

Understanding 2D barcodes in Adobe® Acrobat®/Reader®

Overview

Accurately capturing data from paper forms can be extremely challenging. Traditionally, most organizations have simply re-keyed paper-based-form data as a means of getting it into their electronic systems. Unfortunately, the process of manually keying is extremely human intensive and can be prohibitively expensive, not to mention prone to data entry errors.

Over the past several years, many organizations have adopted semi-automated techniques, such as Intelligent Character Recognition (ICR) or Optical Character Recognition (OCR), to improve the efficiency of their data-capture operations. Semi-automated data-capture systems rely on software to interpret the characters on a page. Often, these systems can help to reduce the amount of human involvement in the data-capture process. The problem is that they don't always interpret the paper-based characters correctly, and therefore, still require humans to monitor and guide the data capture process.

A more recent method to capture paper-based form data is to embed a 2D barcode in the form so that when the end user is filling the form, the 2D barcode automatically encodes the user-supplied data. When the form is printed, mailed or faxed, the recipient organization will simply scan the document and decode the barcode to extract the data from the form. As long as the barcode is successfully decoded, this technique captures the paper-based-form data with 100-percent accuracy.

2D barcode technology is proven and when properly implemented, and will not deliver "false-positive" results. That means either the barcode is successfully decoded and the form data is captured completely, or the barcode is unreadable (for example, the paper is torn, the barcode was damaged, and so on). In those cases, no data can be extracted, and the recipient organization will have to revert to their typical exception-processing procedure, usually re-keying the data. Nevertheless, because 2D barcodes can incorporate error correction, the successful barcode reads can be extremely high, often exceeding 99-percent.

With the release of the Acrobat 7 product line, 2D-barcode objects, using the PDF417-barcode standard, can be embedded in your PDF forms, facilitating accurate and efficient data capture for forms that will be submitted by paper, mail, or fax. The good news is that this 2D-barcode technology has been designed to work seamlessly in Adobe Reader. Customers can use Reader to fill and print barcode-enabled forms and their end-user data will be automatically be encoded into the 2D barcode.

Here are some examples:

- **Form requires ink or multiple signatures.** For example, think of any type of form process that requires you to sign the document with a pen or needs the signature of you and your spouse. In these cases, your customer will need to complete the form, print, sign, and return via mail or FAX.
- **No online form-data-capture solution currently exists.** In this situation, your customer needs to complete the form online, print, and return via mail or FAX.

The following outlines how to add a 2D barcode to your PDF form and efficiently extract data using the barcode from the printed page.

FOR MORE INFORMATION

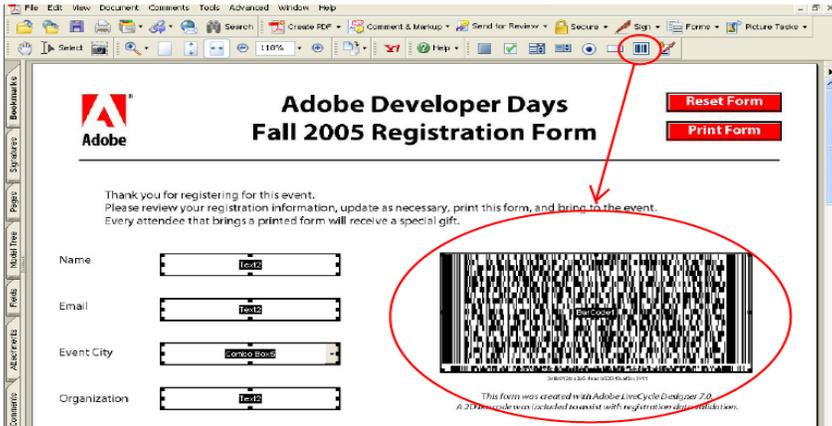
- [Knowledge Base Article](#) (PDF: 147 KB/2 pages)
- [FAQ](#) (PDF: 716 KB/ 6 pages)

Adding a 2D barcode to your PDF form

Adding a 2D barcode to a PDF form is supported in both Adobe Acrobat and Adobe LiveCycle Designer. For Acrobat forms, you will need either Acrobat 7 Professional or Acrobat 3D.

