GS1 Canada

The Global Language of Business

# Barcode Basics: General Distribution and Logistic Units

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## Document Summary

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# 1 About This Guide

GS1 Canada is the only authorized source to issue GS1 Company Prefix Licences in Canada. With a valid annual licence, Canadian businesses of all sizes can create industry-compliant barcodes, enabling their products to be traded in Canada and around the world. Licensed GS1 Company Prefixes are used in the identification of products at all levels of packaging. GS1 barcodes are the global standard required by trading partners worldwide for product identification. They have been improving the consumer experience and meeting industry's product identification needs for over 50 years.

GS1 Canada works with Canadian industry to create and publish implementation guidelines that help promote the use of global standards.

This implementation guide is an introduction to the standards for creating and using trade item groupings and logistic units. It is designed for manufacturers, distributors and suppliers who need a basic understanding of:

1. GS1 identification keys and barcodes
2. What trade item groupings are and how to identify them using the GS1 Global Trade Item Number (GTIN)
3. What logistic units are and how to identify them using the GS1 Serial Shipping Container Code (SSCC)
4. Which barcode symbologies to use
5. Where to place barcode symbologies on trade item groupings and logistic units
6. What is required for the GS1 logistic label

It assumes that readers are familiar with product identification using Global Trade Item Numbers (GTINs), the numbers found at the bottom of a barcode. For technical information refer to *How GTINs Are Formed*.

Additional technical information can be found on *GS1 Canada's Standards* web page.

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# 2 Introduction to GS1 ID Keys and Barcodes

## 2.1 GS1 ID Keys

GS1 identification (ID) keys give companies efficient ways to access information about items in their supply chains and share this information with trading partners.

ID keys enable organisations to assign standard identifiers to trade item, logistic unit, physical locations and more.

Because GS1 ID keys are globally unique, they can be shared between organisations, increasing supply chain visibility for trading partners. To learn more about, please visit GS1 Canada *GS1 Identification Keys* web page.

To ensure that identification numbers are unique, GS1 Canada manages the assignment of *GS1 Global Trade Item Number (GTIN) and barcode numbers in Canada*. To support GS1 global office with the global implementation of GS1 GTIN and barcodes for product identification, GS1 Member Organizations (GS1 MOs) are located in over 100 countries around the world to manage barcodes.

With a valid annual *GS1 Company Prefix Licence*, Canadian businesses of all sizes can create industry-compliant barcodes, enabling their products to be traded in Canada and around the world. Licensed GS1 Company Prefixes are used in the identification of products, shipment, physical location and more.

**Important**: Before creating a GS1 ID key such as Global Trade Item Number (GTIN), Serial Shipping Container Code (SSCC) or others, please refer to your Annual Licence (GS1 Company Prefix Licence Certificate) issued by GS1 Canada or other GS1 Member Organization and use the correct prefix for creating the right GS1 ID key.

## 2.2 GS1 Barcodes

GS1 Barcodes are symbols that can be scanned using laser or image-based technology.
They are used to encode information such as GS1 ID keys (product, shipment, location, etc.) and attributes (serial numbers, batch/lot numbers, dates, etc.) via GS1 syntaxes (plain, GS1 element string and GS1 Digital Link URI).

Barcodes play a key role in supply chains, enabling parties like retailers, manufacturers, transport providers and hospitals to automatically identify and track products as they move through the supply chain.
GS1 utilizes several types of barcodes to satisfy different business requirements.

**Linear (1D) barcodes**
Linear barcodes (1D), like the U.P.C. code commonly found on consumer goods, use a series of variable-width lines and spaces to encode data, including the GTIN for product identification.

**Two-dimensional (2D) barcodes**
2D barcodes use patterns of squares, hexagons, dots and other shapes to encode data. Because the data is encoded in a two-dimensional pattern, 2D barcodes can hold more data than 1D barcodes while still appearing physically smaller.

To learn more about GS1 barcode standards, please visit GS1 Canada *Barcode Standards* web page.

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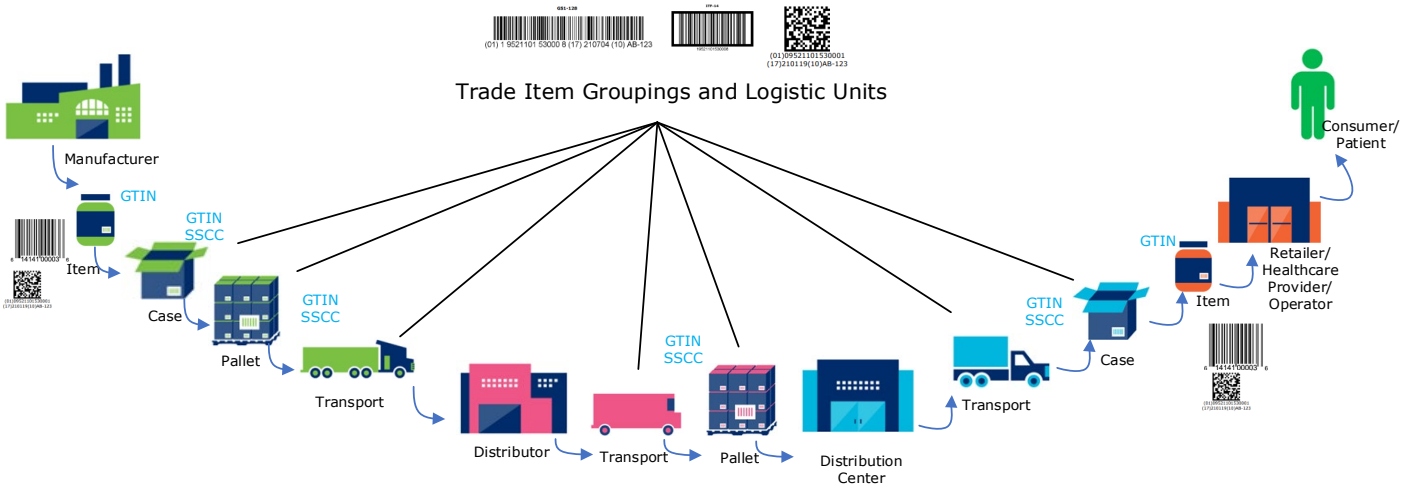
## 2.3 Where GS1 ID Keys and Barcodes are used – From Manufacturer to Consumer

The following illustration shows where GS1 ID keys such as GTIN and SSCC, and different types of barcodes, for products (items), cases, shipping, and logistic units, can be used in the flow of product from manufacturer to consumer:



# 3 Trade Item Groupings (Cartons, Cases, Pallets)

Trade item grouping is a distribution unit that contains a constant pre-defined number of consumer units, for example a case (may also be referred to as shipping container (SC), shipping carton, master case). These units are used in distribution and warehousing processes, and in deliveries to retailers, operators, foodservice distributors, healthcare providers and others. They are traded between companies and usually not sold directly to consumers.

GS1 recommends treating such units as independent trade items, identified, and marked with their own GTIN. The GTIN enables efficient distribution processes such as storage, picking and packing and inspection. It also supports a seamless link with the ordering and invoicing processes, helping companies to establish a 3-way match between what was ordered, received, and invoiced.

There are two types of trade item groupings:

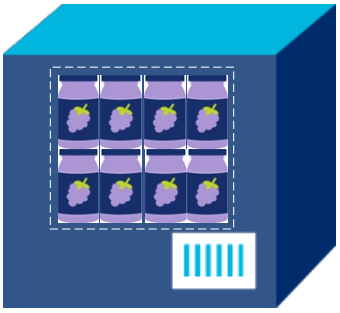
- Homogenous/ Same (identical)
- Heterogeneous/ Mixed

## 3.1 Homogenous (Same) Trade Item Groupings

A homogeneous/same trade item grouping contains one type of item ((identical) trade item). In other word, all the items in a trade item grouping such as a case must have the same GTIN.

Following are examples of homogenous trade item groupings:

- a case containing 48 boxes of 450g breakfast cereal
- a case containing 50 bottles of 30 tablets of antibiotics
- a garment rack containing 50 one-size-fits-all dresses in the same style and colour identified



A homogenous trade item grouping is assigned a GTIN-14. Since all the units inside the case share the same GTIN-12 or GTIN-13, the GTIN-14 case code is based on the unit GTIN and may includes some additional information about the packaging. The same GTIN-14 is used on all like cases. GTIN-14 can only be encoded in a symbology that has a 14-digit capacity.

**Note**: Based on the trading partner requirements, a GTIN-12 or GTIN-13 may be assigned to a homogenous case instead of a GTIN-14.

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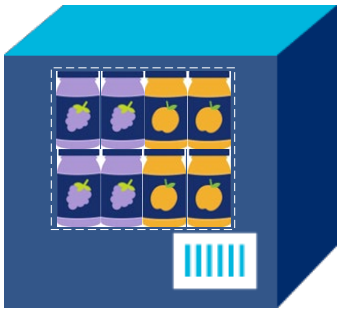
## 3.2 Heterogenous (Mixed) Trade Item Groupings

A heterogenous /mixed trade item grouping contains different types of items that are identified with their own GTINs. In other words, contains more than one type of item and contains more than one GTIN.
The following are examples of mixed trade item groupings:

- a case containing 12 shampoos and 12 conditioners
- a display shipper with variety of products
- a garment rack containing 50 dresses in a range of styles, sizes, and colours



A mixed trade item grouping is assigned a GTIN-12 or a GTIN-13.

