accuracy of barcode scanning.
Type	Used to define a barcode type for scanning from your image. This is suggested to be set if you need to scan a specific barcode type. If it is "All", the scanning process will be slowed down.

Barcode Create

Barcode Creator Add-on is an advanced control, seamlessly integrating with RasterEdge DocImageSDK for .NET. This Barcode Creator Add-on can be easily used in .NET Framework 2.0 and above for high-quality linear and 2d barcodes creation and customization. More than 20 barcodes can be created. See as below.

Linear Barcodes					**2DBarcodes**
Codabar	Code 128	Identcode	ITF-14	RM4SCC	Data Matrix
Code 11	EAN-8	Intelligent Mail	Leitcode	UPC-A	PDF-417
Code 2 of 5	EAN-13	Interleaved 2 of 5	MSI Plessey	UPC-E	Micro PDF-417
Code 39	EAN-128	ISBN	PLANET		QR Code
Code 93	GS1 DataBar	ISSN	POSTNET		Micro QR Code

To test our Barcode Creator Add-on in .NET, C#, VB.NET applications, you need to:

- Integrate package dlls into Visual Studio (2005 or later) project by adding reference;

  In all, you need these dlls: RasterEdge.Imaging.Basic.dll, RasterEdge.Imaging.Basic.Codec.dll, and RasterEdge.Imaging.Barcode.Creator.dll.

- Ready to create barcodes in C# and VB.NET Classes.

How to's

How to: Draw Barcode on Image

The demos below can help you draw barcodes on images and the supported image formats include png, gif, jpeg, bmp and tiff. Here, we take QR Code drawing in C# and VB.NET Classes as examples.

In C# Class

Demo Code:

```
WorkRegistry.Reset();// invoke this static method only once at the beginning of codes
// create an REImage you want to draw on
```

```
REImage reImage = new REImage(@"c:\samplePNG.png", ImageType.PNG);
//Create a QR Code barcode
QRCode barcode = new QRCode();

      barcode.Data = "test123456789";  //Input encodable data
      barcode.X = 20.0F;  //Set module size
        //set the qr code margin which for qr code should be 4 times the width of X module
        barcode.LeftMargin = barcode.RightMargin = barcode.TopMargin = barcode.BottomMargin =
        20.0f * 4;
      barcode.Resolution = 96;  //Set QR Code barcode printing resolution
      barcode.Rotate = Rotate.Rotate0;  //Set rotate
      barcode.DrawBarcode(reImage, 0, 0);  //Draw barcode on REImage with location x and y

      reImage.Save(ImageType.PNG, @"c:\qr.png");
```

You can not only draw barcode on image but also on document page.

Demo Code:

```
WorkRegistry.Reset();// invoke this static method only once at the beginning of codes
Linear linearBarcode = new Linear();
      linearBarcode.Type = BarcodeType.CODE39;
      linearBarcode.Data = "123456789";
      linearBarcode.Resolution = 96;
      linearBarcode.Rotate = Rotate.Rotate0;

// load pdf document, you can also load document like tiff, word, excel, ppt
PDFDocument pdf = new PDFDocument(@"c:\REImage.pdf");
// get the first page
BasePage page = pdf.GetPage(0);

// create barcode image from barcode Object
REImage barcodeImage = linearBarcode.ToImage();

// add barcode image to the desired location
      page.AddImage(barcodeImage, new System.Drawing.PointF(100f, 100f));

      pdf.Save(@"c:\REImageBarcoded.pdf");
```

In VB.NET Class

Demo Code:

```
      WorkRegistry.Reset()
' invoke this static method only once at the beginning of codes
' create an REImage you want to draw on
Dim reImage As New REImage("c:\samplePNG.png", ImageType.PNG)
'Create a QR Code barcode
Dim barcode As New QRCode()

      barcode.Data = "test123456789"
'Input encodable data
      barcode.X = 20F
```

```
        'set the qr code margin which for qr code should be 4 times the width of X module
        barcode.LeftMargin = barcode.RightMargin = barcode.TopMargin = barcode.BottomMargin =
        20.0f * 4

'Set module size
      barcode.Resolution = 96
'Set QR Code barcode printing resolution
      barcode.Rotate = Rotate.Rotate0
'Set rotate
      barcode.DrawBarcode(reImage, 0, 0)

'Draw barcode on REImage with location x and y
      reImage.Save(ImageType.PNG, "c:\qr.png")
```

Besides drawing barcode on image, you can also draw it on document page.

