

GENOVATION

Computer Input Devices

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Bar Code Slot Reader

For use with bar coded badge ID Cards
Available in MiniTerm 905 & 906 models

Description:

Genovation offers a slotted bar code scanning module option within the MiniTerm. This allows a MiniTerm to scan a badge type ID cards with bar code data printed on them. These bar coded badge ID cards are swiped directly and the bar code is read, decoded and sent out via Serial (RS232), USB virtual COM port, or USB HIB keyboard formats.

Scanning Performance:

- Light source: IR 940nm
- Ambient Light: 10000 Lux (Fluorescent Light)
- Sensor: Photo Diode
- Scan speed: 3.0-39inch/sec
- Printing Contrast Scale: 0.9
- Best Resolution: 0.15mm (6 mil)

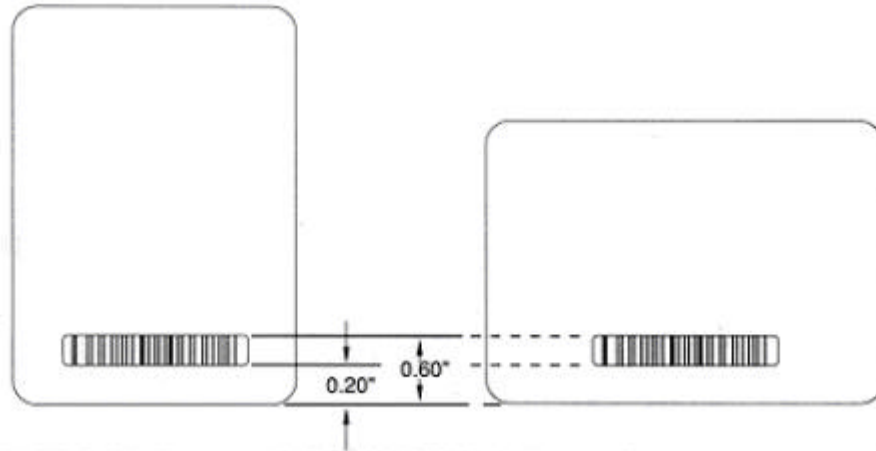
Environmental Conditions:

- Operating temperature
- -0 ~ 40 c
- Storage temperature
- -20 ~ 60 c
- Relative Humidity
- 20% ~ 85%

Supported Bar Code Formats:

- Standard CODE 39
- Full ASCII CODE 39
- Interleaved 2 of 5
- Codabar
- Code 32
- Code 128
- MSI Plessey Code
- Code 11
- Industrial 2 of 5
- Matrix 2 of 5
- UK Plessey Code
- Code 93
- Code 11
- EAN-13
- EAN-8
- UPC-A
- UPC-E
- EAN / UCC 128

Badge ID Card Specifications:



Symbol Placement:

The bar code should occupy the area from 0.20 inch to 0.60 inch (0.5 to 1.5cm) measured from the edge of the card. Refer to Figure above for clarification on symbol placement.

Note: The bar code symbol may be positioned off of either the short or long side of the card.

Skew:

The bar code symbol should not be skewed by more than three (3) degrees as referenced to the edge of the card.

Edge and Surface Defects:

A flat smooth badge with crisp, straight edges, and rounded corners reduces performance changes due to distance variations and undesirable reflectance variations. Any over laminate or coating should also be flat and free from surface defects.

Symbol Orientation:

If the badge is to be used with an insertion reader the symbol must be placed on the side compatible with the insertion reader chosen. Specific requirements of the insertion reader chosen must be coordinated with the symbol placement on the badge.

Reflectance:

The reflectance and signal level of the materials across the scan sweep should be as closely matched as possible. It is recommended that the white or space/quiet zone reflectance exceed 50%* at the illuminating scanning wavelength. If the surrounding background reflectance does not match the symbol's white reflectance, a background reflectance that is lower than the white reflectance is preferred.

*Note: All reflectances are referenced to Kodak 6080 paint, BaSO4

Symbol Dimensions:

The bar code symbol should be dimensionally correct with adequate quiet zones. Bar and space tolerance specifications differ from one symbology to the next and requirements for wide to narrow element ratios are dependent upon the narrow element width. The quiet zones are areas clear of stray marks, which immediately precede the first bar and immediately follow the last bar. For hand and slot type scanning applications, it is recommended that each of these quiet zones be at least 0.25 inch (0.6 cm) or 10 times the narrow element width, whichever is greater. All applicable AIM specifications for bar code symbols must be met.

Contrast:

A high contrast black to white transition allows for better performance. Contrast is defined by two different methods.

