

# BARCODE & GTIN

The Complete Guide



## **Barcode and GTIN: A necessary guide to learning barcode and GTIN**

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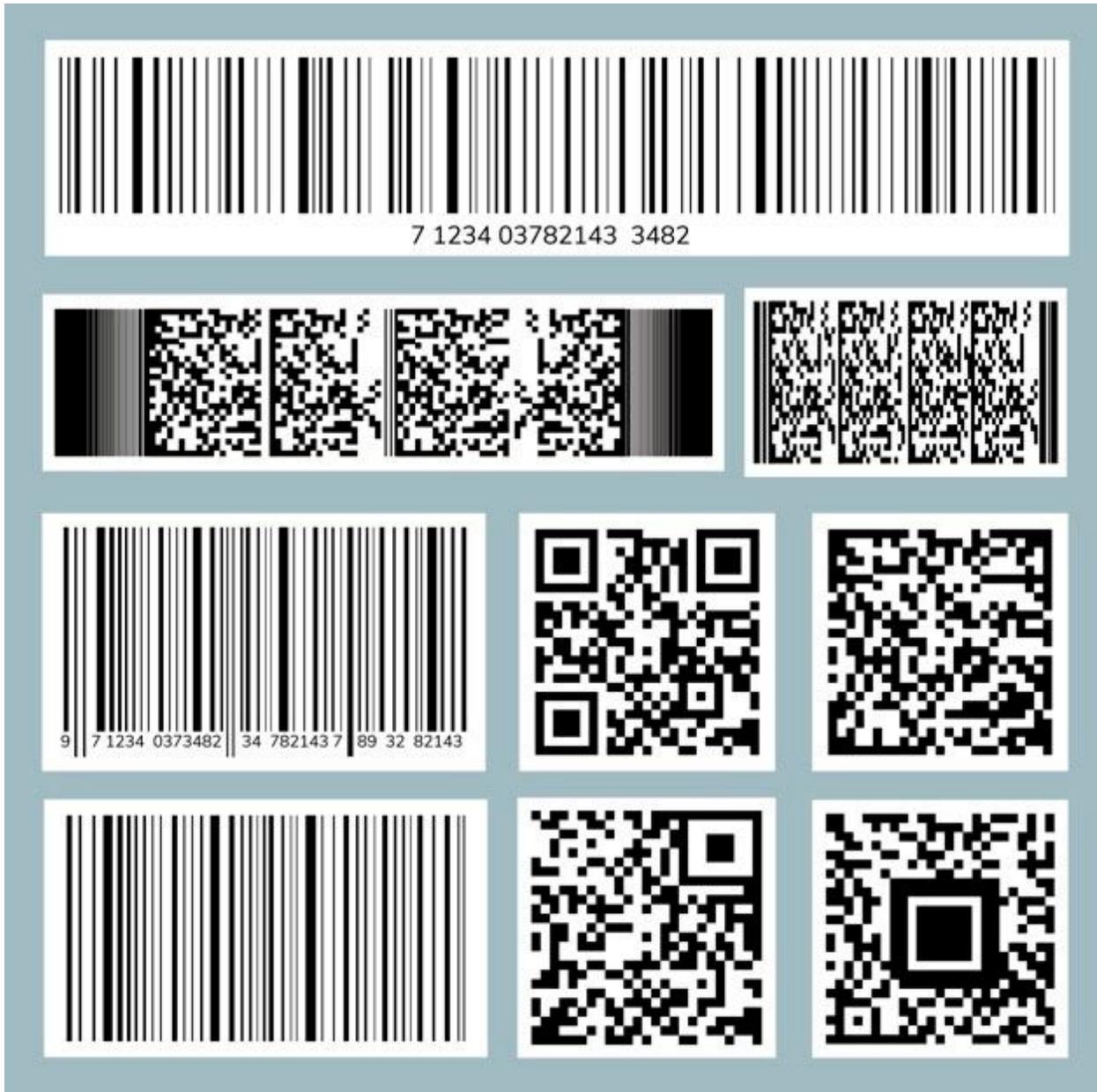
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# What is Barcode

The dictionary meaning of [Barcode](#) is simple, and in layman terms, it has been defined as, ‘a machine-readable code in the form of numbers and a pattern of parallel lines of varying widths, printed on and identifying a product.’