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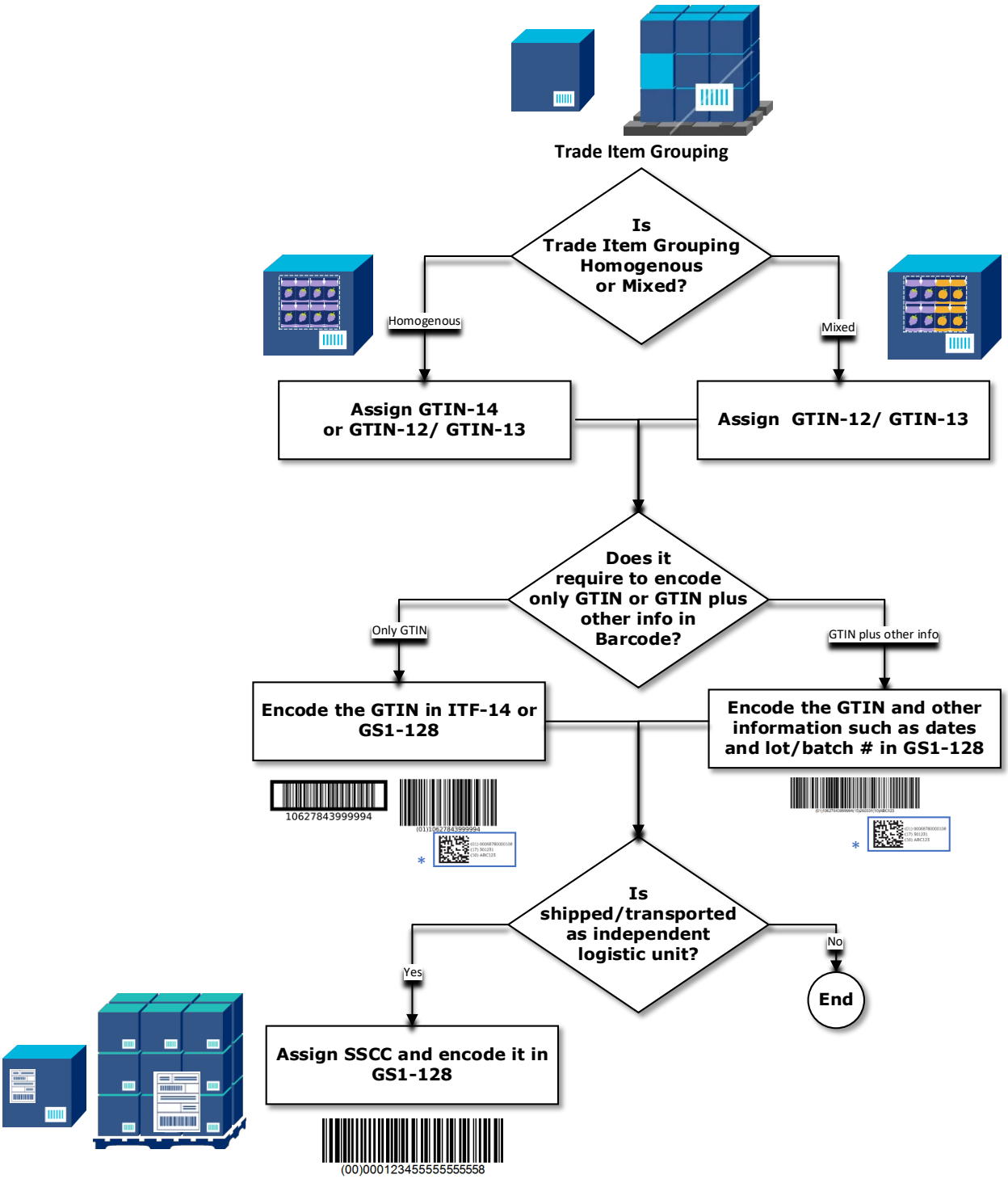
## 3.3 How to Determine the GS1 ID Key and Barcode to Use




* This document includes GS1 DataMatrix information specifically for implementing GS1 DataMatrix Barcodes for Pharmaceuticals at the case level in Canada. As of the publication of this document, there is currently no requirement to apply GS1 DataMatrix at the case level for other sectors in Canada. Refer to section *5 Barcode Symbologies*.

Each of the packaging types in the example below, if traded, is assigned a separate GTIN:

| Trade Item | GTIN numbering Options | | |
|---|---|---|---|
| | GTIN-12 | GTIN-13 | GTIN-14 |
| Single product A | X | X | |
| 12 x product A (Tade item grouping) | X | X | X |
| 50 x product A (Trade item grouping, e.g., display case) | X | X | X |
| 100 x product A (Trade item grouping) | X | X | X |
| Single product B | X | X | |
| 50 x product A<br>50 x product B | X | X | |

If, at any time, the trade item is shipped or transported as an independent logistic unit, at the time of shipment it SHOULD additionally be identified with a Shipping Container Code (SSCC) which is discussed later in this document.

**Note**: When encoding a GTIN-12 or GTIN-13 in a barcode symbology such as ITF-14, GS1-128, GS1 DataMatrix or any other barcode symbologies that requires fixed-length data string of 14-digit, two or one zero(s) respectively must be added in front of the GTIN:

| Barcode Symbology | GTIN | GTIN structure in barcode |
|---|---|---|
| ITF-14<br>GS1-128<br>GS1 DataMatrix | GTIN-12: 627843999997<br>GTIN-13: 7541234999997<br>GTIN-14: 10627843999994 | 14-digit:<br>▪ GTIN-12: 00627843999997<br>▪ GTIN-13: 07541234999997<br>▪ GTIN-14: 10627843999994 |

## 3.4 Understanding the GTIN-14

GTIN-14 is used to identify:

- Homogenous trade item groupings, where all units contained in the group are identical (e.g., case of the same strawberry jam jars or an inner pack of the same strawberry jam jars). This is applicable for all sectors.
- Unit of Use[1] (level below the each) ONLY for regulated healthcare products.

GTIN-14 is always 14 digits in length. **It never starts with a zero as the first digit and is NOT intended for point-of-sale/use.** The GTIN-14 incorporates the GTIN (less its check digit) of the trade item contained in the grouping. The check digit for the GTIN-14 is then recalculated.

[1] Unit of Use: The lowest hierarchy level of trade items within the GS1 System is traditionally referred to as the "each" level. The "each" level trade item may contain more than one unit of use. In this case there may be the need to identify levels below the 'each' down to the single unit or unit of use.

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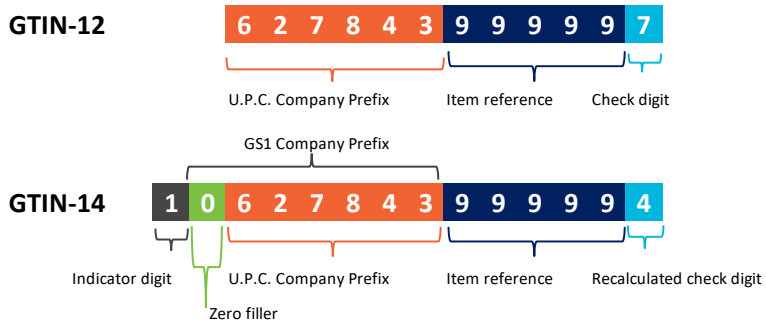
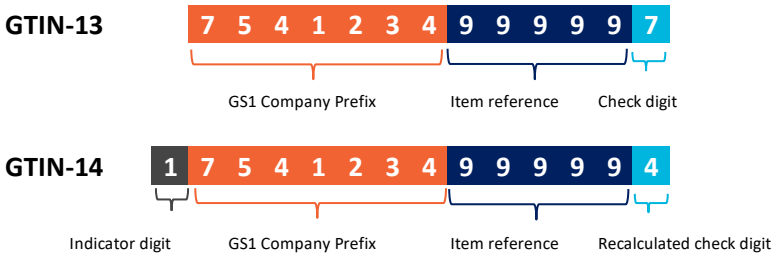
Example of GTIN-14 based on a grouping of homogenous GTIN-12:




Example of GTIN-14 based on a grouping of homogenous GTIN-13:




**Important**: Before creating a GTIN, please refer to your Annual Licence (GS1 Company Prefix Licence Certificate) issued by GS1 Canada or other GS1 Member Organization and use the prefix that is assigned for creating GTINs.

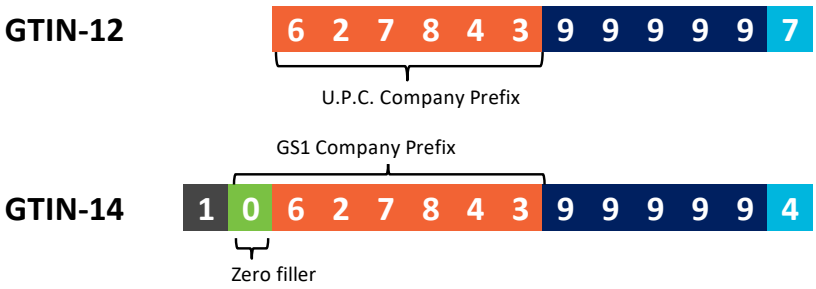
If your organization is assigned a U.P.C. Company Prefix to create 12-digit GTINs and 14-digit GTINs, use the U.P.C. Company Prefix to create a GTIN-12 and then follow the steps below to create a GTIN-14 based on this GTIN-12.

If your organization is assigned only a GS1 Company Prefix to create 13-digit GTINs and 14-digits GTINs, use the GS1 Company Prefix to create a GTIN-13 and follow the steps below to create a GTIN-14 based on this GTIN-13.

The illustration below shows step by step how to create a GTIN-14.

The same steps are applicable to GTIN-14 based on a GTIN-12 or a GTIN-13 of the trade item contained in the grouping, except "Step: 1 Zero filler" is skipped when creating a GTIN-14 from a GTIN-13.

**Step 1: Zero Filler –** ONLY applicable when creating a GTIN-14 based on a GTIN-12. To create a GTIN-14 based on a GTIN-13, skip to step 2.

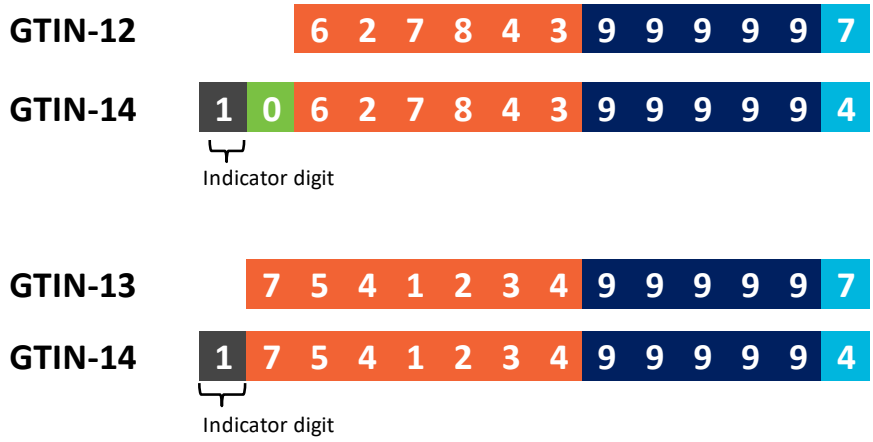


When creating a GTIN-14 from a GTIN-12, the leading zero (zero filler) is added.

A U.P.C. Company Prefix is equivalent to a GS1 Company Prefix with the exception of a leading zero. e.g., U.P.C. Company Prefix 627843 is equivalent to GS1 Company Prefix 0627843.

In the example above, GS1 Canada has assigned the 6-digit U.P.C. Company Prefix **627843** to create GTIN-12s.

**Step 2: Indicator (Packaging Indicator)**




Provide the Indicator digit in the GTIN-14 number as shown in the above examples.

