2.1 Introduction and Basic Rules

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, ordered, or invoiced at any point in any supply chain. This definition covers services and product, from raw materials through to end user products, all of which may have pre-defined characteristics.

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

The Global Trade Item Number (GTIN) is the GS1 Identification Key used to identify trade items. There are four types of GTIN; GTIN-13, GTIN-8, GTIN-12 and GTIN-14. Each trade item that is different from another in design and/or content is allocated a unique GTIN, which remains the same as long as it is traded. The same GTIN is given to all trade items sharing key characteristics.

Basic principles for the identification of trade items include:

- Each trade item that is different from another must be allocated a separate, unique GTIN i.e. a specific trade item cannot have more than one GTIN assigned to it and a particular GTIN cannot be assigned to more than one trade item.
- The GTIN does not carry any information related to the trade item. The brand owner responsible for assigning the GTIN must communicate this information by Electronic Data Interchange (EDI) or other means to all business partners
- An assigned GTIN must never be changed as long as the item is not modified so that it needs to be discriminated from the initial trade item for ordering, stocking, or billing.

2.1.1 GTIN and Leading Zeroes

A GTIN may be an eight, twelve, thirteen or fourteen-digit number. These numbers will be unique when they incorporate a GS1 Prefix or GS1 Company Prefix as requried, and if they are always treated as a data string of numbers plus a final Check Digit. Verification of the Check Digit carried out automatically by the bar code reader, ensures that the number is correctly composed.

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 (filler) zeroes that simply act as filler characters. The presence of these leading zeroes within the data carrier 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 itself may start with one, two or three zeroes. These zeroes are an integral part of the twelve digits that make up the GTIN-12 and should not be confused with the filler zeroes added to make up a 14-digit data string described above.

GTIN structure is described in detail in "Numbering Trade Items (all types)" on page 20

2.1.2 Basic Numbering Rules

2.1.2.1 Branded Items

The brand owner, the organisation that owns the specifications of the trade item regardless of where and by whom it is manufactured, is normally responsible for the allocation of the GTIN.

The brand owner is the organisation that owns the trade item specification and may be:

The Manufacturer or Supplier

The company manufactures the trade item or has it manufactured, in any country, and sells it under its own brand name.

The Importer or Wholesaler

The importer or wholesaler has the trade item manufactured, in any country, and sells it under its own brand name, or the importer or wholesaler changes the trade item (for example by modifying the packaging of the trade item).

The Retailer

The retailer has the trade item manufactured, in any country, and sells it under its own brand.

2.1.2.2 Non Branded Items and Exceptions

There are some exceptions as follows:

Non Branded items

Items without a brand name and generic items – not private labels – are still assigned GTINs by their manufacturer. As different manufacturers may supply items that appear identical to the consumer, it is possible that items that are apparently the same have different GTINs. Companies that trade in these items need to organise their computer applications (replenishment programs for example) to cope with this eventuality. Examples of items that sometimes have no brand are apples, plasterboard, candles, drinking glasses etc.

Customer Specific Items

When a trade item is made specifically for one trade customer and is orderable only by this customer, it is permissible for a GTIN to be assigned by the customer. In this case the GTIN should be formed from the customer's GS1 Company Prefix.

Other Exceptions

If the brand owner does not assign a GTIN, the importer or another intermediary can assign an item a temporary GTIN. This may be used until a GTIN is assigned in the normal way. Alternatively a retail organisation can assign an internal number for use within its own stores only to an item that does not yet have a GTIN assigned to it.

2.1.2.3 Trade Items Requiring Separate Numbers

A separate unique GTIN is required for every different trade item, and for every different variant of an item whenever this variation is in any way apparent and significant to any partner in the supply chain, the final user, or to the retail customer.

Although this list is not exhaustive, the basic pre-defined characteristics of a trade item are:

- The product name, product brand, and product description
- The trade item type and variety
- The net quantity of a trade item (weight, volume, or other dimension impacting trade)
- If the trade item is a grouping – the number of items contained, their subdivision in sub-packaging units, and the nature of the grouping (carton, pallet, box-pallet, flat-pallet, etc.)

Where there is a difference to any of the basic elements that characterise a trade item, each variant should be allocated its own unique GTIN.

For information on when to change a GTIN see "When to Change a Global Trade Item Number (GTIN)" on page 17

2.1.2.4 Promotional Variants

A promotion is a temporary change to a trade item, which modifies the presentation of the trade item. It usually coexists with the standard trade item.

- Promotional variants of trade items that affect the net weight or volume of the trade item must be allocated a separate unique GTIN. Examples: Attached free additional item, 10% extra free.
- Promotional variants of trade items may impact the logistic weight or dimension of the trade item by more than 20%. In this case, the promotional variants must be allocated a separate unique GTIN.
- Each seasonal promotion of a trade item should be allocated a separate unique GTIN. Example: Chocolate especially over-wrapped for Easter.
- Other promotional variants should **not** be allocated a separate unique GTIN. Examples: Money off coupon, free gift inside (unless this causes an increase in any gross dimension by more than 20%), "send for" offer, or competition offer.

2.1.2.5 When to Change a Global Trade Item Number (GTIN)

Trade item changes are any change or improvement during the life of a trade item. The "new" trade item replaces the old one. Should the brand owner decide to create a variant (e.g. with different ingredients) in parallel with the standard trade item, then a separate unique GTIN has to be allocated.

- Minor trade item changes or improvements do not require the allocation of a different GTIN. Examples: label artwork redesign, minor trade item description changes that do not impact the supply chain, gross dimension change in any axis of less than 20% with content quantity or measure unchanged.
- If the consumer will be expected to distinguish between an old and new brand name or product description, or if the change leads to a change in the shelf edge label (consumer declaration), then a new GTIN must be allocated.
- If any gross dimension (e.g. length, depth, weight, etc) changes by more than 20% a new GTIN is required. Changes below 20% may require a new GTIN at the discretion of the brand owner.
- For all declared changes to content, regardless of the amount, a new GTIN is required.
- Price is not a relevant criterion for changing a GTIN except when the price is printed directly on the trade item. If however, the price that the consumer will pay is marked on the item, the GTIN should be changed when the price marked on the item changes.
- In all cases, a change to a GTIN for the trade item at a lower level of packaging will always lead to a change of any GTIN used for associated packaging at higher grouping levels.

Vintage Wines – When the year of production impacts pricing, invoicing, or ordering at any point in the supply chain, a new GTIN is required. If there is no impact on pricing, invoicing, or ordering then the same GTIN can be used regardless of year of production.

For further guidance on when to change GTINs refer to www.gs1.org/gtinrules/

2.1.2.6 Re-Using a GTIN

A GTIN allocated to a trade item that has become obsolete must not be re-used for another trade item until at least 48 months have elapsed after:

- the expiration date of the last original trade items produced with that number, or
- the last original trade items produced with that number have been supplied to the customer.

In the case of clothing the minimum retention period is reduced to 30 months.

Brand Owners should consider a longer period depending upon the type of goods and/or any regulatory framework. For example, steel beams may be stored for many years before entering the supply chain, and processes should be put in place to ensure that the GTIN is not reallocated for a significant period of time. Another example is found with very specific products within the healthcare sector, such as prescription drugs, implants, etc., where steps should be taken by the assigning company to ensure that the issued GTINs are not reallocated for a period well beyond the lifetime of the product or beyond the end of treatment.

In addition, when contemplating the re-use of a GTIN, consideration should be given to the use of data associated with the original GTIN by trading partners for statistical analysis or service records, which may continue long after the original trade item was last supplied.

If a GTIN has been assigned to an item, which was then never actually produced, the GTIN may be deleted from any catalogue immediately without first being marked as discontinued. In this exceptional case the GTIN may be re-used 12 months after deletion from the sellerís catalogue.

2.1.3 Types of Trade Items

Trade items cover a broad variety of things that may carry a bar code and a GTIN. Different standard solutions apply depending on the nature of the item and the scope of the users' applications.

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, 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 a GTIN and information about the variable data.

Retail or Non-Retail

Scanning at POS is a major application of the GS1 System, and trade items that are intended to cross POS are subject to specific rules that differ to the rules for items intended to be scanned in a warehouse or General Distribution Scanning environment.

Single Item or Grouping of Items

A trade item may be a single, non-breakable unit or a standard and stable grouping of a series of single items. Such grouping of items 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 GTIN. Standard groupings of identical or different units, each identified with a GTIN, are identified with a separate GTIN.

