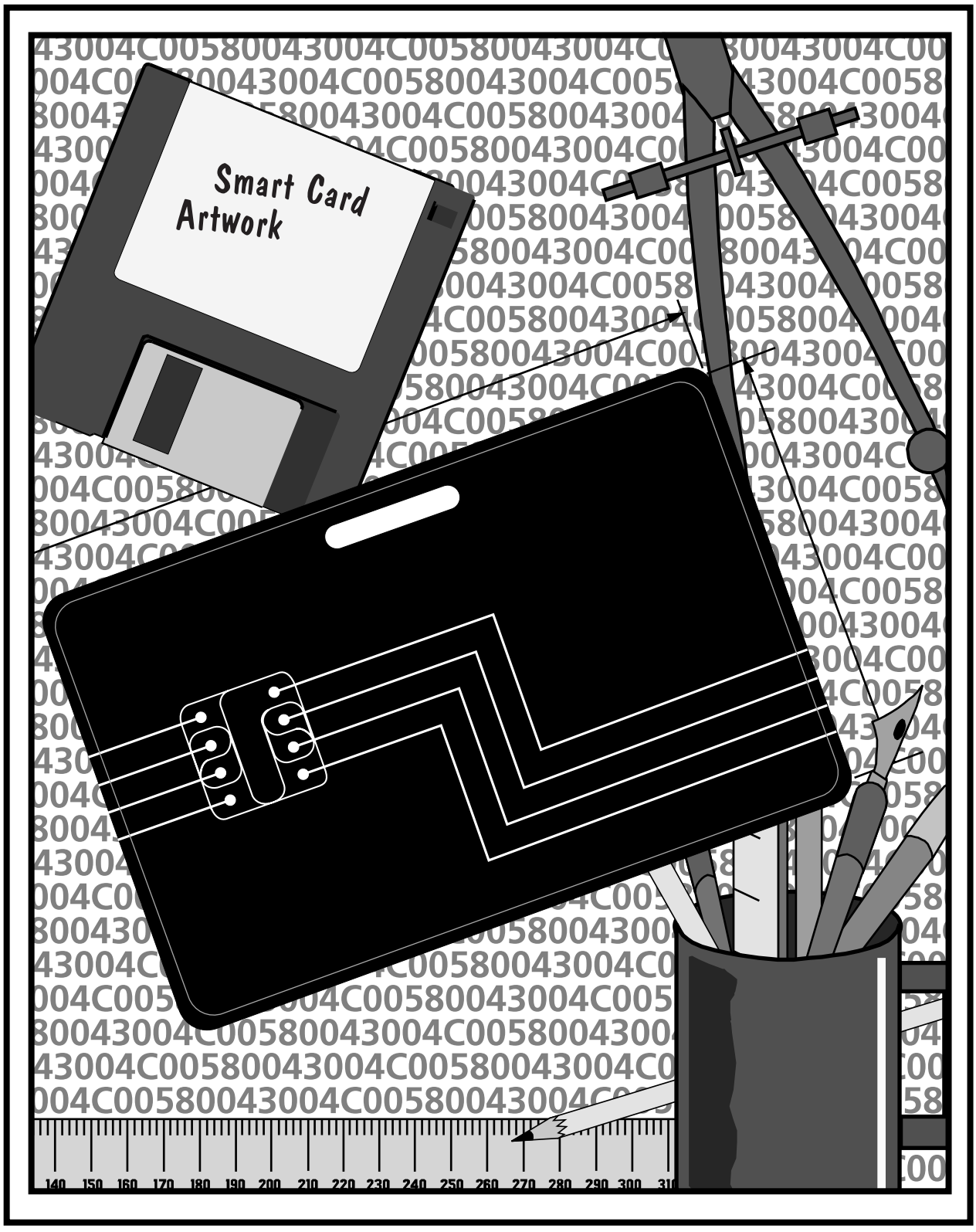
# Smart Card
# Graphic Primer & Design Guide




CardLogix

This guide is intended to be a reference for CardLogix customers when they are having CardLogix print their cards and or card collateral generated with their data and images. This primer covers:

**Electronic Graphic File Formats**
**Printing Types - Guidelines**
**Layouts and Drawings**
**Commonly Used Terms and Definitions**

# Electronic Graphic File Formats

## Submitting Graphic Data To CardLogix

The following discusses several common file formats you can use to transfer artwork to CardLogix for printing on plastic cards or collateral. Graphic file formats differ by the way they represent graphic information. Graphic information is represented as either a *vector drawing* or *bitmap image.* Some graphic file formats contain only vector drawings or only bitmap images, but many can include both in the same file.

CardLogix can read many types of media used in transferring common graphic file formats. We can accept e-mails of sizes up to 8 megabytes. We prefer CD or Zip Disks.