As an end-user, consumers may find them just lines and numbers, but, in reality, they are much more than that. They define each product, and every business, small or big, benefits from barcodes. These lines and numbers, when scanned by a barcode scanner, reveal the complete information about the product and its recent developments. This way, all the information is available under one platform, and it reduces human error.



## History of Barcode

The [story of the barcode](#) began nearly 70 years back. The story goes as, in 1949, a successful chain of grocery stores was having difficulty with their check-out process. Thus, the president requested the Dean of Drexel University to devise a plan to automate their check-out process. Bernard Silver overheard this conversation. Later, Silver approached his colleague, Joseph Woodland, with this unique problem and asked for his assistance. Woodland, a mechanical engineer at Drexel University, started working on helping his colleague with the problem. He wanted to implement the morse

code in unique ways to solve this problem. One day, when Woodland was at the beach, he drew a set of parallel lines on the sand that represented dots and lines or Morse code.

Thus, the year 1949 was the inception of the barcode. In the same year, on October 20, 1949, Woodland and Silver filed a patent for the first barcode concept, "Classifying Apparatus and Method." This patent request was given approval in October 1952.

Though the idea quickly was intriguing and companies planned to commercialize it, the only thing that kept them at bay was that the scanning technology had not yet been discovered. Following which, there were a lot of improvisations done between the 1950s to 1970s, to create what the barcode is today - an interpretation of lines and numbers that can track each and every product.

## Types of Barcode

There are mainly two types of barcode:

1. One Dimension (1D) Barcode
2. Two Dimension (2D) Barcode

Let us understand both the barcodes in detail.

### 1. One Dimension (1D) Barcode

It is also known as Linear 1D Barcode. The 1D Barcode consists of 2 parts

- Barcode (Parallel Lines)
- 12 Digit [Universal Product Code](#) (UPC) Number

In 1D Barcode, each of the 12 digit UPC numbers represents the following:

- The first 6 digits represent the manufacturer's identification number
- The next 5 digits represent the product number
- The last number is called the 'Check Digit.' This is needed to ensure the scanner has correctly scanned the barcode.

There are various types of 1D Barcode, naming a few are:

### **a. Code 39**

The name has originated from the fact that it can encode only 39 characters. Although, due to several upgrades, it can now encode near 43 characters. It is one of the oldest barcodes and used to label goods across many industries. It is mainly used in automobiles, healthcare, and government bodies. Though, considered to have a low data density, it is still preferred by companies as it is barcode scanner-friendly in nature. The next best option for Code 39, is considered as Code 128.



### **b. Code 128**

The name has originated from the ASCII 128 character set. It is also known for its compact barcode and capacity to store highly diversified information. The reason for it being extensively acclaimed by industries is because it can support any character from ASCII 128 set (inclusive of number 0-9, alphabets a-z, A-Z, and even certain special characters). Thus, it is popular in the shipping and logistics industry due to the complexity of supply chain operations.



### **c. Interleaved 2 Of 5**

It is commonly known as ITF Barcodes. It is known for recording only numbers and not a single letter. It can register upto 14 numeric digits, and it encodes in pairs. Thus, the barcode has to have even numbers, and a '0' (zero) is added in case of odd numbers. They have a high tolerance towards printing and, thus, are widely used in packaging materials and cardboards. Saying so, ITF Barcodes are in demand in warehouses, packaging, and manufacturing industries.



## **2. Two Dimension (2D) Barcode**

It is also known as [Matrix Barcode](#). The 1D Barcode consists of 2 parts

- Two Dimension (2D) shapes and symbols
- It stores information in the vertical and horizontal direction

The 2D Barcodes are superior to 1D Barcodes as they can store tens to hundreds of times of information as compared to 1D. Also, the 2D Barcodes are small in size and can contain large amounts of data such as quantity, images, web address, and price.

There are various types of 2D Barcode, naming a few are:

### **a. QR Code**

The QR code became one of the most famous barcodes as it can easily be scanned by any device supporting scanning capability. They are popular in marketing or advertising purposes, and promotional activities. QR code often consists of alphabets, numbers, and bytes. It can hold a lot of information, and, thus, is generally used in the retail, entertainment, and advertising industry.



