



WR15-006 mark-up changes to GS1 General Specifications

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Section 1. **Basics and Principles of the GS1 System**

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1.1. The GS1 General Specifications

1.1.1. Introduction

The GS1 System originated in the United States and was established in 1973 by the Uniform Product Code Council, known until recently as the Uniform Code Council, Inc. (UCC) and since 2005 as GS1 US. The UCC originally adopted a 12-digit identification number, and the first ID numbers and barcodes in open trade were being scanned in 1974. Following the success of this U.P.C. System, the European Article Numbering Association, previously known as EAN International, but launched as GS1 in 2005, was established in 1977 to develop a compatible system for use outside North America. The EAN System was designed as a superset of the UCC System and principally used 13-digit numbers. As a consequence of using certain barcodes and data structures, the GS1 System has expanded.

The GS1 System provides for the use of unambiguous numbers to identify goods, services, assets, and locations worldwide. These numbers can be represented in barcodes to enable their electronic reading wherever required in business processes. The system is designed to overcome the limitations of using company, organisation, or sector specific coding systems, and to make trading much more efficient and responsive to customers.

These identification numbers are also used in Electronic Data Interchange (EDI), XML electronic messaging, Global Data Synchronization (GDSN), and GS1 Network Systems. This document provides information about syntax, assignment, allocation and Automatic Data Capture (ADC) standards for GS1 identification numbers.

In addition to providing unique identification numbers, the GS1 System provides for supplementary information, such as best before dates, serial numbers, and batch numbers, which can appear in barcode form. Currently, barcodes are used as the data carriers, but other technologies, such as radio frequency tags are being developed within EPCglobal as carriers of GS1 data. Changes take place only after wide consultation and are subject to a significant migration period.

By following the principles and design of the GS1 System, users can design applications to process GS1 System data automatically. The system logic guarantees that data captured from GS1 endorsed barcodes produces unambiguous electronic messages, and processing can be fully pre-programmed.

The GS1 System is designed for use in any industry or trade sector, and any changes to the system are introduced so as not to negatively affect current users.

In February 2005, GS1 was officially launched as the successor to the organisations previously known as EAN and UCC. This document is the concise definition and explanation of the use of the GS1 System standards within Automatic Identification and Data Capture (AIDC) technologies, and supersedes all previous AIDC technical documents provided and/or published by GS1 or its predecessor organisations. The document takes immediate effect as the agreed GS1 foundational standards including Application, Identification, and Data Carrier components and principles. Every organisation using GS1 System standards is requested to conform fully to the *GS1 General Specifications*.

1.1.2. Who Should Read These Specifications

The primary audiences of the *GS1 General Specifications* are GS1 Member Organisations and technically oriented users and suppliers.

These specifications provide a global reference document covering all technical aspects of the GS1 System. Their primary objective is to define the international standard upon which individual GS1 Member Organisations can develop user documentation. They are maintained in English and translated into local language by Member Organisations.

1.1.3. Foundational Standards

These *GS1 General Specifications* are the foundation for GS1 Electronic Messaging:

- Electronic Data Interchange (EDI)
- XML
- GDSN
- Net Solutions

The definitions in the *GS1 General Specifications* are the foundation of the [GS1 Global Data Dictionary](#).

1.1.4. Maintenance Responsibility and Management

The GS1 Global Standards Management Process (GSMP) is the mechanism to approve the adoption of additions and changes to the *GS1 General Specifications*. The process is fully defined in the [Global Standards Management Process Manual](#).

1.1.5. The Barcodes Technology Group (BTG)

The Barcodes Technology Group (BTG) provides advice and guidance from the solution provider community regarding practical implementation issues and technical applications. In addition, BTG provides expertise for testing and trial implementations.

1.2. GS1 System Principles

The GS1 System embodies an open architecture approach. It has been carefully designed for modular expansion with minimal disruption to existing applications. Enterprise Resource Planning (ERP) and other supply chain application software drive implementation of the system. New user driven applications can be expected, and this document will be updated accordingly.

The maintenance of these specifications will be the responsibility of GS1 and will be in line with the [GS1 Architecture Principles](#).

1.3. Identification System Policies

The GS1 identification system provides the world a globally unique and unambiguous identification system for physical entities, parties, and relationships exchanged in the supply chain. The policies that follow apply to all sectors making use of the GS1 Company Prefix in association with GS1 Keys and the Application Identification System. These policies provide for the long term integrity of the GS1 identification system so vital to the global supply chain.