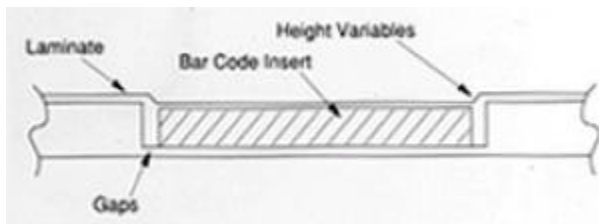
MRD

Where: $MRD = R(\text{min}) - R(\text{max})$ and $R_m(\text{min})$ refers to the minimum reflectance of the spaces $R_b(\text{max})$ refers to the maximum reflectance of the bars The R_m should be $> 50\%$ and $R_m - R_b$ should be $> 40\%$ Print Contrast Ratio The print contrast ratio is defined as: $P.C.R. = \frac{\text{Light Reflectance} - \text{Dark Reflectance}}{\text{Light Reflectance}}$ where: The light and dark refers to the spaces and bars.

P.C.R. values greater than 75 are recommended for optimum read rates.

Applying Bar Code Symbols:

Whenever possible, a bar code should be printed directly onto the substrate material. A thickness of 0.008 or 0.010 inches is recommended for the substrate material. By printing directly onto the substrate the chance of readability problems with the bar code will lessen by eliminating bumps that might be apparent if a cutout is used. If an insert is used, a bar code symbol should fit snugly into the badge cutout area with no gaps about its perimeter and a consistent height from bar code insert to the surrounding badge areas. This is also true for other inserts, like pictures, which lie in the scan path. Refer to the Figure below for an illustration of a badge cross section with a bar code symbol insert.



Scratches:

Whenever possible, all extraneous material, photos scratches or anything that might obscure or distort the bar code symbol should not extend into the scan path.

Badge Thickness Total badge thickness of 0.033 inch (0.84 mm) is recommended.

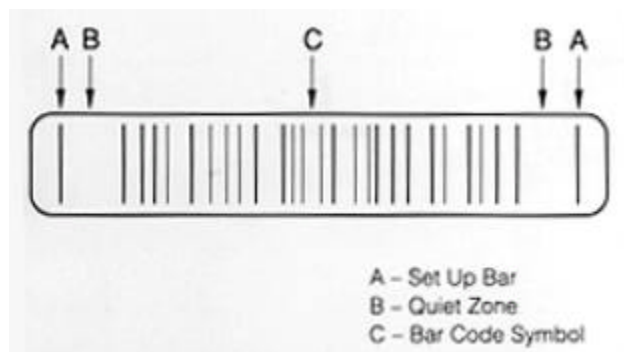
The maximum thickness acceptable is 0.062 inch (1.57 mm). Laminations

With the laminated badges special care should be taken to insure that the plastic overlay does not have thickness and lensing effects which cause the bar code, as viewed through the laminate, to violate dimensional, contrast and reflectance requirements or recommendations.

In addition, the plastic overlays distort the image as seen by the scanner. This phenomenon is commonly referred to as the laminate effect. The laminate should also not vary in thickness or contain bubbles, either of which could distort the bar code symbol. **Symbol Location** The symbol should be located towards the center of the badge so that acceleration and deceleration effects would tend to be reduced. This does not apply when insertion readers are used. **Black Overlays** Any black overlay, which prevents the bar code to be seen or photocopied, should be transparent to the illumination wavelength to minimize contrast variations and signal level losses. The required reflectance levels must be taken through any laminates and overlays used (820nm - 940nm wavelength range for infrared scanners). **Red Overlays** Red overlays, which are used to inhibit photocopying of the bar code symbol, must be transparent at the wavelength used by the reader. As with other overlays, any reflectance or print quality measurements should be made through the laminate using an illumination source of the same wavelength as the reader, which will be used.

Set Up Bars:

Use of "Set Up Bars" is recommended for cases where color of the badges or method of construction present reading problems. A setup bar is a bar one "X" wide (where "X" is the narrow bar width) located at the end of both quiet zones. The setup bar resets the digital circuitry, which may have been disoriented by stray reflectances caused by badge construction variables or the effects of background reflectance being greater than that of the symbol. The setup bars must not reduce the quiet zone below acceptable levels. Refer to the Figure below for an illustration of set up bars.

