



## GLOSSARY OF TERMS

2-D Matrix Symbology	A two dimensional arrangement of contrasting marks encoding information in accordance to specific rules. The resolution of the symbol's markings is substantially equal in two orthogonal axes.
2-D Stacked Symbology	A symbology consisting of 2 or more adjacent and associated rows of varying-width parallel bars and spaces. All of the rows in a symbol are the same length.
2-Dimensional Bar Code	Two dimensional symbology composed of rows of data arranged in a rectangular or square pattern. The rows of data are stacked onto each other to encode an array of data.
Accuracy	The determination of whether any element width or intercharacter gap width (if applicable) differs from its nominal width by more than the printing tolerance.
AIM	Automatic Identification Manufacturers organization supported by manufacturers and suppliers of automatic identification products and services.
Alignment	In an automatic identification system, the relative position and orientation of a scanner to the symbol.
ANSI	The American National Standards Institute, a nongovernmental organization responsible for the development of voluntary standards.
Aperture	The opening in an optical system that establishes the field of view.
ASCII	The character set and code described in American national Standard Code for Information Interchange, ANSI X3.4-1977. Each ASCII character is encoded with 7 bits. The ASCII character set is used for information interchange between data.
Aspect Ratio	In a bar code symbol, the ratio of bar height to symbol length.
Autodiscrimination	Capability of reading and decoding more than one bar code symbology in a single piece of equipment.
Average Background Reflectance	Expressed as a percent; the simple arithmetic average of the background reflectance from at least five different points on the sheet.
Background	The spaces, quiet zones and area surrounding a printed symbol.
Bar	The darker element of a printed bar code symbol.
Bar Code	An automatic identification technology that encodes information into an array of adjacent varying width parallel rectangular bars and spaces.
Bar Code Character	A single group of bars and spaces that represents a specific number (often one) of numbers, letters, punctuation marks or other symbols. This is the smallest subset of a bar code symbol that contains data.
Bar Code Density	The number of data characters that can be represented in a linear unit of measure. Bar code density is often expressed in characters per inch.
Bar Code Label	A label that carries a bar code symbol and is suitable to be affixed to an article.
Bar Code Reader	A device used to read a bar code symbol.
Bar Code Symbol	See Symbol.
Bar Height	See Bar Length.
Bar Length	The bar dimension perpendicular to the bar width. Also called height. Scanning is performed in an axis perpendicular to the bar length.
Bar Width	The thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar.
Bar Width Reduction	Reduction of the nominal bar width dimension on field masters or printing plates to compensate for systematic errors in some printing processes. Bar width reduction can have positive or negative values.
Blemish Percent	The Blemish Percent is an indication of what percent of the total measured bar height has spots or voids or is damaged with ink or toner blobs.
CCD	A Charge Coupled Device is a bar code scanner which senses the light and dark areas of a symbol.
Character	1. A single group of bars and spaces that represents a specific number (usually one) of numbers, letters, punctuation marks, or other symbols. 2. A graphic shape representing a letter, numeral, or symbol. 3. A letter, digit, or other symbol that is used as part of the organization, control or representation of data.
Character Alignment	The vertical or horizontal position of characters with respect to a given set of reference lines.

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Character Density	For a conventional single-row bar code symbol, the number of characters represented in the symbol divided by the total width of the symbol, expressed as characters per unit width (as in characters per inch, cpi). For a multi-row bar code symbol, the number of characters represented by the symbol, expressed as characters per unit area.
Character Set	Those characters available for encodation in a particular automatic identification technology.
Check Character	Those characters included within a string of data whose value is used for the purpose of performing a mathematical check to ensure the accuracy of the data.
Check Digit	A check digit serves the same purpose as a check character, but it may assume numeric values only.
Clear Area	See Quiet Zone.
Cloaking	A term used to describe placing an electronical mask over a bar code label. It is used when there is more than one bar code image in the field of view at the same time.
Codabar	A numeric only bar code consisting of seven black and white bars. Two bars are wide (Code 27).
Code 128	A alphanumeric bar code capable of encoding all 128 ASCII characters.