Indicators are used to identify different sized containers including the same grouping of trade items. **For homogenous cases**, indicator digits 1-8 are used. Indicator digit 9 is used when additional information about the weight or quantity is encoded **– Variable weight or count**. For example: a Case of Chicken wings weighs 5KG, but the count varies between 30-35 pieces.

Brand owners/manufacturers allocate the indicator for their own products.

0 Zero is used when the shipping case is also the packaging for the consumer item. E.g. on a **single item such as a television**.

1-8 To allow flexibility in the way they are used in different industries, the numbers 1 to 8 have not been strictly defined. However, they are commonly used in the following way:

1 When there is only one shipping case size, or for the first level of packaging,

2-8 For inner packs or additional shipping case sizes,

9 When additional information about weight or quantity is encoded.

As explained above, indicators 1 to 8 may be used to create new GTIN-14s. When these eight indicators have been depleted, any additional groupings must be identified with either a GTIN-12 or GTIN-13.

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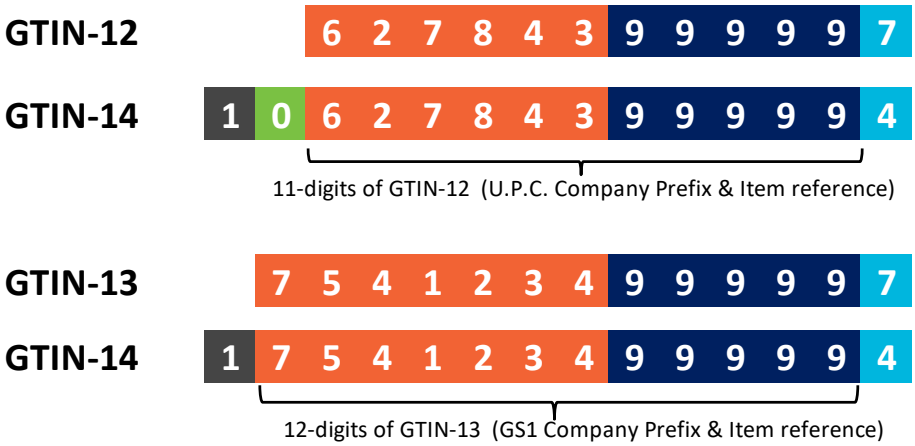
***Step 3:* GS1 Company Prefix and Item Reference**




Provide the Company Prefix and item reference of the GTIN-12/GTIN-13 in the respective GTIN-14s as shown above.

U.P.C. Company Prefix and GS1 Company Prefix:

GS1 Canada assigns this globally unique number to companies which is included in their Annual Licence (GS1 Company Prefix Licence Certificate). For details, visit Company Prefix Licensing (gs1ca.org).

While the U.P.C. Company Prefix and GS1 Company Prefix examples above are six digits and seven digits long respectively, note that they are not always six digits and seven digits long and it depends on the length of the licensed Company Prefix assigned to the organization.

Item Reference:

The item reference is a number that the company assigns to each of their products and services. This information must be maintained in the companies database. The length of the assigned item reference is dependant upon the licensed Company Prefix assigned to the organization. Item references should be allocated sequentially from zero, without any in-built significance and recorded securely and accurately. For example, ….00000, …00001, …00002.

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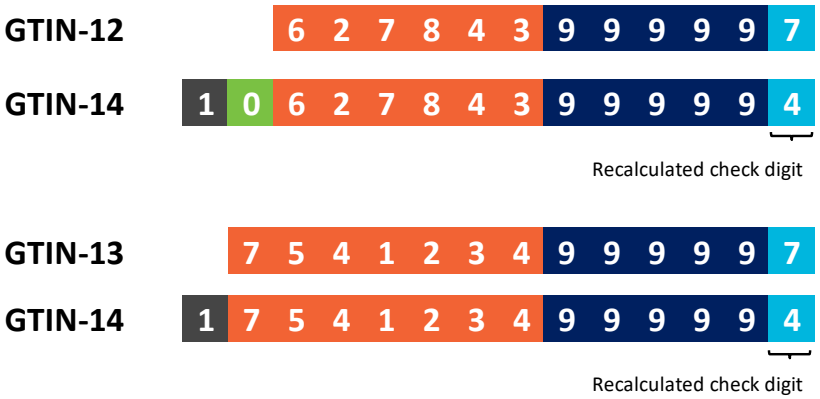
***Step 4:*** **Check Digit**



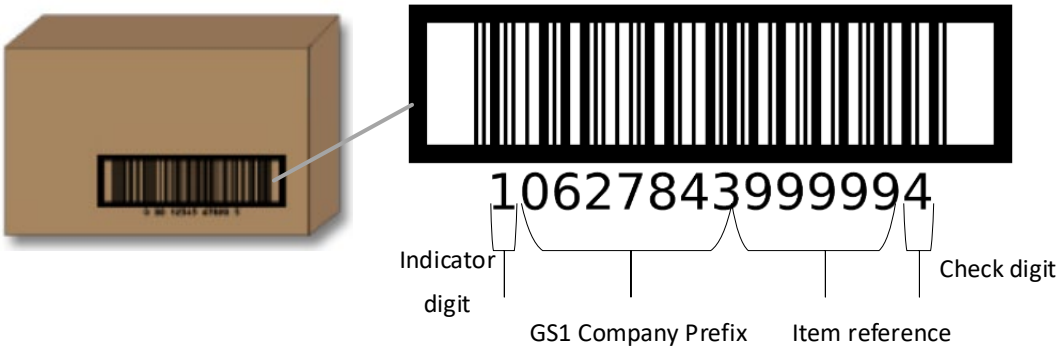

Recalculate the check digit based on the preceding 13 digits.

Position 14 is the check digit for the entire GTIN. Typically, barcode design or printing software calculates this number using the 13 preceding digits. The check digit will change when the 13 preceding digits in the GTIN number change.

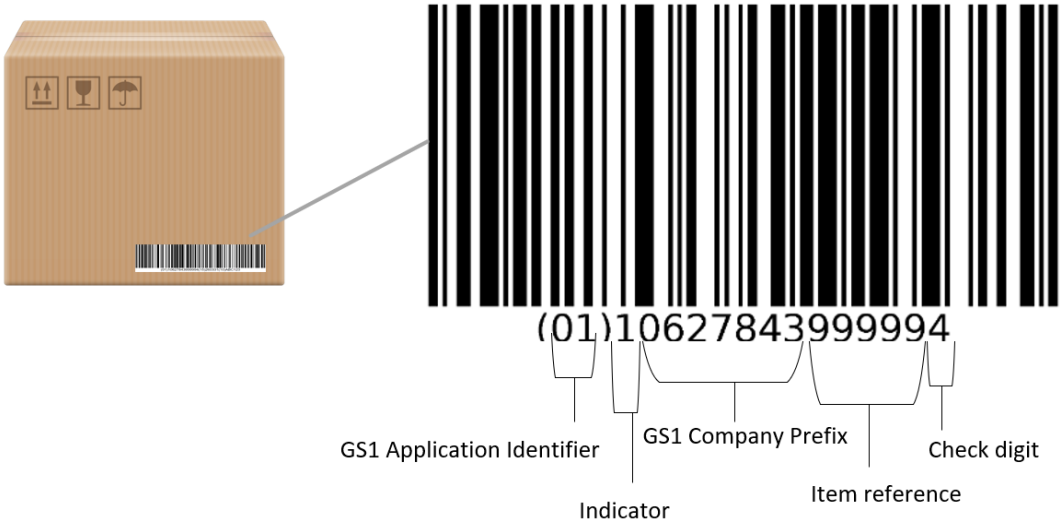
Visit GS1 Canada website: *Check Digit Calculator*.

***What is Next:***
Now that you have your GTIN-14, you can assign it to your product (trade item grouping) and generate the barcode using the GS1 Canada Barcode Generator tool.

**Example of GTIN-14 encoded in ITF-14 barcode symbology:**



**Example of GTIN-14 encoded in GS1-128 barcode symbology:**




GS1 Application Identifiers are prefixes of 2 to 4 digits which indicate the meaning and format of following data:
(01) = introduces a GTIN (10627843999994)

GS1 Application Identifier is a qualifier added to the barcode number, which tells the scanner the meaning of the numbers that follow. In the human readable part of the barcode symbol, the GS1 Application Identifier always appears in parentheses.

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# 4 Logistic Units

A logistic unit is an item of any composition established for transport and/or storage that needs to be managed through the supply chain.

Tracking and tracing logistic units in the supply chain is a major application of the GS1 system. Scanning the standard identification number, marked on each logistic unit, allows the physical movement of units to be individually tracked and traced by providing a link between the physical movement of items and the associated information flow. It also opens the opportunity to implement a wide range of applications, such as cross docking, shipment routing and automated receiving. Logistic units are identified with a GS1 identification number called the Serial Shipping Container Code (SSCC). The SSCC ensures that logistic units are identified with a number that is unique worldwide. The GS1-128 barcode is used to physically mark the SSCC and additional attributes on a logistic label. Usually, the SSCC is represented in a GS1-128 barcode symbol at the bottom of the label, and additional attributes are included in one or more additional GS1-128 symbols above the symbol holding the SSCC. For details, refer to GS1 General Specification *section 2.2 Logistic units*.

There is no correlation between the SSCC and GTINs of the units inside. The information linking these numbers is sent to the customer via the appropriate Electronic Data Interchange (EDI) transaction set – Advance Shipping Notice (ASN).

## 4.1 Understanding Serial Shipping Container Code (SSCC)

Serial Shipping Container Code (SSCC) can be used by companies to identify a logistic unit, which can be any combination of trade items packaged together for storage and/or transport purposes, for example a case, a pallet or a parcel.

An individual SSCC is a unique number, which remains the same for the life of the logistic unit to which it is assigned. When assigning an SSCC, the rule is that an individual SSCC number must not be reallocated within one year of the shipment date from the SSCC assignor to a trading partner. However, prevailing regulatory or industry organisation specific requirements may extend this period. To read further on SSCC rules and allocation, refer to *GS1 General Specification* section 4.3 SSCC rules.

The Serial Shipping Container Code is 18 digits long and below is an example:

**Serial Shipping Container Code (SSCC)**

The parts of SSCC are described below. The illustration below shows step by step creating an SSCC based on a GS1 Company Prefix.

**Important**: Before creating Serial Shipping Container Code (SSCC), please refer to your Annual Licence (GS1 Company Prefix Licence Certificate) issued by GS1 Canada or other GS1 Member Organization and make sure to use the **GS1 Company Prefix** that is issued to your organization to create SSCC.

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***Step 1:* Extension Digit**

Position one (1) in the SSCC is called the extension digit. The extension digit is used to increase the numbering capacity of the serial reference within the SSCC. It is assigned by the company that constructs the SSCC. In this example, an extension digit "1" is assigned to the SSCC.