Open or Restricted Circulation

The main benefit of the GS1 System for trade items is that it provides a unique and unambiguous GTIN for every trade item, which is applicable worldwide in open environments. In addition, the GS1 System provides for other number series that may be exclusively used for restricted environments (e.g. internal company use).

Books and Serial Publications

Published materials (newspapers, magazines, and books) require 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.
- Because of the large number of titles involved and the problems of creating and updating Price Look Up (PLU) files, price may be encoded within the Global Trade Item Number (GTIN).

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 environments.

2.2 Numbering Trade Items (all types)

2.2.1 Selecting the Correct GS1 Identification Number

When selecting the correct/most appropriate GS1 Identification Number, it is important to consider several factors including environment and the type of trade item you are identifying. Combine the information in section 2.1.2 Basic Numbering Rules on page 15 with the information in the table below to select the correct Identification Number.

Use the left most column to select the trade item type and the top row to select the type of Identification Number. The table cell where the trade item type and Identification Number type intersect gives the page number on which the details for generating your chosen Identification Number can be found.

Identification ---------- Trade item type	GTIN-8	GTIN-13	GTIN-14	VMN-13	RCN-13	RCN-8	Coupon-13
POS Fixed	23	22					
GD Fixed		37	36				
POS & GD		37					
GD Variable			38				
Book		25					
Serial		27					
POS Variable				24			
Restricted					32	34	
Coupon							35
Note: POS = Retail Point-of-Sale, GD = General Distribution Scanning, Fixed = Fixed Measure, Variable = Variable Measure, Restricted = Restricted Circulation							

TABLE 3 Selecting the Correct Identification Number

Note: For detailed information on the numbering of trade items for North America, including Canada, please refer to "Numbering Trade Items for North America" on page 44

2.2.2 Retail POS - Fixed Measure

Any trade item that is to be sold to the final consumer through POS is more commonly known as a retail item or consumer unit. Fixed Measure Trade Items are those that are always produced in the same version and composition (e.g. type, size, weight, contents, design).

Any trade item that could be sold at POS as well as scanned in a General Distribution Scanning environment (such as a case of 24 beer cans), must be numbered according to the rules applicable to trade items sold at POS. However, the size and location of the bar codes on these trade items are determined by the rules applicable to trade items not sold at POS.

Although North America set a sunrise date of January, 2005, for the global use of the GTIN-13 and GTIN-8, a GTIN-12 may still required for items sold at retail Point-of-Sale (POS) in the United States and Canada. This is because many North American users cannot yet accommodate a GTIN-13 or GTIN-8 in their twelve-digit database files. If advised by North American distributors that your bar codes are unable to be scanned, please contact GS1 Australia regarding the allocation of a U.P.C. Company Prefix.

2.2.2.1 GTIN-13

One of the most commonly used identification numbers in the GS1 System is the GTIN-13. The GTIN-13 is formed using a GS1 Company Prefix (allocated by GS1 Australia or one of the other GS1 Member Organisations), an Item Reference (allocated sequentially by the member company) and a Check Digit (which is mathematically calculated and ensures the whole number is correct).

How you allocate a GTIN-13 depends on the length of your assigned GS1 Company Prefix. For GS1 Australia members this depends on whether you joined GS1 Australia prior to May 1996, in which case you were allocated a seven-digit GS1 Company Prefix or after May 1996 and were allocated a seven- to nine-digit GS1 Company Prefix.

Individual Bar Code Number Subscriber Members do not have a GS1 Company Prefix but are allocated the entire GTIN-13.

If a trade item identified with a GTIN-13 is to be scanned at Point-of-Sale, the GTIN-13 should be encoded in an EAN-13 Bar Code (or GS1 DataBar Bar Code under conditions described in the note below)

Note: GS1 DataBar has been approved for bilateral use between trading partners from 2010. In 2014 GS1 DataBar becomes an open symbology and all scanning environments must be able to read these symbols.

For details on the EAN-13 Bar Code , including dimensions, please refer to chapter 6, section 6.2.1 EAN-13 Symbol Specifications on page 148. For details on GS1 DataBar refer to chapter 6, section 6.2.9 GS1 DataBar Symbol Specifications on page 166.

	GS1 Company Prefix	Item Reference	Check Digit
Nine-Digit GS1 Company Prefix	$n_1\ n_2\ n_3\ n_4\ n_5\ n_6\ n_7\ n_8\ n_9$	$n_{10}\ n_{11}\ n_{12}$	n_{13}
Seven-Digit GS1 Company Prefix	$n_1\ n_2\ n_3\ n_4\ n_5\ n_6\ n_7$	$n_8\ n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}

TABLE 4 GTIN-13 Structure

The GS1 Company Prefix is allocated to you as a member company.

The Item Reference is a non-significant number that is allocated by the member company. It is purely for identification purposes and the individual digits in the number do not relate to anything or convey any specific item information. It is recommended that the Item Reference is allocated sequentially and that each item is numbered to the lowest level of identification, for example: size, colour, model, finish, type, style.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-13 option.

2.2.2.2 GTIN-8

The allocation of a GTIN-8 is restricted to trade items that genuinely cannot accommodate a larger EAN-13 Bar Code. These can only be obtained directly from GS1 Australia and are represented in an EAN-8 Bar Code. For details regarding the EAN-8 Bar Code, including dimensions, please refer to chapter 6, section 6.2.2 EAN-8 Symbol Specifications on page 150.

Before applying for a GTIN-8 you should consider, jointly with the printer/designer, all available options for using an EAN-13 Bar Code. Every effort must first be made by the applying company to incorporate an EAN-13 Bar Code onto the packaging. This includes:

- Whether the label of artwork can reasonably be changed to enable the printers recommended size of an EAN-13 Bar Code to be included (e.g. redesigning the label, increasing the label size, especially when the existing label is small in comparison with the pack area, or using an additional label).
- Reducing the magnification (size) of the bar code. This must only be done if printing conditions allow. The magnification of the bar code must always meet GS1 Specifications.

When applying for a GTIN-8, it is necessary to provide GS1 Australia:

- A sample of each product, label or actual size artwork (unless many products share identical packaging, in which case one sample will suffice).
- A complete list of every product requiring a GTIN-8.
- Written justification of why the package should be allocated a GTIN-8 and that all efforts have been made to accommodate an EAN-13 Bar Code.

After discontinuing a product carrying a GTIN-8 please notify GS1 Australia. This number will then be withdrawn, making it available to be re-issued by GS1 Australia to another member/item in the future.

GS1 Prefix	Company / Item Reference	Check Digit
n_1 n_2	n_3 n_4 n_5 n_6 n_7	n_8

TABLE 5 GTIN-8 Structure

The GS1 Prefix identifies the GS1 Member Organisation issuing the number. In the case of GS1 Australia the GS1 Prefix is 93.

The Company/Item Reference is allocated by GS1 Australia to a specific item upon application.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-8 option.

2.2.3 Retail POS - Variable Measure

Variable Measure Trade Items are those sold in random quantity against a fixed price per unit quantity and intended to cross a Point-of-Sale (e.g., apples sold at a fixed price per kilogram).

These items are either marked in the store by the retailer or are marked at the source by the supplier.

2.2.3.1 VMN-13 - National Solution

Any company providing its own branded Variable Measure Trade Items to the Australian retail sector can adopt the following number series for Variable Measure Trade Items numbered at source but sold to various Australian retail stores. GS1 Australia has reserved prefixes 28, 29, 22 and 24 series specifically for use in Variable Measure Numbers (VMNs). These numbers are represented in EAN-13 Bar Codes. Equipment suppliers should ensure that POS equipment recognises the prefixes listed above as being variable measure with price and a significant Check Digit. For details on the EAN-13 Bar Code, including dimensions, please refer to section 6.2.1 EAN-13 Symbol Specifications on page 148.

Manufacturers who wish to label and apply bar codes to Variable Measure Trade Items must apply to GS1 Australia for **standard variable measure company item numbers**. These numbers identify the items and the company they are allocated to, and are for use in conjunction with weighing machines and labelling at the point of packaging.

GS1 Australia will allocate a VMN-13 to each individual item as required by the company. The member company allocated these numbers is responsible for all communication in relation to the numbers. GS1 Australia needs to be notified when a VMN-13 has been deleted **as this number will then be withdrawn, making it available to be re-issued by GS1 Australia to another member/item in the future**.

GS1 Prefix	Company / Item Identification	Price Verifier	Price	Check Digit
28, 29, 22 or 24	n_3 n_4 n_5 n_6	n_7	n_8 n_9 n_{10} n_{11} n_{12}	n_{13}

TABLE 6 VMN-13 Structure

The GS1 Prefix 28, 29, 22 or 24 identifies the VMN as a standard variable weight with price within Australia.