We have the ability to read EPS, GIF, JPEG, PICT, TIFF, PDF, and PostScript™. We can also use artwork in any file format supported by Adobe Photoshop and Illustrator, including PhotoCD™, PNG, and TGA. We also accept Corel images if the resolution is not set.

# Common Graphic File Formats

| | |
|---|---|
| BMP - Windows Bitmap | Macintosh PICT |
| EPS - Encapsulated Postscript | PIXAR |
| GIF89a | Pixel Paint |
| IFF | PNG |
| JPEG | PS - Adobe Postscript |
| MacPaint | PSD - Photoshop |
| CDR - Corel Draw | AI - Adobe Illustrator |
| PDF | TIFF |
| PCX | Targa |

***Non-Shaded areas represent preferred file formats.***

# Preferred Graphic File Formats

## EPS (Encapsulated Postscript)

The Encapsulated PostScript (EPS) language file format is supported by most illustration and page layout programs, and in most cases it is the preferred format for these applications. The *EPS* format is used to exchange PostScript language artwork between applications. Typically, EPS files represent single illustrations or tables that are placed onto a host page, but an EPS file can also represent a complete page. EPS files can contain both vector and bitmap graphics. Early versions of EPS files contain only grayscale vector bitmap graphics. Recent versions support color graphics and compressed bitmap images. In addition to the PostScript language representation of the graphics to be placed, many EPS files contain a preview bitmap representation of the graphic that an application can display. This preview bitmap is platform-specific. EPS files intended for Macintosh applications, for example, can contain PICT or TIFF images for screen preview. Those intended for Windows applications contain either TIFF or Windows Metafile bitmap images. Not all applications that create EPS files create preview images.

## PostScript

This page description language is built into many desktop printers and virtually all high-end printing systems. Because it is built into so many printers, most Macintosh, Windows, and UNIX applications can create PostScript files for printing. *This format is acceptable only for card collateral material but not cards.*

1. The first version of the PostScript file format, PostScript Level 1, represents both grayscale vector graphics and grayscale bitmap images.
2. PostScript Level 2 represents color as well as grayscale vector and bitmap images, and supports RGB, CYMK, and CIE-based color models for both vector and bitmap graphics. (Some PostScript Level 1 files also represent color with extensions to the PostScript language that were generalized in PostScript Level 2.) PostScript Level 2 also supports a number of compression techniques for bitmap images, including the LZW, CCITT, and JPEG methods.

## PDF (Portable Document Format)

This format is used by Adobe Acrobat® and Adobe's electronic publishing software for Macintosh, Windows, UNIX®, and DOS. You can view PDF files by using the Acrobat Reader® software included with many commercial programs or you can download it from the Adobe Web site. PDF is based on the PostScript Level 2 language and can represent both vector and bitmap graphics. PDF pages are identical to PostScript pages, but PDF files can also contain electronic document search and navigation features. PDF files, for example, can contain hypertext links and an electronic table of contents. *This format is acceptable only for card collateral material but not cards.*

# Non-Preferred File Formats

CardLogix will accept some of these formats but with no guarantee of the end result. Many of these formats consistently yield poor quality.

## BMP (Windows Bitmap)

This is the standard Windows bitmap image format on DOS and Windows-compatible computers. CardLogix accepts either Microsoft Windows or OS/2~ formatting and a 1-bit to 24-bit depth for the image. For 4-bit and 8-bit images, you can also choose to use Run-Length Encoding (RLE) compression; this compression scheme is lossless, that is, it does not discard detail from the image. ***This is not a good choice for Smart Card graphics.***

## GIF 89a

This Graphics Interchange Format is commonly used to display indexed-color graphics and images in hypertext markup language (HTML) documents over the World Wide Web and other online services. *GIF* is a compressed format that is designed to minimize file transfer time over telephone lines. ***This is not a good choice for Smart card graphics.***

## IFF

The Amiga™ Interchange File Format (IFF) is used for working with Video Toaster and transferring files to and from the Commodore Amiga system. In addition, this format is supported by a number of paint programs on IBM-compatible computers, including DeluxePaint from Electronic Arts; IFF is the best export format to use with that program. ***CardLogix cannot accept artwork in this format.***

## JPEG

The Joint Photographic Experts Group (JPEG) format is commonly used to display photographs and other continuous-tone images in hypertext markup language (HTML) documents over the World Wide Web and other online services. Unlike GIF, JPEG retains all the color information in an RGB image. JPEG also uses a compression scheme that effectively reduces file size by identifying and discarding extra data not necessary for the display of the image. Opening a JPEG image automatically decompresses it. Because it discards data, the JPEG compression scheme is referred to as lossy. This means that once an image has been compressed and then decompressed, it will not be identical to the original image. A higher level of compression results in lower image quality; a lower level of compression results in better image quality. In most cases, compressing an image by using the Maximum Quality Option produces a result that is identical to the original. ***This is not a good choice for Smart Card graphics.***