Code 16K	Multi-row (stacked) code in which each symbol can have between two and sixteen rows or stacks. Each row is separated by a one module separator bar, and consists of 18 bars and 17 spaces. The code is analogous to sentences in a paragraph.
Code 39	A full alphanumeric bar code consisting of nine black and white bars. Three bars are wide (Code 3 of 9). Code 39 is the most frequently used symbology in industrial bar code systems today.
Coercivity	Value of the opposing magnetic intensity that must be applied to a material to remove the residual magnetism when it has been magnetized to saturation.
Concatenation	The ability of a reading system to join together the data from multiple symbols and interpret it as a single message.
Continuous Code	A bar code symbology where all spaces within the symbol are parts of characters, e.g., Interleaved 2 of 5. There is no intercharacter gap in a continuous code.
CPS	Characters Per Second.
CRT	Cathode Ray Tube. Also called a terminal or monitor.
Data Matrix	Variable size two dimensional matrix symbology that is inherently omnidirectional. Data Matrix has a high degree error correction capability and is used primarily for part marking and tracking.
Decode	Each bar code symbology has a specific decode algorithm. If a symbol is decoded correctly, it will receive an "A" grade. If not, it will receive an "F" grade. The ANSI grade of Decode checks for: -Valid Characters -Correct start and stop characters (patterns) -Correct check digits (when applicable) -Legal quiet zones (i.e. blank space before and after a bar code) -Correct number and format of characters
Decoder	As part of a bar code reading system, the electronic package that receives the signals from the scanner, performs the algorithm to interpret the signals into meaningful data, and provides the interface to other devices.
Defects	Defects are voids found in the bars or spots found in the spaces and quiet zones of a bar code symbol. Defects are measured by the ratio between the maximum element reflectance nonuniformity and symbol contrast. Element reflectance nonuniformity is the difference in reflectance between the highest peak and lowest value within an element (bar or space) of the bar code symbol. When an element consists of a single peak or valley, its reflectance nonuniformity is zero. Defects = $ERN_{max}/SC$ . The grade for Defects is determined by: <b>A</b> (4.0)<=.15 <b>B</b> (3.0)<=.20 <b>C</b> (2.0)<=.25 <b>D</b> (1.0)<=.30 <b>F</b> (0)>.30.
Density	See Character Density.
Depth of Field	The distance between the maximum and minimum plane in which a code reader is capable of reading symbols of a specified X dimension.
Diffuse Reflection	The component of reflected light that emanates in all directions from the reflecting surface.

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Direct Thermal	A process in which a set of pins on a printhead are selectively heated onto heat-sensitive paper (or label stock). In turn, the paper turns dark and a bar code is formed. Over time, a Direct Thermal image will eventually fade. Also known as Thermal Printing.
Discrete Code	A bar code symbology where the spaces between characters (interchanger gap) are not part of the code, e.g., Code 39.
DPI	Dots Per Inch.
EAN	European Article Numbering system, the international standard bar code for retail food packages.
Edge Contrast Minimum (Ecmin)	The Edge Contrast Minimum is the minimum difference in the reflectance value between any particular space (including quiet zones) and its adjoining bar within a bar code symbol. The smallest difference that is found across a bar code symbol must be at least 15%.
Edge Determination	In order to calculate the grade of Edge Determination, the Global Threshold (GT) of the bar code must first be determine: $GT = R_{min} + (SC/2)$ . Once the Global Threshold is established, the elements of a bar code are defined as: BAR: Any point on the SRP at or below the Global Threshold. SPACE: Any point on the SRP above the Global Threshold. If the number of elements for a bar code symbology are invalid, the symbol will receive an "F" grade for Edge Determination.
Element	In a bar code symbol, a single bar or space.
FCC	Federal Communication Commission.
FFO	Fixed Focus Optics technology uses a small aperture and non-moving lenses to digitize an image over a wider range of distance than the traditional CCD reader.
Film Master	A photographic film representation of a specific bar code or OCR symbol from which a printing plate is produces.
First Read Rate	The ratio of the number of successful reads on the first scanning attempt to the number of attempts. Commonly expressed as a percentage. Abbreviated as FRR.