The Company and Item Identification digits identify the company/packer and the item that it is allocated to.

The Price Verifier Digit validates the accuracy of the following five digit price. To manually calculate the Price Verifier Digit refer to "Manual Check Digit Calculation" on page 53.

The Price, the next five digits, represent the price of the individual variable weight item to two decimal places. Machines that print the bar code label will automatically calculate the price.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code. A Check Digit Calculator Program which will automatically calculate both the Price Verifier Digit and the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org

For instruction on manually calculating the Check and Verifier Digits refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-13 option.

2.2.4 Books

When identifying books and paperbacks a company may identify them in the same manner as any other retail trade item. However the recommended option is to use the International Standard Book Number (ISBN).

The ISBN is a number that uniquely identifies books and book-like products including all printed books, pamphlets, microfiche publications, and other specialised printed forms of publications published internationally. Each ISBN identifies a unique edition of a publication, from one specific publisher.

The GS1 Prefixes 978 and 979 have been allocated to the ISBN Agency who then allocate ISBNs using these prefixes. An ISBN must never be re-used, even if issued in error.

From 1 January 2007 the ISBN changed from ten digits to thirteen digits; this thirteen-digit ISBN can be encoded into an EAN-13 Bar Code. To obtain an ISBN or find out what to do with existing ten-digit ISBNs, contact the Australian ISBN Agency (details below):

In Australia an ISBN can be obtained from:

The ISBN Agency
Thorpe-Bowker
Level One, 607 St Kilda Road
Melbourne Vic 3004
Phone (03) 8517-8333
Fax (03) 8517-8399
Email: yoursay@thorpe.com.au
Web: www.thorpe.com.au/isbn/

Note: ISBNs shall not be allocated to non-book products even if the products are related to a book (e.g., teddy bears, coffee mugs, t-shirts, etc. related to a book launch). Such non-book products shall be identified and bar coded in the same manner as any other trade item.

As stated above, there are two different options for identifying book products:

Option 1: Use the Thirteen-Digit ISBN as Allocated

This is the recommended option and is only available if you have been allocated a thirteen-digit ISBN by the ISBN Agency. If you have previously been issued with a ten digit ISBN, contact the ISBN Agency so that it can be converted to a thirteen digit ISBN. The thirteen-digit ISBN can be encoded into an EAN-13 Bar Code as described in chapter 6, section 6.2.1 EAN-13 Symbol Specifications on page 148.

Option 2: Allocate a Unique GTIN-13

For this option, please refer to "GTIN-13" on page 22. Using this option it is recommended that the ISBN be printed above the EAN-13 Bar Code.

Five-Digit Add-On Symbols

Some publishers may wish to communicate information which is additional to the title in a bar code in order to meet their internal requirements. For example, publishers may wish to include an edition variant (i.e. unchanged reprint or price increase) which is not distinguished by the GTIN. The GS1 System provides an additional five-digit symbol, called an Add-On Symbol, which can be used on the item just to the right of main bar code.

Add-On Symbols involve the following constraints:

- The Add-On Symbol should not contain information that should rightly be looked up using the item's GTIN-13
- The reading of the Add-On Symbol by the retailers' Point-of-Sale system is optional
- The use of the Add-On Symbol is the responsibility of each publisher

The data encoded in the Add-On Symbol consists of numeric data of any structure and meaning. It is the publisher's responsibility to define the numbering scheme.

Numbering Non-Retail Book Items

Our advice to publishers is that they need to be a member of GS1 Australia in order to number their non-retail items. For details on numbering structures for non-retail items see "Non-Retail - Fixed Measure" on page 36.

2.2.5 Serial Publications

The ISSN (International Standard Serial Number) is an eight-digit unique code for the identification of serial publications.

A serial is a publication made up of a number of parts issued in sequence and linked by a common title. Usually each part bears an issue number and/or date. Serials are intended to continue indefinitely, and include periodicals (e.g. Business Review Weekly), newspapers, newsletters, annual reports, yearbooks, directories, and journals.

Monographs in series are also a type of serial. These are books which have their own title as well as a collective or series title (e.g. Working Paper). Normally all books in the series will be issued by the same publisher in a uniform style and usually in a numerical sequence. The series title of the monographic series is eligible for an ISSN.

Serials can be published in printed form, or in a range of alternative formats including microfiche, microfilm, CD-ROM, and online. Serials in all formats are eligible for the allocation of an ISSN.

The ISSN system is in use throughout the world for numbering periodical publications. An agreement between GS1 Global Office and the International Centre for the Registration of Serial Publications (which administers ISSNs) allows the coordination of both systems.

In Australia an ISSN application form is available by request or online from:

Australian ISSN Agency
National Library of Australia
Canberra ACT 2600
Phone: (02) 6262-1213
Fax: (02) 6273-4492
Email: issn@nla.gov.au
Web: http://www.nla.gov.au/services/issn.html

There are two options for allocating a GTIN to a serial publication, both of which are represented in an EAN-13 Bar Code.

For more information on the EAN-13 Bar Code refer to chapter 6, section 6.2.1 EAN-13 Symbol Specifications on page 148

Option 1: Allocate a Unique GTIN-13

For this option, please refer to "GTIN-13" on page 22. Using this method it is recommended that the ISSN be printed above the EAN-13 Bar Code.

Option 2: Convert the ISSN into a GTIN-13

The second option for numbering serial items is to convert the ISSN into a GTIN-13.

GS1 Prefix	ISSN (Without the Check Digit)	Variant	Check Digit
977	$n_4\ n_5\ n_6\ n_7\ n_8\ n_9\ n_{10}$	$n_{11}\ n_{12}$	n_{13}

TABLE 7 Structure of a GTIN-13 formed using the ISSN

The GS1 Prefix 977 is assigned for the encoding of the ISSN in a GTIN-13 format.

The ISSN without the Check Digit is the next seven digits. It is also recommended that the full ISSN be printed above the bar code.

The Variant (previously known as Sequence Variant) may be used to identify variants of the same title for issues with a different price, or to identify different issues of a daily issue within one week. Normal titles take the value 00.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-13 option.

Figure 8 EAN-13 Bar Code Formed Using the ISSN

Variant Overview

When there is no need to distinguish between different issues, fill the variant position in the GTIN that has been formed using your ISSN with 00.

When it is essential to distinguish between two successive issues of periodicals, and you use Option 2 to identify periodicals, scanning at title level is too imprecise. The variant caters for these situations while retaining the same ISSN. While a variant changes between different issues of a publication, the ISSN always remains the same.

For regular price changes use variant 01 for the initial cover price when the periodical first uses a bar code. Increase the variant by one for each regular price change.

Recalculate the Check Digit each time the Variant value changes.

For special issues use variant 99 the first time you sell a special issue with a different cover price from the preceding or following issue. If the situation occurs annually, you can re-use the same GTIN-13 every year.

For all other circumstances, or if you choose to apply a new variant for annually occurring special issues, decrease the variant by one, for example, 98, 97, 96, and so on.

Recalculate the check digit each time the variant value changes.

Titles published daily or more than once a week are considered separate items. They require a different variant for each separate issue. While each Monday issue can carry the same variant as each other Monday issue, it must be different from the variants used for other days of the week.

If the item is published Monday through to Sunday, begin with variant 01 on Monday, then 02 on Tuesday, and so on. International standards treat Monday as the first day of the week.

Re-using variants

Eventually, many price changes will increase the variant number that starts at 01, and many special issues will decrease the variant number that starts at 99. Eventually the two numbers will be the same. To avoid this from happening, restart both variants when the difference is no less than five.

When to Change the GTIN

Change the GTIN for the serial publication for:

- A regular cover price change between two successive issues
- A special issue, for example a double issue at Christmas, being sold at a different cover price from the previous issue
- Titles published more than once a week

If you identify serials using Option1 and you need to identify between two successive issues, allocate a different Item Reference to each issue of the periodical.

If you identify serials using Option 2 and you need to identify between two successive issues, allocate a different variant to each issue.

Two-Digit Add-On Symbol

A two-digit serial number may be encoded in a two-digit Add-On Symbol. Together the GTIN-13 and serial number identify a partiular issue of a particular serial publication.

