

Multi Technology Proximity Cards

Multi Technology Proximity Cards (Pyramid Associates models PSM-2P and -2S) are designed to give customers all the benefits of proximity access control, plus the convenience of combining multiple technologies, including photo ID, text, bar code, and color graphics onto a single card. Typical applications employ the card's proximity technology for access control, the text and photo for positive picture ID, and the magnetic stripe and bar code for compatibility with numerous systems, such as those commonly utilized for time and attendance. Other applications include systems for cafeterias, libraries, copy machines, and other office equipment management.

Following the basic guidelines outlined in this document will help ensure users gain the maximum usage and performance from the Multi Technology Card.

Dye Sublimation Printing on Multi Technology Proximity Cards

Multi Technology Cards are manufactured using glossy PVC materials designed to allow edge-to-edge dye sublimation printing of a quality image on both sides of the card. However dye sublimation printing requires that special care be taken. Follow the basic guidelines below, as well as recommendations from the dye sublimation printer's manufacturer, for best printing results:

1. When designing card artwork avoid large blocks of colored background and half tones, such as yellow, light blue and gray (Note printed images rarely match those displayed by the monitor.). Instead choose a white background. It is less likely to show imperfections, such as voids, blotches and blurs, and will normally yield the most professional results.
2. If the cards must be handled, it is strongly recommended finger cots or cotton gloves be used. This will help prevent smudges from oils on the hands, as well as scratches from fingernails and jewelry.
3. If the card is contaminated with oil or dust, a soft cloth can be used to clean it. Make sure the cloth is of a material that will not leave lint residue. Alcohol may be used to improve cleaning.
4. The cards should not be handled excessively. Excessive handling can scratch the card's glossy finish.
5. Insure the printer is clean and in good working order. If this is questionable, contact the printer manufacturer before attempting operation.
6. When loading cards into the printer hopper, insure cards are handled only on their edges.
7. When printing bar codes, insure the correct color and print location is used for the bar code reader the card is to be used with.
8. For maximum protection of the printed image, consider the overlay option available with many dye sublimation printers. Overlays are strongly recommended when a printed card's magnetic stripe will be used, as repeated swiping can wear-off the printed image. Normally overlays should not be applied directly over magnetic stripes or contact smart card modules.

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9. Always use test cards to verify printer operation, card artwork, and image quality before printing "live" Multi Technology cards.
10. Large printing runs can lead to heat build-up in the printer, and may cause variations in print quality. Regular breaks may be required, allowing the printer to cool down.
11. Slot punch cards only after printing. Printing a slot punched card can jam or damage the dye sublimation printer, and lead to printing irregularities.
12. When storing cards after printing, arrange them such that they all face in the same direction to best protect the printed text, photos, bar codes and/or images.

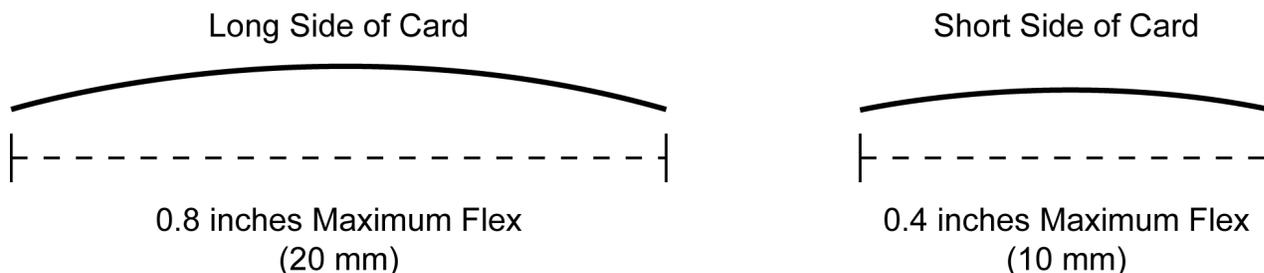
It is not recommended that the Multi Technology Cards be hot laminated. In hot lamination a clear polyester layer is applied to the card with heat and pressure. Although it is rare when lamination damages the card's internal electronics, it can cause the card to warp, bend, and discolor, as well as void the card's warranty.

