

The Truth About UPC Bar Codes

by Gary Elfring

The Truth About UPC Bar Codes

Everything you ever wanted to know about retail bar codes...



About the Author

Gary Elfring has worked with bar codes since 1979. His software company, [Elfring Fonts, Inc](#) sells programs to print bar codes and licenses bar code technology to other firms. He has created [bar code software](#) to print bar: 2/5 interleaved, 39, 93, 128, EAN, GTIN, SCC-14, SSCC-18, & UPC. His web site [My Bar Code Store](#) is a certified reseller of UPC bar code number assignments.

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4,210,785 Tape Replay System, July 1, 1980

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Book:

Microcomputer Assembly Language Programming, Van Nostran Reinhold Company, 1984

Magazine Articles:

“Choosing A Programming Language”, *Byte* 6/85;

“Basic: Used or Abused”, *Computer Language* 2/86,

“Guide to Real-Time Executives”, *Computer Language* 2/86,

“Modular Programming Tools”, *Computer Language* 6/86,

“The QNX Real-Time Operating System”, *PC Tech Journal* 1/87.

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What Is A UPC Code?

If you run a store you want to be able to ring up sales as fast as possible. And you want to make sure that the prices charged for each item are correct. So how can you accomplish both goals with the least amount of effort? If you live in North America, the answer is the Universal Product Code, or UPC bar code. Unless otherwise noted here we use the term UPC bar code to refer to the UPC-A bar code format.

A UPC bar code is nothing more than an 11 digit number that is used to identify **one specific product**. For example, a 5 ounce bottle of hot sauce would have one UPC number and a 10 ounce bottle of the same hot sauce would have a different UPC number. They both contain the same product, but have different prices so they must have different UPC codes. Along the same lines, a 5 ounce bottle of “medium” hot sauce would have a different UPC number from a 5 ounce bottle of “spicy” hot sauce- since they are different items for the purpose of inventory in a store.



If you look at the example UPC bar code above you will notice that it actually has 12 digits in it. Where did the extra number come from? The last digit in this bar code, (4), is an extra digit called a checksum. The checksum character in a UPC bar code is [calculated based on the first 11 digits](#) and added to the end of the bar code. Every bar code scanner performs the same checksum calculation when it reads your bar code. It compares the result of its calculation to the checksum number it read. If the two match,

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Bar Code Terminology

Bookland: a world wide bar code for books that converts a book's ISBN number into an EAN 13 bar code and adds an optional 5 digit supplemental code for the book price.

Checksum: a number that accompanies data transferred from one place to another and helps to ensure that the data was transferred correctly. Bar code scanners use the checksum to ensure they have read a bar code correctly.

EAN-13: European Article Numbering- the 13 digit retail bar code used everywhere except North America.

GS1.org: the global organization that control retail bar code number assignments and bar code standards.

GTIN: Global Trade Identification Number, a family of 8, 12, 13, or 14 digit numbers used to identify retail products.

ITF-14: an implementation of the Global Trade Information Number (GTIN). ITF is an acronym for Interleaved Two of Five. An ITF-14 bar code is based on your 12 digit UPC code.

Mod / Modulo: a mathematical operation that gives the remainder when one number is divided by another.

Number Assignment: Retail products must have unique ID numbers. To keep these identifying numbers unique, they are all assigned by a single agency, GS1. You can not make up your own numbers.

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SCC-14: Shipping Container Code- a bar code for the outside of fixed content shipping containers.

SSCC-18: Serial Shipping Container Code- a bar code for the outside of fixed content shipping containers that also includes tracking information.

Scanner: a device that enables a computer to read bar codes.

Start Code: the leading character of a bar code. This character indicates this is the beginning of a bar code and identifies what kind of bar code it is.

Symbology: a method of representing information using printed bar code characters. There are many different bar code symbologies, just like there are many different spoken languages.

Stop Code: the last character of a bar code that tells the bar code reader when it has reached the end of the bar code.

UPC: Universal Product Code, the 12 digit bar code used on all retail products in North America.

UPC-A: the most commonly used variation of UPC bar codes, which shows 12 digits.

UPC-E: A very compact version of the UPC bar code format. It shows 7 digits, but is actually a zero suppressed variation of the standard 12 digit bar code.

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