The following number assignment guidelines for the two-digit serial number are recommended:

- Dailies (or more generally publications with several issues a week): The publications of each day of the week are considered separate trade items and therefore have different GTINs. A two-digit serial number together with the GTIN-13 establishes the week of the year a particular day belongs to.
- Weeklies: Number of the week (01 - 53)
- Bi-weeklies: Number of the first week of the respective period (0 - 53)
- Monthlies: Number of the month (01 - 12)
- Bi-monthlies: Number of the first month of the respective period (01 - 12)
- Quarterlies: Number of the first month of the respective period (01 -12)
- Seasonal period: First digit = last digit of the year; Second digit = 1 spring, 2 summer, 3 autumn, 4 winter
- Bi-annual period: First digit = last digit of the year; second digit = number of the first season of the respective period
- Annuals: First digit = last digit of the year; second digit = 5
- Special intervals: Consecutively numbered from 01 to 99

The preferred location for the Add-On Symbol is to the right of the primary bar code

Five-Digit Add-On Symbol

Serial publications can also use a five-digit serial number carried by a five-digit Add-On Symbol that is placed to the right of the main bar code. The reading of the Add-On Symbol at POS is optional. The Add-On Symbol must not be used to encode information that should be identified with the GTIN. The Add-On Symbol provides additional information about a particular publication of a printed item, and it is the publisher's responsibility to define the numbering scheme. When using a five-digit Add-On Symbol, a two-digit Add-On Symbol cannot also be used.

Information that can be encoded in the five-digit Add-On Symbol includes the actual date of issue, in order to differentiate between successive issues.

2.2.6 Retail POS - Restricted Circulation

The GS1 System includes a numbering series that enables companies to identify items for use in a restricted environment. Restricted Circulation Numbers (RCNs) should be used only within the boundaries of the company who originates the number.

The originators of the RCN are responsible for ensuring that the number is used for **internal purposes only**. They must ensure that items using an RCN cannot "escape" to cause ambiguity elsewhere.

The principal use of restricted circulation numbering is for encoding items in retail stores that are not numbered at source (source marked).

There are two number series' available for internal numbering:

- RCN-13 represented in an EAN-13 Bar Code
- RCN-8 represented in an EAN-8 Bar Code

2.2.6.1 RCN-13

Within the GS1 System, prefixes **02, 20, 21, 23, 25, 26** and **27** are **reserved** for GS1 Australia members to use at their discretion for internal numbering purposes using an RCN-13 format.

The U.P.C. Prefix 2 is also available to be used in an RCN-12 structure. Refer to "Numbering Trade Items for North America" on page 44 for more information.

These series' of numbers allows users to have maximum flexibility when working out any special numbering structures they require with their equipment suppliers.

In particular, these series' of numbers are useful for retail Variable Measure Trade Items, for example, fresh meat, fruit and vegetables, cheeses and delicatessen items. After the two-digit prefix you can structure the available ten digits in a variety of ways to represent the item type, the weight, or the calculated price.

The originators can use the digits following the prefixes at their discretion. However, GS1 Australia provides recommendations for using these numbers when identifying Variable Measure Trade Items to provide some degree of standardisation for equipment.

GS1 Prefix	Item Reference	Check Digit
02, 20, 21, 23, 25, 26 or 27	$n_3\ n_4\ n_5\ n_6\ n_7\ n_8\ n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}

TABLE 8 RCN-13 Structure

The GS1 Prefix, the first two digits, identify the number as an RCN-13. Begin every RCN-13 with a prefix from 02, 20, 21, 23, 25, 26, or 27.

The Item Reference, the next ten digits, is assigned at the discretion of the organisation allocating the RCN-13. Allocate a separate Item Reference for each item.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-13 option.

2.2.6.2 Recommended RCN-13 Formats for Variable Measure Trade Items

Although you are free to develop your own internal numbering structure, GS1 Australia recommends that you:

- Position the price to the right of the internal Item Reference.
- If using a Price Verifier Digit, position the Price Verifier Digit to the left of the price and the Item Reference to the left of the Price Verifier Digit.

GS1 Australia does not make any recommendation for using a Price Verifier Digit.

Taking into account the above recommendations, there are four different formats available.

GS1 Prefix	Item Reference	Price Verifier Digit	Price	Check Digit
20, 21, 23, 25, 26 or 27	$n_3\ n_4\ n_5\ n_6$	n_7	$n_8\ n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}

TABLE 9 Structure of RCN-13 - Five-Digit Price with Price Verifier Digit

GS1 Prefix	Item Reference	Price Verifier Digit	Price	Check Digit
02*, 20, 21, 23, 25, 26 or 27	$n_3\ n_4\ n_5\ n_6\ n_7$	n_8	$n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}
* When prefix 02 is used to identify a retail Variable Measure Trade Item, GS1 Australia recommends that the Four-Digit Price with Price Verifier Digit format be used.				

TABLE 10 Structure of RCN-13 - Four-Digit Price with Price Verifier Digit

GS1 Prefix	Item Reference	Price	Check Digit
20, 21, 23, 25, 26 or 27	$n_3\ n_4\ n_5\ n_6\ n_7\ n_8$	$n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}

TABLE 11 Structure of RCN-13 - Four-Digit Price Without Price Verifier Digit

GS1 Prefix	Item Reference	Price	Check Digit
20, 21, 23, 25, 26 or 27	$n_3\ n_4\ n_5\ n_6\ n_7$	$n_8\ n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}

TABLE 12 Structure of RCN-13 - Five-Digit Price Without Price Verifier Digit

The price digits may contain none, one, or two decimal places. The decimal point is not bar code marked, but must be taken into account by the marking equipment when creating the label.

A Check Digit Calculator Program which will automatically calculate both the Price Verifier Digit and the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For details on how to manually calculate a four-, or five-digit Price Verifier Digit, and also a Check Digit, refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-13 option.

2.2.6.3 RCN-8

Within the GS1 System the prefix 2 is reserved for internal use in an RCN-8 structure. This gives a total of six digits available for structuring entirely at the discretion of the user.

GS1 Prefix	Item Reference	Check Digit
2	$n_2\ n_3\ n_4\ n_5\ n_6\ n_7$	n_8

TABLE 13 RCN-8 Structure

The GS1 Prefix 2 identifies the number as an RCN-8.

The Item Reference is six digits to be allocated at your own discretion.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-8 option.

2.2.7 Coupons

A coupon is a voucher that can be redeemed at POS for a cash value or a free item.

The purpose of coupon numbering and symbol marking is to automate and speed up coupon handling procedures at POS. Moreover, coupon issuers and retailers may be able to reduce the costs involved in sorting coupons, administering manufacturers' payments, and producing reports on redemption.

The GS1 System reserves the prefix **99** for numbering coupons using the Coupon-13 format.

	GS1 Prefix	Company Number	Promotion Number	Check Digit
Nine-Digit GS1 Company Prefix	99	$n_3\ n_4\ n_5\ n_6\ n_7\ n_8\ n_9$	$n_{10}\ n_{11}\ n_{12}$	n_{13}
Seven-Digit GS1 Company Prefix	99	$n_3\ n_4\ n_5\ n_6\ n_7$	$n_8\ n_9\ n_{10}\ n_{11}\ n_{12}$	n_{13}

TABLE 14 Coupon-13 Structure

The GS1 Prefix identifies the item as a Coupon-13

The Company Number already issued by GS1 Australia identifies the issuing company and can be used to tally amounts owing to the retailer. The Company Number is the GS1 Company prefix issued to you when you become a member, minus the prefix 93 (the GS1 Prefix).

The Promotion Number is a non-significant number used to identify the individual promotion. It is recommended that the Promotion Number be allocated sequentially. For companies with a seven-digit Company Number (originally allocated a nine-digit GS1 Company Prefix) the Promotion Number will be three digits long. For companies with a five-digit Company Number (originally allocated a seven-digit GS1 Company Prefix) the Promotion Number will be five digits long.

The Promotion Number may be re-used after a period of no less than three years has elapsed from the end of the previous promotion using the same number.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-13 option.

Please contact GS1 Australia for further information about coupon numbering both locally and internationally.

2.2.8 Non-Retail - Fixed Measure

Non-retail items are trade items not intended for sale to consumers at the retail POS. They may be a standard and stable grouping or a series of single items. Such a unit may be presented in a wide variety of physical forms: a fibreboard carton, a covered or banded pallet, a film wrapped tray, a crate with bottles, etc. Non-retail trade items are often referred to as trade units.

If there is any possibility of a non-retail trade item being sold at retail POS, it must carry a GTIN-13 represented in an EAN-13 Bar Code

Some examples of non-retail trade items are:

- an outer carton
- a pallet containing several cartons
- a display carton
- a piece of steel
- a reel of paper
- a pack of timber pieces

For non-retail trade items you can choose either of the following two numbering options.