## MacPaint

The MacPaint format is commonly used to transfer bitmap-mode images between Macintosh applications. *This is not a good choice for Smart Card graphics.*

## PICT

This format is widely used among Macintosh graphics and page-layout applications as an intermediary file format for transferring files between applications. The PICT format is especially effective at compressing images that contain large areas of solid color. When saving an RGB image in PICT format, you should choose either a 16-bit or 32-bit pixel resolution. For a grayscale image, you should choose 2, 4, or 8 bits per pixel. ***This is not a good choice for Smart Card graphics.***

## PIXAR

This format is designed specifically for exchanging files with PIXAR image computers. PIXAR workstations are designed for high-end graphics applications, such as those used for three-dimensional images and animation. ***CardLogix cannot accept artwork in this format.***

## PixelPaint

This is a Macintosh file format. We can accept PixelPaint 1.0 and 2.0 files. ***This is not a good choice for Smart Card graphics.***

## PNG

This format was developed as an alternative to the GIF format and, like GIF, it is used for displaying images on the World Wide Web and other online services. PNG maintains all the color information in an image and uses a lossless compression scheme to reduce file size. Saving an image in PNG format gives you the ability to display the image in gradually increasing detail as it is downloaded. ***This is not a good choice for Smart Card graphics.***

## TIFF

The Tagged-Image File Format (TIFF) is used to exchange files between applications and computer platforms. TIFF is a flexible bitmap image format that is supported by virtually all paint, image editing, and page-layout applications. In addition, nearly all desktop scanners can produce TIFF images. TIFF supports up to 24-bit RGB, CMYK, and YCbCr color images. It also supports JPEG and LZW compression; the latter is a lossless compression method, which does not discard detail from the image. When you save artwork in TIFF, you sometimes have the choice to save in a format that can be read either by Macintosh or by IBM PC-compatible computers. You can also choose an RGB, CMYK, or grayscale color model and define the image resolution. To compress the file to a smaller size use an LZW Compression option. ***This is not a good choice for Smart Card graphics.***

# Ordering & Printing

## Guidelines and Considerations

**Quotations:** Quotations are valid for thirty days and are subject to a final review of artwork and specifications when the purchase order is received.

**Terms:** Our normal terms are 50% down, balance at the time of shipment or Net 30 upon approved credit application.

**Shipments:** In accordance with the *Printing Industries of America* established trade customs, overruns or under-runs not to exceed 10% shall constitute acceptable delivery, and the excess or deficiency shall be charged or credited to the customer. Exact shipping quantities are available for a 5% premium over the standard price.

**Proofs:** CardLogix will supply a proof of your card to your specifications. This proof will help you visualize how your printed card will appear and give you an opportunity to make any necessary changes or corrections. Colors on the overlay are indicative of color separations only and are not representative of the inks on your final card. If a 2nd proof is required there is a $150 charge. Color matching proofs are available on special request. There is an additional charge for this service.

**Materials:** We typically print on a specific PVC (Poly-Vinyl Chloride) material that is compatible with our processes. Other card materials are available on special request.

**Ink Colors:** We can match any PMS color; however, *slight* color variations may occur due to variations in materials, inks, processes, heat lamination, and other factors.

**Rights to Promotion:** CardLogix reserves the right to use all products produced by us in our advertising and promotions unless otherwise specified in writing at the time of the order.

# Card Options

**Laser Engraving/Indenting:**Laser Engraving and Indenting can be applied to the card design. A 10,000 card minimum order applies.

**Tipping & Embossing:** Card embossing is available in two point sizes and one font style. “Tipping” color is applied to the embossed type for clarity, you specify either gold or silver.

**Holograms & Overlays:** Available in either metallic foil or polyester overlays to increase security. Special tooling charges apply.

**Card Punching/Die Cutting:** Tether or badge holes can be made to accommodate clasps. See page 3 for badge hole location and specifications.

**Barcode Printing:** The following barcodes are supported;

| | |
|---|---|
| Code 39 Plus | EAN8 |
| HIBC Code 39 Plus | UPCA |
| Code 39 | Code128 |
| Codabar | Code128 Func 1 |
| EAN 13 | Code128 Func 2 |
| Code128 Func 1 & 2 | |

**Motion Graphics Printing:** 3D or Motion graphics are available with a Lynticular Optical design. A minimum order requirement of 25,000 cards applies.

**Signature Panels:** A writeable panel for a user’s signature or other hand written data adding additional security. See page 4 for signature panel options and dimensions.

