Global Trade Item Number® (GTIN®) Implementation Guide

Executive Summary

The GTIN (Global Trade Item Number) is the foundation for the EAN.UCC System for uniquely identifying trade items (products and services) sold, delivered, warehoused, and billed throughout the retail and commercial distribution channels. It provides an accurate, efficient and economical means of controlling the flow of products and information through the use of an all-numeric identification system.

The Global Trade Item Number (GTIN) is the globally unique EAN.UCC System identification number for trade items, which encompasses both products and services. GTINs provide the capability to deliver unique identification worldwide. GTINs are encountered everyday because that is what is encoded in U.P.C. and EAN-13 symbols.

GTINs are a key component of e-commerce transactions. Users can be confident that a GTIN, when used correctly, will uniquely identify their products as they pass along the global supply chain to the ultimate end user. This global identification system ensures that the corresponding electronic communications will contain information unique to their company and products.

Key Benefits

- Facilitates the global flow of trade items (products and services) and associated information along the supply chain.
- Identifies uniquely trade items at all levels of packaging (item, case, and pallet).
- Allows accurate machine read (scanning) identification of trade items when encoded in bar codes and Radio Frequency Identification (RFID) tags of the EPCglobal Network™.
- Delivers trade item data in a consistent format and structure.
- Simplifies supply chain management.
- Employs the globally accepted and utilized EAN.UCC System whose language is understood by the global marketplace.

Why Standards?

Open, global standards:

- Allow system-to-system interaction

- Speed processes by enabling end-to-end automation
- Lower costs, while reducing errors
- Reduce the risk of system incompatibility
- Protect technology investments by removing the limitations of closed, proprietary systems and solutions
- Enable the optimization of supply chain management practices
- Eliminate supply chain roadblocks and bottlenecks

In today's competitive global marketplace, speed and efficiency is critical to success and survival. Producing a good product is no longer enough to keep a company competitive. Managing the physical flow of product with the electronic flow of business data is a major challenge in today's intensely competitive environment. The same time, attention, and detail that goes into designing and producing a quality product must also be evident in the transmission of that product's business data through the supply chain. A system built with standardized processes and a common business language is needed to monitor and manage the movement of product and information through every component along the supply chain.

Definition

The Global Trade Item Number is the globally unique EAN.UCC System identification number, or key, used for trade items (products and services). It is used for uniquely identifying trade items (products and services) sold, delivered, warehoused, and billed throughout the retail and commercial distribution channels. A GTIN is a numeric data structure containing 8 digits, 12 digits, 13 digits, or 14-digits. It is recommended that GTINs are represented in software applications as 14-digits by right justifying and zero filling left, as appropriate.

The term *trade item* refers to any product or service upon which there is a need to retrieve pre-defined information; this product or service may be priced, ordered, or invoiced at any point in the supply chain. This includes individual items as well as all of their different packaging configurations.

There are four data structures for the GTIN; each provides unique numbers when right justified in a 14-digit database field:

- UCC-12 (Twelve Digits)
  - Six digits representing the UCC Company Prefix
  - Five digits representing the Item Reference number
  - One digit representing the Check Digit

  Or

    - Seven digits representing the UCC Company Prefix
    - Four digits representing the Item Reference number
    - One digit representing the Check Digit

    Or

    - Eight digits representing the UCC Company Prefix
    - Three digits representing the Item Reference number
    - One digit representing the Check Digit

    Or

    - Nine digits representing the UCC Company Prefix
    - Two digits representing the Item Reference number
    - One digit representing the Check Digit

- EAN/UCC-13 (Thirteen Digits)
    - Twelve digits containing the EAN.UCC Company Prefix and Item Reference number
    - One digit representing the Check Digit
- EAN/UCC-14 (Fourteen Digits)
    - One digit representing the Indicator digit to indicate packaging level
    - Twelve digits containing the EAN.UCC Company Prefix and Item Reference number
    - One digit representing the Check Digit
- EAN/UCC-8 (Eight Digits)
    - Seven digits containing a EAN.UCC Company Prefix and Item Reference number
    - One digit representing the Check Digit

UCC Company Prefix – the number assigned to a company by the UCC. The inclusion of the UCC Company Prefix ensures uniqueness throughout the world. The UCC Company Prefix is assigned to companies in varying lengths. Note: A UCC Company Prefix is converted to an EAN.UCC Company Prefix by adding a leading zero, e.g., UCC Company Prefix 614141 becomes 0614141.