### **b. Data Matrix Code**

The Data Matrix Code is known as one of the most popular 2D Barcodes. They appear in square shape and can occupy vast density information. The design is in such a manner

that they are easily readable even if the resolution is low or also if the scanner is not in ideal condition. They are in demand in healthcare, retail, or government industries.



### **c. PDF417**

The PDF417 are the most powerful 2D codes. They can store large amounts of data, nearly 1.1 kilobytes of data. Mostly, because of this, it is almost 4 times the size of any other 2D barcode. As it can hold multiple layers of data files, they are sought-after in courier companies, government, and logistics companies.



## **How does a Barcode Work?**

Barcodes are a combination of parallel lines and numbers, as we have discussed before. The barcode scanner reads through the lines and interprets the data fed into the barcode. The information can consist of product information, price, quantity, or even website address. Here, it is essential to know that 2D barcode scanners are different to 1D barcode scanners. Thus, for a barcode to work, the only things required are - a barcode, a barcode scanner, and an appropriate system.

Hey, watch this link to understand how a barcode works.

<https://www.youtube.com/watch?v=MXCiGNSvqdw>

## **How to Create a Barcode?**

Many companies are helping you to create barcodes, but, as a beginner, you can always go through online platforms and learn to create a barcode. Here, I have uploaded a self-explanatory link for you to know how to create your own barcode.

<https://www.youtube.com/watch?v=BmiPA54gHBo>

# What are the benefits of Barcode?

It is very easy to manage products and information with the help of a barcode and barcode scanner. Let us understand a few benefits that make a company's life easier.

## 1. Information Accuracy

With the help of barcode, the chances of misinterpretation become lesser and human error reduces. Especially in large companies that deal with numerous products, such as shipping, logistics, or manufacturing industry, there are high chances of incorrect manual information fed in the system. Thus, with a barcode, the barcode scanner tags the product, and the information gets entered into the system. This increases accuracy and eradicates human error.



## **2. Track Inventory**

Once you scan a product, you can track the entire movement of the product. If the product is in the warehouse, you can know the product quantity, price, and its movement. In the same way, when a product reaches the retail store, after scanning the product, you can know the availability of the same. Accordingly, you can reorder the product at any given time.



## **3. Speed and Productivity**

It is simpler to scan the barcode rather than counting each product manually. Thus, with the help of a barcode, the speed increases. As you just have to scan the barcode with the scanner, and the information is fed into the system. In this way, the speed increases, and along with that, productivity increases as well. When an employee would take a couple of minutes to feed the data of each product manually, a barcode does the same under a minute.



#### **4. Reduce the Training Time**

Every employee requires job training before starting work. In this case, you don't need a learned or highly skilled employee. You only require a person who can thoroughly use the barcode scanner, point to the barcode, and click. Also, make sure that the entry is getting recorded in the system!



## What is GTIN

Global Trade Item Number (GTIN) is a number assigned to a specific item that states its uniqueness across the globe. Usually, GTINs are used exclusively as bar codes, but they can always be used in RFIDs as well. To assign a GTIN to a product, the product and manufacturer details are to be submitted to “[GS1 – The Global Language of Business](#)” (the only organization that provides GTIN) by the manufacturer.

The Global Trade Item Number standard has incorporated the [International Standard Book Number \(ISBN\)](#), [International Standard Serial Number \(ISSN\)](#), [International Standard Music Number \(ISMN\)](#), [International Article Number](#) (which includes the European Article Number and Japanese Article Number) and some [Universal Product Codes \(UPCs\)](#), into a universal number space. (source: Wikipedia)

# Types of GTIN

There are mainly four types of Global Trade Item Numbers:



## a. GTIN-12

Also known as UPC-A, this GTIN is given to a product and consists of 12 digits. GTIN-12 is only assigned to the products within the United States and Canada.

## b. GTIN-13

This GTIN is given to standard products, except for the US and Canadian geography.

If you are a manufacturer away from the US or Canada and are planning to sell in these two countries, your product or shipping cases would require GTIN-12 and GTIN-14. The same products to be sold in any geography will need GTIN-8 or GTIN-13.