Option 1: GTIN-14

This option is only available when the retail trade items within the non-retail item are carrying the same GTIN-13 or GTIN-8.

Note: The GTIN-14 can be represented in an ITF-14 or GS1-128 Bar Code but the ITF-14 Bar Code is better suited to direct printing on to corrugated fibreboard.

Indicator	First Twelve Digits of GTIN-13	Check Digit
1-8	$n_2\ n_3\ n_4\ n_5\ n_6\ n_7\ n_8\ n_9\ n_{10}\ n_{11}\ n_{12}\ n_{13}$	n_{14}

TABLE 15 GTIN-14 Formed From a GTIN-13

Indicator	Filler Zeros	First Seven Digits of GTIN-8	Check Digit
1-8	0 0 0 0 0	$n_7\ n_8\ n_9\ n_{10}\ n_{11}\ n_{12}\ n_{13}$	n_{14}

TABLE 16 GTIN-14 Formed From a GTIN-8

To form a GTIN-14 from a GTIN-13, put an Indicator (a number from one to eight) in front of the first twelve digits of the GTIN-13 of the lowest level of packaging within the non-retail trade item. The Check Digit must then be recalculated.

To form a GTIN-14 from a GTIN-8, put an Indicator (a number from one to eight) followed by five filler zeros, in front of the first seven digits of the GTIN-8 of the lowest level of packaging within the non-retail trade item. The Check Digit must then be recalculated.

Indicators are chosen at the discretion of the company allocating the GTIN. They are used to create a unique GTIN-14, which distinguishes between different packaging levels of the same trade item.

For example: Indicator '1' may be allocated to the 6 pack and indicator '2' may be allocated to a carton containing four 6 packs, thus creating a unique GTIN-14 for every level of packaging, as shown below.

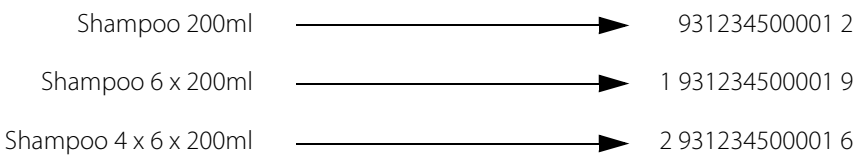


Figure 9 Examples of GTINs for various packaging levels

The last digit is the Check Digit. The Check Digit must be recalculated every time the Indicator changes.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-14 option.

Option 2: GTIN-13

If printing conditions permit the successful printing of an EAN-13 Bar Code, a GTIN-13 can be allocated. The method used to allocate this number is the same as for allocating a number to a retail trade item – refer to "GTIN-13" on page 22.

Ensure that the non-retail trade item is not allocated the same GTIN as an existing retail trade item.

While a GTIN-13 encoded in an EAN-13 Bar Code is suitable for scanning both in retail POS and General Distribution Scanning environments, the size and location of the EAN-13 Symbol must adhere to specifications for items not sold at POS.

If the GTIN-13 is to be encoded in an ITF-14 or GS1-128 Bar Code, a filler zero must be added in front of the GTIN-13.

Note: The ITF-14 Bar Code is better suited for direct printing onto corrugated fibreboard.

2.2.9 Non-Retail - Variable Measure

Trade items may be considered to be variable measure either because the production process does not guarantee consistency in weight, size or length (carcasses of meat, whole cheeses, etc.) or because the items are created to meet a special order which states a quantity (e.g. textiles ordered by the metre, glass ordered by the square metre).

Only trade items that are sold, ordered, or produced in quantities which can vary continuously are covered by the rules outlined here. Trade items which are sold in discrete and pre-defined units (e.g. as a nominal weight) are treated as Fixed Measure Trade Items.

A GTIN-14 with the Indicator 9 is used to identify a Variable Measure Trade Item. The presence of the variable measure information is mandatory for the complete identification of a particular Variable Measure Trade Item and the variable data is encoded using the appropriate Application Identifier as shown in the examples on the pages that follow.

Unlike GTIN-14s used to identify fixed measure trade items, this GTIN-14 is not derived from the GTIN of the contained trade items.

Indicator	GS1 Company Prefix	Item Reference	Check Digit
9	$n_2\ n_3\ n_4\ n_5\ n_6\ n_7\ n_8\ n_9\ n_{10}$	$n_{11}\ n_{12}\ n_{13}$	n_{14}

The Indicator 9 precedes a unique GTIN-13 and is used to identify a Variable Measure Trade Item.

The GS1 Company Prefix is allocated to you as a member company and may vary in length but is usually either seven or nine digits long. In this example it is nine digits in length.

The Item Reference is a non-significant number that is allocated by the member company. It is purely for identification purposes and the individual digits in the number do not relate to anything or convey any specific item information. The Item Reference must be unique and varies in length depending on the length of the GS1 Company Prefix. In this example it is three digits in length.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-14 option.

2.2.9.1 Types of Variable Measure Trade Items

On the following pages are examples of five common types of Variable Measure Trade Items.

Items Traded In Bulk

Neither portioned nor pre-packed for retail sale, ordered in any quantity and delivered as a non-standardised trade item. Examples: Fish, fruit, vegetables, cables, carpets, timber, fabrics.

The GTIN identifies the product and that it is a bulk, non-fixed quantity and, if applicable, the form of packaging. Weight or dimensions are necessary to complete the identification of each individual unit.

The following example shows an order and delivery of an item traded in bulk, invoiced by weight.

- The supplier's catalogue contains one entry: cabbage unwrapped sold in bulk by kilogram.
- The order is for 100kg. It is delivered in two cases. Each case is marked with the GTIN of the cabbage followed by the actual weight of the items contained.
- The two cases may be stored on a pallet that may itself be marked with an SSCC.
- The invoice refers to the GTIN as ordered and shows the total weight and the price per kilogram. The delivered weight may be verified as being close to the ordered quantity.

Process	Description	Bar Code Marking of the Item
Supplier's catalogue	Cabbage unwrapped sold in bulk by kilogram	GTIN: 99312345000046
Order	100kg of cabbage	100kg x 99312345000046
Delivery	2 trade items Unit 1: Weight = 42.7kg Unit 2: Weight = 57.6kg	 Unit 1: (01)99312345000046(3101)000427 Unit 2: (01)99312345000046(3101)000576
	If delivery is made on a pallet	Pallet: (00)393123450000010104 (02)99312345000046(3101)001003(37)02
Invoice	GTIN of the item and the total weight (100.30kg) + the price per kilogram	99312345000046; 100.30kg x price per kilogram

TABLE 17 Items Traded in Bulk

Trade Items Ordered and Delivered By Piece

Wrapped or unwrapped and invoiced by weight or measure because weight or measure vary due to the nature of the product or due to the manufacturing process. Examples: a whole cheese, a side of bacon, a beef carcass, a fish, a sausage, a ham, a chicken.

The GTIN identifies the product, that it is supplied and ordered by the piece and, if necessary, the form of packaging. Price, weight or dimensions complete the identification of the individual item.

The following example shows the order and delivery of an item traded by piece, invoiced by weight.

- The supplier's catalogue contains one entry: one salami weighing 500g
- The order for 100 units is delivered in three boxes. Each box is marked with an SSCC and, optionally, with information on the content of the box, expressed as follows:
    - AI (02) indicates the variable measure GTIN of the units contained within the box.
    - AI (3101) indicates the total weight of the items contained within the box.
    - AI (37) indicates the count of items contained within the box.
- The three boxes may be stored on a pallet that may itself be marked with an SSCC and, optionally, with information on the contents of the pallet, expressed as follow:
    - AI (02) indicates the variable measure GTIN of the units contained within the pallet.
    - AI (3101) indicates the total weight of the items contained within the pallet.
    - AI (37) indicates the total count of items contained within the pallet.
- The invoice refers to the GTIN and the quantity delivered and shows the total weight and the price per kilogram. The GTIN and quantity of the invoice match the GTIN and quantity of the order.