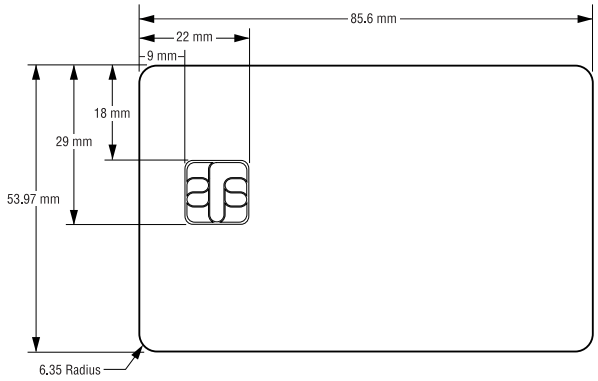
**Scratch Off Panels:** To protect pre-loaded PINs and /or other customer specific data; a Scratcher panel can be applied to UltraGraphix™ printing up to 10 digits.

# Available Card Printing Methods

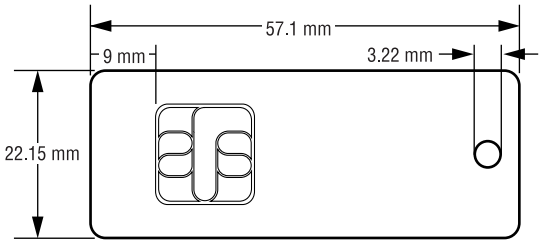
| Printing Method | Features | Min. Order | Design Considerations | Relative Cost | Drawbacks |
|---|---|---|---|---|---|
| **Lithography** | Four color process with optimal Pantone® color matching. Full bleed available on both sides. You can supply your own artwork as negatives or resolution-independent computer files. | 1000 | If card has a bleed in its design, allow 1/8" extra image all around. Do not round off corners. Do not position type within 1/16" of the card edge. Metallic Inks are considered a separate Pantone® color | Lowest cost in volume. But no flexibility in personalization | Lead-time and personalization |
| **Screen Printing** | Up to seven colors. No bleeds allowed. You can supply your own artwork as negatives or resolution-independent computer files. | 200 | Provide trapping (.003" - .004") on objects with tight registration. Artwork that bleeds must extend 1/16" beyond each edge of the card. Keep all non-bleeding copy and variable text at least 1/8" from the edge of the card. | Cost effective for small to medium runs 200 to 3000 | Durability and costs |
| **UltraGraphics®** | Up to 13 individual colors, each applied in a single pass at 300 dpi. You can supply art as a resolution-independent computer file. | 50 | All logos and images are limited to a 1"x1" size. Keep all copy and variable text at least 3/16" from the edge of the card. See the table for available fonts and bar-codes | Lowest Cost for individual personalization of each card, $250.00 Set up | Limited to small (1"x1") single color images |
| Dye Sublimation | Full Color, Variable Field printing, available with overlays | 50 | All images submitted need to be exact size. | Quick Turn only Highest unit cost per card, $150.00 Set up | Cost per card, No Pantone® matching, No Bleeds |
| **Photo ID** | Individual Color or B&W photos printed on each card. Usually used in combination with one of the above. You must supply a database of individuals and their associated photos in Bitmap or JPEG format and at a minimum of 150 dpi. | 5000 | All images submitted need to be exact size. | Highest unit cost per card for individual personalization of each card $500.00 Set up | Cost per card, No Pantone® matching, |