Demo Code:

```
      WorkRegistry.Reset()
' invoke this static method only once at the beginning of codes
Dim linearBarcode As New Linear()
      linearBarcode.Type = BarcodeType.CODE39
      linearBarcode.Data = "123456789"
      linearBarcode.Resolution = 96
      linearBarcode.Rotate = Rotate.Rotate0

' load pdf document, you can also load document like tiff, word, excel,ppt
Dim pdf As New PDFDocument("c:\REImage.pdf")
' get the first page
Dim page As BasePage = pdf.GetPage(0)

' create barcode image from barcode Object
Dim barcodeImage As REImage = linearBarcode.ToImage()

' add barcode image to the desired location
      page.AddImage(barcodeImage, New System.Drawing.PointF(100F, 100F))

      pdf.Save("c:\REImageBarcoded.pdf")
```

How to: Create Barcode and Save as Image

If you want to directly create a barcode and save it as image in C# or VB.NET Class, the following demo codes may help you.

In C# Class

Demo Code:

```
Linear barcode = new Linear();//Create a barcode

      barcode.Type = BarcodeType.CODE128;//Select barcode type
      barcode.Data = "123456789";//Set barcode data
```

```
        barcode.X = 1.0F;//Set x
        barcode.Y = 60.0F;//Set y
        barcode.Resolution = 96;//Set resolution
        barcode.Rotate = Rotate.Rotate0;//Set rotate

REImage reImage = barcode.ToImage();

        reImage.Save(ImageType.PNG, @"c:\qr.png");
```

In VB.NET Class

Demo Code:

```
Dim barcode As New Linear()
'Create a barcode
      barcode.Type = BarcodeType.CODE128
'Select barcode type
      barcode.Data = "123456789"
'Set barcode data
      barcode.X = 1F
'Set x
      barcode.Y = 60F
'Set y
      barcode.Resolution = 96
'Set resolution
      barcode.Rotate = Rotate.Rotate0
'Set rotate
Dim reImage As REImage = barcode.ToImage()

      reImage.Save(ImageType.PNG, "c:\qr.png")
```

Advanced Settings

Below is a table of all supportive barcodes properties. You may free to customize all the properties in your .NET project.

ClassAttribute	Value	Description	Barcode Type
AddCheckSum	Type: bool; Default: false	Enabled to add barcode checksum at the end.	All linear barcodes. For Intelligent Mail, this property is not applied.
AutoResize	Type: bool; Default: false	Enabled to automatically resize the created barcode image.	All barcodes
BackColor	Type: Color; Default:white	Used to set the background color of barcode image.	All barcodes

BarAlignment	Type: int Default: Center	Used to set the horizontal alignment of barcode inside the image. Valid values: Left, Center, Right.	All barcodes
BarcodeHeight	Type: float Default: 0	Used to set the height of barcode image. If setting is smaller than required minimum height, the barcode image will be automatically reset.	All barcodes
BarcodeWidth	Type: float Default: 0	Used to set the width of barcode image. If setting is smaller than required minimum width, the barcode image will be automatically reset.	All barcodes
BearerBarHori	Type: float Default: 1	Used to set the value of top and bottom bars (horizontal bearer bars). Valid values: 0 to 10, which should be a multiple of X.	ITF14
BearerBarVert	Type: float Default: 1	Used to set the value of left and right bars (vertical bearer bars). Valid values: 0 to 10, which should be a multiple of X.	ITF14
BottomMargin	Type: float Default: 0	Used to set the size of bottom margin. For linear barcodes, 10X is recommended. For Data Matrix, PDF417, Micro PDF417, QR Code, Micro QR Code, X/2X/4X, 2X, X, 4X, 2X are recommended respectively.	All barcodes
CodabarStartChar	Type: CodabarStartStopChar Default: A	Used to set the start character of Codabar. Valid values: CodabarStartStopChar.A, B, C, D.	CODABAR
CodabarStopChar	Type: CodabarStartStopChar Default: A	Used to set the stop character of Codabar. Valid values: CodabarStartStopChar.A, B, C, D.	CODABAR
ColumnCount	Type: int Default: 5	Used to set the number of columns and this should be increased according to your data size. Valid values: 1 to 30.	PDF417

