



The Australian Red Meat Industry

Industry
Guidelines for the
Numbering and
Bar Coding of
Trade Items

Draft Version 3.2



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2.3	January 2002	• Term bar coding to become bar coding • Non-retail items to become non retail trade items • Introduction of assets into the definition of EAN.UCC System is an internationally compatible system for the identification of items, services, logistic units and assets, locations.... • EAN Australia technical manual becomes EAN User Manuals • Introduction of Global Trade Item Number (GTIN) instead of EAN/UCC identification number • Introduced the concept of the EAN/UCC-13 with a filler zero rather than an EAN/UCC-14 • Introduced EAN.UCC Company prefix • Variable Weight becomes variable measure trade items



		• Definition of AI 17 and 15 were corrected • Variable Quantity becomes variable count • Attribute information location has been updated to should be aligned with to the left or right of the main bar code rather than under the main bar code • Light margins should be printed with the leading and trailing light margin areas of at least 10 modules in width rather than at least 10mm in width • Location of logistics label from one side to ideally on a minimum of two adjacent vertical sides • Updated Figure 4 to reflect the correct data titles on the label to define data • Updated AI list • Updated When To Change A Number table • Updated Services Section
3.0	November 2005	• Updated name and format • Added RSS & RFID information • Term bar code or data carrier to become bar code symbol
3.1	July 2009	• EAN Australia changed to GS1 Australia • EAN/UCC-8, 12, 13 & 14 changed to GTIN-8, 12,13 & 14 respectively • UCC/EAN-128 Bar Code Symbol changed to GS1-128 Bar Code Symbol • Section entitled to GS1 Solutions and Services updated • Diagrams updated where necessary • Table entitled Selecting the Correct GS1 ID Key added • GTIN and Bar Code Symbol Decision Flow Chart updated • Bar Code Verification added to Services Offered by GS1 Australia and other services in this section updated • Inclusion of numbering and bar coding retail trade items for fixed and variable measure
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These guidelines should be read in conjunction with the **GS1 Australia User Manual - Numbering and Bar Coding**.



Disclaimer

Every possible effort has been made to ensure that the information and specifications in this manual are correct; however GS1 Australia and the Australian Red Meat Supply Chain Committee expressly disclaim liability for any errors. In addition, no warranty or representation is made that this manual will not require modification due to developments in technology or changes or additions to the GS1 System.



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1 Executive Summary

The Red Meat Industry in Australia has adopted the key principles of the GS1 System. There is increased demand for improved data capture at all points of the supply chain. This should be a key objective for all trading partners if they are to effectively meet their company's needs and exceed customers' expectations.

The efficient servicing of customers is the process of supplying the right products, right quantity, right price and right quality at the right time and place with a minimum of effort. The benefits are the avoidance of wasted effort, measured in terms of low cost and high levels of customer service.

Achieving efficiency in the management of the supply chain relies on having fast, accurate and timely information about production, distribution and consumption. The need for a highly responsive supply chain is driving forward the development of communication techniques. Technologies such as automatic data capture (through the use of bar coding or RFID), electronic messaging, and data synchronisation are essential for this communication. Any company serious about exploiting the concepts and practices of supply chain management must be competent in the use of these technologies. Nothing is more central to the effectiveness of a supply chain than the ability to transmit accurate, relevant, understandable and timely information among its participants.

These recommendations for best practice encompass the main requirements of the Australian Red Meat Industry (export and domestic) for retail and non-retail trade items. Trade items, in relation to this guideline can relate to either edible meat product i.e. for human consumption or non-edible meat products e.g. hides and by-products. Adoption of these recommendations should bring improved business efficiency and effectiveness for all companies within the supply chain.

This guideline specifically provides examples and methods of use for both export and domestic products for the following:

- Retail trade items -
 - Fixed weight product
 - Random weight product (domestic only)
- Non-retail trade items -
 - Carcase - (whole or part – wrapped or non-wrapped [non-carton])
 - Carton (standard cartons, bulk bins, tubes, bladders)
- Logistic Units –
 - Pallet (of cartons, tubs)
 - Module lots
 - Shipment (container, truck load)

This guideline does not specifically address live animal requirements or non-edible by-products but focuses on edible (for human consumption) products; however, it can be equally applied to non-edible products.