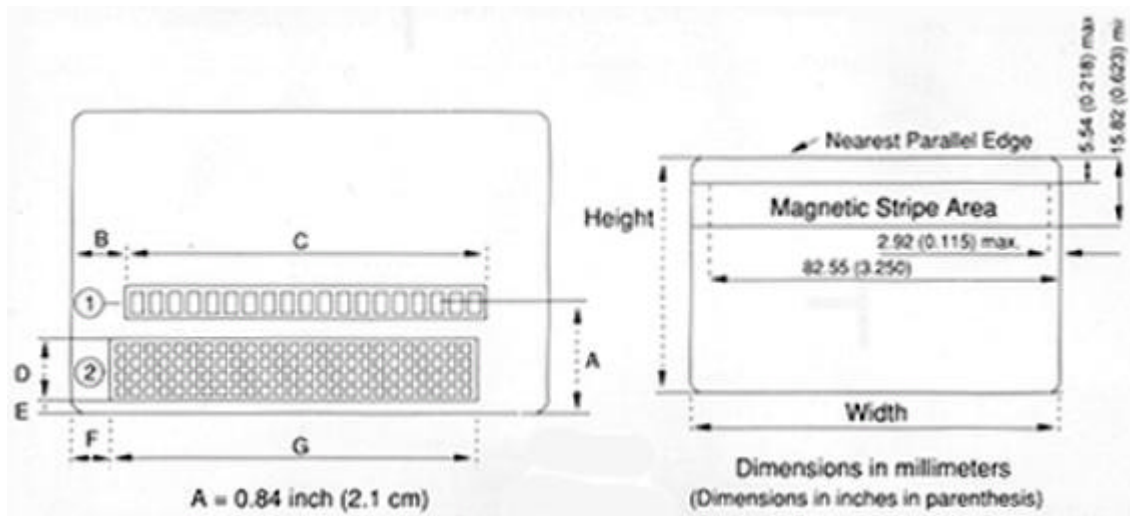


Lamination Thickness:

Lamination thickness is a total of the laminate and adhesive thickness. Quantitative recommendations for laminate and adhesive thickness are dependent upon the optical system used for reading. In general, the laminate thickness should avoid $1.5X$ where X is the width of the narrow bars in the bar code symbol. **Laminate Glare** The laminate should have a low glare surface and have a minimum 95% light transmission at the wavelength to be used for reading. The material of construction should be suitable for the intended use. Badges may be made of many different materials with new materials periodically becoming available. Properties such as resistance to cracking and discoloration should be considered. **Badge Property Measurements**, the method used to measure the properties of the badge should simulate the badge reader characteristics in regards to incident and reflected light paths.

Badge Property Measurements:

The method used to measure the properties of the badge should simulate the badge reader characteristics in regards to incident and reflected light paths Dual or Multimedia Cards When dual or multimedia cards are used, the following recommendations apply. A. Bar code and magnetic stripe should not be placed on the same edge and side. In addition, the method of placement or printing of the bar code symbol should not cause surface distortion in the magnetic stripe. B. Any embossing used should not occupy the same area or scan path as the bar code or magnetic stripe portion of the card. C. ISO standards ISO 7811/ 2-1985(E) for magnetic stripe placement and ISO 7811/3-1985(E) for embossing location should be adhered to. Sketches, which show the general placement area allowed by these standards, are provided in the figure below. If either embossed or magnetic stripe is used, the ISO standards should be obtained from ANSI (see reference).



Reading Device Resolution:

The resolution of the reading device should be compatible with the apparent "X" dimension of the bar code symbol and the void and speck characteristics of the bar code symbol ANSI / AIM Recommendations ANSI and AIM recommendations for bar code symbol production should be adhered to. Refer to Figure 4 for recommended embossing locations and location of magnetic material for tracks 1, 2, and 3 on ID type card.

Badge Considerations:

There is a wide range of methods of generating a bar code identification badge for a wide range of applications. The prime factor in selecting materials and method of construction is matching the badge to the application. Typical questions, which must be answered in the badge selection process, are:

1. How long will the badge be used?
2. What environmental conditions will the badge be exposed to?
3. What mechanical stress will the badge encounter?
4. What level of security against counterfeiting is required?
5. What information in addition to bar code must be included on the badge? (i.e. photo, magnetic strip, etc.)?
6. How much information must be encoded in bar code?
7. What type of reader will be used?

Once these factors are identified the badge can be produced. If the badge is a single use such as an airline-boarding pass, unlaminated paper stock can fill the need. The extension of the application is a one-day ski pass where the badge will likely get wet and therefore either a treated paper or laminate coating will assure a successful useful life. The use of laminates requires an understanding of the use. Some laminating materials (laminate includes both laminate and adhesive) will discolor or become brittle upon aging or exposure to sunlight and chemicals encountered in the workplace. If the badge will be used extensively and subjected to flexing both the substrate and laminate must be flexible over the life of the badge.