EAN.UCC Company Prefix – the number assigned to a company by either an EAN Member Organization or by the UCC. The inclusion of the EAN.UCC Company Prefix ensures uniqueness throughout the world. The EAN.UCC Company Prefix is assigned to companies in varying lengths.

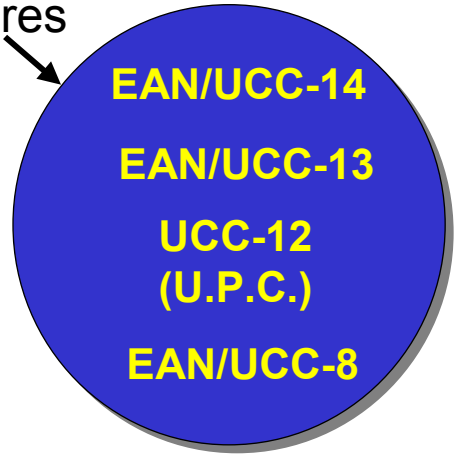
Item Reference – the number assigned by the holder of the EAN.UCC Company Prefix to uniquely identify a trade item within the company. The Item Reference varies in length as a function of the Company Prefix length.

Check Digit – a calculated one-digit number used to ensure data integrity. To understand how this digit is calculated; visit the UCC at http://www.uc-council.org/checkdig.htm.

Global Trade Item Number®

GTIN data structures

- Globally unique 8, 12, 13, and 14-digit numbers to identify trade items (product or service)



GTINs® in a GTIN Compliant database

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
UCC-12	0	0	X	X	X	X	X	X	X	X	X	X	X	C
EAN/UCC-13	0	X	X	X	X	X	X	X	X	X	X	X	X	C
EAN/UCC-8	0	0	0	0	0	0	X	X	X	X	X	X	X	C
EAN/UCC-14	X	X	X	X	X	X	X	X	X	X	X	X	X	C

The GTIN may be encoded in EAN/UPC, ITF-14, and UCC/EAN-128 symbologies. The appropriate data structure and symbology combination is

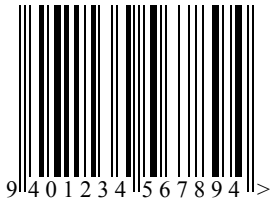
determined by many factors, such as the type of product, supply channel, and printing material used for the product packaging.

The following table provides examples of unique product identification at various levels and using various bar codes.

Desc.	Item	Level	Bar Code	GTIN	GTIN in database
Product A	1 Unit	Consumer	U.P.C.	614141000012	00614141000012
Product A	96 Units	Case	ITF-14	00614141000029	00614141000029
Product B	1 Unit	Consumer	U.P.C.	614141000777	00614141000777
Product B	6 Pack	Consumer	U.P.C.	614141000883	00614141000883
Product B	12 Pack	Consumer	U.P.C.	614141000999	00614141000999
Product B	2x12 Pack	Case	UCC/EAN-128	10614141000996	10614141000996
Product B	4x12 Pack	Case	UCC/EAN-128	30614141000990	30614141000990
Product B	8x12 Pack	Case	ITF-14	50614141000994	50614141000994

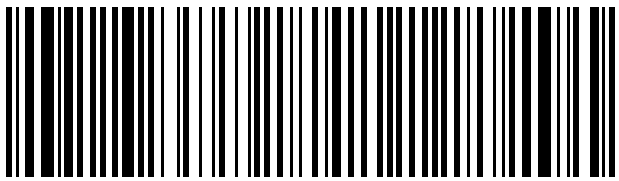
The following illustrates the use of a GTIN in UPC-A and EAN-13 bar codes:

UPC-A symbol
UCC-12 structure



EAN-13 symbol
EAN/UCC-13 structure

The following illustrates a GTIN in a UCC/EAN-128 bar code:

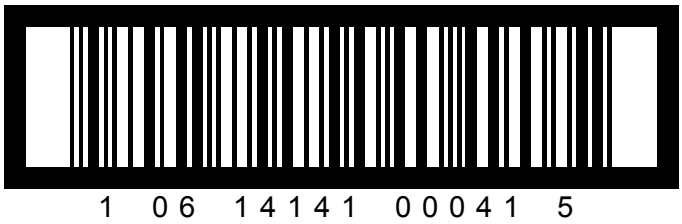


(01) 90614141000415 (3202) 000712

Note:

- When UCC/EAN-128 symbology is used to encode a GTIN, the AI of (01) prefixes the data
- Ability to string together (concatenate) multiple fields (Here, the GTIN plus net weight in pounds)

The following illustrates a GTIN in an ITF-14 bar code:

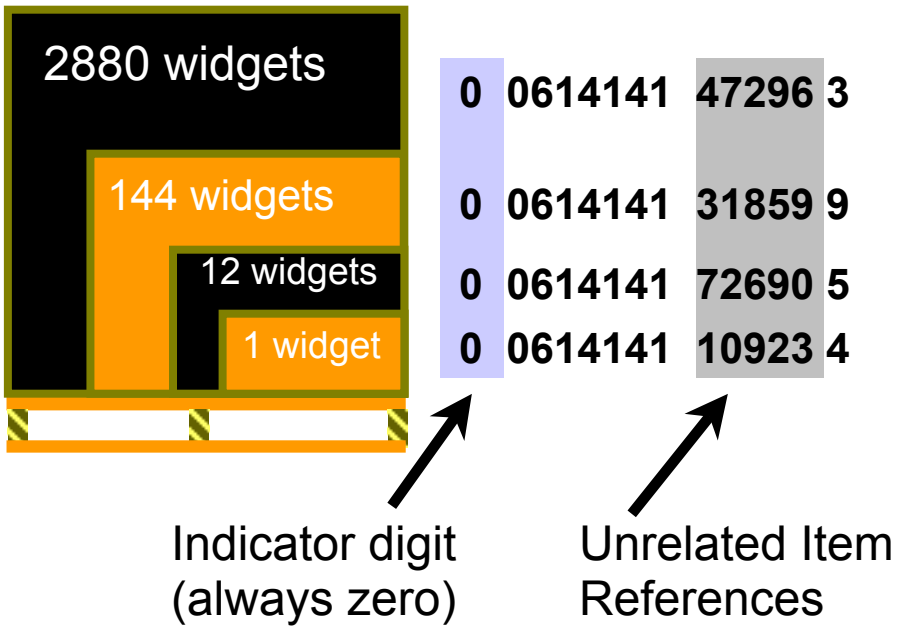


Note:

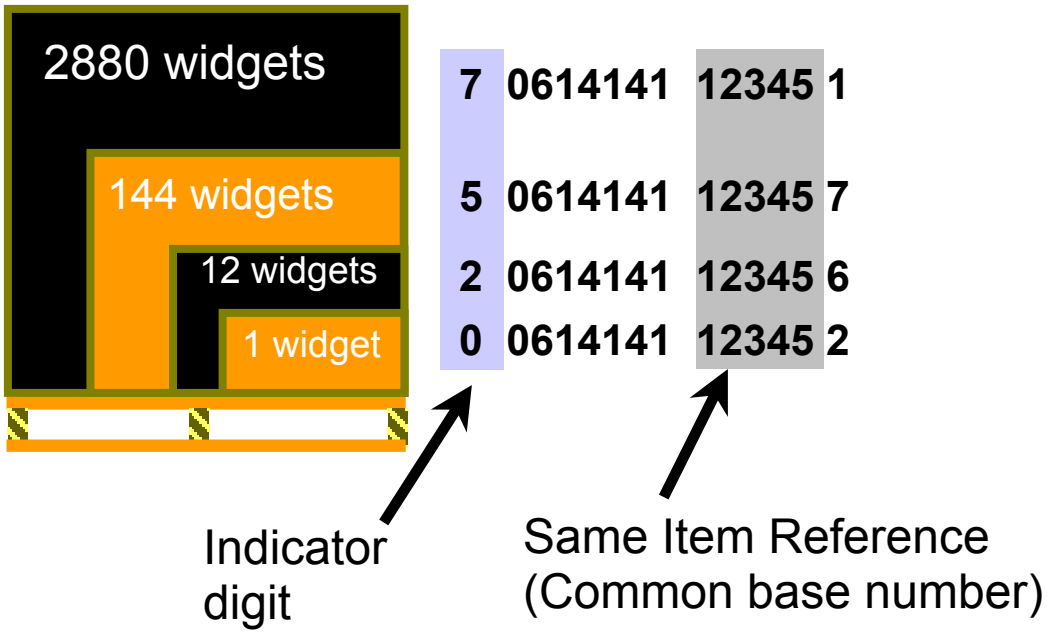
- ITF-14 = The EAN.UCC system's only use of Interleaved 2 of 5. It is only used to encode the GTIN
- Any of the GTIN data structures may be used, as long as they are expressed as a 14-digits

The following illustrates the assignment of GTINs at various item and package levels; note that uniqueness can be achieved through the use of different Indicator digits or different Item References at the higher levels of packaging.