- The extension digit ranges from 0-9.

***Step 2:* GS1 Company Prefix**

Positions two through eight in this example makes up the GS1 Company Prefix. GS1 Canada assigns this globally unique number to companies which is included in their Annual Licence (GS1 Company Prefix Licence Certificate). To read more on GS1 Company Prefix, visit *Company Prefix Licensing (gs1ca.org)* on GS1 Canada website.

In the example above, GS1 Canada has assigned GS1 Company Prefix **0627843** in positions two through seven for this company. While this GS1 Company Prefix example is seven digits long, note that they are not always seven digits long and it depends on the length of the GS1 Company Prefix assigned to the organization.

***Step 3:* Serial Reference**

The serial reference is created by the company allocating the SSCC. It can be any number that is unique when combined with the extension digit (Step 1) for each shipment. This information must be maintained in the companies database.

In the above example, the nine-digit serial reference **000000001** is used in positions 9 through 17. The length of the assigned serial reference number is dependant upon the licensed GS1 Company Prefix assigned to the organization.

The serial reference is a serial number created by the company allocating the SSCC. The simplest way to allocate the serial number is sequentially, for example ….00000, …00001, …00002.

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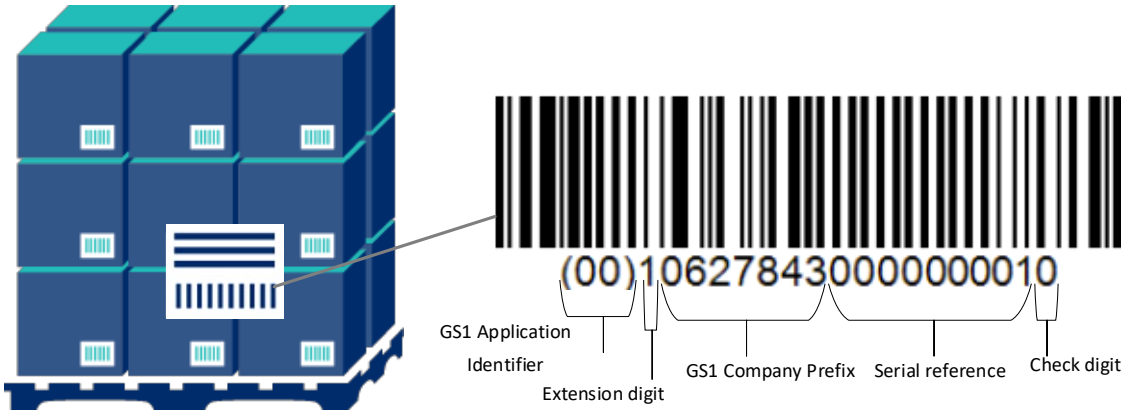
***Step 4:* Check Digit**

Position 18 is a check digit for the entire SSCC. Typically, the barcode design or printing software calculates this number using the 17 preceding digits. In this example, the calculated check digit 0 is placed in position 18. The check digit will change when the preceding 17 digits in the SSCC number change.

Visit GS1 Canada website: *Check Digit Calculator*.

***What is Next:***
Now that you have your SSCC, you can assign it to your logistic unit and generate the barcode for the logistic label.

**Example of an SSCC encoded in GS1-128 barcode symbology**:




The GS1 Application Identifier (00) indicates that the GS1 Application Identifier (AI) data field contains an SSCC.

AI is a qualifier added to the barcode number, which tells the scanner the meaning of the numbers that follow. In the human readable part of the barcode symbol, the AI always appears in parentheses.

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# 5 Barcode Symbologies

One-dimensional (1D) barcode symbols consist of a pattern of bars and spaces. Generally, there are 3 types of 1D symbologies:

- Two symbologies, European Article Number/ Universal Product Code (EAN/UPC) and Interleaved 2 of 5 (ITF-14), can only carry the GTIN and no additional data attributes.
- The third symbology, GS1-128 can represent the GTIN plus additional data attributes, and all other GS1 ID keys including SSCC.

- 2D barcodes are symbols composed of patterns such as square modules arranged in a matrix such as GS1 DataMatrix.

Depending on the length of the additional attributes to be included, the 1D symbols (GS1-128) can become large, making them more difficult to produce, fit on the label, and scan. For GS1-128 it is allowed to include multiple separate symbols to alleviate size concerns. The 2D symbologies such as GS1 DataMatrix are more space efficient. Normally the data required for a trade item grouping will fit into one 2D symbol without a significant impact on the required label space.

1D barcodes are used to physically mark the GTIN on the product label or directly on the packaging material of higher packaging levels such as outer case. The barcode may be an ITF-14, and EAN/UPC that can only carry the GTIN. In case additional item data/attributes such as expiry date/best before date, lot/batch number, serial number, and others are needed for trade item groupings (higher packaging level) to address product and consumer safety requirements, a GS1-128 barcode is used. Such attributes are often already included as text on the label, but GS1-128 makes it possible to capture them automatically.

With the emergence of 2D barcodes such as GS1 DataMatrix, more compact representations of the GTIN and attributes have become possible. When marking an outer case with GS1-128 barcode symbology, you may optionally include GS1 DataMatrix. Also, the addition of GS1 DataMatrix depends on the product category such as healthcare trade item groupings and trading partners requirements. Currently, the Roadmap to the implementation of GS1 DataMatrix Barcodes on Pharmaceuticals in Canada recommends affixing a GS1-128 at the case level and the additional option of GS1 DataMatrix.

**Note**: When using GS1-128 along with the optional GS1 DataMatrix on outer cases, both barcodes must contain the same GTIN.

The following three barcode symbologies will be discussed in detail:

- ITF-14
- GS1-128
- GS1 DataMatrix

**Important**: This document includes GS1 DataMatrix information specifically for implementing GS1 DataMatrix Barcodes for Pharmaceuticals at the case level in Canada. As of the publication of this document, there is currently no requirement to apply GS1 DataMatrix at the case level for other sectors in Canada.

Although, EAN/UPC barcode symbologies can be used for trade item grouping such as cases, they are less common. Therefore, these barcodes will not be discussed in this document. Refer to *Barcode Standards* in GS1 Canada website for further information.

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### 5.1.1 ITF-14 Symbology

ITF-14 symbology (previously know as Interleaved 2 of 5) is used primarily on cases and units that do not need to convey additional information beyond the GTIN or the product. It can be printed directly on corrugated cardboard.

ITF-14 encodes only numeric characters. While it has some use in other applications, the only use that GS1 makes of this barcode is to encode the 14-digit GTIN-12, GTIN-13 or GTIN-14. ITF-14 is only applied in general distribution, and not applied at the retail Point-of-Sale (POS).

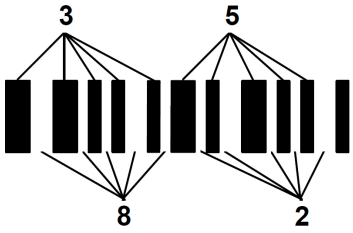
| Barcode Symbology | GTIN | GTIN structure in barcode |
|---|---|---|
| ITF-14 | GTIN-12: 627843999997<br>GTIN-13: 7541234999997<br>GTIN-14: 10627843999994 | 14-digit:<br>▪ GTIN-12: 00627843999997<br>▪ GTIN-13: 07541234999997<br>▪ GTIN-14: 10627843999994 |

What Does Interleaved 2 of 5 Mean?

Interleaved 2 of 5 describes the way the bars are designed:

- There are only two widths for the bars and spaces: wide and narrow (GS1-128 symbology uses bars of this different widths)
- Five bars or spaces represent one digit. Two out of five are wide; three out of five are narrow; and
- The first five bars represent the first digit, the first five spaces represent the second digit, the next five bars represent the third digit, and so on, hence the term interleaved.

The following illustration shows how the number 3852 is read using Interleaved 2 of 5 symbology. (The start and stop characters are not shown.)




Several features are built into the ITF-14 barcode symbology to help the scanner locate and read the symbol when it is printed on a rough surface. These features include:

- Bearer bars: the thick lines around the symbol, which provide support for the printing plate when printing directly on corrugate. For details refer to *GS1 General Specification* section 5.3.2.4 Bearer bars
  - When printed on corrugate, the bearer bars are printed on all four sides of the barcode. When printed on labels, only the top and bottom bars are required.
  - The width of the bearer bar at 100% magnification is 4.65mm (0.19in)
- Quiet zones: the clear space to the left and right of the bars

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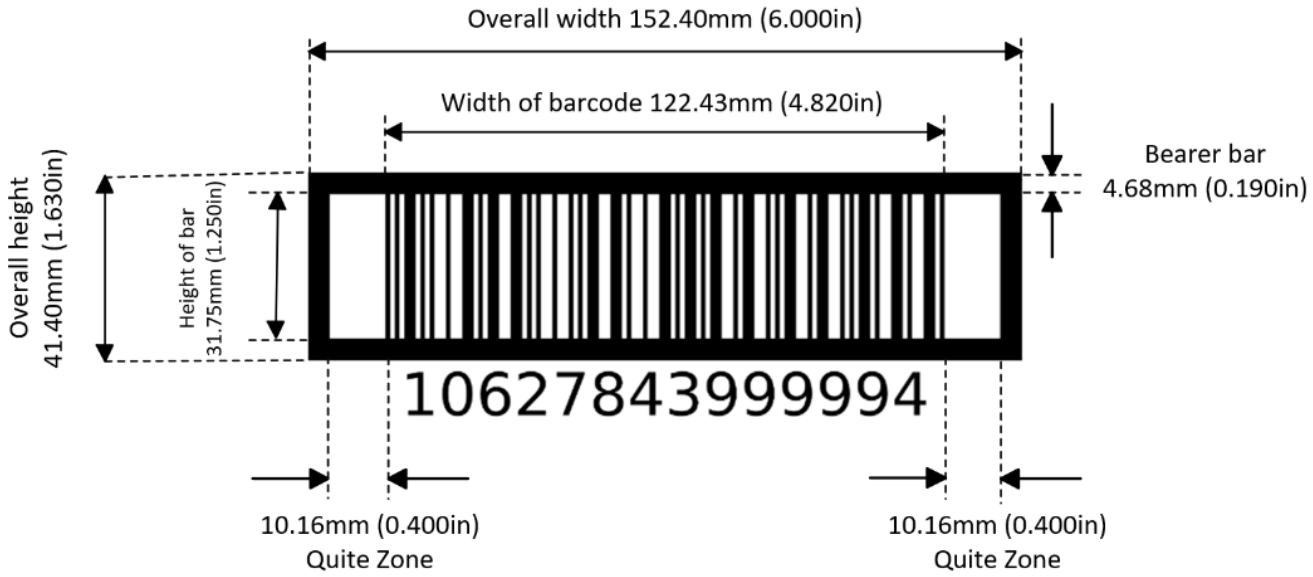
- The quiet zones must be clear from any graphics or printing. The minimum width of the quiet zone at 100% magnification is 10.16mm (0.400in)

- Size:
  - the dimensions shown below are for the nominal or standard size symbol. A nominal size barcode symbol has a magnification of 100%
  - Enlargement or reduction of symbol is permitted, the minimum size is 70% of the nominal size when printed on corrugate or 62.5% when printed on labels
  - For barcode symbols printed directly on corrugate, use a magnification of 100% or greater. In general, bigger is better




**Note**:

- Main dimensions at X-dimension 1.016 mm (0.0400 in.)
- Figure is not to scale. Measurements are in millimetres and inches

**Printing ITF-14 Barcode**

The ITF-14 barcodes can be printed directly onto corrugated materials using contact or non-contact printing methods. To produce the best scanning results:

- Print with black, dark blue or dark green ink.
- The minimum acceptable International Standards Organization (ISO) print quality grade when using direct printing on corrugate is 0.5in.
- Print at nominal size (100%)

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**ITF-14 Barcode Symbology Overview:**

Capacity and GTIN: 14 digits

Data structure: Only GTIN. Encodes GTIN-12, GTIN-13 and GTIN-14 in 14-digit format.