Data	Type: string Default: ""	Used to input the data value that will be encoded in barcode. Valid values vary from different barcode types.	All barcodes
DataMode	Type: DataMatrixDataMode Default:DataMatrixDataMode.ASCII	Used to set the data encoding mode of Data Matrix. Valid values: DataMatrixDataMode.Auto, ataMatrixDataMode.ASCII, DataMatrixDataMode.C40, DataMatrixDataMode.Text, DataMatrixDataMode.X12, DataMatrixDataMode.Edifact, DataMatrixDataMode.Base256.	DataMatrix
	Type:PDF417DataMode Default: PDF417DataMode.Text	Used to set the data encoding mode of (Micro) PDF417. Valid values: PDF417DataMode.Auto, PDF417DataMode.Text, PDF417DataMode.Byte, PDF417DataMode.Numeric, PDF417DataMode.Customer.	PDF417, MicroPDF417
	Type: QRCodeDataMode Default: QRCodeDataMode.Auto	Used to set the data encoding mode of (Micro) QR Code. Valid values: QRCodeDataMode.Auto, QRCodeDataMode.AlphaNumeric, QRCodeDataMode.Byte, QRCodeDataMode.Numeric, QRCodeDataMode.Kanji.	QRCode, MicroQRCode
ECI	Type: int Default: 3	Used to enable the output data stream to have different interpretations that differ from the default character set.	QRCode
ECL	Type: PDF417ECL Default: PDF417ECL.Level_2	Used to set the error correction level of PDF417. Valid values: PDF417ECL.Level_0 to PDF417ECL.Level_8.	PDF417
	Type: QRCodeECL Default: QRCodeECL.L	Used to set the error correction level of QR Code. Valid values: QRCodeECL.L, QRCodeECL.M, QRCodeECL.Q, QRCodeECL.H.	QRCode

Field	Type: int Default: 0	Use to set Field property to be identified to the same file.	DataMatrix
FNC1	Type: FNC1 Default: FNC1. FNC1_NONE	Used to encode GS1 compatible barcode and FNC1 value should be set to FNC1.FNC1_1ST_POS.	EAN128, DataMatrix, QRCode
ForeColor	Type: Color Default: black	Used to set the foreground color of barcode image.	All barcodes
FormatMode	Type: DataMatrixFormatMode Default: DataMatrixFormatMode. Format_10X10	Used to define the format of Data Matrix to use on that symbology. Valid values: please directly see enum DataMatrixFormatMode.Format_*X*.	DataMatrix
I	Type: float Default: 1.0f	Used to set the space between two characters of barcode. Valid value: a multiple of X.	CODE39
LeftMargin	Type: float Default: 0	Used to set the size of left margin. For linear barcodes, 10X is recommended. For Data Matrix, PDF417, Micro PDF417, QR Code, Micro QR Code, X/2X/4X, 2X, X, 4X, 2X are recommended respectively.	All barcodes
Macro	Type: bool Default: false	Enabled to apply Macro PDF417 function.	PDF417, MicroPDF417
MacroSegmentIndex	Type: int Default: 0	Used to set the position of current symbol in the sequence, which begins with 0.	PDF417, MicroPDF417
MacroSegment Count	Type: int Default: 0	Used to set the number of total symbols which consist of the sequence.	PDF417, MicroPDF417
MacroFileIndex	Type: int Default: 0	Be identified to the same file.	PDF417, MicroPDF417
N	Type: float Default: 2.0f	Used to set the ratio of wide bar to narrow bar. Valid values: 2.0 to 3.0 inclusive.	CODABAR, CODE2OF5, CODE39, INTERLEAVED25, ITF14
Parity	Type: int Default: 0	Used to set Parity property of QR Code.	QRCode