Font	A specific size and style of printer's type.
Font-Independent OCR	Optical character recognition by generalized algorithms allowing wide ranges of character fonts. In the most general case, this extends to bar code patterns as well.
Global Threshold	See definition of GT.
GT	Abbreviation for Global Threshold. The global threshold is a position located half way between the highest recorded reflectance and the lowest recorded reflectance on a scan reflectance profile.
Guard Bars	The bars that are at both ends and center of a UPC and EAN symbol. They provide reference points for scanning, serving a function similar to start/stop codes.
GUI	Graphical User Interface. The visual design of a software application.
Height	This number indicates how many horizontal scan lines of the video camera detected bar code data. It is figured out by determining the difference between the lowest scan line number ever decoded and the highest scan line ever decoded. A standard UPC label will have a height of 140. This figure can be found on the SETUP SCREEN.
Helium Neon Laser	A type of laser commonly used in bar code scanners. It emits coherent red light in a wavelength of 633 nanometers.
Horizontal Bar Code	A bar code or symbol presented in such a manner that its overall length dimension is parallel to the horizon. The bars are presented in an array which look like a picket fence.
I - 25	See Interleaved 2 of 5.
IAN	Industrial Article Numbering. See EAN.
Ideal	It is a number which indicates the ideal IRIS setting in a camera based reader.
In Spec	A term used to describe a bar code symbol that has been printed in complete compliance with the symbology specification's requirements for element widths and tolerances, element reflectivity and uniformity, spots, voids, and edge roughness.

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Infrared Laser Diode	An invisible light beam used in some bar code readers to scan a bar code that is invisible to the human eye. This technology is used specifically to prohibit people from visually reading the bar code. Analogous to night vision goggles.
Input Device	That portion of a bar code reading system that employs electro-optical techniques to determine the localized reflectivity of a symbol.
Intercharacter Gap	The space between two adjacent bar code characters in a discrete code. For example, the space between two characters in Code 39.
Interleaved 2 of 5	A numeric only bar code consisting of five bars. Two bars are wide, three are narrow. Used generally in industrial and master carton labeling.
Interleaved Bar Code	A bar code in which characters are paired together using bars to represent the first character and spaces to represent the second, i.e., Interleaved 2 of 5 (See Continuous Code).
Iris	[Vmax - Vmin = Iris] This number is an indication of how much light is being allowed on to the surface of the CCD element of the video camera. It is always equal to Vmax minus Vmin. It can be found on the SETUP SCREEN.
Iso	The international standards organization, k and international nongovernmental organization responsible for the development of voluntary standards.
Label Repeat	The distance between the top of a bar code image to the top of the next bar code image.
Ladder Barcode	See Vertical Bar Code.
Laser Scanner	An optical bar code reading device using a low energy laser light beam as is source of illumination.
LCD	Liquid Crystal Display.
LED	Light emitting diode. A semiconductor that produces light at a wavelength determined by its chemical composition. The light source often used in light pens.
Light Pen	In a bar code system, a hand-held scanning wand that is used as a contact bar code reader held in the hand. (See Wand Scanner.)
LPM	Lines per minute.
MaxiCode	Fixed size two dimensional symbology having elements arranged around a unique circular finder pattern. MaxiCode is omnidirectional and is primarily used for freight sortation and tracking.
MICR	Magnetic Ink Character Recognition style printing on the bottom of personal and bank checks.
Mil	One one-thousandth of an inch (0.001"). Bar code densities are commonly referred to as number of mils (i.e. 10 mils).
Minimum Reflectance (Rmin)	The reflectance value of the darkest bar within a bar code symbol must be less than or equal to half the reflectance of the lightest space.
Misread	A condition that occurs when the data output of a reader does not agree with the data encoded in the bar code symbol.
Modulation	Modulation relates to how a scanner "sees" wide elements in relationship to narrow elements, as represented by reflectance values in the Scan Reflectance Profile. Scanners typically "see" narrow spaces as being less reflective than wide spaces. The closer the grades of Edge Contrast Minimum and Symbol Contrast, the higher the Modulation grade. MOD = ECmin/SC. The grade for Modulation is determined by: <b>A(4.0)&gt;=.70 B(3.0)&gt;=.60 C(2.0)&gt;=.50 D(1.0)&gt;=.40 F(0)&lt;.40</b>
Module	The narrowest nominal width unit of measure in a bar code.