1.3.1. Mandatory Identifiers

All GS1 standards shall incorporate GS1 identification standards as mandatory identifiers exclusive of all other mandatory identifiers.

1.3.2. Non-GS1 Identifiers

Non-GS1 identifiers may only be used with GS1 standards as additional identifiers (not alternates). Implementations using non-GS1 identifiers as primary identifiers are not compliant with GS1 standards.

1.3.3. GS1 Company Prefix

The GS1 Company Prefix is used exclusively within GS1 identification standards that may be expressed in GS1 approved barcode applications, in GS1 eCom messages, for global data synchronization, network registration, and in EPC Tags within the header values reserved for the GS1 System. See Section [1.5](#) for further details on the GS1 Company Prefix Allocation.

1.3.4. Carrier Independence

GS1 Identification Keys are defined and utilized per GS1 definitions independent of data carrier (e.g., barcode, Radio Frequency Identification (RFID), business message).

1.3.5. GS1 Business Messages

GS1 business messages or GS1 standards-based applications use GS1 Identification Keys for identification exclusive of GS1 data carrier features. Examples of data carrier features include use of:

- Modulo 103 GS1-128 Symbol Check Character to secure data capture
- Function 1 Symbol Character (FNC1) in the second position of GS1-128 barcode or an Electronic Product Code (EPC) header value to discriminate between GS1 data content and data carrier overhead
- FNC1 as separator character or EPC parsing value to parse a decoded data string into significant data parts



Exception: If an EPC user is using GS1 System and non-GS1 System headers to support an application, this policy does not apply, and advice should be sought on the use of EPC headers to provide uniqueness among multiple numbering systems.

1.4. GS1 Prefixes, GS1-8 Prefixes and GS1 Company Prefixes

1.4.1. Global, Open Versus Restricted

1.4.1.1. Global, Open Numbers (Unrestricted Distribution)

Global, Open is an identification number used in unrestricted distribution which signifies that such system data may be applied on goods to be processed anywhere in the world without restraint as to such things as country, company, and industry.

1.4.1.2. Restricted Circulation Numbers

Restricted Circulation Numbers are GS1 identification numbers used for special applications in restricted environments, defined by the local GS1 Member Organisation (e.g., restricted within a country, company, or industry). They are allocated by GS1 for either internal use by companies or to GS1 Member Organisations for assignment based on business needs in their country (e.g., Variable Measure Trade Item identification, coupons).

- RCN-12 is a 12-digit Restricted Circulation Number
- RCN-13 is a 13-digit Restricted Circulation Number
- RCN-8 is an 8-digit Restricted Circulation Number beginning with GS1-8 Prefix 0 or 2.

A Variable Measure Number identifies Variable Measure Trade Items for scanning at the Point of Sale. It is defined per GS1 Member Organisation rules.

- VMN-12 is a 12-digit Restricted Circulation Number encoded in UPC-A Symbols to allow scanning of Variable Measure Trade Items at the Point-of-Sale. It is defined per target market specific rules that are associated with U.P.C. Prefix 2.
- VMN-13 is a 13-digit Restricted Circulation Number encoded in EAN-13 Symbols to allow scanning of Variable Measure Trade Items at the Point-of-Sale. It is defined per target market specific rules that are associated with GS1 Prefixes 20 through 29.

1.4.2. GS1 Prefixes

The GS1 Prefix is a unique numberstring of -with- two or more digits, administered-issued by the GS1 Global Office, which is and allocated to GS1 Member Organisations or for Restricted Circulation Numbers and used to create GS1 Company Prefixes or for allocated to other specific usage areas listed in Figure 1.4.2-1. The main purpose of the GS1 Prefix is to allow decentralisation of the administration of identification numbers. GS1 Prefixes are shown in [Figure 1.4.2-1](#).