Although the degree to which companies implement the guideline will vary because of the differences in commercial needs, the aim of this guideline is to provide a basis for a common approach to an internationally compatible numbering and bar coding system. It should be noted that the adoption of this guideline by the Australian Meat Industry is voluntary and implementation is left to the discretion of the individual company. The requirements of trading partners and the need for product traceability mandate the commercial necessity for publication of this guideline. It should also be noted that this guideline has complete compatibility with other industry guidelines on the use of the GS1 System.

If there is a change in industry focus, this guideline will be adjusted, either to include the implementation of the GS1 System from the live animal or to include any international requirements. This document will be appropriately updated at that time. Suffice to say, this document is relevant at any part of the supply chain and is consistent with the international application of the GS1 System.



These guidelines are a recommendation only. Before implementation please consult your trading partners for specific requirements above and beyond this document.



2 Introduction and Overview

The GS1 System originated in the United States and was established in 1973 by the Uniform Code Council (UCC), now known as GS1 US. The UCC adopted a 12-digit identification number, and the first identification numbers and bar codes in open trade were being scanned in 1974.

Following the success of the UCC System, the European Article Numbering Association (now known as GS1), was established in 1977 to develop a compatible system for use outside North America.

Today, full global compatibility is achieved through the use of the Global Trade Item Number (GTIN), an 8, 12, 13, or 14-digit number that is unique worldwide. The GS1 System is designed for use in any industry or trade sector, at all levels of manufacturing and distribution. In Australia, major system adopters include the grocery, health, steel, hardware, consumer electronics, furniture, meat and telecommunications industries. The GS1 System is even used for fire brigades and electricity generators.

The following information contains guidelines on how to number and bar code trade items using the GS1 standards for the Australian Red Meat Industry.

The versatility of the GS1 System provides users with various numbering and bar coding options. It is left to the discretion of manufacturers and suppliers to decide which option is suitable to their business needs and those of their trading partners.

2.1 Who is GS1 Australia

GS1 Australia is part of the not-for-profit GS1 global organisation and locally administers the GS1 System in Australia.

Created to help Australian business enterprises to become more efficient, GS1 Australia's fundamental role is to allocate GS1 Identification Numbers, maintaining internationally accepted trading standards. This in turn allows Australian organisations to adopt world's best practice supply chain management techniques.

Today, over 1 million member companies, serviced by offices in 108 countries, use the GS1 standards as part of their daily business communications, representing over five billion scanning transactions a day.

The today's GS1 Australia organisation was formed in 1978 as *the Australian Product Numbering Association (APNA)*, which was named *EAN Australia* from 1993 to 2005.

2.2 The GS1 System

The GS1 System permits organisations of any size to order, track, trace, deliver and pay for goods across the supply chain, anywhere in the world.

As illustrated in the Figure 1 on page 6, GS1 Solutions and Services using the GS1 System include:

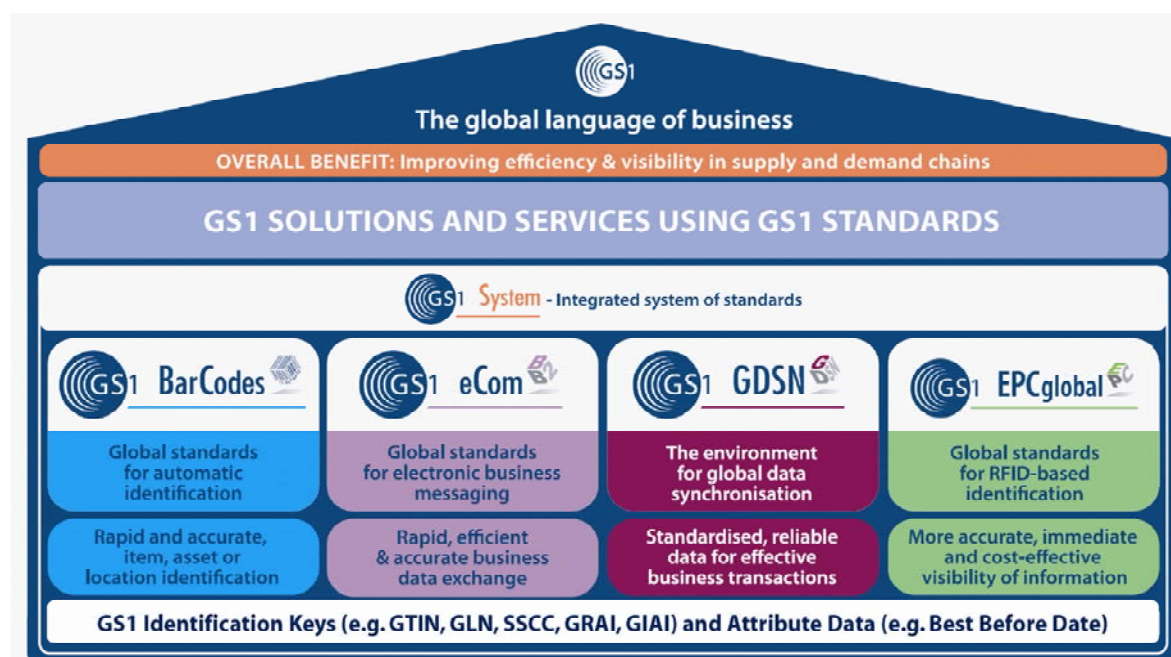
GS1 Identification Keys: GS1 Identification Keys are the keys to accessing information about a product (or any physical or non physical item) on a computer file. The numbers are unique, non significant and global. They can be allocated to trade items, logistic units, locations, assets, shipments, consignments, documents and service relationships. The main elements of the numbering system are GTIN, SSCC, GLN and the Attribute Data. Please contact GS1 Australia for a full list of a GS1 Identification Keys.



Bar Codes: Within the GS1 System, data carriers (most commonly bar codes) are used to encode the GS1 Identification Keys to facilitate communication, data collection and exchange of information and smooth the flow of information between trading partners.

eMessaging: GS1 EANCOM and Business Messaging Standards for eMessaging (based on XML) are based on the principle of the transfer of structured data, using agreed messaging standards from one computer application to another by electronic means and with a minimum of human intervention. The structure and data content are exchanged by agreed means by trading partners. The electronic exchange of data or eMessaging provides trading partners with an efficient trading tool for the transmission of data.

Figure 1: the GS1 System



GS1 GDSN: The GS1 Global Data Synchronisation Network (GDSN) is a concept developed by various industry groups, including Global Commerce Initiative (GCI) and GS1 to assist industries streamline their supply chain transactions with the aim of reducing supply chain costs. The GS1 GDSN is an internet based interconnected network of interoperable data posted to a global registry that enables companies around the globe to exchange and synchronise supply chain master data with their trading partners. GS1net is the GDSN Data Pool run by GS1 Australia.

EPCglobal: The EPC (Electronic Product Code) Network is an open standards-based system that will make organisations more effective through real and timely visibility of information about items in the supply chain. This new, open global standard combines Radio Frequency Identification technology (RFID), existing communications network infrastructure and the EPC (a number for uniquely identifying an item) to create cost-efficient, real-time, accurate information about the location of items, the history of items, and the number of items in the supply chain. It is based on research conducted through the Auto-ID Centre with the support of more than 100 leading companies.

The EPC Network is comprised of five fundamental elements:

- Electronic Product Code (EPC)
- EPC Tags and Readers
- Object Name Service (ONS)
- Physical Markup Language (PML)
- Middleware (Application Level Event Software)