Usage: Generally used on higher packaging levels of products such as cases or cartons. It lends itself well to being directly printed on corrugated material.

Example: Used on cases and pallets in general distribution. Not for retail POS. A case containing 12 bottles of 500ml shampoo.

To read more on ITF-14 barcode symbology, refer to *GS1 General Specification* section 5.3 Linear barcodes- ITF-14 symbology specifications.

### 5.1.2 GS1-128 Symbology

The GS1-128 symbology is a subset of the more general Code 128 symbology. By agreement between Association for Automatic Identification and Mobility (AIM) and GS1, use of the Function 1 Symbol Character (FNC1) in Code 128 symbols in the first symbol character position following the start character has been reserved exclusively for the GS1 system. There are also additional characters built into the GS1-128 symbol for specific purposes. These codes are not shown as part of the number. They are generated automatically by the computer that creates and prints the symbol.

GS1-128 is only applied in general distribution and logistics environments, and not applied at the retail Point-of-Sale (POS). GS1-128 barcodes can carry GTIN, SSCC and other GS1 ID keys, plus information like expiration date/best before date, lot/batch number, serial number and more. GS1-128 includes information through use of GS1 Application Identifiers (AIs), which indicate what comes next within the barcode, what format the data will be in, whether it is fix or variable length. For example, the AI (01) tells the scanning system "the GTIN is coming next, and it will be 14 digits". GS1 Application identifiers are both encoded into the barcode and are featured underneath the barcode as numbers in a human readable format.

The capacity of GS1-128 is 48 alphanumeric and this includes FNC1 when used as a field separator. The GTIN format is 14-digits:

| Barcode Symbology | GTIN | GTIN structure in barcode |
|---|---|---|
| GS1-128 | GTIN-12: 627843999997<br>GTIN-13: 7541234999997<br>GTIN-14: 10627843999994 | 14-digit:<br>▪ GTIN-12: 00627843999997<br>▪ GTIN-13: 07541234999997<br>▪ GTIN-14: 10627843999994 |

**Size**

The dimensions shown here reflect the recommended minimum symbol size for target x-dimension of 0.495 mm (0.0195 inches). The maximum physical length of the GS1-128 barcode is 165 mm (6.5 inches), and the maximum height should be 31.75 mm (1.25 inches). The barcode should not be compressed to fit into a smaller label if all 48 data characters are used.

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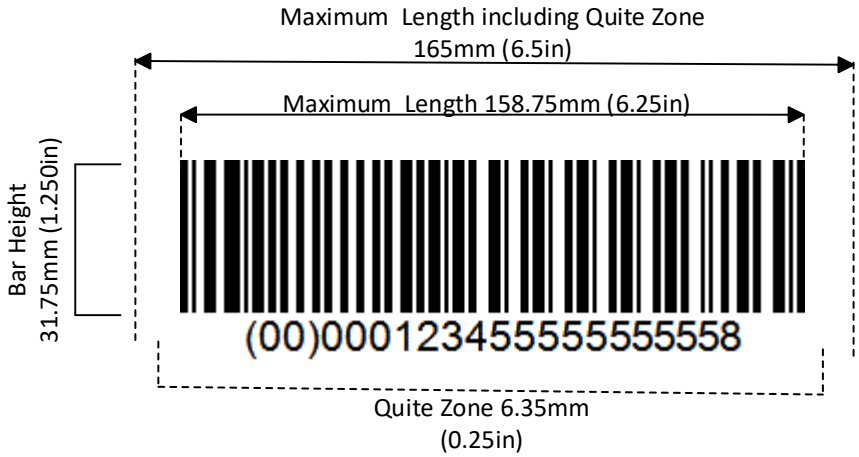
The following image illustrates the components of GS1-128 barcode symbology:




**Note**: Figure is not to scale. Measurements are in millimetres and inches

**Features**

- Bearer bars are not used on GS1-128 barcode symbols.
- The quiet zones are part of the symbol.

GS1-128 is capable of combining the GTIN and additional information into one barcode. This process, called concatenation, can only be used if the additional information is available at the time the barcode carrying the GTIN is printed. Concatenation makes the overall area required for the barcode smaller.
Example of encoding GTIN, best before date and batch/lot number:

**Note**: Figure is not to scale

GS1 Application Identifier (AI): Prefixes of 2 to 4 digits which indicate the meaning and format of following data.
In the example above:
(01) = introduces a GTIN (10627843999994)
(15) = best before date (260331) March 31, 2026
(10) = lot/batch # (AB123)

**Note:** Brackets are not encoded in the barcode. Only for human readable interpretation that is written below the barcode.

Example of SSCC encoded in GS1-128:

**Note**: Figure is not to scale

In the example above:
(00) = introduces a SSCC (000123455555555558)

**GS1-128 Barcode Symbology Overview:**

| | |
|---|---|
| Capacity and GTIN: | Up to 48 characters. |
| Data structure: | GTIN and other GS1 ID keys like SSCC, GLN, and more<br>GTIN plus information using GS1 AIs such as best before date, batch/lot number and many other attributes.<br>Encodes GTIN-12, GTIN-13 and GTIN-14 in 14-digit format. |
| Usage: | Generally used on higher packaging levels of products such as cases, cartons or logistic units. Not for retail POS. |
| Example: | A case containing 12 bottles of 500ml shampoo with expiry data April 31, 2026, and lot/batch number ABC-12345.<br>A logistic label affixed to a logistic unit with an SSCC “006141411234567890”. |

To read more on GS1-128 barcode symbology, refer to *GS1 General Specification* section 5.4 Linear barcodes - GS1-128 symbology specifications.

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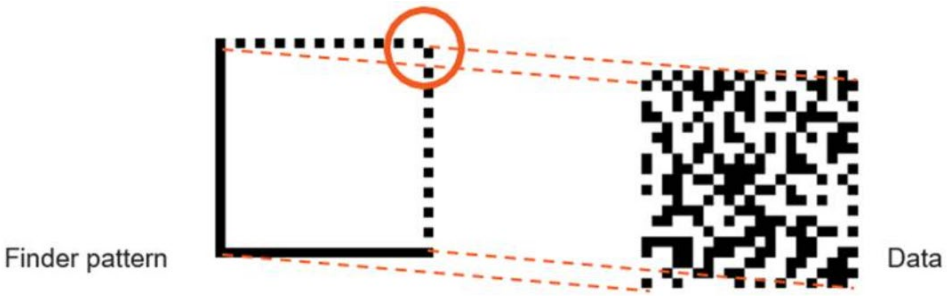
### 5.1.3 GS1 DataMatrix

GS1 DataMatrix is a standalone, two-dimensional (2D) matrix symbology that is made up of square modules arranged within a perimeter finder pattern. The GS1 DataMatrix uses Reed-Solomon error correction (four selectable levels of error correction is specified) and this feature helps correct for partially damaged symbols.




Just like linear (1D) barcodes GS1 DataMatrix has a mandatory Quiet Zone. This is a light area around the symbol which must not contain any graphic element which may disrupt reading the barcode. It has a constant width equal to the X-dimension of the symbol on each of the four sides.

GS1 DataMatrix symbols are read by two-dimensional imaging scanners or vision systems. Most other scanners that are not two-dimensional imagers cannot read GS1 DataMatrix. GS1 DataMatrix symbols are restricted for use with applications that will involve imaging scanners throughout the supply chain.

Each Data Matrix symbol is made up of number of rows and columns. GS1 DataMatrix always has an even number of rows and columns. Therefore, it always has a light "square" in the upper right hand right corner (circled in the figure above). Obviously, this corner will be dark if the GS1 DataMatrix symbol is printed in negative (inverse reflectance printing).

GS1 DataMatrix can carry GTIN and other GS1 keys such as Serial Shipping Container Code (SSCC), Global Location Number (GLN), etc., plus using GS1 Application Identifiers (AIs) to encode information like expiration date/best before date, lot/batch number, serial number and more. The capacity of GS1 DataMatrix is up to 2,335 alphanumeric characters or 3,116 numbers and the GTIN format is 14-digits. As GS1 DataMatrix always requires the use of the Function 1 symbol character in its first position, its capacity is reduced to 2,334 alphanumeric characters, or 3,114 numbers.

| Barcode Symbology | GTIN | GTIN structure in barcode |
|---|---|---|
| GS1DataMatrix | GTIN-12: 627843999997<br>GTIN-13: 7541234999997<br>GTIN-14: 10627843999994 | 14-digit:<br>▪ GTIN-12: 00627843999997<br>▪ GTIN-13: 07541234999997<br>▪ GTIN-14: 10627843999994 |

As indicated above, GS1 DataMatrix can encode variable length data. Therefore, the size of the resulting symbol varies according to the amount of data encoded.

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**Note**: Figure is not to scale

**GS1 DataMatrix Barcode Symbology Overview:**

| | |
|---|---|
| Capacity and GTIN: | 2,335 alphanumeric characters or 3,116 numbers. |
| Data structure: | GTIN and other GS1 ID keys such as SSCC, GLN, and more<br>GTIN plus information using GS1 AIs such as best before date, batch/lot number and many other attributes. Encodes GTIN-12, GTIN-13 and GTIN-14 in 14-digit format. |
| Usage: | A two-dimensional barcode and requires image-based scanners. |
| Example: | Specific healthcare applications in the GS1 System of Standards. Currently specified primarily for Pharmaceutical and Cannabis products in Canada at the item level (unit). May be used on cases, pallets, and logistic units in general distribution. |

To read more on GS1-DataMaterix barcode symbology, refer to *GS1 General Specification* section 5.6 Two-dimensional barcodes -GS1 DataMatrix symbology.