Figure 1.4.2-1. Synopsis of GS1 Prefixes

Synopsis of GS1 Prefixes	
GS1 Prefixes	Significance
00000	<u>Unused to avoid collision with GTIN-8</u>
00001 – 00009 0001 – 0009 001 – 019000 – 019	<u>GS1 Prefix* (u)Used to create issue U.P.C. Company Prefixes)</u>
02	<u>Used to issue</u> GS1 Variable Measure Trade Item identification for restricted distribution
030 - 039	<u>GS1 PrefixUsed to issue U.P.C. Company Prefixes</u>
04	<u>Used to issue</u> GS1 restricted circulation number within a company
05	GS1 US Reserved for future use
060 - 099	<u>GS1 Prefix (u)Used to create issue U.P.C. Company Prefixes)</u>
100 - 199	<u>GS1 PrefixUsed to issue GS1 Company Prefixes</u>
20 - 29	<u>Used to issue</u> GS1 restricted circulation number within a geographic region
300 - 976	<u>GS1 PrefixUsed to issue GS1 Company Prefixes</u>
977	Allocated to ISSN International Centre for serial publications
978 - 979	Allocated to International ISBN Agency for books, portion of 979 sub-allocated to International ISMN Agency for music
980	<u>Used to issue</u> GS1 identification of Refund Receipts
981 - 984	<u>Used to issue</u> GS1 coupon identification for common currency areas
985 - 989	Reserved for <u>further-future</u> GS1 coupon identification
99	<u>Used to issue</u> GS1 coupon identification

* ~~Starting from GS1 Company Prefix 00 00100 to avoid collision with GTIN-8 Identification Numbers.~~

 **Note:** GS1 Company Prefixes 00 00000 and 00 01000 to 00 07999 have specific application for Locally Assigned Codes (LACs) or Retailer Zero-Suppressed Codes (RZSCs).

1.4.3. GS1-8 Prefixes

The GS1-8 Prefix is a unique string of three digits issued by one-, two-, or three-digit index number, administered by GS1 Global Office, that and is allocated to GS1 Member Organisations for the creation of GTIN-8s or for Restricted allocated to create Circulation Numbers. GS1-8 Prefixes are only ever used to create GTIN-8s or RCN-8s.

GS1-8 Prefixes are shown in [Figure 1.4.3-1](#) ~~Figure 1.4.3-1~~.

Figure 1.4.3-1. Synopsis of GS1-8 Prefixes

Synopsis of GS1-8 Prefixes	
GS1-8 Prefixes	Significance
<u>000 - 099</u>	<u>Used to issue GS1 restricted circulation number within a company</u> Velocity Codes
100 - 139 199	<u>Used to issue GTIN-8s</u> GS1 Prefix
140 - 199	Reserve
<u>200 - 299</u>	<u>Used to issue</u> GS1 restricted circulation number within a company
300 - 969	<u>Used to issue GTIN-8s</u> GS1 Prefix
<u>970 - 999</u>	<u>Reserved</u> d for future use

1.4.4. GS1 Company Prefix

A GS1 Company Prefix is a unique string of four to twelve digits used to issue GS1 Identification Keys. The first digits are a valid GS1 Prefix and the length 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. Note that the GS1 EPC Tag Data Standard supports only GS1 Company Prefixes between six and twelve digits in length (inclusive). a four- or five-digit GS1 Company Prefix shall be treated as a block of consecutive six-digit values for the purposes of RFID tag encoding and EPC URI generation. The GS1 Company Prefix is a part of GS1 data structures. It consists of a GS1 Prefix, which is administered by GS1, and a Company Number, which is assigned by a GS1 Member Organisation.

1.5. GS1 Company Prefix Allocation

A GS1 Company Prefix gives access to all the applications using GS1 System identification standards.

The GS1 Company Prefix may not be sold, leased, or given, in whole or in part, for use by any other company. This restriction applies to all GS1 Identification Keys even those which are constructed without a GS1 Company Prefix. This requirement applies to GS1 Identification Keys which have been assigned individually by a GS1 Member Organisation to an individual user company.

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. Note

that the GS1 EPC Tag Data Standard supports only GS1 Company Prefixes between six and twelve digits in length (inclusive), a four- or five-digit GS1 Company Prefix shall be treated as a block of consecutive six-digit values for the purposes of RFID tag encoding and EPC URI generation.

See Section [1.6](#) for additional guidelines that apply when a company changes legal status as a result of an acquisition, merger, partial purchase, split, or “spin-off.”

A GS1 Company Prefix assigned to a member of any Member Organisation entitles that member to create any of the GS1 Identification Keys:

- Global Trade Item Number (GTIN)
- Global Location Number (GLN)
- Serial Shipping Container Code (SSCC)
- Global Returnable Asset Identifier (GRAI)
- Global Individual Asset Identifier (GIAI)
- Global Service Relation Number (GSRN)
- Global Document Type Identifier (GDTI)
- Global Shipment Identification Number (GSIN)
- Global Identification Number for Consignment (GINC)
- Global Coupon Number (GCN)
- Component / Part Identifier (CPID)

1.6. Allocation

The normal requirements on the re-use of GS1 identification numbers apply to all organisations at all times. The additional guidelines in the following sections apply when a company changes legal status as a result of an acquisition, merger, partial purchase, split, or “spin-off.”

