

The Barcode FAQ version 5

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What is a barcode?

Barcodes (bar codes) are machine-readable symbols used to store bits of data. Barcodes are used for identification, tracking, inventory, and as part of retail point of sale (POS) systems. Barcodes are used everywhere in the modern world and are there if you look for them (though most of us ignore them altogether).

What types are there?

There are different types of barcodes known as barcode *symbologies*. Different symbologies are used by different vertical markets. An example is the UPC (Universal Product Code) barcode scanned at the cash register. Some symbologies are fixed length, others variable length; some are numeric-only and others are alphanumeric (letters and numbers).

What's a barcode scanner?

Barcode scanners are optical or laser devices that read and decode barcodes. They interpret the varying widths of bars and stripes or the matrix patterns then transmit the data within the barcode. Most scanners can read most barcode symbologies. They autodiscriminate based on each symbology's unique start and stop bar patterns at the beginning and end of the symbol. Many barcodes include a check digit to insure data integrity.



What are the benefits of using barcodes?

Barcodes enable automated work processes without human intervention. Auto ID technology like barcodes is often called *keyless data entry*. Barcodes are fast and accurate, never dyslexic. The use of barcodes eliminates many errors and often saves time and money.

Are there specs and standards?

Various standards bodies regulate the use of barcodes. Some standards describe physical characteristics (shape, size, data structure, character set, etc.) while others describe how barcodes are used in context (shipping standards, labeling standards, etc.) The important thing is that everyone who creates or scans a barcode agree beforehand.

UPC, EAN, Bookland, & ISSN



UPC bar codes are used in the U.S. and Canada on retail items. EAN and JAN symbols are used in Europe and Japan respectively. Bookland symbols, based on ISBN numbers, are used on books. ISSN bar codes are used on non-U.S. periodicals. All of these symbologies are numeric-only, have a fixed length, and include one or more check digits.

Code 128

A dense, compact symbology that supports the lower 128 ASCII characters. Used whenever space is at a premium. Variable length strings with a mandatory check digit. Widely used in the shipping industry, it has three variations: code set A, code set B, and code set C. The latter is numeric-only and employs simple compression. There are several industry-specific subsets of Code 128.



Code 39 (Code 3 of 9)

A popular symbology for ID, inventory, and tracking purposes. It has a variable length, supports alphanumeric strings, and can be printed at a variety of sizes and aspect ratios. This is the bar code used anywhere a simple bar code is needed.



The full ASCII version supports the lower 128 ASCII characters. Rarely used with an optional check digit.

Interleaved 2 of 5 (ITF)

Interleaved 2 of 5 is a numeric-only symbology that is relatively compact because information is encoded in both the bars and spaces. Interleaved 2 of 5 bar codes are used on corrugated boxes, in the shipping industry, and in laboratories. 2 of 5 (non-interleaved) is an older bar code that isn't used much today.



Codabar

Codabar is a numeric-only symbology used by FedEx, libraries, and blood banks.



A3419500A

MSI-Plessey



3419500

MSI-Plessey is another numeric symbology used in libraries.

Code 93

Code 93 is a compact symbology used on electronic components.

POSTNET



POSTNET bar codes are used to encode ZIP codes on U.S. mail.

Unlike other bar codes, POSTNET symbols consist of bars that vary in height, not width. A check digit is appended to the bar code, which can be used for 5-digit ZIP codes, 9-digit ZIP+4 codes, or the newer 11-digit delivery point barcodes.

PDF 417

2D (two dimensional) symbologies are extremely dense bar codes that look like a crossword puzzle or a honeycomb-like matrix. PDF 417 is found on the backs of many states' drivers licenses. Because PDF417 encodes up to 1108 bytes of information, it is really a portable data file (PDF), as opposed to simply being a pointer into an external database.



Data Matrix



A popular 2D sybology that takes up much less space compared to PDF 417. It's the basis for UID (universal identification) symbols mandated by the Dept. of Defense.

MaxiCode

A 2D symbology that resembles a honeycomb used by United Parcel Service for fast package sortation.

Specifications:

UPC - www.gs1us.org/gsius.html

EAN - www.ean-int.org

JAN - www.gs1jp.org

Bookland - www.bowker.com

ISBN - www.isbn.org

ISSN - www.issn.org

POSTNET - pe.usps.gov/cpim/ftp/pubs/Pub25/pub25.pdf

Automatic Identification Manufacturers (AIM USA) - www.aimusa.org

Association for Automatic Identification and Mobility - www.aimglobal.org

American National Standards Institute (ANSI) - www.ansi.org

International Organization for Standardization (ISO) - www.iso.ch

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