
Getting Started with GS1-128 Barcodes in Foodservice

Recommendations developed by the Foodservice GS1 US Standards Initiative

GS1-128 barcodes are used to encode trade item data and logistic unit information for cases and pallets that are not intended to pass through retail point-of-sale (POS). The use of this barcode helps to support fast and accurate data capture and inventory tracking, adding visibility to your supply chain.



The GS1-128 barcode is more than just a number. Specific information can be encoded in GS1-128 barcodes through the use of GS1 Application Identifiers (AIs). Global Trade Item Number® (GTIN®), Batch/Lot/Serial Numbers, and Production Dates are examples of data that can be included. This additional dynamic product data, which is used in advanced barcoding, is increasingly viewed as important by many operators and distributors.

Basic Education

1. **Online Education:** GS1 US has developed a Learning Management System (LMS) which houses many short videos on how to properly leverage standards in your organization. These videos will answer many frequently asked questions regarding the GS1 Company Prefix, GTINs and barcoding your products, among other topics. A foodservice specific syllabus has been created for information pertaining to our industry vertical. Access to the LMS is free (you'll need to create an account) and can be accessed at: www.gs1us.org/online-training-courses
2. **Barcode Quality:** Ensuring your barcodes scan the first time, every time is vital. Barcode verification is the best way to increase scanability and help your barcodes scan the first time, every time. Poor quality barcodes may cost you time, productivity, and money. Using a barcode verification service will help ensure the highest quality barcodes. GS1 US has certified several solution providers on compliance to the standards, you may access this list of partners at: www.gs1us.org/barcode-verification
3. **Industry Guidelines for GS1-128 Barcode Labeling:**
 - a. *The North American Industry Implementation Guidance for Standard Case Code Labeling:* This document provides best practice guidelines for industry-wide adoption of a common standard for case-labeling information for finished products in the grocery and foodservice sectors. A copy of the guide can be found here: www.gs1us.org/NACaseLabelingGuidance
 - b. *The Foodservice GS1 US Standards Initiative's Voluntary GS1-128 Barcode Guideline for Cases and Cartons:* This document contains foodservice-specific guidance for GS1-128 implementation and is meant to be a companion guide to the North American Implementation Guidance document listed above. It outlines how foodservice operators, distributors and manufacturers are realizing the benefits of case-level barcoding and beginning to make the necessary investment in labelling and scanning technology. A copy of the guide can be accessed at: www.gs1us.org/Voluntary-Foodservice-GS1-128-Guideline



- c. The *Foodservice Implementation Guideline for Case Level Traceability Using GS1 Standards* was developed by the Foodservice GS1 US Standards Initiative with input from industry stakeholders to create guidance for implementing case-level traceability processes leveraging GS1-128 barcodes. This guidance outlines the steps needed to capture Key Data Elements at Critical Tracking Events from growers/suppliers to operators/restaurants. No matter what role you play in the supply chain, the document provides step-by-step instructions on what information should be collected and when, how to record that information, as well as the business steps and data need to be captured for effective traceability. You can access this document at: www.gs1us.org/Foodservice-Traceability-Guide

How to Implement

Implementation Checklists: The Foodservice GS1 US Standards Initiative has created implementation checklists to aid those getting started in the adoption and usage of GS1 standards. These checklists are broken out by manufacturer, distributor and operator. A copy of each can be accessed at: www.gs1us.org/industries/foodservice/implementation-resources

There are multiple steps to implementation:

1. **Identify:** Assign Global Trade Item Numbers (GTINs) to all of your products, at each of the hierarchy levels that need to be priced, ordered, or invoiced at any point in the supply chain.
 - a. **GS1 Company Prefix:** The first step in creating the GS1-128 barcode and the GTIN that goes into them is to obtain a GS1 Company Prefix. A GS1 Company Prefix is a unique identification number that GS1 US® issues just to your company—and it's part of every identification number, for example a GTIN®, that you create. It's an internationally accepted way to uniquely identify your brand in the global supply chain. For more information on how to get started please visit this link: www.gs1us.org/upcs-barcodes-prefixes/get-started-guide
 - b. **Creating a 14-digit GTIN:** This 14-digit number is used to identify individual cases. Suppliers can utilize GS1 US Data Hub | Product to create GTINs quickly and be confident that they are properly formatted and follow GS1 Standards. Please see our website at www.gs1us.org/tools/gs1-us-data-hub/product. Additionally, more information can be found in the "Education" section above.
 - c. **Determine any additional data elements to support identification:** Determine the GS1 Application Identifiers based on (1) the product; and (2) trading partner capabilities. The selection criteria can be found in the Foodservice guideline highlighted above in the "Education" section.
2. **Capture:** Create a GS1-128 barcode for your cases, which for foodservice should include the GTIN, the appropriate product date(s), and batch/lot or serial number.