**Important**: This document includes GS1 DataMatrix information specifically for implementing GS1 DataMatrix Barcodes for Pharmaceuticals at the case level in Canada. As of the publication of this document, there is currently no requirement to apply GS1 DataMatrix at the case level for other sectors in Canada.

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# 6 Printing the Barcode

For details, refer to *Barcoding Basics for Designers, Printers & Packagers* which discuss the standards used for barcode symbols on product packaging and discuss the requirements for colour, contrast, reflectance, material, different printing methods and barcode quality and verification.

# 7 Barcode Symbol Placement

Consistency of barcode placement is critical to successful scanning. With manual scanning, variation of barcode placement makes it difficult for the scanning operator to predict where the barcode is located, and this reduces efficiency. With automated scanning, the barcode must be positioned so that it will pass through the field of vision of a fixed scanner as it travels past.
This section includes guidelines for the placement of barcodes on packages and containers. It gives the general principles that apply, mandatory rules and recommendations for barcode placement on specific packaging and container types. To ensure that you are working with the most current version of the Barcode Symbol Placement, please refer to *GS1 General Specifications Standard* section 6 Barcode Placement.

# 8 GS1 Logistic Label Design

The GS1 Logistics Label Design was developed in response to manufacturers, distributors, carriers and retailers who identified a need for a uniform system of labeling shipping containers. With the increasing use of electronic scanning and automated systems for moving the containers throughout the distribution channel, uniform labeling is important.

GS1 recognizes the need for flexibility for this label, as shipping containers are available in many different sizes and shapes. Using a common label maximizes consistency. Please refer to *GS1 Logistic Label Guideline* for an overview of the normative rules and best practice recommendations based on GS1 Logistic Label implementations around the word.

### 8.1.1 What is the GS1 Logistics Label Design?

The GS1 Logistics Label Design is made up of several segments, each of which contains information supplied by the supplier, the customer, and the carrier.

By following the label format, the completed label will be constructed and applied in a way that all users of the system can understand.
The GS1 Logistics Label Design format specifies:

- the size of the label and its segments
- how each segment of the label should be titled and what information it should contain
- the size of the printing and barcodes

For more specific information about GS1 Logistics Label Designs, refer to *GS1 General Specifications - Standards* section 6.6.3 GS1 Logistic Label design or to *GS1 Logistic Label Guideline.*

### 8.1.2 The Layout of a GS1 Logistics Label

The information included on a GS1 Logistic Label comes in two basic forms.

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1. Information to be used by people: This comprises Human Readable Interpretation (HRI) of the data encoded in the barcodes, and non-HRI text and graphics.
2. Information designed for data capture by a machine: Barcodes.

Barcodes are machine readable and are a secure and efficient method for conveying structured data, while Human readable Interpretation (HRI), Non-HRI text and graphics allow people general access to basic information at any point in the supply chain. Both methods add value to GS1 Logistic Labels, and often co-exist on the same label.

**Note:** Human readable Interpretation (HRI) and Non-HRI Text.
For the purposes of interpreting this guideline, there are two types of text that appear on a label:
1. HRI is the data encoded in the barcode.
2. Non-HRI text is all other text on a label.

The SSCC is the single mandatory element for all GS1 Logistic Labels. Other information, when needed, shall comply with the specifications in this document and with the proper use of GS1 Application Identifiers.

#### *8.1.2.1 Building blocks of the GS1 Logistics Label*

A distinction is made between the types of data communicated on the Logistic label. This is expressed in three building blocks:

1. The top building block may contain anything, e.g. text and graphics. This may include extra information about the logistic unit that is not encoded in the barcode(s).
2. The middle building block contains non-HRI text reflecting the information represented in the barcode(s) using data titles rather than AIs, and optionally additional information not represented in barcodes (preferably including data titles).
3. The bottom building block contains the barcode(s) including HRI. Only the bottom building block is mandatory. A GS1 2D barcode symbol such as GS1 DataMatrix, if used, should be placed to the right of the non-HRI text including data titles within the middle building block. If there is enough space, the lower two building blocks may be placed side by side.

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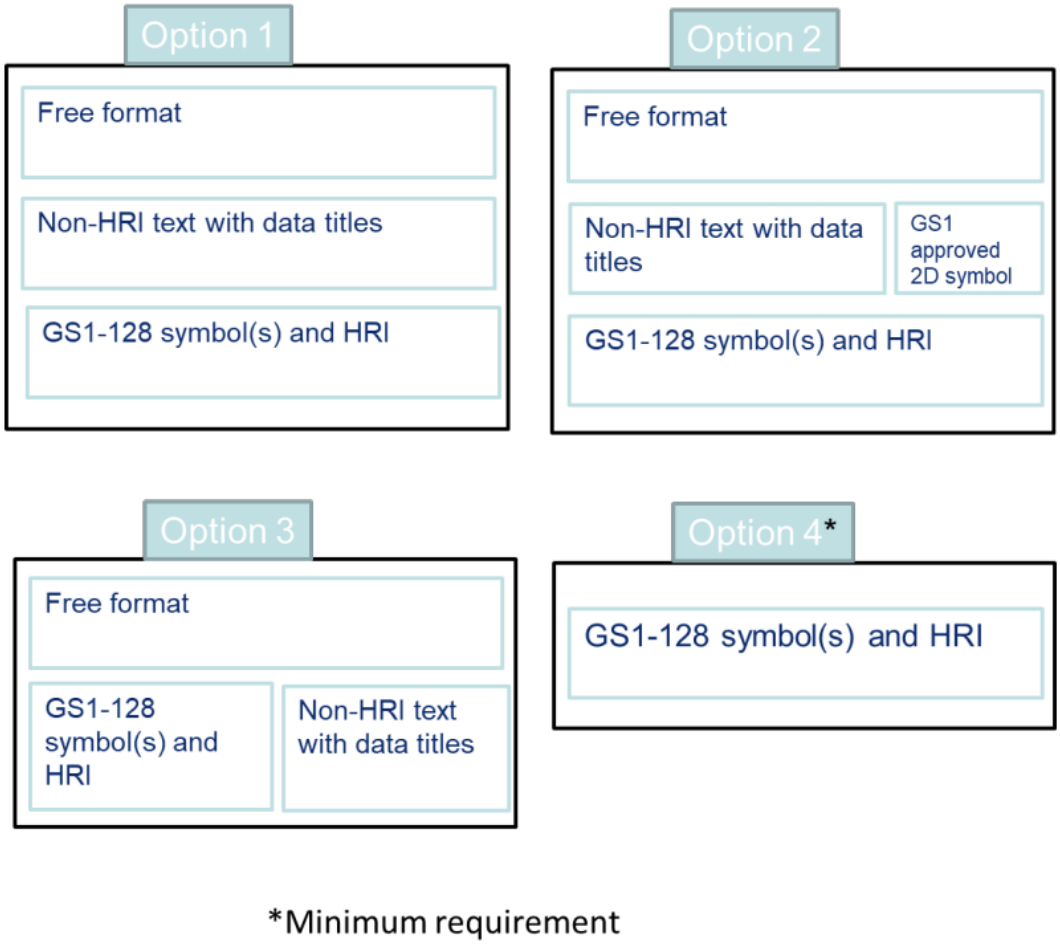


### *8.1.2.2 Segments of the GS1 Logistics Label*

The information to be included on the label may become available at separate stages. Some information may also need to be replaced during the lifetime of the logistic unit. Dividing the label into separate segments is a way to address this.
A segment is a logical grouping of information that is generally known at a particular time. There may be up to three label segments on a GS1 Logistic Label, each representing a group of information.

Generally, the order of the segments, from top to bottom, is carrier (transport), customer, and supplier. However, this order and top/down alignment may vary depending on the size of the logistic unit and the business process being served.

Each segment may contain a combination of defined building blocks as determined by trading partners. Segments may be printed as separate labels in which case they must be placed vertically in close proximity to one another, with the segment containing the SSCC at the bottom. When segments are added separately, care should be taken not to obscure existing segments. The carrier segment may be replaced during the journey of the logistic unit, in which case special care should be taken to ensure the customer and supplier segments are preserved.

⚠ **Important:** When adding or replacing a segment an SSCC already present must never be replaced or changed.

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When segments are used, the data within them still needs to be organized using building blocks as described above. In that case segments are the primary grouping mechanism; building blocks are subordinate to that.

Refer to*GS1 Logistic Label Guideline* section 2.3 Segments.

The illustration below shows the label segments and dimensions for a typical complete label format. Dimensions may vary by +/- 0.2”. Certain areas of the label are optional, and certain variations to the layout are permitted to accommodate different sized packages.