3 Benefits of Implementation

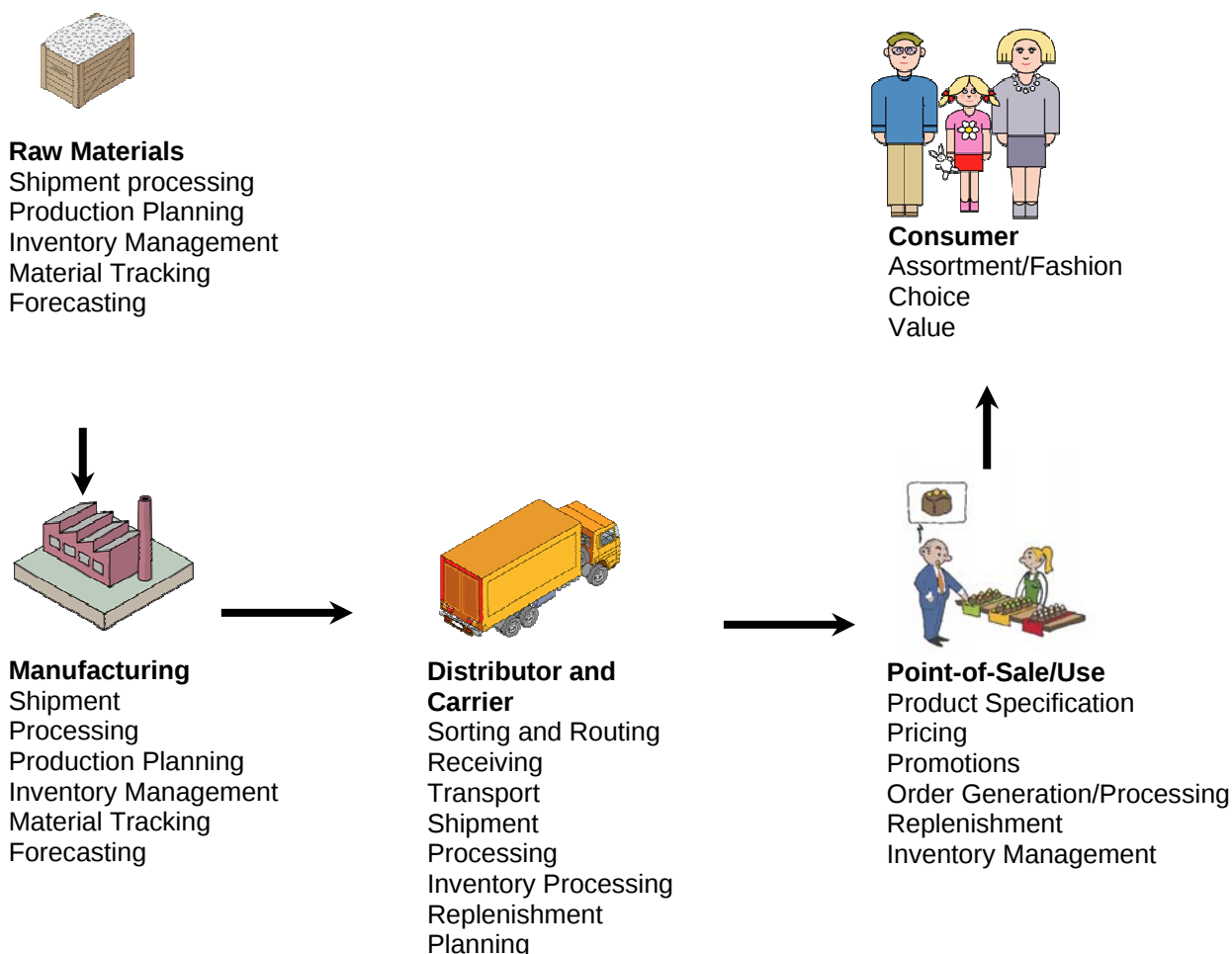
Using a standard common approach to the numbering and bar coding of trade items, logistic units, locations, assets, and documents, amongst others, will deliver the benefits of speed, accuracy and labour savings in the handling and distribution of goods throughout the entire supply chain. Companies should consider that the implementation of the GS1 standards is applicable not only to meet customer or trading partner demands but also to improve internal supply chain management. The benefits listed below are defined generically for users throughout the entire supply chain and not just the end user.

Some of the specific identified benefits are:

- More accurate information
- Real-time information
- Reduced manual entry
- Improved traceability (including for product recalls/withdrawals)
- Common identification across Industry
- Improved stock handling
- Improved stocktaking
- Reduced picking errors
- Reduce customer order errors

The numbering and bar coding of trade items supports the following supply chain functions:

Figure 2: Numbering and Bar Coding Benefits along the Supply Chain



4 How to Number and Bar Code Trade Items

4.1 Definition of Trade Item

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 raw materials through to the end user products and also includes services, all of them having pre-defined characteristics.

A trade item may be a single, non-breakable unit; it may also be a standard and stable grouping of 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. Trade items consisting of single units are identified with a unique Global Trade Item Number (GTIN); standard groupings of identical or different units are identified with separate unique GTINs.