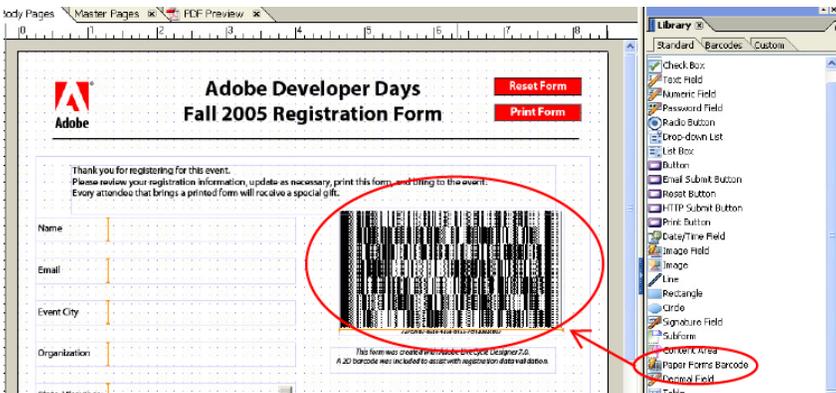
Using Adobe Acrobat

Select the Barcoded Forms tool from the Forms Toolbar. (Note: this tool is only available when you purchase [Adobe LiveCycle Barcoded Forms](#).) Drag and drop the object onto the page. A [sample form](#) is attached for reference.



Using Adobe LiveCycle Designer

Select the Paper Forms Barcode object from the Standard tab of the Library palette. Drag and drop the object onto a body page. A [sample form](#) is attached for reference.



TEXT EXAMPLES

Clear Text

```
<form1><sfForm>  
<DropDownList1>San Jose<  
<Email>ldefurio@adobe.co  
<Name>Lori DeFurio</Name  
<Country>US</Country>
```

Encrypted Text

```
2LO^`x|*_$_ePJ"+XxwWyW|jz  
W|jds32HS[v\H_M?YH?a8JC'
```

Extracting data from a 2D barcode

To "read" a 2D barcode, you will need a scanning device that can interpret 2D barcodes, or you can purchase the [Adobe LiveCycle Barcoded Forms](#), which can decode barcodes from scanned pages.



Using a scanner

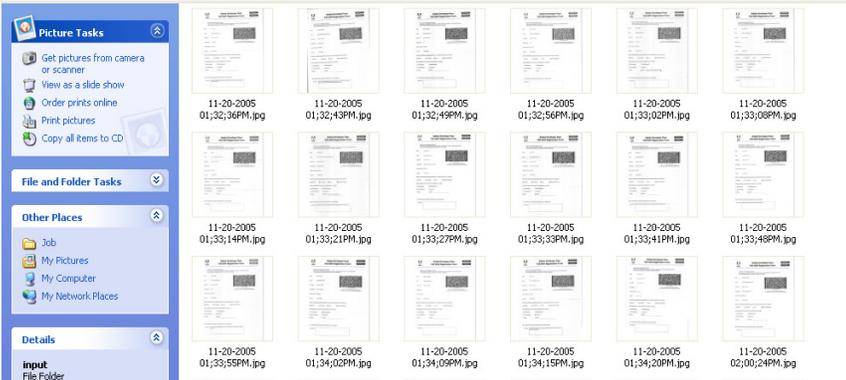
To use a 2D-barcode scanner (similar to the one pictured to the left), pass it over the 2D barcode to extract the data embedded in the barcode image. The data can be clear text or encrypted, depending on how the PDF form was created and which tool (Acrobat or Reader) your customer used to fill the form.

2D barcode data encoding

The PDF file has...	Customer has...	Data will be...
No additional features enabled by Adobe LiveCycle Reader Extensions	Adobe Reader	encrypted*
	Adobe Acrobat Standard, Professional, or Acrobat 3D	clear text
2D barcode decoding that has been enabled by Adobe LiveCycle Reader Extensions	Adobe Acrobat (any version) or Adobe Reader	clear text
*Can be unencrypted by Adobe LiveCycle Barcoded Forms (Requires additional license)		

Using Adobe LiveCycle Barcoded Forms

Adobe LiveCycle Barcoded Forms is a paper-forms-processing solution that will allow you to create and process barcoded forms. The LiveCycle Barcoded Forms Decoder analyzes scanned pages in either PDF or TIFF, finds the barcode or barcodes and captures the encoded data. For example, I forwarded the form shown on the previous page to each person registered for an event. When the attendees completed and printed the PDF form and returned it to me, I scanned all pages to an input folder. Adobe LiveCycle Barcoded Forms Decoder processed each scan, interpreted the 2D barcode, and created XML data files representing the user-supplied data. I then did some simple integration work to place this data in a back end database system.



Conclusion

2D barcodes are extremely useful for fill-and-print PDF forms. In situations where a form will arrive via paper or fax due to ink-signature requirements or the need for paper attachments, using 2D barcodes in your PDF forms can completely automate your paper-forms processing and eliminate costs and errors associated with manual-processing techniques. The Barcoded Forms design technology was introduced in Acrobat 6.0.2. Form fill with automatic barcode updating and works in Acrobat and Reader 6.0.2 and higher.

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