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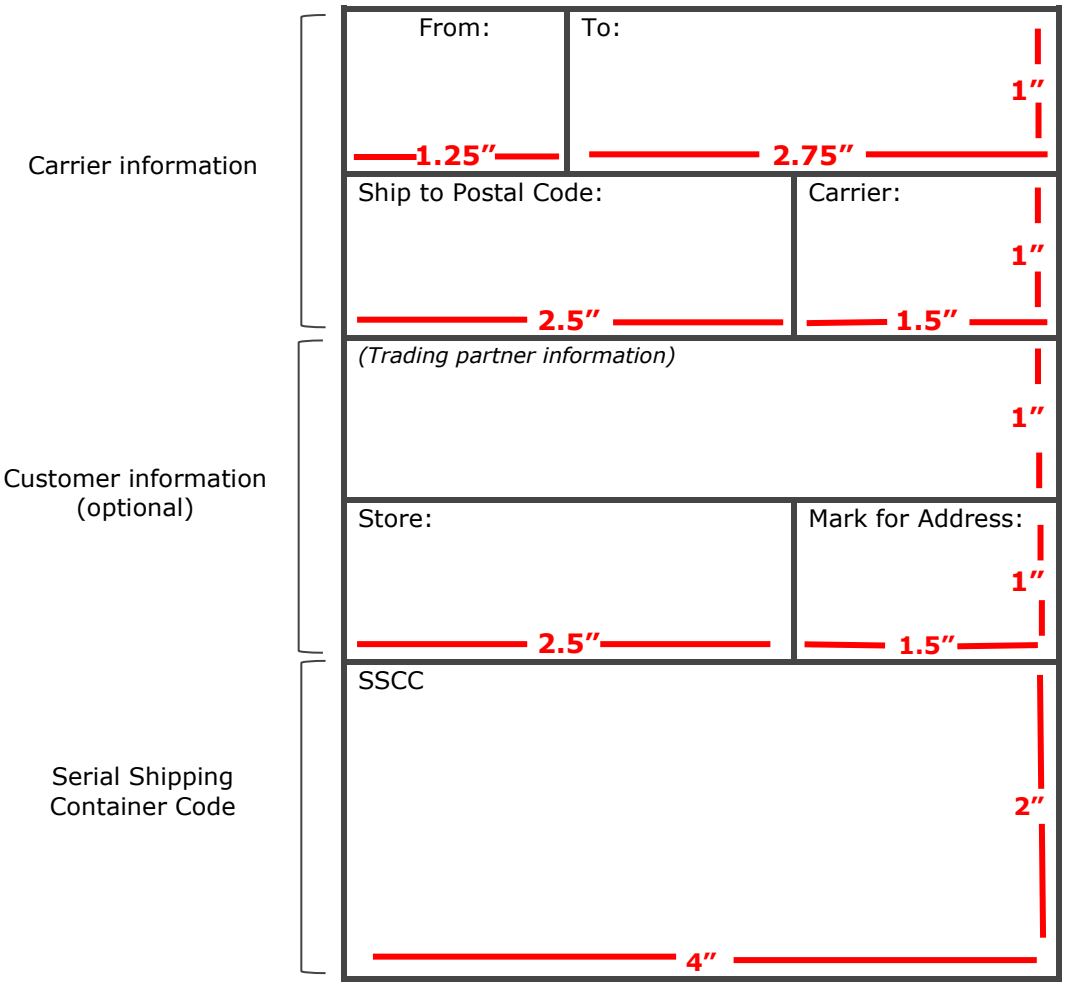
Carrier information
From:
To:
1.25”
2.75”
1”
Ship to Postal Code:
Carrier:
2.5”
1.5”
1”
Customer information (optional)
(Trading partner information)
1”
Store:
Mark for Address:
2.5”
1.5”
1”
Serial Shipping Container Code
SSCC
2”
4”

**Examples of GS1 Logistics Labels**

These examples show two common layouts:

4 inches x 6 inches label – the store number symbol is used for automatic sorting

4 inches x 3 inches label – all data related to the container is sent via Electronic Data Interchange (EDI). The SSCC links the EDI data to the container.

| From: | To: |
|---|---|
| Good Time Supplier<br>155 Main Street<br>Anytown<br>Province X0X 0X0 | **Primo Retailer**<br>**246 King Street**<br>**Bigtown**<br>**Province Z9Z 9Z9** |
| Serial Shipping Container Code<br> <br>**(00) 00012345 555555555 8** | |

For additional information on GS1 Logistic Label size and examples, refer to *GS1 Logistic Label Guideline* section "7 Size of the GS1 Logistic Label" and section "10 Practical examples".

### 8.1.3 How to include trade item information

Items that are priced or ordered or invoiced are considered trade items and are identified by a GTIN. Typically, supply chains are most efficient when:

GTIN of ordered item = GTIN on the item being delivered = GTIN of invoiced item.

This is an important consideration in logistic label design.

When it comes to including trade item information three types of logistic units can be distinguished:

- **A homogeneous logistic unit** containing one type of trade item. All the items at the highest level of packaging are the same and are identified with the same GTIN. Example: a pallet containing 50 trade item groupings (e.g. boxes) of Product X.
    - The GTIN is identified using GS1 Application Identifier (02) CONTENT, specifying the GTIN of the included trade items (the highest packaging level contained in the logistic unit)

    **Note:** Use of AI (02) is not the preferred option for regulated healthcare trade items.

- **A mixed /heterogeneous logistic unit** containing different types of trade items at the highest level of packaging that are identified with different GTINs. Example: a pallet containing 30 standard trade item groupings (e.g. boxes) of Product X and 20 standard trade item groupings (e.g. boxes) of Product Y.
    - No GTIN and related trade item information should be included

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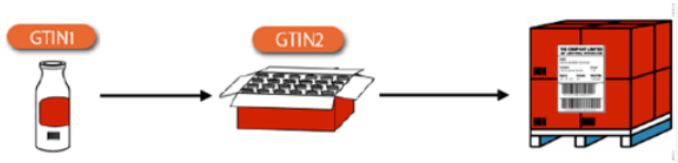
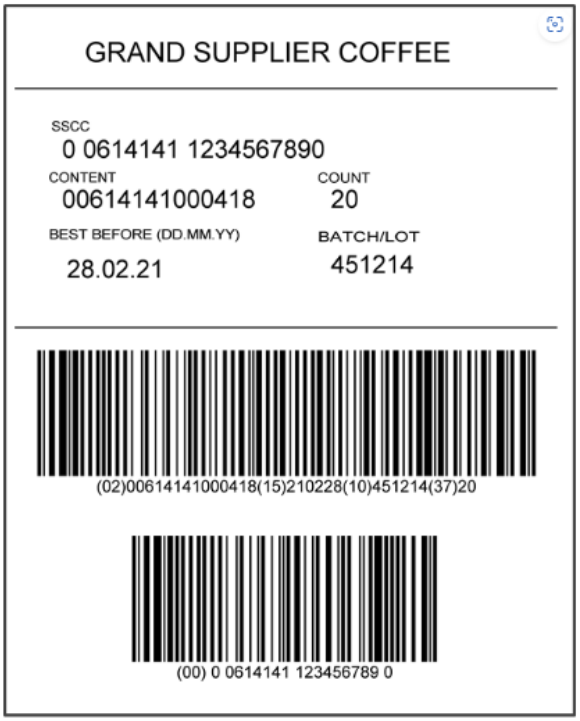
- **A logistic unit that is also a traded unit** (one that is priced or ordered or invoiced). Such logistic units can be homogeneous, for example goods in bulk, heterogeneous (for example display units), or a single product (for example a refrigerator, or a mobile phone transported as a parcel).
    - The GTIN is identified using GS1 Application Identifier (01) GTIN, specifying the GTIN of the trade item.

**Examples:**
**Homogenous Logistic Unit:**




| | |
|---|---|
| Mandatory data | **SSCC with AI (00)** |
| Optional data | GTIN2 with AI (02) + count of trade items contained with AI (37)<br>batch / lot number with AI (10)<br>one of the following dates if applicable: production date with AI (11), packaging date with AI (13), best before date with AI (15), expiry date with AI (17) |



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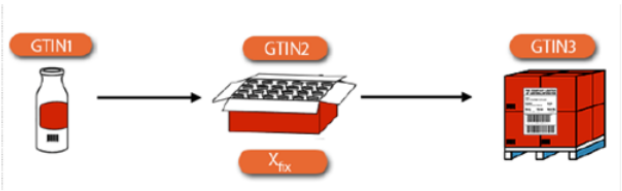
**Logistic Unit that is also a traded unit:**

<table>
<tr><td colspan="4"> 
</td></tr>
<tr><td>Mandatory data</td><td colspan="3">SSCC with AI (00)</td></tr>
<tr><td rowspan="2">Optional data</td><td>GTIN2 with AI (02)<br>count of trade items contained with AI (37)</td><td>OR</td><td>GTIN3 with AI (01)*</td></tr>
<tr><td colspan="3">batch / lot number with AI (10)<br>one of the following dates if applicable: production date with AI (11), packaging date with AI (13), best before date with AI (15), expiry date with AI (17)</td></tr>
</table>

### 8.1.4 Using GS1 Application Identifiers in Logistic Units

A GS1 Application Identifier is a prefix or qualifier that tells the scanner the meaning of the characters to follow. In the human readable part of the barcode symbol, the application identifier is the number in parentheses.

For example, on this logistic label, three different barcodes are identified by application identifiers:

(420) ship-to postal code
(91) store number
(00) SSCC

All barcodes that include a GS1 Application Identifier are encoded using the GS1-128 symbology.

In addition to the "stand-alone" applications, such as postal code and store number shown above, secondary product attributes, such as weight and production date, can be combined with a GTIN in a single concatenated barcode. Each part of the barcode is identified by a GS1 Application Identifier.

To learn more about using GS1 Application Identifiers, refer to the *GS1 General Specifications* section 3 GS1 Application Identifier definitions.

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# 9 APPENDIX

## 9.1 Glossary of Terms

| Term | Definition |
|---|---|
| 1D | See Linear barcode / one-dimensional barcode symbology |
| 2D | See two-dimensional (2D) barcode symbology |
| AI | Abbreviation for Application Identifier. |
| AIDC | Abbreviation for Automatic Identification and Data Capture. |
| Alphanumeric (an) | Describes a character set that contains alphabetic characters (letters), numeric digits (numbers), and other characters, such as punctuation marks. |
| Attribute | Additional information about an entity identified with a GS1 identification key. |
| Background | The lighter portion of a barcode symbol, including the quite zones and spaces between the bars. |
| Bar | The dark (low reflectance) rectangular element of a barcode symbol. |
| Barcode | A symbol that encodes data into a machine-readable pattern of adjacent, varying width,<br>parallel, rectangular or square dark and light spaces. The term barcode is inclusive of all linear<br>and two-dimensional (2D) versions. |
| Barcode Height | The dimension of a bar (line) measured from its top to its bottom. |
| Barcode Width | The thickness of a bar (line) measured from one of its edges to the other. |
| Batch/Lot | Associates an item with information the manufacturer considers relevant for traceability of the<br>trade item. |
| Bearer Bars | Bearer bars is the thick line around the barcode in an Interleaved 2 of 5 (ITF) shipping container code. They help define the edges of the barcode when it is printed on a rough surface. |
| Brand Owner | The organisation that owns the specifications of a trade item, regardless of where and by<br>whom it is manufactured. The brand owner is normally responsible for the management of the<br>Global Trade Item Number (GTIN) or other GS1 identification keys. |
| Carrier | The party that provides freight transportation services. A physical or electronic mechanism that carries data. |
| Check Digit | The check digit is the last digit that is calculated from the preceding numbers in accordance with a specific formula. It is used to confirm that the numbers in have been encoded and decoded correctly. |
| Company Number | See Company Prefix. |
| Company Prefix | Uniquely identifies the manufacturer who is licensed to use the Company Prefix. It is part of the barcode structure. See also, GS1 Company Prefix and U.P.C. Company Prefix. |
| Consumer Unit | The consumer unit is usually the smallest unit of a product that is normally sold to the consumer. It may also be referred to as an item. |
| Concatenation | The representations of several Element Strings in one barcode symbol. |
| Corrugated | A material comprised of one or more sheets of fluted paper stuck between flat sheets of paper (e.g., a brown box used for case packs). |