# Smart Card Dimensions & Specifications

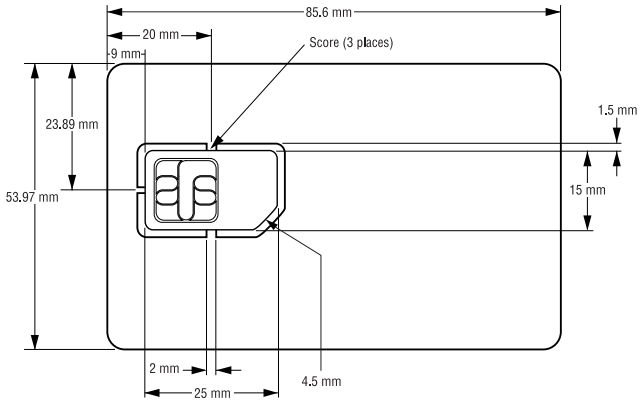
## CR-80 Card



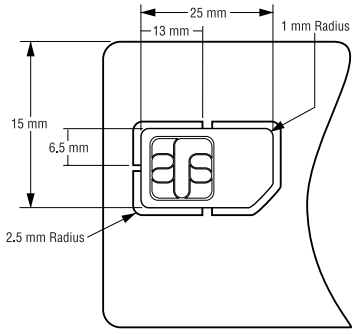

## Keychain Card



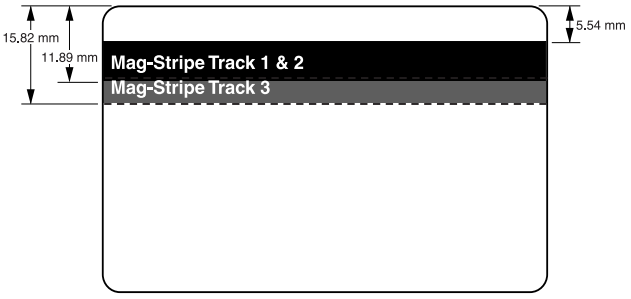

## GSM SIM/SAM Card

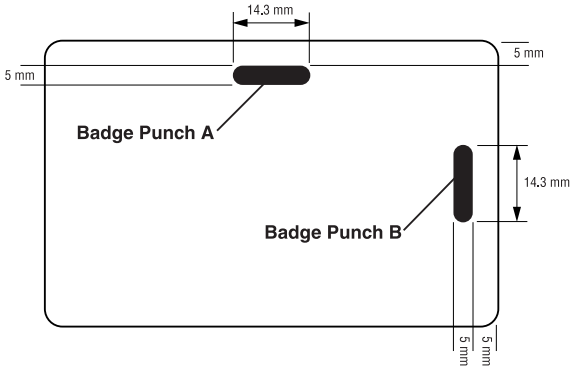


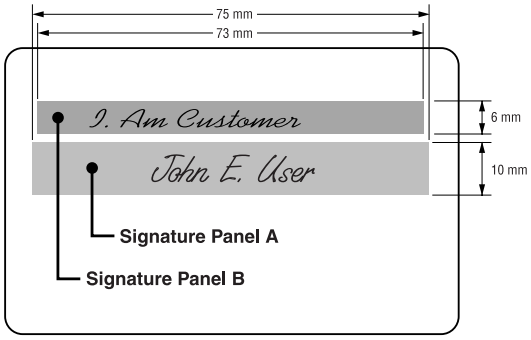

## GSM SIM/SAM Card (cutout)




# Dimensions For Other Card Options




**NOTE:** Signature panels can be placed on any area of the card back provided it does not overlap any other element on the front or back of the card.

# Most Common Blister Pack Dimensions

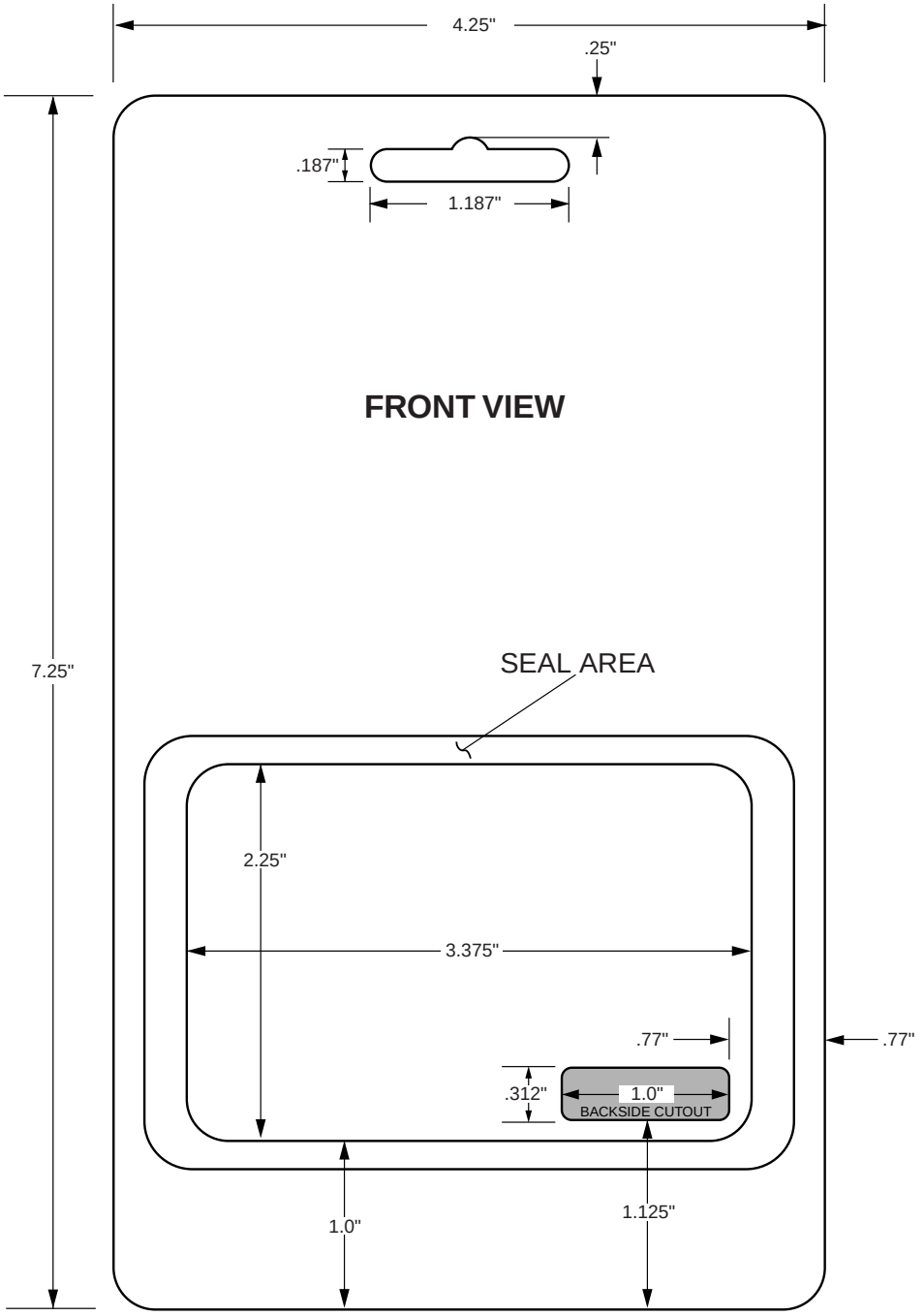
**CardLogix Blister Pack Dimensions**
**Part Numer CLA-100**