GS1 Member Organisations may adapt the following guidelines if the law of the country makes it absolutely necessary.

Companies should notify their GS1 Member Organisation of any legal status change within one year of that change to facilitate a smooth transition.

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Section 2. **Application Identification**

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2.1. Trade Items

2.1.1. Introduction

A trade item is any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain. This definition covers services and products, from raw materials through to end user products, all of which may have pre-defined characteristics.

The identification and marking of trade items enables the automation of the Point-of-Sale (through Price Look Up (PLU) files), of goods receiving, inventory management, automatic re-ordering, sales analysis, and a wide range of other business applications.

If the item is of variable measure, the respective measure or price information will often be of critical importance to business applications. Attributes relating to trade items (e.g., dates, lot number) are also available as standardised Element Strings.

Each trade item that is different from another in design and/or content is allocated a unique identification number, which remains the same as long as it is traded. The same identification number is given to all trade items sharing key characteristics. Such numbers must be treated in their entirety throughout the supply chain.

The serialised identification of trade items, which enables total connectivity of information and communication systems, is achieved through the use of Application Identifier AI (01) GTIN and AI (21) Serial Number.

Different standard solutions apply depending on the nature of the item and the scope of the user's applications. The following sections determine the identification and symbol marking rules applicable to a particular trade item.

2.1.1.1. Physical or Non-Physical Trade Items

Non-physical trade items are usually called services. Services may be identified with standard numbers for open trade applications or in restricted distribution environments.

2.1.1.2. Open or Restricted Distribution

The main benefit of the GS1 System for trade items is that it provides a unique and unambiguous identification number for every trade item, which is applicable worldwide in open environments. In addition, the system provides for other number series that may be exclusively used for restricted distribution (e.g., national use, company internal use). Restricted distribution identification numbers are available to GS1 Member Organisations' members to help them develop solutions applicable within their territory.

2.1.1.3. Fixed or Variable Measure

Fixed Measure Trade Items are those that are always produced in the same version and composition (e.g., type, size, weight, contents, and design). Like a Fixed Measure Trade Item, a Variable Measure Trade Item is an entity with pre-defined characteristics, such as the nature of the product or its contents. Unlike a Fixed Measure Trade Item, a Variable Measure Trade Item has at least one characteristic that varies whilst other characteristics of the trade item remain the same. The variable characteristic may be weight, dimension, number of items contained, or volume information. The complete identification of a Variable Measure Trade Item consists of both an identification number and information about the variable data.

2.1.1.4. General Retail Consumer Trade Item, Regulated Healthcare Retail Consumer Trade Item or Non-Retail Trade Item

Scanning at the Point-of-Sale (POS) is a major application of the GS1 System, and trade items that are intended to cross a Point-of-Sale are subject to specific rules. Scanning of trade items are broken into three groups based on the application and sector.

- **General Retail Consumer Trade Items** use omnidirectional linear barcodes that are read by high-volume Omnidirectional Retail POS scanners or linear hand held scanners. This scanning environment cannot read 2D Matrix symbols.
- **Regulated Healthcare Retail Consumer Trade Items** require 2D Matrix symbols, but these cannot be deployed for high-volume Omnidirectional Retail POS. Regulated Healthcare Retail Consumer Trade Items marked with 2D Matrix symbols are intended to be read in lower-volume retail scenarios or hospital pharmacies or in high volume applications such as distribution centres.
- **Non-Retail Trade Items** are any trade item that does not cross Retail POS. Commonly, these trade items will appear in mixed scanning environments (laser, image based, etc.) depending on the application and industry sector. Typical examples include trade item groupings, direct part marked items, etc.

2.1.1.5. Books and Serial Publications

Published material (newspapers, magazines, and books) requires special consideration due to the following factors:

- A solution for published material should address the requirement to process returns (sorting and counting) to wholesalers and publishers. This implies the reading of a supplementary number that is not required for item identification.
- The international systems, ISSN and ISBN, already handle the numbering of publications and books.