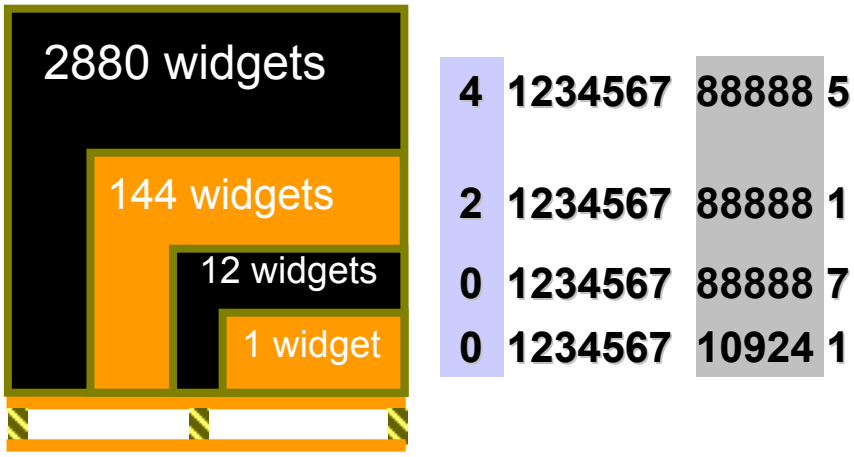
Item Reference for higher levels of packaging



Indicator digit for higher levels of packaging



Combination of Indicator digit and Item Reference for higher levels of packaging



Why is the GTIN useful?

Uniqueness: The GTIN identifies an item uniquely. The rules for assigning GTINs ensure that every variation of an item (product or service) is allocated a single reference number that is globally unique.

Non-significance: The GTIN numbering structure does not contain any meaningful information in itself. GTINs are simple pointers to database information that can be directly used in any company and in any country.

Multi-sectoral: GTINs are unique across all business sectors. This means that a healthcare product, a PC sound card or an internet-ordered service are all identified in a compatible manner.

International: GTINs are unique worldwide. A GTIN assigned anywhere in the world and can be used anywhere in the world.

Security: Security of GTINs is provided through a combination of database look-up and the fixed length, numeric format that includes a standard Check Digit.

Data Integrity: The Check Digit ensures the integrity of data passing into the system.

Source Numbering: The GTIN is assigned by the brand owner of the product. Once assigned, all trading partners and internal users can use the GTIN. The same GTIN can be used to identify a series of identical items.

Automatic Data Capture: One of the key benefits of the GTIN is that it can be encoded in many automatic data capture technologies (such as a bar code or radio frequency identification tags). Scanning allows the information flow to be linked to the physical flow of trade items through the supply chain.

Examples of GTIN Use

According to a KPMG study, “the adoption of an industry standardized numbering system provides benefits and savings across the supply chain. The initial ones were related to increased process efficiencies, reduction of errors, etc. More significant, but more difficult to capture, were the benefits from supply chain visibility and collaboration, that can drive significant inventory reductions across the whole supply chain.”[1]

In the book industry, the move to computerize book information led to the realization that a descriptive/alpha system was too cumbersome. In the grocery industry, the idea had been around, but the evolution of commercially viable scanning equipment signified an opportune moment. It is significant to note that both industries adopted an all-numeric schema.

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[1] *Industry Standard Numbering Systems in the Globalization of Supply Chains and Markets*, KPMG Consulting LLC, September 28, 2000.

Only in the grocery industry have significant attempts been made to quantify the benefits. Net benefits (after implementation costs) were initially estimated at approximately 1% of sales, but more recently revised to 2.8% of sales, or US$8 billion. These benefits were primarily due to increased process efficiencies and productivity gains. The same studies also estimate that an additional US$15 billion of benefits could potentially be realized through improved collaboration[2].

In the case of the book industry, the benefits and savings of using a standard product identification numbering system were considered so obvious that a cost/benefit analysis was not even done to quantify anticipated results.

In conclusion, the agreement to adopt a standardized product identification numbering system provides the foundation to reap extensive benefits throughout the supply chain, not only for all the individual members but also in growing the whole industry.

All EAN.UCC Identification Numbers

EAN.UCC identification numbers, or keys, identify:

Trade items: Products and services upon which there is a need to retrieve pre-defined information at any point in the supply chain (Global Trade Item Number/**GTIN**).

Logistic units: Physical units established for transport and storage of goods of any kind that need to be tracked and traced individually in a supply chain (Serial Shipping Container Code/**SSCC**).