Use this page as a guide when planning your package design. The shaded area at the bottom right of the illustration is an optional punch out on the rear of the package, thus allowing a view of the back of the Smart Card itself.

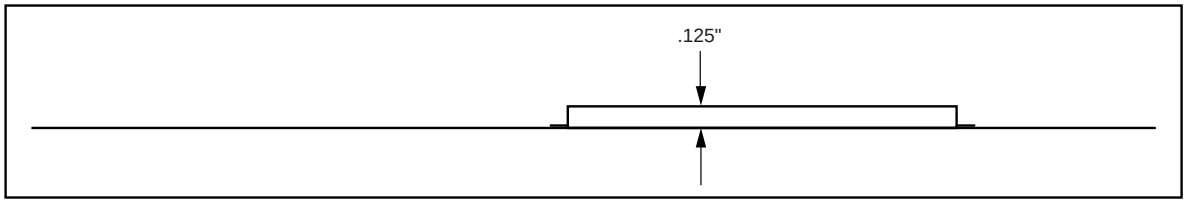
This package and those presented on page 6 are made by different manufactures, therefore, when selecting a package size from page 6, these dimensions SHOULD NOT be used.

All blisters are transparent allowing a view of the package contents.

Printing can extend from edge to edge, with full bleeds and the area underneath the blister can be printed upon.