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- a. Utilize proper barcode production software to encode the GTIN and other extended data with the proper GS1 Application Identifiers. Please refer to your operator's implementation guidelines as well as the Foodservice GS1 US Standards Initiative's Voluntary GS1-128 Barcode Guideline from the "Education" section above.
 - b. Test printed barcodes. Barcode verification is the best way to increase scanability and help your barcodes scan the first time, every time. Poor quality barcodes may cost you time, productivity, and money. For a list of testing options, please see our website at: www.gs1us.org/barcode-verification
3. **Share:** Be sure to provide transactional or master data information, per your trading partner agreements, via electronic data interchange (EDI) or the Global Data Synchronization Network™ (GDSN®) standards.
 4. **Tools and Resources:**
 - a. Best Practices on Barcode Printing Directly on Corrugate Cases: This document provides assistance for suppliers who wish to print barcodes directly on corrugate. A copy of the guide can be accessed at: www.producetraceability.org/documents/Direct_Print_Best_Practices_Guideline_Jan_2012.pdf
 - b. Guidance on Barcode Color and Placement: This information provides simple GS1 recommendations on proper barcoding placement. More information can be found at: www.gs1us.org/upcs-barcodes-prefixes/get-started-guide/4-place-barcodes-onproducts

Common Mistakes in GS1-128 Barcode Implementation

- 1) **GS1-128 vs. Code 128:** Analyzing the differences between a GS1-128 and Code 128 Barcodes. The GS1-128 is a **subset** of the Code 128 barcode. Although the barcodes may look the same, you must ensure that it utilizes the special character (Function Code 1 or FNC1 character) at the beginning of the data string along with the proper GS1 Primary Identifier, such as a Global Trade Item Number (GTIN). You can consult with your barcode production software manufacturer on how to implement the Function Code 1 character.
- 2) **Direct Print on Corrugate:** Printing a GS1-128 barcode directly on craft (brown corrugate) does not deliver the same performance as an ITF-14 barcode. There are different print quality grades differentiating between the GS1-128 and ITF-14, therefore a GS1-128 may not scan accurately if directly printed on this type of corrugate. Please see Best Practices on Barcode Printing Directly on Corrugate Cases in the "Tools and Resources" section of this document.
- 3) **Barcode scanner compatibility:** Some barcode scanners may not be able to "read" the GS1-128 barcode because the functionality is not activated. Consult with your scanner manufacturer in order to "turn-on" the capability of scanning a GS1-128 barcode. There is no need to purchase a new scanner/imager.



- 4) **GS1-128 Barcode Size limitation is 48 characters:** Be careful not to exceed the 48 character limit within a GS1-128 barcode. The characters that are included are the Application Identifiers and specific data elements, for example if the GTIN was only encoded in the GS1-128 barcode the total character count would be 16 (2 for the AI (01) and 14 for the GTIN itself). Consult with your trading partner's GS1-128 barcoding requirements in addition to the Industry Guidelines noted above in the "Education" section.
- 5) **Proper GS1-128 barcode formatting:** The GS1 Application Identifiers are displayed in parenthesis e.g., AI (10) in the human readable information below the barcode, but the parenthesis are not to be encoded within the barcode, therefore the data packet/message should not have any parentheses within it.
- 6) **Proper Barcode Size, Placement, and Positioning:** There are standards for proper barcode placement on cases, for example proper placement is having a barcode on 2-adjacent sides of the case and 1.25" from the bottom of the base of the case and 0.75" away from the vertical edge of the case. See Section 6.7 of the [GS1 General Specifications](#) for the full details on placement.
- 7) **Application Identifier Positioning:** When creating a GS1-128 barcode, best practice is to order the Application Identifiers (AIs) in the following order: First is the GS1 Identifier, GTIN AI (01), next include any fixed length Application Identifiers, such as the Pack Date AI (13) or Sell-By Date AI (16), then last is the variable length fields, such as the Batch/Lot Number, AI (10) or Serial Number, AI (21). These AIs are used as examples and following the best practice can help ensure proper barcode encoding. Please note the Function Code 1 (FNC1) character is also used to separate multiple variable length AIs and must be encoded within the barcode. Therefore, if you chose to encode a Batch/Lot Number **AND** a Serial Number, the Function Code 1 is needed to separate the two. This is needed for all Variable length AIs. For more information on Application Identifiers, please see Section 3 of the [GS1 General Specifications](#).
- 8) **Proper GS1 Encoding Rules on 4-Digit Application Identifiers (AIs):** Some of the 4-digit AIs have a 4th position for encoding that is reserved for an implied decimal point position and may cause confusion in the supply-chain if not properly followed. For example for the AI on Net Weight in Pounds can drastically alter the stored value based on the decimal point position. If the Net Weight was AI (3200) and the value contained is 000400, then the value is stored as 400 LBS., but if the AI is AI (3202) and the same value is contained, 000400, then the value is stored as 4 LBS. The rules are highlighted in Section 3 of the [GS1 General Specifications](#).



About GS1

GS1® is a neutral, not-for-profit, global organization that develops and maintains the most widely-used supply chain standards system in the world. GS1 Standards improve the efficiency, safety, and visibility of supply chains across multiple sectors. With local Member Organizations in over 110 countries, GS1 engages with communities of trading partners, industry organizations, governments, and technology providers to understand and respond to their business needs through the adoption and implementation of global standards. GS1 is driven by over a million user companies, which execute more than six billion transactions daily in 150 countries using GS1 Standards.

About GS1 US

GS1 US®, a member of GS1 global, is a not-for-profit information standards organization that facilitates industry collaboration to improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely-used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®).

About the Foodservice GS1 US Standards Initiative

The Foodservice GS1 US Standards Initiative serves as a strategic effort in which industry trade associations and individual companies may choose to join on a voluntary basis to assist with their company's adoption and implementation of GS1 Standards. Nothing herein should be construed as constituting or implying an agreement among foodservice companies to adopt or implement GS1 Standards. Nothing herein should be construed as constituting or implying an agreement regarding any company's prices, output, markets, or dealings with customers and suppliers. Nothing herein is inconsistent with the proposition that each participating company must and will exercise its independent business judgment on all standards adoption.