ProcessTilde	Type: bool Default: false(for linear barcodes)/true (for 2d barcodes)	Enabled to use the tilde character "~" to specify special characters in input data.	CODE39, CODE128, EAN128, DataMatrix, QRCode, MicroQRCode, PDF417, MicroPDF417
Resolution	Type: int Default: 72	Used to set the barcode image resolution (in DPI, Dots per inch).	All barcodes
RightMargin	Type: float Default: 0	Used to set the size of right margin. For linear barcodes, 10X is recommended. For Data Matrix, PDF417, Micro PDF417, QR Code, Micro QR Code, X/2X/4X, 2X, X, 4X, 2X are recommended respectively.	All barcodes
Rotate	Type: Rotate Default: Rotate0	Used to rotate barcode image to a desired position. Valid values: Rotate.Rotate0, Rotate.Rotate90, Rotate.Rotate180, Rotate.Rotate270.	All barcodes
RowCount	Type: int Default: 3	Used to set the number of rows. Valid values: 3 to 90.	PDF417
ShortTallRatio	Type: float Default: 0.4f	Used to set the ratio of short bar to tall bar (Y).	PLANET, POSTNET
ShowCheckSumChar	Type: bool Default: true	Enabled to show the check digit(s) at the end of barcode text.	All linear barcodes. For Intelligent Mail, this property is not applied.
ShowStartStopInText	Type: bool Default: true	Enabled to show a * at the beginning and end of barcode text.	CODE39
ShowText	Type: bool Default: true	Enabled to show barcode text under the barcode bars.	All linear barcodes
StructuredAppend	Type: bool Default: false	Enabled to apply Structured Append function to barcode.	DataMatrix, QRCode

SymbolCount	Type: int Default: 0	Used to set the number of total symbols which consist of the sequence.	DataMatrix, QRCode
SymbolIndex	Type: int Default: 0	Used to set the position of current symbol in the sequence, which begins with 0.	DataMatrix, QRCode
SupData	Type: string Default: ""	Used to input the supplement data to encode in add-on barcode. Valid values: 2 or 5 digits.	EAN8_2, EAN8_5, EAN13_2, EAN13_5, ISBN_2, ISBN_5, ISSN_2, ISSN_5, UPCA_2, UPCA_5, UPCE_2, UPCE_5
SupHeight	Type: float Default: 0.8f	Used to set the height of add-on barcode bar. Valid value: a multiplicator of Y.	EAN8_2, EAN8_5, EAN13_2, EAN13_5, ISBN_2, ISBN_5, ISSN_2, ISSN_5, UPCA_2, UPCA_5, UPCE_2, UPCE_5
SupSpace	Type: float Default: 15	Used to set the space between the main barcode and its add-on barcode.	EAN8_2, EAN8_5, EAN13_2, EAN13_5, ISBN_2, ISBN_5, ISSN_2, ISSN_5, UPCA_2, UPCA_5, UPCE_2, UPCE_5
TextColor	Type: Color Default: black	Used to set the color of barcode text.	All linear barcodes
TextFont	Type: Font Default: new Font("Arial", 9f, FontStyle.Regular)	Used to set the font style of barcode text.	All linear barcodes
TextMargin	Type: float Default: 6	Used to set the space between barcode bar and data text.	All linear barcodes

TopMargin	Type: float Default: 0	Used to set the size of top margin. For linear barcodes, 10X is recommended. For Data Matrix, PDF417, Micro PDF417, QR Code, Micro QR Code, X/2X/4X, 2X, X, 4X, 2X are recommended respectively.	All barcodes
TopTextColor	Type: Color Default: black	Used to set the color of text above barcode.	ISBN, ISSN
TopTextFont	Type: Font Default: new Font("Arial", 9f, FontStyle.Regular)	Used to set the font style of text above barcode.	ISBN, ISSN
Truncated	Type: bool Default: false	Enabled to apply Truncated PDF417 function, which may be used if space considerations are the primary concern and symbol damage is unlikely.	PDF417
Type	Type: BarcodeType Default: CODE128	Used to set the linear barcode type.	All linear barcodes
UOM	Type: UnitOfMeasure Default: PIXEL	Use to set the unit of measure for all size related settings. Valid values: UnitOfMeasure.PIXEL, UnitOfMeasure.CM, UnitOfMeasure.INCH.	All barcodes
UPCENumber	Type: int Default: 0	Used to set the number system of UPC-E. Valid values: 0, 1.	UPCE
Version	Type: MicroPDF417Version Default: Version_3X08.	Used to set the version of Micro PDF417. Valid values: please directly see enum MicroPDF417Version Version_*X*.	MicroPDF417
	Type: QRCodeVersion Default: QRCodeVersion.V1	Used to set the version of QR Code. Valid values: V1 to V40.	QRCode