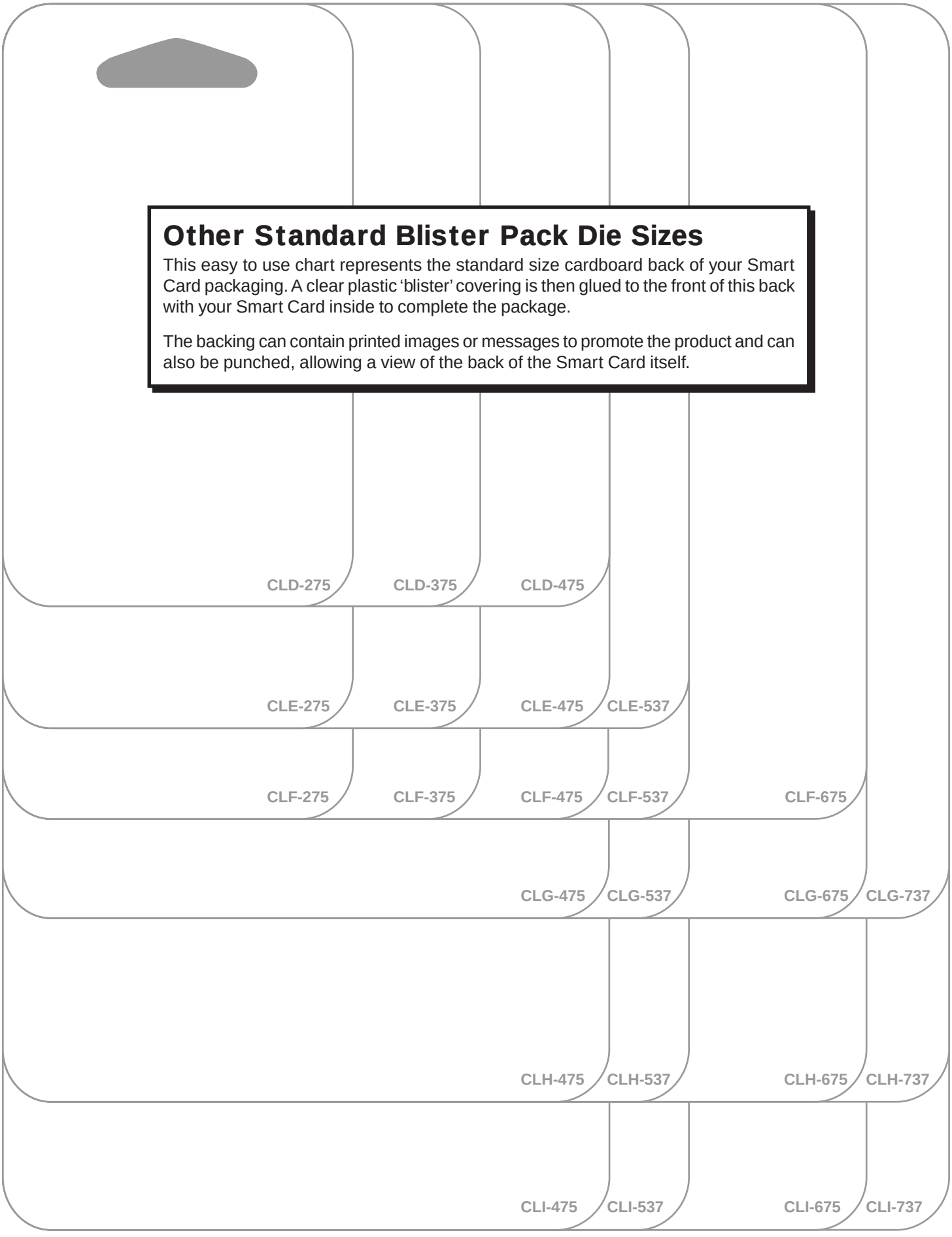

## SIDE VIEW



# Other Standard Blister Pack Die Sizes

This easy to use chart represents the standard size cardboard back of your Smart Card packaging. A clear plastic 'blister' covering is then glued to the front of this back with your Smart Card inside to complete the package.

The backing can contain printed images or messages to promote the product and can also be punched, allowing a view of the back of the Smart Card itself.



## Design Tips & Suggestions

**PLACEMENT OF GRAPHICS ON CARD**
Position your graphics no closer than 1/32" from the card edge. Graphic images imported from another source do not reproduce well near the edge of the card.

**PHOTOGRAPHIC ARTWORK**
NEVER use photograhic style artwork when using the Datacard printing method, summarized on page 3. Because the Datacard printer only prints one color at a time it cannot accurately reproduce photos.

**COLORS**
The card core plastic is white. Dark printed colors show scratches more than light colors. In general, dark colors such as black look best.

**CARD STOCK**
Smart card stock is closer to 0.032" thick than 0.030". CardLogix uses the thicker material per ISO specification for better-quality flatness of plastic under module area.

**FULL BLEED**
For full bleed allow the artwork to be at 90 degrees in the corner for bleeding of edges- the card comer radius is punched after printing.

**INSERTION INSTRUCTIONS**
CardLogix highly recommends the printing of arrows to indicate proper insertion of the card into the reader; for example, arrows show correct side and/or end of card to be inserted.

**COLOR PROOFING**
Artwork proofs are for the purpose of selling, location of all text, signature panels etc., NOT COLORS. The printed cards will be close to the specified colors, but there are variations due to process. Exact color matching is available at extra cost.

**FILE FORMATS**
It is always best to submit your graphic files to CardLogix in a vector image format as opposed to bitmap. Bitmapped or rasterized images typically do not print well.

**FONTS**
When using fonts not listed in the matrix below, convert the type to curves in your application program. This will allow them to print accurately and without substitution by the printer. Consult your design programs documentation for instructions on how to convert type to curves ('outlines', is another term for this).

**PROOF COPIES**
Always request a proof from CardLogix, examine it carefully, and sign off on it. CardLogix cannot be responsible for mispellings or ther copy errors once the print run has been completed.

## Ultragraphics Color Chart

When choosing the colors that you are going to incorporate into your Card or package design it is important to note that the Ultragraphics printer cannot print Pantone© colors. We have provided the following table as a conversion guide that will print the closest possile match to the specified Pantone© color. Keep in mind that all colors are approximate and the actual colors may vary.

| | |
|---|---|
| Teal | PMS 322C |
| Warm Red | PMS 214C |
| Purple | PMS 266C |
| Gold | PMS 872C |
| Burgundy | PMS 201C |
| Green | PMS 349C |
| Royal Blue | PMS 287C |
| Silver | PMS 877C |
| Process Blue | Process Cyan C |
| Red | PMS 200C |

## Ultragraphics Font Support

When choosing the fonts (type style) that you are going to incorporate into your Card or package design it is important to note that the Ultragraphics printer can only print the following fonts natively. We have provided the following chart to guide you in you font selection.

