

BAR CODE BASICS

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DEFINITION

Bar codes are the most popular of the automatic data entry methods. It is a pattern of parallel bars and spaces of variable widths arranged in a specific predetermined pattern to represent a corresponding number, letter, or symbol. The information in a bar code is contained in the relative thickness and relative position of the lines and spaces within the specific data characters. Scanners convert the bars and spaces into usable information for data entry.

WHY BAR CODES ARE USED

Bar codes streamline data entry. They are used to increase the speed and accuracy of reading and entering data. It is primarily intended as a machine-readable data management system. Bar codes have received wide spread acceptance because of their low susceptibility to errors in data input. The error rate in human reading of hand written data is 7-14%. The error rate in human reading of preprinted data is 1/300 characters. There is a one in two million error rate for scanner read bar codes. It is considered the most effective data entry method. Most new bar code installations have a payback of less than one year. Credited with accuracy, speed, control, reliability and portability, bar code technology is the most popular method of tracking and transmitting data and is replacing other methods of tracking and transmitting data.

BAR CODE ADVANTAGES

Easy to print

Not language dependent

Low error rate

Variety of print methods

Full character set

Beam scan able

BAR CODE DISADVANTAGES

Low density except for new 2D code

BAR CODE APPLICATIONS

In industrial and business-to-business settings, there are four applications that are common to all businesses: materials management, information management, labor management, and asset management. The use of bar codes is rapidly increasing in document management. Documents are either filmed or entered into an electronic imaging system. Automatic data entry can be provided with bar coded documents (i.e. the bar code could contain an invoice number a number of pages, and a page number). Since bar code reading is highly accurate, less data entry errors will occur and faster data entry will result. Data that can be entered automatically can be either numeric or alphanumeric depending on

the bar code symbology selected. Document sorting can also be reduced if a document code is included in the bar code. A bar code should be considered as an alternative to OCR in many indexing applications.

HOW IT WORKS

Standard bar codes are read by a light source, illuminating the bars and spaces. This involves moving the read head over the code symbol, or if the read head is in a fixed-position (as in the supermarket), then the code is presented to the read head. The light is absorbed by the black bars and reflected by the white spaces and/or background, in a specific sequence with orientation being determined by the start and stop codes. A sensor detects the reflected light from the spaces and produces a "high" signal output for each space and a "low" signal output for each bar where the light has been absorbed. The duration of the high and low signals indicates whether the bars and spaces are wide or narrow. The thickness is always in reference to a line or space contained with the bar code. The reference thickness is called the "x" dimension, or the narrow element width.

It is then necessary to determine what this pattern of wide and narrow elements symbology is to decode the bar code. This is accomplished with decoding software. The decoder performs 4 basic functions. It times the duration of the electrical pulses and classifies them as wide or narrow bars or spaces. A determination is made regarding which bar code symbology is being used. Once this is done it translates the bar and space pattern into the actual characters that make up the bar code. The last function is to transmit the bar code data to some other device that will use the data. Transmitting the data through a computer interface to various computer devices usually does this.

The data stored in the bar code is a unique identifier that provides access to data stored in a central computer system. By keeping the data separate from the bar-coded identifier and centrally located, you also simplify updating the information. However, the "license plate" method only works if everyone has access to the same database. This is not usually a problem for internal operations; when the code crosses into another environment, the database may not be accessible.