	Type: MicroQRCodeVersion Default: Version.M4_L.	Used to set the version of Micro QR Code. Valid values: M1 to M4_Q.	MicroQRCode
X	Type: float Default: 1	Used to set the width of barcode bar module (narrow bar).	All barcodes
XtoYRatio	Type: float Default: 0.3333333f	Used to set the ratio of bar width to bar height.	PDF417, Micro PDF417
Y	Type: float Default: 60	Used to set the height of barcode bar module.	All linear barcodes

TWAIN Scanning

TWAIN Scanning Overview

With RasterEdge.Imaging.WinformsControl.Twain assembly you can acquire raw images from input devices such as scanner and camera. You can query the capacities supported by the device. You may set or alter scanning properties, if supported, for the acquisition process.

Since RasterEdge.Imaging.WinformsControl.Twain is a dll that is built on official Twain driver. Please install the official TWAINDSM.dll (provided in our dlls collection) manually before using RasterEdge.Imaging.WinformsControl.Twain. Simply put TWAINDSM.DLL in x86 folder under the Windows System directory (normally C:\Windows\System32). On a 64bit system, make sure TWAINDSM.DLL in x64 folder ends up in the WOW64 System directory (normally C:\Windows\SysWOW64)。

Following are the basic classes you need to know about to gain image from scanning process.

Acquisition

The Acquisition object is the primary class in RETwain. You can drop this component onto a Form after adding it to the toolbox, or you can instantiate it directly. This is the only class that you need to add standard image acquisition capabilities to an application. For greater control over the acquire process, this class contains a collection of Device objects that control numerous properties used for the image acquisition.

TWAINDevice

The TWAINDevice object provides full access to a TWAIN compatible source on the system. Use it to open a connection to the device, to get and set properties, and then to acquire one or more images. Because this class represents a system device resource, you cannot create an instance of it. You can obtain an instance to a Device object by calling GetAvailbleDevices, or from the Devices collection in the Acquisition object.

Getting Started with RETwain

If you do not want to set and query properties of the Device or customize your acquisition, an instance of the Acquisition class is enough for basic scanning process. Call the acquire method for the scanning process. Default property and device are used.

Note: You need to add reference to RasterEdge.Imaging.WinformsControl.Twain.dll if you want to use RETwain.

Example code

```
public void Scanning()
        {
        Acquisitionacq = new Acquisition();
        acq.ImageAcquired += new ImageAcquiredEventHandler(acq_ImageAcquired);
        acq.Aquire();


        }
```

Setting Up Events

You need to use events when acquiring images. When an image is acquired, the ImageAcquired event fires, providing an ImageAcquiredEventArgs object that contains the image. At the very least, theImageAcquired event must be handled, and it is recommended that the AcquireCanceled and AcquireCompleted events also be handled. The following code shows how the image is handled.

```
this.acquisition.ImageAcquired += new ImageAcquiredEventHandler (OnImageAcquired);
private void OnImageAcquired(object sender, ImageAcquiredEventArgsargs)
{
// If the image exists, save it to local file or do some operation
if(args.OutputImage!= null)
{
        args.OutputImage.Save(RasterEdge.Imaging.Basic.ImageType.PNG, @"C:\test.png");
}
}
```

Getting and Setting Properties

To get or set a device property, you must open a connection to the device using the **Open()** method. Whenever the **Open()** method is invoked, the **Close()** method must be invoked to close the connection. Closing a connection resets all of the device properties to their default values and therefore a device should be closed after the image or all desired properties have been acquired.

Note: To get a device object you must get it through an **Acquisition** Instance.

The code below opens a connection to the device in order to retrieve the default Resolution values of the device, and then closes the connection. This technique can be useful if you are looking for a device of choices with specific default properties or capabilities.