2.1.1.6. Trade Item Assortments

Three kinds of assortments exist:

- **Pre-defined assortments:** An assortment that comprises a fixed count of two or more different trade items, each identified with a unique GTIN that is declared on the package. The trade items contained within the assortment may be trade items of one or more manufacturers. When an assortment contains items from multiple manufacturers the GTIN requirements for the assortment is the responsibility of the organisation that creates the assortment. Any change in the configuration of the assortment is considered a new trade item.
- **Dynamic assortments:** An assortment that comprises a fixed count of a changing assortment of two or more different retail consumer trade items, each identified with a unique GTIN. All of the retail consumer trade items and their GTINs will have been communicated to the recipient before trading takes place and are declared on the package. The recipient has accepted that the supplier may change the assortment without any prior notice.
- **Random assortments:** An assortment that comprises items that are not uniquely identified on the package and are not marked for individual sale (e.g., a bag of individually wrapped lifesavers or colours of tooth brushes).

2.1.1.7. Single Item or Trade Item Grouping

A trade item may be a single, non-breakable unit or a pre-defined grouping of a series of single items. Such trade item groupings may be present in a wide variety of physical forms, such as a fibreboard case, a covered or banded pallet, a film wrapped tray, or a crate with bottles. Trade items consisting of a single unit are identified with a Global Trade Item Number (GTIN). Trade item groupings of identical or different units, each identified with a GTIN, are identified with a separate GTIN; the individual trade item GTIN, within any grouping, shall remain the same. Example: trade item A has the same GTIN whether it is sold as a single unit in a case of twelve or sold as a single unit in a case of twenty-four.

2.1.1.8. Regulated Healthcare Trade Items (RHTI)

Regulated Healthcare Trade Items (RHTI) are pharmaceutical or medical device trade items that are sold or dispensed in a controlled environment such as in a retail pharmacy, hospital pharmacy, etc.

2.1.1.8.1. Marking Levels of Regulated Healthcare Trade Items

For Regulated Healthcare Trade Items (RHTI) three levels of identification have been developed:

- Minimum Level of AIDC Marking
- Enhanced Level of AIDC Marking
- Highest Level of AIDC Marking

The identification solution for each of these levels may differ between the category of “pharmaceuticals” (which includes biologics, vaccines, controlled substances, clinical trial pharmaceuticals, and therapeutic nutritional products) versus the category of “medical devices” (which includes all classes of medical devices) and may also differ by configuration or packaging level (trade items direct marked, primary packaging, secondary packaging, case/shipper, pallet, logistics unit). The standards in Section [Error! Reference source not found.2.1.2.5](#) define the data required by packaging level and by product type. For purposes of AIDC marking the Brand Owner is responsible for determining the proper assignment of each particular regulated healthcare retail consumer trade item to either the pharmaceutical or medical device category in accordance with local regulatory requirements.

2.1.1.8.2. National Healthcare Reimbursement Numbers

National Healthcare Reimbursement Number (NHRN) is the term for identification numbers used on pharmaceutical and/or medical devices, where required by national or regional regulatory organisations, for product registration purposes and/or for the management of reimbursement. For compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the current need, the trade item shall be identified with GTIN and the applicable National Healthcare Reimbursement Number Application Identifier.

See Sections [Error! Reference source not found.2.1.2.4](#), [Error! Reference source not found.2.1.2.5](#) and [Error! Reference source not found.3.8.13](#) for a complete description of the structure and rules of use of the Application Identifier for National Healthcare Reimbursement Number (NHRN).

2.1.1.9. Medical Devices (Non-Retail Trade Items)

Application Description

Within this application are the rules and recommendations for the direct part marking (DPM) of medical devices for the Automatic Identification and Data Capture (AIDC) management, including

medical devices that are reprocessed (within the micro-logistics cycle of use, including cleaning and sterilization), see section [Error! Reference source not found.2.1.4.](#)

Medical devices should be identified with GTIN and any appropriate Application Identifiers used for production control, as determined by the responsible entity for the device. For medical devices that are reprocessed, GTIN and serial number are recommended for manufacturers that use DPM to enable traceability throughout the product lifecycle.

Also, for hospitals or instrument owners that mark medical devices that are reprocessed, GTIN and Serial Number are recommended for all hospital / instrument owner marking. Some existing in-house legacy systems already use GS1 asset identifiers (GIAI or GRAI, see Section [Error! Reference source not found.2.3](#)), which are compliant with GS1 Standards.



Note: Only one GS1 Key (GTIN or GIAI/GRAI) should be marked on a single instrument.