Many dye sublimation printers provide adjustments for print head temperature, color print intensity and card thickness (gaping). Before attempting any printer adjustment, it is strongly advised that the dye sublimation printer manufacturer be consulted.

Mechanical Stress

Multi Technology Cards are manufactured to comply with internationally accepted standards. In addition to size and shape, these standards dictate the amount of stress the card should be capable of withstanding. As such these Multi Technology Cards are appropriate to wear as an ID, or carry in a purse or wallet.

However the limitations of cards manufactured from PVC are well known. To maximize the life of the card, never bend, twist or probe it with sharp objects; the internal electronics can be damaged if abused. The card will withstand stress caused by flexing the card as shown in the examples below, though flexing just a small portion of the card to these levels may indeed cause damage.



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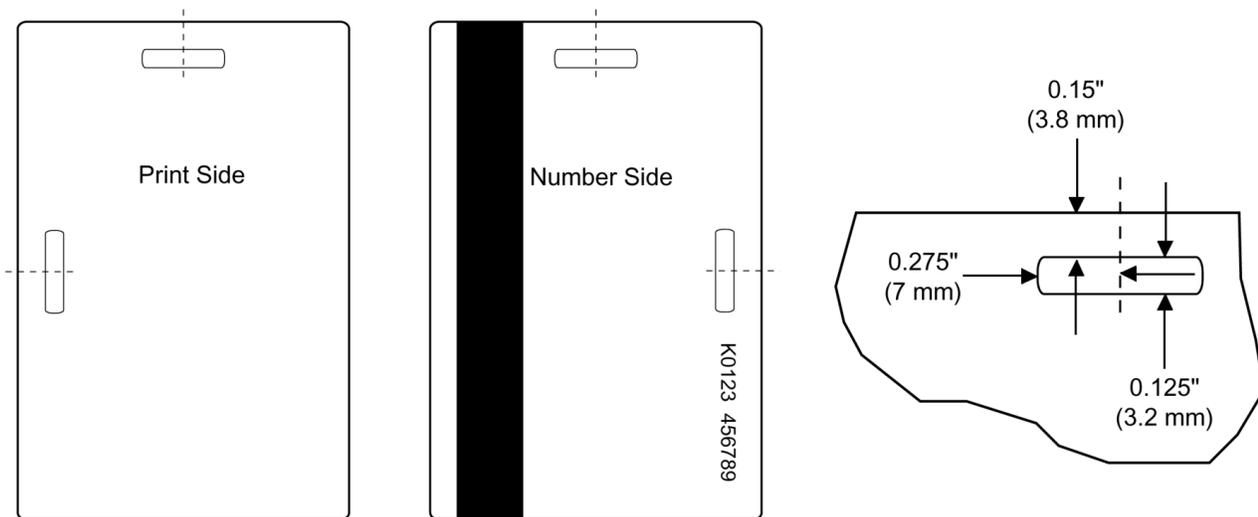
Thermal Stress

Never subject Multi Technology Cards to heat in excess of 158°F (70°C). Temperatures exceeding 158°F can permanently warp the card. This warping will cause mechanical stress that may lead to the card's failure.

An example of a location that regularly experiences temperatures in this range is a vehicle's dashboard. It is simply good practice never to leave a Multi Technology Card on a dashboard, in particular when a vehicle is exposed to full sun.

Slot Punch

Care should be taken to slot punch the Multi Technology Card only in the two areas marked on the card. Punching outside of these areas may damage the card's internal electronics and void the card's warranty. Further, care should be taken when slot punching to not flex the card beyond the limits detailed above. The image below details the appropriate slot punch size:



Lastly, a Multi Technology Card with a slot punch and worn as an ID badge with a strap clip is predisposed to breakage at the slot punch location. Such breakage voids the card's warranty. To eliminate issues surrounding the slot punch, an option is the use of a clear vinyl, tear resistant, clip-on badge holder.