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| Term | Definition |
|---|---|
| Digits | Any one of the Arabic numerals 0 to 9. |
| EAN/UPC Symbology | A family of barcode symbols including EAN-8, EAN-13, UPC-A, and UPC-E barcode symbols. See also EAN-8 barcode Symbol, EAN-13 barcode Symbol, UPC-A barcode Symbol, and UPC-E barcode Symbol. |
| EAN-13 barcode | A barcode of the EAN/UPC symbology that encodes GTIN-13 or RCN-13. |
| EAN-8 barcode | A barcode of the EAN/UPC symbology that encodes GTIN-8 or RCN-8. |
| EDI | Abbreviation for Electronic Data Interchange. |
| EDI Transaction | The conversion of application data to and from the X12 standard format. |
| Electronic Data Interchange | The computer-to-computer transmission of business Interchange (EDI). Information using a public standard format. |
| Extension Digit | The first digit within the Serial Shipping Container Code (SSCC) which is assigned by the company that constructs the logistic unit. |
| Fixed Length | Term used to describe a data field in an element string with an established number of characters. |
| Function 1 Symbol Character (FNC1) | A symbology character used in some GS1 data carriers for specific purposes. |
| Global Trade Item Number | See GTIN. |
| GS1 | GS1 is a neutral, not-for-profit organization with Member Organizations in over 116 countries. The GS1 System of standards is the most widely used supply chain standards system in the world. See also, GS1 Canada |
| GS1-128 | A subset of code 128, a high-density alphanumeric symbology. |
| GS1 Application Identifier (AI) | A qualifier added to the barcode number, which tells the scanner the meaning of the numbers that follow. In the human readable part of the barcode symbol, the application identifier always appears in parentheses. For example, the application identifier for:<br>(00) Identifies an SSCC serial shipping container code<br>(01) Identifies a GTIN<br>(420) Identifies a Ship-to postal code within the same country |
| GS1 Canada | The GS1 Member Organization that administers the GS1 System in Canada. With roots that stretch back to 1975, GS1 Canada supports Canadian businesses of all types and sizes. |
| GS1 check digit calculation | An algorithm used by the GS1 system for the calculation of a check digit to verify accuracy of data. (e.g., modulo 10 check digit, price check digit). |
| GS1 Company Prefix (GCP) | A unique string of four to twelve digits used to issue GS1 identification keys. The first digits are a valid GS1 Prefix. The length of the GS1 Company Prefix must be at least one longer than the length of the GS1 Prefix. The GS1 Company Prefix is issued by a GS1 Member Organisation. As the GS1 Company Prefix varies in length, the issuance of a GS1 Company Prefix excludes all longer strings that start with the same digits from being issued as GS1 Company Prefixes. See also U.P.C Company Prefix. |
| GS1 DataMatrix | A subset of Data Matrix which uses the function that allows the encoding of element strings. |

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| Term | Definition |
|---|---|
| GS1 Digital Link URI | A Web URI syntax for expressing GS1 identifier keys and attributes in a format using GS1Application Identifiers and GS1 Application Identifier data fields as specified in the GS1 Digital Link standard. |
| GS1 element string | A syntax for expressing GS1 identifier keys and attributes in a format using GS1 Application Identifiers and GS1 Application Identifier data fields. |
| GS1 identification key | A unique identifier for a class of objects (e.g., a trade item) or an instance of an object (e.g., a logistic unit). |
| GS1 identification licensee | The person (natural or legal) to which the right to use a GS1 Company Prefix or a GS1 identification key has been granted through an agreement with a GS1 Member Organisation or GS1 Global Office, acting as licensor. GS1 identification licensees may use the licensed GS1 Company Prefix or GS1 identification key, subject to any terms and conditions in place when the licence was granted or set by the licensor from time to time, until such time as the agreement under which the licence was granted expires or in perpetuity if the agreement has no expiration date. |
| GS1 syntax | A data structure used within the GS1 system of standards for representing data elements.<br>GS1 syntax includes plain syntax, GS1 element string, GS1 Digital Link URI, and Electronic Product Code (EPC) URI. |
| GTIN | Global Trade Item Number is an umbrella term used to describe the entire family of GS1 data structures for trade item identification. GTIN is a 14-digit product identifier that has to be adopted for all globally available products by January 1, 2005. GTIN assignment is governed by the rules contained in the GS1 General Specifications. |
| GTIN-12 | The 12-digit GS1 Identification Key composed of a U.P.C. Company Prefix, Item Reference, and Check Digit used to identify trade items. |
| GTIN-13 | The 13-digit GS1 Identification Key composed of a GS1 Company Prefix, Item Reference, and Check Digit used to identify trade items. |
| GTIN-14 | The 14-digit GS1 Identification Key composed of an Indicator digit (1-9), GS1 Company Prefix, Item Reference, and Check Digit used to identify trade items. |
| GTIN-8 | The 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference and check digit used to identify trade items |
| Homogenous Case | A homogeneous case containing one type of trade item ((identical) trade items). All the items at the highest level of packaging are the same and are identified with the same GTIN. |
| Heterogeneous Case | A heterogeneous case containing different types of trade items that are identified with different GTINs. |
| Human Readable Interpretation (HRI) | Characters, such as letters and numbers, which can be read by persons and are encoded in GS1 AIDC data carriers confined to a GS1 standard structure and format. The human readable interpretation is the encoded data. Start, stop, shift and function characters, as well as the symbol check character, are not shown in the human readable interpretation. |
| human readable text | Refers to HRI and/or non-HRI text collectively, when referencing data that is encoded into a data carrier. |
| Indicator | A digit from 1 to 9 in the leftmost position of the GTIN-14. |
| ITF-14 Barcode | ITF-14 (a subset of Interleaved 2-of-5) barcodes carry GTINs only on trade items that are not expected to pass through the point-of-sale. |

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| Term | Definition |
|---|---|
| Item Reference number | The manufacturer assigns a unique item number to each product they are applying a barcode. This information must be maintained in the manufacturers database. The length of the assigned item number is dependant upon the licensed Company Prefix assigned to the organization. |
| Leading zero(s) | Adding zeroes in the leftmost position(s) of a data string when GTIN-8, GTIN-12, or GTIN-13 are encoded in an GS1 AIDC data carrier, message, or database that requires 14-digits or when used for the same intent in other data structures such as GRAI. |
| Linear barcode/ one-dimensional barcode symbology | Barcode symbology using bars and spaces in one dimension. |
| Logistic Unit | An item of any composition established for transport and/or storage that needs to be managed through the supply chain. It is identified with a Serial Shipping Container Code (SSCC). |
| Machine Readable Data | Machine-readable refers to the symbology barcode itself (bars and spaces), which is read by a scanner. |
| Mixed Case | See Heterogeneous Case |
| Nominal Size | The barcode dimension size specifications use nominal size = 100% of magnification (preferred size) for best scanning results. barcodes may be larger or smaller than the nominal size. Maximum and minimum sizes are outlined in the specifications for the different types of barcodes. |
| non-human readable interpretation text (nonHRI) | Characters such as letters and numbers that can be read by persons and may or may not be encoded in GS1 AIDC data carriers and are not confined to a structure and format based on GS1 standards (e.g., a date code expressed in a national format that could be used to encode a date field in a GS1 AIDC data carrier, brand owner name, consumer declarations). |
| Packaging Indicator | See Indicator |
| Packaging Type | Within the structure of an SSCC, the packaging type denotes a general type of container. Note: The application identifier is always shown in parentheses preceding the packaging type. (See SSCC structure.) |
| Point-of-Sale (POS) | Refers to the retail checkout where omnidirectional linear barcodes must be used to support high-volume laser-based scanning or low volume checkout where linear barcodes (or for regulated healthcare trade items, GS1 DataMatrix) are used with image-based scanners. |
| Quite Zone | An area to the left and right of a barcode that is free of all printing or graphics, which enables the scanner to read the barcode symbology. The quiet zones are an integral part of the barcode symbol. |
| Scanner | A scanner is an electronic device to read barcodes and convert them into electrical signals understandable by a computer devise. |
| Serial Number | The serial number is a unique 9-digit number assigned by a manufacturer to identify a shipping container. The number should not be repeated on any other shipping container for 12 months or while the shipping container (containing the product) may still be in use, whichever is longer. The serial number is part of the serial shipping container code. It may also refer to a stand-alone alphanumeric or numeric character using application identifier 21 or 250. |

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| Term | Definition |
|---|---|
| Serial Reference | A component of the Serial Shipping Container Code (SSCC) assigned by the physical builder or brand owner of the logistic unit to create a unique SSCC. |
| Serial Shipping Container Code (SSCC) | The GS1 identification key used to identify logistics units. The key comprises an extension digit, GS1 Company Prefix, serial reference and check digit. |
| Shipment | A grouping of logistic and transport units assembled and identified by the seller (sender) of the goods travelling under one despatch advice and/or Bill of Lading to one customer (recipient). |
| Symbology | A defined method of representing numeric or alphabetic characters in a barcode; a type of barcode. |
| Symbology | A defined method of representing numeric or alphabetic characters in a barcode; a type of barcode. |
| Trade Item | Any item (product or service) upon which there is a need to retrieve predefined information and that may be priced, or ordered, or invoiced at any point in any supply chain. |
| Trade Item Grouping | A predefined composition of trade item(s) that is not intended for point-of-sale scanning. It is identified with a GTIN-14, GTIN-13, or GTIN-12. |
| Truncation | Printing a symbol shorter than the symbology specification's minimum height recommendations. Truncation can make the symbol difficult for an operator to scan. |
| two-dimensional (2D) barcode symbology | Optically readable symbols that must be examined both vertically and horizontally to read the entire message. 2D barcodes may be one of two types: matrix symbols and multi-row symbols. 2D barcodes have error detection and may include error correction features |
| U.P.C. | See GTIN-12. |
| U.P.C. Company Prefix | A GS1 Company Prefix starting with a zero ('0') becomes a U.P.C. Company Prefix by removing the leading zero. A U.P.C. Company Prefix is used to issue and allocate GTIN-12. |
| UPC-A barcode | A barcode of the EAN/UPC symbology that encodes GTIN-12 and RCN-12. |
| UPC-E barcode | A barcode of the EAN/UPC symbology representing a GTIN-12 in six explicitly encoded digits using zero-suppression. |
| X12 | X12, chartered by the American National Standards Institute, develops and maintains EDI standards and XML schemas which drive business processes globally. |
| X-dimension | The specified width of the narrowest element of a barcode. |

## 9.2 Legacy (retired) Terms

| Legacy Term | Current Term |
|---|---|
| Interleaved 2 of 5 | ITF-14 Symbol |
| SCC-14 | Global Trade Item Number (GTIN) |
| SSCC-18 | SSCC |

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