Modulo Check Digit or Character	See Check Character.
Moving Beam Bar Code Reader	A scanning device where scanning motion is achieved by mechanically or electronically moving the optical geometry.
MRD	Minimum Reflectance Differential. A method that is used to determine if there is an adequate difference between absorbed and reflected light.
MSI Plessey	Modified Plessey Code is a pulse width modulated bar code used primarily for making retail shelving.
N	The ratio between the widths of wide elements and narrow elements in a 2-width symbology.
Nanometer	A unit of measure used to define the wavelength of light. Equal to 10 <sup>-9</sup> meters.
Narrow bar	1. An indication of the bar width in nanoseconds. 2. This generally refers to the narrowest bar in a bar code.

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Nominal	The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.
Non-Read	In a bar code system, the absence of data at the scanner output after an attempted scan due to no code, defective code, scanner failure or operator error.
Numeric	A character set that includes only the numbers.
OCR	Optical Character Recognition is a technology designed specifically to read certain stylized fonts (such as OCR-A and OCR-B) containing the full alphanumeric character set. The term OCR is also used when translating and inputting other stylized fonts (such as Courier) or text found in magazines and newspapers into a computer. This technology is also referred to as Intelligent Character Recognition (ICR).
OCR - A	An abbreviation commonly applied to the character set contained in ANSI Standard X3.17-1981.
OCR - B	An abbreviation commonly applied to the character set contained in ANSI Standard X3.49-1975.
Omnidirectional	A scanner that can read in both horizontal and vertical label positions, or any position between horizontal and vertical.
Omnidirectional Label	Two oversquare bar codes, placed perpendicular to each other. A common application is the airline baggage label.
Opacity	The optical property of a substrate material that quantifies the show-through from the back side or the next sheet. The ratio of the reflectance with a black backing to the reflectance with a white backing. Ink opacity is the property of an ink that prevents the substrate from showing through.
Optical throw	The region between the scanner and the readable depth of field.
Orientation	The alignment of a bar code symbol with respect to horizontal. Two possible orientations are horizontal with vertical bars and spaces (picket fence) and vertical with horizontal bars and spaces (ladder).
Overhead	Overhead - In a bar code system, the fixed number of characters required for start, stop and checking in a given symbol. For example, a symbol requiring a start/stop and 2 check characters contains 4 characters of overhead. Thus to encode 3 characters, 7 characters are required to be printed.
Oversquare	A label in which the height is greater than the length.
PCS	Print Contrast Signal. A measurement of the ratio of the reflectivities between the bars and spaces of a symbol, commonly expressed in percent. PCS is calculated as: $R_L - R_D / R_L \times 100\%$ , where $R_L$ = reflectivity of the light elements and $R_D$ = reflectivity of the dark elements.
PDF417	Two-dimensional bar code providing error correction, detection and security used primarily in parcel tracking applications and hazardous material control.
PDT	Portable Data Terminal. Handheld terminal capable of storing and recording data that is captured remotely and later transmitted into a computer.
Picket Fence Code	See Horizontal Bar Code.
Pitch	Rotation of a bar code symbol about an axis parallel to the direction of the bars.
PostNet	Postal Numeric Encoding Technique used to encode ZIP code information on letter mail. PostNet uses redundant information within a compact bar code format to provide error detection capability and a significant degree of error correction capability.
Print Contrast	See PCS.
Print Quality	The measure of compliance of a bar code symbol to the requirements of dimensional tolerance, edge roughness, spots, voids, reflectance, PCS, quiet zone, and encodation.
Printhead	The device on a direct thermal or thermal transfer printer containing the heating element that causes that image to be transferred to the facestock.
Quiet Zone	A clear space, containing no dark marks, that precedes the start character of a bar code symbol and follows the stop characters. Sometimes called the "clear area".
Raster	More than one scan line in two or more horizontal dimensions to allow reading of bar codes in different positions.