GS1 Key

Definition

- The GTIN-12 is the 12-digit GS1 Identification Key composed of a U.P.C. Company Prefix, Item Reference, and Check Digit used to identify trade items.
- The GTIN-13 is the 13-digit GS1 Identification Key composed of a GS1 Company Prefix, Item Reference, and Check Digit used to identify trade items.
- The GTIN-14 is 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.
- The GRAI is the GS1 Identification Key used to identify Returnable Assets. The key is comprised of a GS1 Company Prefix, Asset Type, Check Digit, and optional serial number.
- The GIAI is the GS1 Identification Key used to identify an Individual Asset. The key is comprised of a GS1 Company Prefix and an Individual Asset Reference.

Rules

- All the GTIN Allocation Rules described in Section 4.
- All the GIAI and GRAI Application Rules described in Section 4.
- If the AIDC marking on the medical device may be seen and scanned when placed in the protective packaging after sterilization, the protective packaging will not have to be AIDC marked.

Attributes

Required

Not Applicable

Optional

When using GTIN-12, GTIN-13, or GTIN-14 to identify a medical device that is reprocessed, serial number, is recommended to complete the identification. To manage GS1 Healthcare data requirements within GS1 EPCglobal RFID tags, see Section 3.11 of the General Specifications and EPCglobal Tag Data Standard.

Rules

Not Applicable

Data Carrier Specification

Carrier Choices

Medical devices (Non-Retail Trade Items), when direct marked, shall be marked with GS1 DataMatrix Symbology. See Section [Error! Reference source not found.2.1.4](#) Fixed Measure Direct Part Marking for more detail.

Symbol X-dimensions, Minimum Symbol Height, and Minimum Symbol Quality

See Section [Error! Reference source not found.5.5.2.7.7](#), GS1 System Symbol Specification Table 7.

Symbol Placement

All the Symbol Placement Guidelines defined in Section 6.

Unique Application Processing Requirements

For a description of processing requirements, see Section 7.

2.1.1.10. Single Trade Items Composed of Several Physical Parts

Because of its physical nature, a trade item may be packed in separate physical parcels. For example, furniture equipment may be composed of several pieces (e.g., a sofa and two armchairs, which cannot be ordered or sold separately). A specific standard solution is available to identify and symbol mark each component of a trade item composed of several physical parts.

2.1.2. Fixed Measure Trade Items – Open Supply Chain

Fixed Measure Trade Items are those that are always produced in the same version and composition (e.g., type, size, weight, contents, design). The identification number identifies the item unambiguously. Every trade item that is different from another in any respect is assigned a separate Global Trade Item Number (GTIN). ~~The GS1 Prefixes 000 to 019, 030 to 039, 060 to 099, 100 to 139, 300 to 969, and 977 to 979 are used for all GTINs described in Section 1.4. Any valid GS1 Company Prefix may be used to create a GTIN and the GS1 Prefixes used for this purpose can be found in section 1.4.2, GS1 Prefixes.~~ [DB1]

2.1.2.1. General Retail Consumer Trade Items Scanned in General Retail POS

A General Retail Consumer Trade Item that is intended to be read at high-volume POS. The General Retail Consumer Trade Item must carry a barcode from the EAN/UPC Symbology family and in limited circumstances (see Note below) a symbol from the GS1 DataBar Retail POS Family (*). Therefore, these trade items support only GTIN-8, GTIN-12, or GTIN-13s.

Some Point-of-Sale scanning systems may be able to handle symbologies other than the EAN/UPC Symbology. However, in an open environment, it is not possible to predict the type of scanner that will be used. Therefore, items that may be scanned at Point-of-Sale must be marked with an omni-directional barcode. To support new applications additional GS1 approved data carriers (encoding additional data with the GTIN) may be applied with mutual agreement between trading partners. For information on how to manage multiple barcodes see section 4.15.

(*) In 2014 GS1 DataBar became an open symbology and all scanning environments must be able to read these symbols.

2.1.2.1.1. GTIN Data String

A GTIN may be an eight, twelve, thirteen or fourteen-digit number as explained in the sections below. These numbers will be unique when they incorporate a GS1 Prefix, GS1-8 Prefix or GS1 Company Prefix as required, and if they are always treated as a data string of numbers plus a final Check Digit. The Check Digit is explained in section [Error! Reference source not found.7.9](#). Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

Figure 2.1.2.1.1-1. Overview of GTIN formats

GTIN	GTIN format
GTIN-8	N7 + C
GTIN-12	N11 + C
GTIN-13	N12 + C
GTIN-14	N13 + C

* N - numeric digit
C - Check Digit

When any of these GTINs is encoded in a data carrier that must encode a fixed-length data string of 14-digits, the GTINs less than 14-digits in length must be prefixed by leading zeroes that simply act as filler characters. The presence or lack of these leading zeroes does not change the GTIN concerned. These series of GTINs may be stored with or without leading zeroes in the same database field, depending on the requirements of the particular application.