Process	Description	Bar Code Marking of the Item
Supplier's catalogue	1 salami – approx. 500g	GTIN: 99312345000015
Order	100 salamis	100 x 99312345000015
Delivery	3 logistic units	
	Unit 1: 33 salamis weight = 16.7kg	Unit 1: (00)393123450000010005 (02)99312345000015(3101)000167(37)33
	Unit 2: 33 salamis weight = 16.9kg	Unit 2: (00)393123450000010012 (02)99312345000015(3101)000169(37)33
	Unit 3: 34 salamis weight = 17.1kg	Unit 3: (00)393123450000010029 (02)99312345000015(3101)000171(37)34
	If delivery is made on a pallet	Pallet: (00)393123450000010036 (02)99312345000015(3101)000507(37)0100
Invoice	GTIN of the items and the total weight (50.70kg) + the price per kilogram	100 x 99312345000015; 50.70kg x price per kilogram

TABLE 18 Trade Items Ordered and Delivered by Piece

Standardised Trade Items with Selectable Dimensions

This refers to items where GS1 standard numbering does not make sense to cover the multiplicity of all variations. Examples: Wooden planks, carpets.

The GTIN denotes the pre-defined basic trade item. The applicable dimension(s) completes the identification of the individual unit.

The following example shows a product that can be purchased from a supplier or sold to a customer by any length in metres.

- The supplier's catalogue contains one entry: cable T49 sold in any length in metres
- The order is for one length of cable of 150 metres. The delivered package is marked with the GTIN of the cable followed by the actual length of cable contained
- The invoice refers to the GTIN as ordered and delivered and the total length

Process	Description	Bar Code Marking of the Item
Supplier's catalogue	Cable T49 sold in any length in metres	GTIN: 99312345000060
Order	One trade item of 150 metres	99312345000060 x 150 metres
Delivery	One trade item of 150 metres	(01)99312345000060(3110)000150
Invoice	GTIN of the trade item andand the total quantity	1 x 99312345000060; 150 x price per metre

TABLE 19 Standardised Trade Items with Selectable Dimensions

Standardised Composition of a Fixed Number of Trade Items Contained Within Each Unit

Example: Trade item which always contains 20 steaks. The weight of the items in each case varies. The customer is invoiced based on the price per kilogram.

The GTIN identifies both the product and the number of items contained within each unit and, if applicable, its form of packaging. The total weight of all items contained completes the identification of the particular trade item.

The following example shows the order and delivery of an item traded by standard grouping and invoiced by weight.

- The supplier's catalogue contains one entry: One case of 20 steaks weighing approximately 200g each
- The order is for three cases. Each case delivered is marked with the GTIN of the single case followed by the actual weight of the items contained
- The three cases may be stored on a pallet that itself may be marked with an SSCC and, optionally, with information on the contents of the pallet, expressed as follows:
    - AI (02) indicates the variable measure GTIN of the units contained within the pallet
    - AI (3102) indicates the total weight of the items contained within the pallet
    - AI (37) indicates the total count of items contained within the pallet
- The invoice refers to the GTIN and quantity delivered and shows the total weight and the price per kilogram. The GTIN and quantity of the invoice match the GTIN and the quantity order

Process	Description	Bar Code Marking of the Item
Supplier's catalogue	eg. One case of 20 steaks ~ approx. 200g vacuum packed	GTIN: 99312345000008
Order	Three cases	3 x 99312345000008
Delivery	3 trade items Unit 1: Weight = 4.15kg Unit 2: Weight = 4.07kg Unit 3: Weight = 3.98kg	 Unit 1: (01)99312345000008(3102)000415 Unit 2: (01)99312345000008(3102)000407 Unit 3: (01)99312345000008(3102)000398
	If delivery is made on a pallet	Pallet: (00)393123450000070009 (02)99312345000008(3102)001220(37)03
Invoice	GTIN of the items and the total weight (12.20kg) + the price per kilogram	3 x 99312345000008; 12.20kg x price per kg

TABLE 20 Standardised Composition of a Fixed Number of Trade Items Contained Within Each Unit

Standardised Composition of a Variable Quantity Trade Item

Example: Trade item which contain approximately 10 cabbages. The count of items in each case varies. The customer is invoiced based on quantity delivered.

The GTIN identifies the product and, if applicable, its form of packaging. The count of all items contained completes the identification of the particular trade item.

The following example shows an order of standardised variable measure trade items by case that are invoiced by the number of pieces delivered.

- The supplier's catalogue contains one entry: One case of approximately 10 cabbages sold by piece
- The order is for two cases. Each case delivered is marked with the GTIN of the single case followed by the actual count of the items contained
- The two cases may be stored on a pallet that itself may be marked with an SSCC and, optionally, with information on the contents of the pallet, expressed as follows:
    - AI (02) indicates the variable measure GTIN of the units contained within the pallet
    - AI (30) indicates the total count of the items contained within the pallet
    - AI (37) indicates the total count of cases contained within the pallet
- The invoice refers to the GTIN as ordered and delivered and the total count of items

Process	Description	Bar Code Marking of the Item
Supplier's catalogue	One case containing ~ approx. 10 cabbages sold by pieces	GTIN: 99312345000039
Order	Two cases	2 x 99312345000039
Delivery	2 trade items Unit 1: 11 pieces Unit 2: 12 pieces	 Unit 1: (01)99312345000039(30)11 Unit 2: (01)99312345000039(30)12
	If delivery is made on a pallet	Pallet: (00)393123450000010098 (02)99312345000039(30)23(37)02
Invoice	GTIN of the trade item and the total quantity	2 x 99312345000039; 23 pieces x price per piece

TABLE 21 Standardised Composition of a Variable Quantity Trade Item

2.3 Numbering Trade Items for North America

Although North America set a sunrise date of January, 2005, for the global use of the GTIN-13 and GTIN-8, a GTIN-12 represented by a UPC-A or UPC-E Bar Code may still be required for items sold at retail Point-of-Sale (POS) in the United States and Canada. This is because many North American users cannot yet accommodate a GTIN-13 or GTIN-8 in their twelve-digit database files. If advised by North American distributors that your bar codes are unable to be scanned, please contact GS1 Australia regarding the allocation of a U.P.C. Company Prefix.

Note: The compatibility issue is only a one way problem. While parts of the United States and Canada may be unable to manage a GTIN-13 or GTIN-8, all other countries will be able to manage a GTIN-12.

2.3.1 Selecting the Correct GS1 Identification Number

When selecting the correct/most appropriate GS1 Identification Number, it is important to consider a number of factors including environment and the type of trade item you are identifying. Combine the information in "Basic Numbering Rules" on page 15 with the information in the table below.

Use the left most column to select the trade item type and the top row to select the type of Identification Number. The table cell where the trade item type and Identification Number type intersect gives the page number on which the details for generating your chosen Identification Number can be found.

Identification ---------- Trade Item Type	Zero Suppressed GTIN-12	GTIN-12	GTIN-14	RCN-12
POS Fixed	47	46		
GD Fixed		52	36	
POS & GD		52		
Restricted				49
Note: POS = Retail Point-of-Sale, GD = General Distribution Scanning, Fixed = Fixed Measure, Restricted = Restricted Circulation				

TABLE 22 Selecting the Correct GS1 Identificaton Number for North America

2.3.2 Retail POS - Fixed Measure

Any trade item that is to be sold to the final consumer through retail POS is more commonly known as a retail item or consumer unit. Fixed Measure Trade Items are those that are always produced in the same version and composition (eg. type, size, weight, contents, design).

Any trade item that could be sold at retail POS as well as scanned in a General Distribution Scanning environment must be numbered according to the rules applicable to trade items sold at POS. However, the size and location of the bar codes on these trade items are determined by the rules applicable to trade items not sold at POS.

There are two types of GTINs for trade items that can be scanned globally at POS.

- GTIN-12, which is represented in a UPC-A Bar Code (or GS1 DataBar Bar Code under conditions described in the note below)

Note: GS1 DataBar has been approved for bilateral use between trading partners from 2010. In 2014 GS1 DataBar becomes an open symbology and all scanning environments must be able to read these symbols.

- Zero Suppressed GTIN-12, which is represented in a UPC-E Bar Code

Note: GS1 US have ceased allocation of Zero Suppressed GTIN-12s.

2.3.2.1 GTIN-12

A GTIN-12 is encoded in a UPC-A Bar Code (or GS1 DataBar under conditions described in the note below) and can be used for the identification of any retail trade item.

Note: GS1 DataBar has been approved for bilateral use between trading partners from 2010. In 2014 GS1 DataBar becomes an open symbology and all scanning environments must be able to read these symbols.

For details on the UPC-A Bar Code, including dimensions, please refer to section 6.2.3 UPC-A Symbol Specifications on page 152. For details on GS1 DataBar refer to chapter 6, section 6.2.9 GS1 DataBar Symbol Specifications on page 166

TABLE 23 GTIN-12 Structure

The U.P.C. Company Prefix is allocated by GS1 US. The length of the U.P.C. Company Prefix is varying, and the numbering capacity you are allocated depends on the U.P.C. Company Prefix issued.