## c. GTIN-8

This GTIN is given to small products like chewing gum and consists of 8 digits. GTIN-8 is assigned to any product except for the US and Canadian geography.

## d. GTIN-14

This GTIN is given to the cases used while shipping the products from one place to another. GTIN-14 has 14 digits and is to be assigned only to the casings shipped within the United States and Canada.

## Example of how GTINs are allotted

There is an electronics manufacturer located in Paris. His retailing network is majorly from the US and Canada. He has manufactured earphones, Bluetooth speakers, and wireless microphones, and wishes to sell the same to his primary customers.

To sell within the US and Canada, the manufacturer first needs to get a GTIN-12 or UPC-A for the above-mentioned products. Even the cases in which the products are to be delivered to the seller or merchant need a GTIN-14. The manufacturer can ship all the products i.e. Earphones, Bluetooth Speakers, and Wireless Microphones to the US or Canada with their own product GTINs and the cases' GTINs.

## What happens after the products reach the merchant?

Even after the product reaches the US or Canadian merchant, the Global Trade Item Number won't change. But, when the merchant chooses the product quantity to sell to the customer, the shipment boxes carrying the product(s) will also differ, and so will the GTIN for all the boxes. Again, every case has a unique GTIN-14.

## Cost of purchasing a GTIN for your product

### Prefix Pricing Schedule\*

Number of items needing a barcode/GTIN**	Initial fee	Annual renewal fee
1 - 10	\$250	\$50
1 - 100	\$750	\$150
1 - 1,000	\$2,500	\$500
1 - 10,000	\$6,500	\$1,300
1 - 100,000	\$10,500	\$2,100
NDC/NHRIC Company Prefix	\$2,100	\$2,100

GS1us.org

## Where and how to find a Global Trade Item Number?

The official website for purchasing a GTIN is GS1us.org (for the US and Canada) and GS1.org (for other countries). You can simply [click here](#) and register your product to get a GTIN allotted to it.

Purchasing the GTINs directly from **GS1 (the organization which issues GTIN)** might be an expensive deal for you, especially when you are a small-scale manufacturer. In that case, Amazon.com and eBay.com can help you with bulk GTINs at cheaper and competitive rates.

The screenshot shows an eBay listing for "15 Unit UPC EAN Codes Certified Numbers Barcodes For Amazon". The listing features a large barcode and the text "amazon/ eBay UPC/EAN Codes". The price is listed as "US \$1.00" (approximately INR 71.12). The listing includes a "Buy It Now" button, an "Add to cart" button, and an "Add to watch list" option. The listing also displays "100% buyer satisfaction", "Free delivery in 1-2 days", and "151 sold". The shipping information indicates "FREE UPS Worldwide Express Plus" and "Ships today if paid within 12 hrs 56 mins". The listing also shows "Payments" options: PayPal, VISA, MasterCard, American Express, and Discover. The returns policy is "30 day returns. Buyer pays for return shipping".

The above screenshot shows that UPC codes are sold on eBay.com at a cheaper rate compared to GS1.org.

## Products that do not require a GTIN

Certain product categories fall under the list of “exempted products from GTIN”...

- Customized Products

- oHandicrafts
- Private Labels

To sell on Amazon, GTIN is a compulsion. Still, if you have a product that falls in the category mentioned above, you can always request an exemption from the Seller Central of Amazon and then list your product without a GTIN.

Amazon always tries to convince the sellers to allocate a GTIN to their products, as it can later become challenging for the other sellers to differentiate. Also, ASIN is something that Amazon introduced to find a solution to the mentioned problem.

## Conclusion

A barcode or GTIN widely receives appreciation in the current age. It is always better to be updated with the latest technology to be ahead of the game. Also, as barcodes are used in almost every company, it is beneficial to be a part of the league. It has helped many businesses in many ways and has helped them increase their efficiency. Though, I sincerely hope that this guide has helped you find your answers. In case you need to know more, please feel free to check the references below.

## References

[Know more about Barcodes and Shipping Labels](#)

[Benefits of Barcode](#)

[Generate a Barcode](#)

[Know more about GTIN](#)

[General Rules of Allocation GTIN](#)