Assets: Fixed or returnable assets (Global Individual Asset Identifier/**GIAI**, Global Returnable Asset Identifier/**GRAI**).

Locations: Physical locations, functional entities, or legal entities requiring a permanent identification, such as a company, department, or warehouse (Global Location Number/**GLN**).

Service Relations: Public or private service provider to track any entity's service requirements and needs over a continuing relationship (Global Service Relation Number/**GSRN**).

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[2] *17 Billion Reasons to Say Thanks: The 25th Anniversary of the U.P.C. and Its Impact on the Grocery Industry*, PriceWaterhouseCoopers, December 14, 1999.

Frequently Asked Questions

1. Why are the UCC and EAN promoting the use of GTINs?

GTIN is a new term, not a new standard. The term was introduced to ensure consistent terminology around the world. Since the U.P.C. symbol encodes a 12-digit GTIN, the UCC has been promoting GTINs since 1972. GTINs ensure that trade items are identified uniquely around the world, which enables more efficient global trading.

2. Do GTINs replace the U.P.C.?

No, GTIN is a new term only. Remember the U.P.C. symbol encodes a 12-digit GTIN. The U.P.C. does not go away; companies that place a UCC-12 (U.P.C.) on products now should continue to do so.

3. Is a unique GTIN required for every level of packaging?

Yes. There should be a unique GTIN identifying the single unit, an inner, multi-pack, and a case.

4. What is 2005 Sunrise?

By January 1, 2005 United States and Canadian companies must be capable of scanning and processing EAN-8 symbols and EAN-13 symbols, in addition to 12-digit U.P.C. symbols, at point-of-sale. The UCC announced this initiative in 1997 to allow U.S. and Canadian companies ample time to address all conversion issues. See http://www.uc-council.org/2005sunrise for complete information.

5. What is GTIN Compliance?

A company or product that is able to process, store, and communicate with trading partners using all GTINs, whether 8, 12, 13, or 14 digits. Because many company must expand systems and software to 13-digits for 2005 Sunrise, the UCC recommends becoming GTIN Compliant by expanding to 14-digits. This will support the GTIN on products at all levels of packaging (consumer, inner packs, cases, and pallets, etc.) The three reasons to become GTIN Compliant are:

- Global Data Synchronization Network (GDSN) including UCCnet™ Services
- Reduced Space Symbology (RSS)
- EPCglobal Network™

6. ***Does my company need a new UCC Company Prefix to create GTINs?***

   No. Continue to use the one you have.

7. ***What data structures are considered GTINs?***

   EAN/UCC-8, UCC-12, EAN/UCC-13, and EAN/UCC-14.

8. **If a change is made to the product does the GTIN need to change?**

   A separate unique GTIN is required whenever any of the pre-defined characteristics of a trade item are different in any way that is relevant to the trading process. The guiding principle is if the consumer is expected to distinguish a new trade item from an old trade item and purchase accordingly, a new GTIN should be assigned to the new trade item (product package and shelf edge label declarations should appear the same to the consumer). For complete information refer to *GTIN Allocation Rules* document available individually or included within *Bar Codes and Identification Numbers* section of the UCC Solutions Center®.

9. ***When is a "9" used as the Indicator digit in a GTIN?***

   It is used to indicate a variable measure product.

10. ***What are the correct ASC X12 EDI qualifiers for GTIN?***

    The correct qualifiers are UK for 14-digit GTINs, EN for 13-digit GTINs, UP for 12-digit GTINs, and EO for 8-digit GTINs.

Standard Reference

The UCC Solutions Center® - your one-stop source for EAN.UCC System tools to help you **improve supply chain management and conduct business more productively**. You will find the essential education and implementation resources you need to:

- Integrate and utilize the standards of the EAN.UCC System in your business
- Guide you through the bar coding process
- Improve the efficiency of your electronic commerce activities
- Uniquely identify your company's products, assets, locations, and logistics units throughout the global supply chain

Specifically, *Bar Codes for Different Uses* will guide you through the implementation process, giving you specific solutions and guidelines to properly mark products and logistics units for use within the EAN.UCC System. This easy-

to-follow system will guide you through the essentials of the bar coding process to help you:

- Assess where you will use the bar code
- Determine the specific information to include in the bar code
- Prepare bar code specifications for those responsible for printing your bar codes

A preview can be seen at http://www.uc-council.org/solutionscenter.

Glossary

http://usnet03.uc-council.org/glossary

Further Help

E-mail: mailto:info@uc-council.org

Phone: 1.937.435.3870

Web site: http://www.uc-council.org/