Note: A GTIN-12 may start with one, two or three leading zeros. For the list of GS1 Prefix use see Section [1.4](#).

2.1.2.1.2. GTIN-12 and GTIN-13

Application Description

Figure 2.1.2.1.2-1. GTIN-12 / GTIN-13 Data Structure

GTIN-12 / GTIN-13 Data Structure													
GS1 Company Prefix												Item Reference	Check Digit
(GTIN-13)	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	N ₇	N ₈	N ₉	N ₁₀	N ₁₁	N ₁₂	N ₁₃
(GTIN-12)	0	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	N ₇	N ₈	N ₉	N ₁₀	N ₁₁	N ₁₂

The GS1 Company Prefix is allocated by a GS1 Member Organisation to a system user. It makes the ID number unique worldwide but does not identify the origin of the item. Any valid GS1 Company Prefix, other than ones starting with a zero, may be used to issue a GTIN-13 and any valid U.P.C Company Prefix may be used to issue a GTIN-12. The GS1 Prefixes used for this purpose can be found in section 1.4.2, GS1 Prefix. ~~GS1 Company Prefixes starting with GS1 Prefixes 000 to 019, 030 to 039, 060 to 099, 100 to 139, 300 to 969, or 977 to 979 in the first three digits are used in this Element String.~~

The Item Reference is assigned by the system user, who must observe the rules in Section 4.

The Check Digit is explained in Section [Error! Reference source not found.7.9](#). Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

GS1 Key

Definition

- The GTIN-12 is the 12-digit GS1 Identification Key composed of a U.P.C. Company Prefix, Item Reference, and Check Digit used to identify trade items.
- The GTIN-13 is the 13-digit GS1 Identification Key composed of a GS1 Company Prefix, Item Reference, and Check Digit used to identify trade items.

Rules

All the GTIN Allocation Rules described in Section 4.

Attributes

Required

Not Applicable

Optional

For all the Application Identifiers (AI) that can be used with a GTIN, see Section 3.

Rules

Not Applicable

Data Carrier Specification

Carrier Choices

The data carriers for this Element String are:

- UPC-A barcode (carrying a GTIN-12)
- EAN-13 barcode (carrying a GTIN-13)
- GS1 DataBar Retail POS Family (carrying GTIN-12 or GTIN-13) (*)

EAN-13 and UPC-A is generally referenced as a common symbology called EAN/UPC.

The system recognises this Element String by the symbology identifier **JE0** and **Je0** (*) and ~~the GS1 Prefixes starting with 000 to 019, 030 to 039, 060 to 099, 100 to 139, 300 to 969, or 977 to 979, and a valid GS1 Company Prefix (also see section 1.4.2, GS1 PrefixGS1 Prefix).~~

The data transmitted from the barcode reader means that one Fixed Measure Trade Item with a GTIN-13 or GTIN-12 has been captured.

(*) In 2014 GS1 DataBar became an open symbology and all scanning environments must be able to read these symbols.

Symbol X-dimensions, Minimum Symbol Height, and Minimum Symbol Quality

See Section [Error! Reference source not found.5.5.2.7.1](#), GS1 System Symbol Specification Table 1, and Section [Error! Reference source not found.5.5.2.7.3](#), GS1 System Specification Table 3.

Symbol Placement

All the Symbol Placement Guidelines are defined in Section 6.

Unique Application Processing Requirements

For a description of processing requirements, see Section 7.

2.1.2.1.3. GTIN-12 Carried by a UPC-E Barcode

Application Description

Only U.P.C. Company Prefixes beginning with zero can be used to construct UPC-E barcodes. Distribution of a U.P.C. Company Prefix in this range is restricted to proven need only (e.g., for items whose packaging does not include enough available space to permit the use of any other barcode). Companies with these prefixes are encouraged to manage their finite resource carefully.

Some GTIN-12s beginning with the U.P.C. Prefix 0 may be represented in a small symbol called the UPC-E barcode. The GTIN-12 is condensed into a barcode consisting of six symbol character positions. For application processing, the GTIN-12 must be transformed into its full length by the barcode reader software or by the application software. There is no six-digit UPC-E barcode. See Chapter [Error! Reference source not found.7.10](#) for UPC-E barcode options.