AvantGarde-Book
**AvantGarde-Demi**
Bookman-Light
*Bookman-LightItalic*
**Bookman-Demi**
***Bookman-DemiItalic***
Courier
**Courier-Bold**
Helvetica
**Helvetica-Bold**
NewCenturySchlbk-Roman
**NewCenturySchlbk-Bold**
*NewCenturySchlbk-Italic*
***NewCenturySchlbk-BoldItalic***
Palatino-Roman
*Palatino-Italic*
**Palatino-Bold**
***Palatino-BoldItalic***
Σψμβολ (Symbol Font)
Times-Roman
*Times-Italic*
**Times-Bold**
***Times-BoldItalic***
ZAPF CHANCERY
✡✢⌘✦✧★✪ (ZapfDingbats)

# Commonly Used Terms in the Printing Industry

### Adobe PostScript®
The industry-standard page-description language invented by Adobe printing documents that integrate text, graphics, images, and color. Built into printers from over 55 major manufacturers worldwide.

### ATM®
Adobe Type Manager® software is a font style which makes type appear sharp and clear for printing. Type I Fonts are Adobe's industry-standard outline font technology that enables type to be scaled to any size.

### Bleed, Full Bleed
Printed colors which run all the way to the edge of a card or printed material are referred to as bleeds. We charge extra for bleeds since they require the printed image to actually be slightly larger than the final trim size (thereby using more plastic).

### Blister Pack
The process of thermally molding plastic to a specific form or shape. Often the form is attached via a glue to a paper backing. (see page X for standard dimensions) clamshell (see sample layout) designs have no backing.

### Cut lines:
(Crop marks) Crop marks show where a card or collateral is to be cut.

### Digital Reprographics - Docutech
Electronic source files are processed directly to the printing press or printing system, rather than through analog steps such as film imagesetting and platemaking.

### Direct-to-Plate Printing
This process is often used for cardboard collateral material i.e. blister packs. The traditional offset printing process includes generating film, "burning plates", and mounting the resulting plates on offset presses. Direct-to-plate printing eliminates the film imaging step by imaging directly on the plate material.

### Dots Per Inch (DPI)
A measure of the resolution of a device. The higher the number, the sharper the type and images.

### Dye Sublimation
A printing process used in plastic card printing. The ink is transferred on to the card via ribbon one color at a time. It is heated by a print head that sublimates each image into the top layer of a card. Typical resolution is 300 DPI.

### Embossing
A process of forming the card or paper around type set characters or a steel rule die. Commonly used in the production of credit cards. CardLogix limits the character set to the American Bank Association formats.

### Encapsulated PostScript (EPS)
A standard file format for importing and exporting PostScript language files among applications in a variety of heterogeneous environments.

### Fonts
Typefaces in different styles that give documents personality. Common font technologies include the Windows True Type format and Adobe Postscipt outline fonts.

### Laser Engraving
The process of cutting an image or character sequence into the surface of a card. This manufacturing process is capital-intensive, thereby reducing fraudulent reproduction.

### Lithography or Offset Printing
The most common commercial printing technology in use today. Offset printing applies layers of ink on the page. For each layer, a reverse image of the page is placed on a roller in the printing press. Ink is applied to the non-image areas on the roller, so that as the roller presses against plastic moving through the press, the proper image is left on the card.

### Pantone
Pantone* Matching System: Often referred to as PMS, the Pantone* systems are the most popular color matching systems in the printing industry. Pantone, PMS and the Pantone Matching System are trademarks of Pantone, Inc.

### Pixel
The smallest dot that can be produced on a computer screen.

### Pre-Press
The steps required to turn a design into final form, ready for final printing on a printing press. Includes color correction, color trapping, imposition, color separation, proofing, and imagesetting.

### Raster Image Processor (RIP)
The hardware and/or software that translates data from PostScript and other high-level languages into dots or pixels in a printer or imagesetter.

### Resolution
The sharpness of text and graphics provided by any printer or output device, measured in dots per inch.

### Screen Printing / Surface Printing
This type of printing is very common on short runs of cards and is used extensively on odd-shaped of uneven surface materials such as cardboard boxes and tee-shirts. Each color has a separate screen imaged on to it. The screen is then laid on top of the object to be printed and the ink is squeegeed through each screen one color at a time. The inks cannot blend well with this process. This type of card printing is not as durable as other methods. Typically resolution is 140 DPI.

### Trapping
The process of creating an overlap between abutting colors to compensate for imprecision in the printing press.

### TrueType Fonts
Scaleable typefaces for Windows and Macintosh software.

### UltraGraphix®
A DataCard Corporation trademark for a single-color-per-pass Dye Sublimation printing process. CardLogix supports 12 individual colors and B&W Barcoding. The process is 240 DPI.

## NOTES

## NOTES

## *Quality*

CardLogix Corporation is absolutely committed to providing defect free products and services to our customers in partnership with equally committed suppliers and authorized dealers.

CardLogix

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DC-GP-Q1-2/2000a
3-20-00