C#

```
device.Open();
int res = device. ScanSetting.Resolution;
int bitDepth = device. ScanSetting.BitDepth;
device.Close();
```

How to's

How to Do Console Based Scanning

Scanning from the Console is done similarly to scanning in a WinForms application

```
public class AcquisitionClass
    {
static void Main(string[] args)
        {

Acquisition acquisition = new Acquisition();

            AddEvents(acquisition);

            count = 0;

List<string> names = acquisition.GetAvailbleDevicesName();

string deviceName = names[0];

TWAINDevice device = acquisition.GetDevice(deviceName);
Console.Out.WriteLine("---Beginning Scan---");
            device.Open();
//scan all availble pages
            device.ScanSetting.ShouldTransferAllPages = true;

            device.Acquire();

Console.Out.WriteLine("---Ending Scan---\n Press Enter To Quit");

Console.In.Peek();

        }
private static void AddEvents(Acquisition acquisition)
        {
```

```
            acquisition.ImageAcquired += new
ImageAcquiredEventHandler(acquisition_ImageAcquired);

            acquisition.AcquireCompleted += new
AcquireCompletedEventHandler(acquisition_AcquireCompleted);

            acquisition.AcquireCanceled += new
AcquireCanceledEventHandler(acquisition_AcquireCanceled);

        }



static void acquisition_AcquireCanceled(object sender, EventArgs args)
        {

Console.Out.WriteLine("Acqusition Canceled");

        }



static void acquisition_AcquireCompleted(object sender, AcquireCompletedEventArgs args)
        {

Console.Out.WriteLine("Acquisition Finished");

        }



static int count;

static void acquisition_ImageAcquired(object sender, ImageAcquiredEventArgs args)
        {

string filename = "out" + count++ + ".tif";
//save scanned images as png
            args.OutputImage.Save(ImageType.PNG, @"c:\"+count+".png");

Console.Out.WriteLine("Frame " + count + " Acquired. Saved At: " + filename);

        }



    }
```

How to Scan Many Pages into a PDF or TIFF file

A common task in the document imaging world is to scan many pages into a single file. RETwain, along with REImage can easily be used to accomplish this task. The two most popular multipage image formats are TIFF and PDF, and this example will concentrate on PDF. Since in RasterEdge

Imaging, the TIFFDocument and PDFDocument have common prototype, BaseDocument Class, so the procedure for TIFF is very similar.

The key is to set up the event to assist with the process of scanning from device and convert the image obtained to form a PDFDocument.

- ***AcquireCanceled***: Raised if the user cancels the acquisition process.
- ***AcquireCompleted***: Raised when the scanner has finished scanning the last page.
- ***ImageAcquired***: Raised each time the scanner finishes scanning a page.

Note: You need to reference RasterEdge.XDoc.PDF Assembly and RasterEdge.Imaging.WinformsControl.Twain Assembly to your project to complete the following function.

```
private bool _acquireCanceled;
private List<REImage> _imageList;

public void ScanImages()
        {
            _acquireCanceled = false;
Acquisition myAcquisition = new Acquisition();
            myAcquisition.AcquireCanceled += new AcquireCanceledEventHandler(OnAcquireCanceled);
           myAcquisition.AcquireCompleted += new
AcquireCompletedEventHandler(OnAcquireCompleted);
            myAcquisition.ImageAcquired += new ImageAcquiredEventHandler(OnImageAcquired);

TWAINDevice device = myAcquisition.DefaultDevice;

            device.Open();
            device.ScanSetting.ShouldTransferAllPages = true;
            _imageList = new List<REImage>();

            device.Acquire();
        }

private void OnImageAcquired(object sender, ImageAcquiredEventArgs args)
        {
if (args.OutputImage != null)
            {
//Add Scaned images to image collection
                _imageList.Add(args.OutputImage);


            }
        }

private void OnAcquireCanceled(object sender, EventArgs args)
        {
            _acquireCanceled = true;
        }
```

```
private void OnAcquireCompleted(object sender, AcquireCompletedEventArgs args)
        {
if (_acquireCanceled)
return;

//form a pdf document using image collection scanned
PDFDocument doc = new PDFDocument(_imageList.ToArray());

//save pdf document
            doc.Save(@"c:\ScannedPDF.pdf");
            doc.Dispose();

// do some extra work to finish compose the pdf document.


////Get a tiff document using similar operation
//TIFFDocument doc = new TIFFDocument(_imageList.ToArray());

////save tiff document
//doc.Save(@"c:\scannedTiff.tif");
//doc.Dispose();


        }
 }
```

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