The Item Reference is a non-significant number that is allocated by the member company. It is purely for identification purposes and the individual digits in the number do not relate to anything or convey any specific item information. It is recommended that the Item Reference is allocated sequentially and that each item is numbered to the lowest level of identification, for example: size, colour, model, finish, type, style. The length of the Item Reference will depend on the length of you U.P.C. Company Prefix.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-12 option.

2.3.2.2 Zero Suppressed GTIN-12

Note: GS1 US Have ceased allocation of Zero Suppressed GTIN-12s.

If packaging is too small to accommodate a UPC-A Bar Code, then the alternative is a UPC-E Bar Code. Although only eight digits are directly encoded in the UPC-E Bar Code, the data contained is actually a GTIN-12 with the zeros suppressed. For application processing, the GTIN-12 must be transformed into its full length by the bar code reader software or by the application software. For details on the UPC-E Bar Code, including dimensions, please refer to "UPC-E Symbol Specifications" on page 155.

Note: You can only apply zero suppression to a GTIN-12 with a U.P.C. Company Prefix starting with zero.

Creating a Zero Suppressed GTIN-12

Note: To establish a Zero Suppressed GTIN-12, first allocate a GTIN-12 according to the rules set below. The Zero Supressed GTIN-12 Check Digit is calculated on the original GTIN-12 (the expanded number), not the number in its zero suppressed form.

If the company's number ends in 000, 100, or 200, there are 1,000 item numbers available between 00000 and 00999. Obtain the six characters from:

- the first two characters after the leading **0** of the company's number
- followed by the last three characters of the item number
- followed by the third character of the company's number

If a company's number ends in 300, 400, 500, 600, 700, 800, or 900, there are 100 item numbers available between 00000 and 00099. Obtain the six characters from:

- the first three characters after the leading **0** of the company's number
- followed by the last two characters of the item number
- followed by **3**

If a company's number ends in 10, 20, 30, 40, 50, 60, 70, 80, or 90, there are 10 item numbers available between 00000 and 00009. Obtain the six characters from:

- the first four characters after the leading **0** of the company's number
- followed by the last character of the item number
- followed by **4**

If a company's number does not end in 0, then five item numbers between 00005 and 00009 are available. Obtain the six characters from:

- all five characters after the leading **0** of the company's number
- followed by the last character of the item number

Decoding a Zero Suppressed GTIN-12

The UPC-E Bar Code is encoded in a special way that leaves out some zeros that can occur within the number. By suppressing these zeros, effectively the area needed for the bar code can be halved.

The decoding process returns the suppressed zeros to the number.

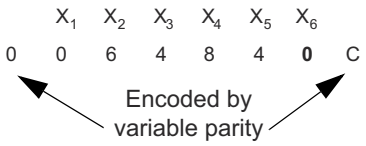
To decode a Zero Suppressed GTIN-12 into a full GTIN-12 use the value of the **second last** human readable digit (**not** the Check Digit) to determine the way in which to insert zeros. See TABLE 24.

Note: Scanning equipment is normally programmed to decode the UPC-E Bar Code in accordance with the rules in this section.

GTIN-12 zero suppressed	Decoded into GTIN-12	
Human readable digits	UCC Company prefix	Item reference
0 $X_1X_2X_3X_4X_5$ **0** C	0 X_1X_2 0 0 0	0 0 $X_3X_4X_5$ C
0 $X_1X_2X_3X_4X_5$ **1** C	0 X_1X_2 1 0 0	0 0 $X_3X_4X_5$ C
0 $X_1X_2X_3X_4X_5$ **2** C	0 X_1X_2 2 0 0	0 0 $X_3X_4X_5$ C
0 $X_1X_2X_3X_4X_5$ **3** C	0 $X_1X_2X_3$ 0 0	0 0 0 X_4X_5 C
0 $X_1X_2X_3X_4X_5$ **4** C	0 $X_1X_2X_3X_4$ 0	0 0 0 0 X_5 C
0 $X_1X_2X_3X_4X_5$ **5** C	0 $X_1X_2X_3X_4X_5$	0 0 0 0 5 C
0 $X_1X_2X_3X_4X_5$ **6** C	0 $X_1X_2X_3X_4X_5$	0 0 0 0 6 C
0 $X_1X_2X_3X_4X_5$ **7** C	0 $X_1X_2X_3X_4X_5$	0 0 0 0 7 C
0 $X_1X_2X_3X_4X_5$ **8** C	0 $X_1X_2X_3X_4X_5$	0 0 0 0 8 C
0 $X_1X_2X_3X_4X_5$ **9** C	0 $X_1X_2X_3X_4X_5$	0 0 0 0 9 C

TABLE 24 Placement of Zeros When Decoding a Zero Suppressed GTIN-12

For example, to decode the Zero Suppressed GTIN-12 0064840



U.P.C. Company Prefix = 0 X_1X_2 0 0 0 = 006000

Item Reference = 0 0 $X_3X_4X_5$ C = 00484C

Reconstituted GTIN-12 = 006000004840

Calculate the Check Digit over the full length GTIN-12.

Treat all numbers as right justified in a fourteen-digit field. Therefore, consider these reconstituted numbers as having an additional two digits to the left with a value of 0. This means that the reconstituted Zero Suppressed GTIN-12 will start with three zeros in a fourteen-digit field.

2.3.3 Retail POS - Restricted Circulation

The GS1 US System includes a numbering series which enables companies to identify items for internal use. The primary purpose of this structure is to deal with Variable Measure Trade Items, that is, items sold in random weights against a fixed price per unit weight; for example, fresh meat, fruit and vegetables, cheeses, and delicatessen goods.

The originators of the Restricted Circulation Number (RCN) are responsible for ensuring that the numbers are used for internal purposes only. They must ensure that items using the internal number series cannot "escape" to cause ambiguity elsewhere.

The principal use of restricted circulation numbering is for encoding in-store retail items that are not numbered at source (source marked).

In a twelve-digit format, the prefix 2 is reserved for restricted circulation numbering. This format is also available for retailers for restricted circulation use in GS1 member countries.

GS1 US has specific recommendations for the use of this prefix when used in the USA. Information on the options given by GS1 US is available from GS1 Australia.

GS1 Australia recommends the following structure for use by retailers in Australia.

U.P.C. Prefix	Item Reference	Price Verifier	Price	Check Digit
2	n_2 n_3 n_4 n_5 n_6	n_7	n_8 n_9 n_{10} n_{11}	n_{12}

TABLE 25 Recommended Structure for RCN-12 use in Australia

This structure has been used as a standard for the commercial production of equipment designed to weigh items, calculate the item price from the unit price, and print a bar code label accordingly. POS scanning equipment can also be

programmed to decode bar code or identification numbers commencing with the U.P.C. Prefix 2. Members may use this as a basis for agreement with their equipment suppliers.

The same structure may also be used for internal purposes if desired for fixed weight, fixed price items. This gives the possibility of coding and labelling items internally with both item identity and selling price, for direct registration at POS, without requiring price look-up.

If used in conjunction with POS scanning equipment that is not programmed for the standard structure, numbers under U.P.C. Prefix 2 can be used internally in any other manner, as agreed with the equipment supplier.

The U.P.C. Prefix 2 identifies the number as an RCN-12.

The Item Reference, the next five digits, are allocated at the discretion of the organisation allocating the number. Allocate a separate number for each item.

The Price Verifier Digit validates the accuracy of the following five digit price. To manually calculate the Price Verifier Digit refer to "Manual Check Digit Calculation" on page 53.

The Price, the next five digits, represent the price of the individual variable weight item to two decimal places. Machines that print the bar code label will automatically calculate the price.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code.

A Check Digit Calculator Program which will automatically calculate both the Price Verifier Digit and the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating both the Check Digit and the Price Verifier Digit refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-12 option.

2.3.4 Non-Retail - Fixed Measure

There are two available options for generating a GTIN for a non-retail trade item if you are using a U.P.C. Company Prefix.

If there is any possibility of a non-retail trade item being sold at retail level, it must carry a GTIN-12 represented by a UPC-A Bar Code. as described in Option 2.

Option 1: GTIN-14

This option is only available when the retail trade items within the non-retail item are carrying the same GTIN-12.