GS1 Key

Definition

The 12-digit GS1 Identification Key composed of a U.P.C. Company Prefix, Item Reference, and Check Digit used to identify trade items.

Rules

All the GTIN Allocation Rules described in Section 4.

Attributes

Required

Not Applicable

Optional

Not Applicable

Rules

Not Applicable

Data Carrier Specification

Carrier Choices

The UPC-E barcode is a barcode of the EAN/UPC Symbology representing a GTIN-12 in six explicitly encoded digits using zero-suppression techniques.

Symbol X-dimensions, Minimum Symbol Height, and Minimum Symbol Quality

See Section [Error! Reference source not found.5.5.2.7.1](#), GS1 System Symbol Specification Table 1.

Symbol Placement

All the Symbol Placement Guidelines defined in Section 6.

Unique Application Processing Requirements

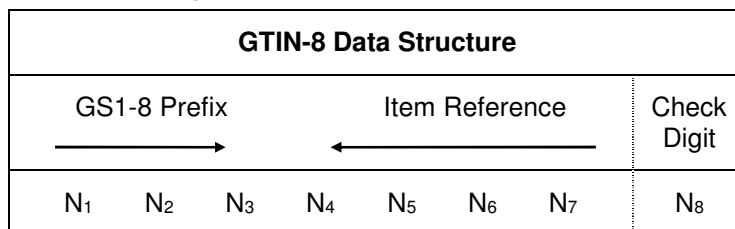
For a description of processing requirements, see Section 7.

2.1.2.1.4. GTIN-8

Application Description

The GTIN-8 is available for items whose packaging does not include enough available space to permit the use of an EAN-13 or UPC-A Symbol. GTIN-8s are individually assigned by GS1 Member Organisations on request. Figure 2.1.2.1.3 - 1 shows the data structure of a GTIN-8.

Figure 2.1.2.1.4-1. GTIN-8 Data Structure



The GS1-8 Prefix is a unique string of three digits issued by GS1 Global Office one, two, or three-digit index number, administered by the GS1 Global Office. It does not identify the origin of the item (DB2). See section 1.4.3 for the GS1-8 Prefixes 100 to 139 and 300 to 969 in positions N₁ to N₃ are used in this Element String.

The Item Reference is assigned by the GS1 Member Organisation. The GS1 Member Organisations provide procedures for obtaining GTIN-8s.

The Check Digit is explained in Section [Error! Reference source not found.7.9](#). Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

8.1 GS1 Glossary of Terms and Definitions

Term	Definition
Company Number	A component of the GS1 Company Prefix.
GS1 Company Prefix	<u>A unique string of four to twelve digits used to issue GS1 Identification Keys. The first digits are a valid GS1 Prefix and the length 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. Part of the GS1 System identification number consisting of a GS1 Prefix and a Company Number. The Company Number is allocated by GS1 Member Organisations. See also U.P.C. Company Prefix. GS1 Member Organisations assign GS1 Company Prefixes to entities that administer the allocation of GS1 System identification numbers. These entities may be, for example, commercial companies, not for profit organisations, governmental agencies, and business units within organisations. Criteria to qualify for the assignment of a GS1 Company Prefix are set by the GS1 Member Organisations. See also U.P.C. Company Prefix.</u>
GS1 Prefix	<u>A unique number with string of two or more digits, administered issued by GS1 Global Office that is and allocated to GS1 Member Organisations to issue GS1 Company Prefixes or allocated to other specific areas or for Restricted Circulation Numbers.</u>
GS1-8 Prefix	<u>A one-, two-, or three-digit index number unique string of three digits r, administered issued by GS1 Global Office, that is and allocated to GS1 Member Organisations to issue for the creation of GTIN-8s or allocated to issue RCN-8s for Restricted Circulation Numbers (see RCN-8).</u>
U.P.C. Company Prefix	<u>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 GTIN-12. A special representation of a GS1 Company Prefix constructed from a U.P.C. Prefix and a Company Number. The U.P.C. Company Prefix is only used to create GTIN-12, Coupon-12, RCN-12, and VMN-12, which are encoded in a UPC-A barcode.</u>
U.P.C. Prefix	<u>A GS1 Prefix starting with a zero ('0') becomes a U.P.C. Prefix by removing the leading zero. A U.P.C. Prefix is used to issue U.P.C. Company Prefixes or allocated to other specific areas. A special representation of the GS1 Prefixes '00—09' with the leading zero removed. Used when representing the GTIN-12, Coupon-12, RCN-12, and VMN-12 in a UPC-A barcode.</u>