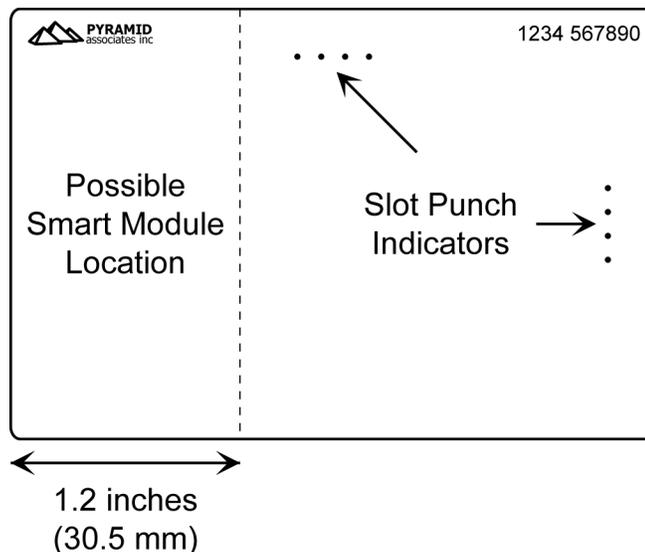
Magnetic Stripe

A magnetic stripe is optional with the Multi Technology Card. When ordered, it is shipped unprogrammed. As with the magnetic stripe on a bank card, care should be taken to keep it away from high strength magnetic fields after it has been encoded. Such fields can corrupt the data encoded on the magnetic stripe.

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Smart Card Module

Multi Technology Proximity Cards are manufactured such that they can have a smart card chip module embedded, in either the front or the back side of the card, according to ISO 7816 and AFNOR (Association Française Normal) specifications. Depending upon the module to be embedded, this process can make the Multi Technology Proximity Card a true 'smart card.' Care should be taken that the module be embedded only in the area defined below. Embedding the chip in an area other than that defined may damage the card's internal electronics and will void its warranty.



If the card is to be dye sublimation printed before the module is embedded, ensure the printed image will not be compromised when the module is embedded. If the card is to be printed after the module is embedded, know that the embedding process may generate residues that must be cleaned before attempting printing. As the embedding process physically removes plastic from the card, the physical properties of the card will be altered. Due to this alteration, dye sublimation printing on the opposite side of the card over the location of the embedded smart card module may result in printing inconsistencies. And most card overlays should normally never be applied directly over contact smart card modules.

Due to compatibility issues surrounding the many smart card chip modules available, it is always recommended that the dye sublimation printer manufacturer, the smart card chip module manufacturer, the smart card reader manufacturer, and the manufacturer providing the smart card chip embedding services be consulted when considering such a project.



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Alternatives to the Multi Technology Card

While "multi technology"-style cards are growing in popularity, there are viable alternatives. Should the magnetic stripe not be required, standard proximity "clamshell"-style cards (Pyramid Associates model PSC-1) can be personalized either via a dye sublimation printable PVC adhesive overlay (Pyramid Associates model PVC-9) or new classes of printers that will image directly to this card. Made of ABS, these clamshell cards often feature longer read ranges and lifetime warranties.

Alternatively, a user may wish to consider a two-credential solution. For non-contact identification needs the small proximity key ring tags (Pyramid Associates model PSK-3) can be a good choice. And for the user's contact identification needs, a second card can be issued. This second card might be for temporary use only, and contain technologies that will wear out, such as a magnetic stripe or a smart card module .

Reference Materials

Below is a list of additional reference materials related to the Multi Technology Card:

- Security Industry Association's [Access Control Standard-Badging Specifications, SIA AC-03-2000.06](#)
- International Organization for Standardization's Standard [ISO 7811-Identification Cards](#)
- International Organization for Standardization's Standard [ISO 7813-Identification Cards - Financial Transaction Cards](#)
- International Organization for Standardization's Standard [ISO 7816-Identification Cards - Integrated Circuit\(s\), Cards with Contacts](#)
- American National Standards Institute's [ANSI x4.16-1973 Magnetic-Stripe Encoding for Credit Cards](#)
- Magicard's Online "How To?" Guide to Dye Sublimation Printing - www.ultramagicard.com/support-howto.html
- Pyramid Associates's [PSM-2 Multi Technology Card Data Sheet](#), Part Number 01891-001