When the retail item contained within the non-retail unit carries a Zero Suppressed GTIN-12, the Zero Suppressed GTIN-12 must first be expanded into its full twelve-digit form (refer to "Decoding a Zero Suppressed GTIN-12" on page 48).

Note: The GTIN-14 can be represented in an ITF-14 or GS1-128 Bar Code but the ITF-14 Bar Code is better suited to direct printing onto corrugated fibreboard.

Indicator	Filler Zero	First 11 Digits of GTIN-12	Check Digit
1-8	0	$n_3\ n_4\ n_5\ n_6\ n_7\ n_8\ n_9\ n_{10}\ n_{11}\ n_{12}\ n_{13}$	n_{14}

TABLE 26 GTIN-14 Structure - Indicator Method

To form a GTIN-14, put an Indicator followed by a filler zero in front of the first eleven digits of the GTIN-12 of the lowest level of packaging within the non-retail trade item. The Check Digit must then be recalculated.

Indicators are chosen at the discretion of the company allocating the GTIN. They are used to create a unique GTIN-14 which distinguishes between different packaging levels of the same trade item.

For example: Indicator '1' may be allocated to the 6 pack and Indicator '2' may be allocated to a carton containing four 6 packs, thus creating a unique GTIN-14 for every level of packaging, as shown in Figure 9 on page 37.

The last digit is the Check Digit. The Check Digit must be recalculated every time the Indicator changes.

A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org.

For instruction on manually calculating the Check Digit please refer to "Manual Check Digit Calculation" on page 53.

For either method of calculating the Check Digit use the GTIN-14 option.

Option 2: GTIN-12

If printing conditions permit the successful printing of a UPC-A Bar Code a GTIN-12 can be allocated. The method used to allocate this number is the same as for allocating a number to a retail item, refer to "GTIN-12" on page 46.

Ensure that the non-retail trade item is not allocated the same GTIN-12 as an existing retail trade item.

While an item intended for both POS and General Distribution Scanning environments must carry a retail number and bar code, the size and location of the bar codes must adhere to the specifications for items not sold at POS.

If the GTIN-12 is to be encoded in an ITF-14 or GS1-128 Bar Code, two filler zeroes must be added in front of the GTIN-12.

The ITF-14 Bar Code is better suited for direct printing onto corrugated fibreboard.

2.4 Manual Check Digit Calculation

Standard Check Digit Calculations

Below is a detailed explanation on how to calculate the Check Digits for the different length GS1 Identification Numbers.

Note: The Check Digit for a Zero Supressed GTIN-12 (encoded in a UPC-E Bar Code) is calculated using the first eleven digits of the GTIN-12 in its expanded form.

Digit Positions																		
GTIN-8											n_1	n_2	n_3	n_4	n_5	n_6	n_7	n_8
GTIN-12							n_1	n_2	n_3	n_4	n_5	n_6	n_7	n_8	n_9	n_{10}	n_{11}	n_{12}
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-14					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}	n_{14}
SSCC	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}	n_{14}	n_{15}	n_{16}	n_{17}	n_{18}
Multiply value of each position by:																		
	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	
Accumulated results = *Sum*																		
Subtract sum from the next highest multiple of ten = *Check Digit*																		

TABLE 27 Manual Check Digit Calculation

Positions		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}
Number *without* Check Digit		9	3	1	2	3	4	5	6	7	8	9	0	
Step 1:	Multiply	x	x	x	x	x	x	x	x	x	x	x	x	
	by	1	3	1	3	1	3	1	3	1	3	1	3	
Step 2:	Add up	=	=	=	=	=	=	=	=	=	=	=	=	
	results to *sum*	9	9	1	6	3	12	5	18	7	24	9	0	=103
Step 3: Subtract *sum* from next highest multiple of ten (110) = Check Digit (7)														
Number *with* Check Digit		9	3	1	2	3	4	5	6	7	8	9	0	**7**

TABLE 28 Example One of a Manual Check Digit Calculation for a GTIN-13

Step One Starting with the first number on the right, add all the alternate numbers 9 3 1 2 3 4 5 6 7 8 9 0 ←Check Digit Position	0 + 8 + 6 + 4 + 2 + 3 = 23
Step Two Multiply the result by three	23 x 3 = 69
Step Three Starting with the second number on the right, add all the alternate numbers. 9 3 1 2 3 4 5 6 7 8 9 0 ←Check Digit Position	9 + 7 + 5 + 3 + 1 + 9 = 34
Step Four Add the results of Step One and Step Two. **Note**: If the result is an exact multiple of 10 your Check Digit is a 0 (zero): do not continue to Step Five.	69 + 34 = 103
Step Five Subtract the sum obtained in Step Four from the next highest multiple of ten.	110 - 103 = 7
Check Digit The result of Step Five is your Check Digit 9 3 1 2 3 4 5 6 7 8 9 0 7 ←Check Digit	Check Digit = 7

TABLE 29 Example Two of a Manual Check Digit Calculation for a GTIN-13

Price Verifier Digit Calculations

The basic principle of the Check Digit calculation is that each digit position in a price/weight field is assigned a weighting factor. Weighting factors are 2-, 3, 5+, and 5-. Each weighting factor affects the particular calculation for the position concerned. The result of such a calculation is called a weighted product.

The figures below show the weighted products of the various weighting factors.

Weighting Factor 2-										
Digit	0	1	2	3	4	5	6	7	8	9
Weighted product	0	2	4	6	8	9	1	3	5	7
Calculation rule: The digit is multiplied by 2. If the result has two digits, the tens digit is subtracted from the units digit. The units digit resulting is the weighted product.										

TABLE 30 Price Verifier Digit Calculation Weighting Factor 2-

Weighting Factor 3										
Digit	0	1	2	3	4	5	6	7	8	9
Weighted product	0	3	6	9	2	5	8	1	4	7
Calculation rule: The digit is multiplied by 3. The units digit of the result is the weighted product.										

TABLE 31 Price Verifier Digit Calculation Weighting Factor 3

Weighting Factor 5+										
Digit	0	1	2	3	4	5	6	7	8	9
Weighted product	0	5	1	6	2	7	3	8	4	9
Calculation rule: The digit is multiplied by 5. The units digit and the tens digit of the result are added together. The result of this sum is the weighted product.										

TABLE 32 Price Verifier Digit Calculation Weighting Factor 5+

Weighting Factor 5-										
Digit	0	1	2	3	4	5	6	7	8	9
Weighted product	0	5	9	4	8	3	7	2	6	1
Calculation rule: The digit is multiplied by 5. The tens digit is the result subtracted from the result. The units digit of the result of this subtraction is the weighted product.										

TABLE 33 Price Verifier Digit Calculation Weighting Factor 5-

Five-Digit Price Field Calculation

Digit Position	1	2	3	4	5
Weighting Factor	5+	2-	5-	5+	2-

TABLE 34 Assigned Weighting Factors for a Five-Digit Price Field Calculation

Step 1: Determine the weighted product for each number in positions one to four according to the assigned weighting factors.

Step 2: Add the products of step 1.

Step 3: Subtract the result from the nearest equal or higher multiple of 10.

Step 4: Take the result and search for the same number in the weighted product row of figure – Weighting Factor 5. The Price Verifier Digit is the number in the digit row of the same column.

Position of the price field	1	2	3	4	5	
Assigned weighting factor	5+	2-	5-	5+	2-	
Amount	1	4	6	8	5	
Step 1: Weighted product according to figure	5	8	7	4	9	
Step 2: Sum	+	+	+	+	+	= 33
Step 3: Result of subtraction (40-33)						= 7
Step 4: Weighted product 7 in the figure weighting factor 5- shows number 6 to be the check digit						

TABLE 35 Example of a Price Verifier Digit Calculation for a Five-Digit Price Field

Four-Digit Price Field Calculation

Digit Position	1	2	3	4
Weighting Factor	2-	2-	3	5-

TABLE 36 Assigned Weighting Factors for a Four-Digit Price Field Calculation

Step 1: Determine the weighted product for each number in positions one to four according to the assigned weighting factors.

Step 2: Add the products of step 1.

Step 3: Multiply the result of step 3 by the factor 3. The units digit of the result is the Price Verifier Digit.

Position of the price field	1	2	3	4	
Assigned weighting factor	2-	2-	3	5-	
Amount	2	8	7	5	
Step 1: Weighted product according to figure	4	5	1	3	
Step 2: Sum	+	+	+	+	= 13
Step 3: Multiply by 3					= 39
The unit position of Step 3, in this case 9, is the Check Digit.					

TABLE 37 Example of a Price Verifier Digit Calculation for a Four-Digit Price Field