Ratio	The ratio between wide elements and narrow elements. It is used to measure decodability properly. This applies to symbologies such as Code 39 Codabar and,

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Read window	The region within which the scanner is capable of reading bar code. The read window is defined by the scanner's scan width, focal point, and depth of field.
Reader	See Bar Code Reader.
Reduced Scale Symbology	See RSS.
Reflectance	The ratio of the amount of light of a specified wavelength or series of wavelengths reflected from a test surface to the amount of light reflected from a Barium Oxide or Magnesium Oxide standard under similar illumination conditions.
Resolution	In a bar code system, the narrowest element dimension that can be distinguished by a particular reading device or printed with a particular device or method.
RF	Radio Frequency. Wireless communication technology using electromagnetic waves to transmit and receive data. RF provides real-time access to a host computer.
Ribbon	Material used with thermal transfer printers producing visible marks on a label (or substrate). A printhead is heated and the ribbon is burned on the label stock producing the bar code.
RSS-14	Encodes the full 14 digit EAN.UCC item identification in a linear symbol.
RS-232	The most common communication interface (e.g. serial (COM) port) standard using a DTE (Data Terminal Equipment) and DCE (Data Communications Equipment) interface. Also known as serial communication.
RS-422	The second most common communication interface standard which extends beyond the 100 feet limitation of RS-232 data communication supporting a maximum distance of 4000 feet.
RSS	A bar code symbology that contains three linear symbologies to be used with the EAN.UCC system. The use of the symbologies are restricted and subject to compliance with the EAN International (EAN) and Uniform Code Council Inc (UCC) rules and registration procedure.
RSS Expanded	Encodes EAN.UCC item identification plus supplementary AI element strings such as weight and "best before" date in a linear symbology. RSS expanded can also be panted in multiple rows as a stacked symbol.
RSS Limited	Encodes the 14-digit EAN.UCC item identification with indicator digits of zero or one in a linear symbol for use on small items.
RSS Stacked	A version of the RSS-14 symbology that is stacked in two rows and is used when the normal symbol would be too wide for the application. It comes in two versions, a truncated version used for small item marking applications and a taller omnidirectional version which is designed to be read by omnidirectional scanners. RSS expanded can also be panted in multiple rows as a stacked symbol.
Scan line	The beam of light that reads across the bar code for information.
Scan rate	Scanner speed, in scans per second.
Scan Reflectance Profile (SRP)	A map (or plot) of the localized symbol reflectivity as a measuring aperture is scanned across the symbol along a specific path. The "peaks" of the SRP indicate the largest value of reflectance (the spaces in the bar code) and the "valleys" of the SRP indicate the smallest value of reflectance (the bars in the bar code).
Scanner	An electronic device that electro-optically converts optical information into electrical signals.
Self-Checking	A symbology is termed self-checking if a single printing defect will not cause a character to be transposed into another valid character in the same symbology.
Serial Communication	See RS-232.
Skew	Rotation of a bar code symbol about an axis parallel to the symbols length.
Skew	The rotation of a bar code symbol about an axis parallel to the bars.
Space	The lighter element of a bar code usually formed by the background between bars.
Space Width	The thickness of a space measured from the edge closest to the symbol start character to the trailing edge of the same space.
Spectral Response	The variation in sensitivity of a reading device or the variation in reflectivity of a test surface to light of different wavelengths.
Specular Reflection	The mirror-like reflection of light from a surface.
Specular reflection zone	A narrow zone in front of the scanner in which direct, non-diffused light blinds the scanner.

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Spot	1. The undesirable presence of ink or dirt in a space. 2. The area on a bar code symbol that is being examined by an input device at any given point of time.
SRP	See scan reflectance profile.
Stack Code	Two-dimensional bar code where linear bar codes are stacked one upon another and are printed in a rectangular shape to achieve the most efficient use of label area.
Standard	A set of rules, specifications, instructions, or directions for printing, labeling, scanning, etc. bar coded information.
Start/Stop Character or Pattern	A special bar code character that provides the scanner with start and stop reading instructions as well as scanning direction indicator. The start character is normally at the left-hand end of a horizontally oriented symbol. The stop character is normally at the right-hand end of a horizontally oriented symbol.
Substitution Error Rate (SER)	The rate of occurrence of incorrect characters from an automatic identification system.
Substrate	The surface on which a bar code symbol is printed.
Symbol	A combination of bar code characters including start/stop characters, quiet zones, data characters, and check characters required by a particular symbology, that forms a complete, scannable entity.
Symbol Contrast: (SC)	The difference between the largest (including quiet zones) and smallest reflectance values within a Scan Reflectance Profile. $SC = R_{ax} - R_{min}$ . The grade for Symbol Contrast is determined by: <b>A</b> (4.0) $\geq$ 70% <b>B</b> (3.0) $\geq$ 55% <b>C</b> (2.0) $\geq$ 40% <b>D</b> (1.0) $\geq$ 20% <b>F</b> (0) $<$ 20%
Symbol Density	See Bar Code Density.
Symbol Length	The distance between the outside edges of the quiet zones on the two ends of a bar code symbol.
Target	This number correlates vision based bar code data to wand bar code data. A target value will increase or decrease due to differences in X dimensions, bar heights, or electronic noise. A full size UPC label will have a target of 190.
Thermal	See Direct Thermal.
Thermal Transfer	A process in which a set of pins on a printhead are selectively heated onto a ribbon and the ink from the ribbon is burned (transferred) onto the label stock. Thermal transfer leaves a permanent image on the label.
Tilt	Rotation of a bar code symbol about an axis perpendicular to the substrate.
Traditional OCR	The first form of 2-dimensional OCR developed, using the stylized OCR-A and OCR-B fonts.
Trigger	A method for informing the scanner/decoder of when to look for bar codes. This can be an external sensor device or a host-generated signal.
UCC	Uniform Code Council is an organization which administers the UPC and other retail standards.
UCS	Uniform Container Symbol.
Uniform Code Council (UCC)	Previously the Uniform Product Code Council, the organization that administers the UPC and other retail standards.
UPC	Universal Product Code, the standard bar code symbol for retail food packages in the United States.
UPC-A	A UPC symbol encoding a number system character, 10 digits of data, and a check digit.
UPC-E	A UPC symbol encoding 6 digits of data in an arrangement that occupies less area than a UPC-A symbol. Also called a "zero-suppressed" symbol because a 10 digit UPC-A code can be compressed to a 6 digit UPC-E format by suppressing redundant zeros.
USS	Uniform Symbol Specification. The current series of symbology specifications published by AIM; currently include USS-Interleaved 2 of 5, USS-39, USS-93, USS-Codabar, and USS-128.
Verifier	A device which measures the characteristics of a bar code including the contrast, reflectance, modulation, and compliance with the parameters of the bar code symbology to ANSI/ISO standards.
Vertical Bar Code	A code pattern presented in such orientation that the axis of the symbol from start to stop is perpendicular to the horizon. The individual bars are in an array appearing as rungs of a ladder.
Visible Laser Diode	Used in most handheld scanners to project a visible red light for scanning human readable bar codes.

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Vmax	This number indicates a value for the highest point of reflectivity in the image of a bar code as used in camera based systems.
Vmin	This number indicates a value for the lowest point of reflectivity in the image of a bar code label as used in camera based systems.
Void	The undesirable absence of ink in a printed bar.
Wand	See Wand Scanner.
Wand Scanner	A handheld scanning device used as a contact bar code or OCR reader.
Wedge	A hardware device or software program (Software Wedge) which uses a scanner for input and sends data directly into an application by emulating a keyboard stroke. A wedge (hardware wedge) is an external device and plugs between the keyboard and terminal.
WYSIWYG	"What You See Is What You Get" is a term used to describe the presentation of the printable output viewed as is on the terminal.
X Dimension	The nominal width dimension of the narrow bars and spaces in a bar code symbol. The narrowest element of a barcode image.
X Dimension	The dimension of the narrowest bar in a bar code.
Z Dimension	The achieved width of the narrow elements, calculated as the average of the average narrow bar width and the average narrow space width.