The GTIN can be represented in one of four ways:

- GTIN-8
- GTIN-12
- GTIN-13
- GTIN-14

A separate GTIN must be assigned to every different variation of a product. Cut, grade, etc are all considered separate variations and thus require separate GTINs.

Any change to trade items, such as weight, description, etc may require the allocation of another GTIN. In this event consult www.gs1.org and follow the links to “GTIN Allocation Rules” for guidance on when a change of GTIN is required, or contact GS1 Australia for further information.

When allocating GTINs in any of the formats described in the following sections, GS1 Australia recommends that no significance is created within the GTIN itself. Data is linked via a database to the GTIN, thus no level of understanding is required within the number itself.

Note: 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 (4 years) has elapsed after:

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

Companies may choose to extend the period of time before a GTIN is re-used beyond the minimum of four years; this is perfectly acceptable.

Consideration should be given to items which may exist in the marketplace for a longer period. 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.

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.

Further consideration should be given to trade items in the healthcare sector, where it has been determined that GTINs will never be re-issued, for the purposes of patient safety.



4.2 Attributes of Trade Items

Attribute information of trade items is any data over and above the item identifier, ie. the GTIN. Examples of this type of information include batch numbers, serial numbers and variable measure information such as length, weight etc.

Attribute information is represented by GS1 Application Identifiers (AIs) and these ensure that the attribute information can be interpreted unambiguously by trading partners throughout the entire supply chain.

Example:

Figure 3: Attribute Information used for traceability



Note: Bar code size is not to scale.

Important Notes REGARDING TRADE ITEM ATTRIBUTE INFORMATION:

- Attribute information cannot stand-alone; it must always be accompanied by a GTIN
- Attribute information can be encoded with the GTIN in a GS1-128 or GS1 DataBar¹ Bar Code. It can also be added as an additional bar code to an existing EAN-13, UPC-A, ITF-14 or a GS1-128 Bar Code, which is representing a GTIN
- If an AI appears on the same item more than once (e.g. if two labels are applied to the same item) the AI must be followed by the same information on each label
- Attribute information cannot currently be scanned at the retail Point-of-Sale¹

For further information regarding the use of Application Identifiers please refer to the **GS1 Australia User Manual-Numbering and Bar Coding**.

¹ GS1 DataBar has been approved for bilateral use between trading partners from 2010 and, in 2014 GS1 DataBar becomes an open Symbology and all scanning environments must be able to read these symbols.



4.2.1 Attribute Information Options for Trade Items for the Meat Industry

In “principle” the Australian Meat Industry supports the use of variable data in the long term. Individual companies need to make their own assessment on the implementation and use of variable data in their business.

Suppliers may wish to enhance the traceability of their own products by introducing additional information over and above the allocation of a GTIN to each trade item.

Suppliers at their discretion can apply to trade items any of the Application Identifiers (AIs) available to them under the GS1 specifications. For a full list of Application Identifiers refer to the **GS1 Australia User Manual - Numbering and Bar Coding** available from the GS1 Australia web site www.gs1au.org

The use of attribute data can facilitate traceability within the supply chain and hence improve quality control, production of consistent product etc. The Australian Meat Industry has requirements for specific attribute information to be bar coded for carton and carcass edible product suitable for domestic or export trade. Individual companies need to make their own assessment on the implementation and use of variable data in their business.

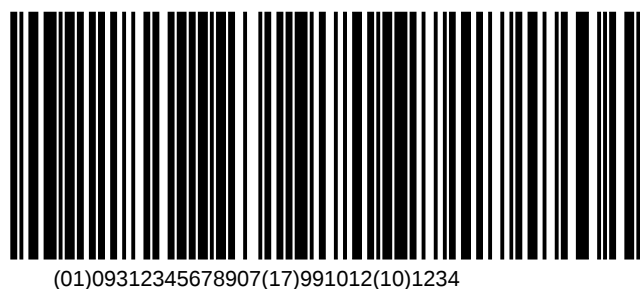
All attribute information must be represented in a GS1-128 (previously UCC/EAN-128) Bar Code Symbol. When attribute data is applied to an item that is sold at Point-of-Sale then this is added alongside the EAN-13 Bar Code Symbol, (see Figure 4) otherwise it can be concatenated (linked together) with the GTIN, in one single GS1-128 Bar Code Symbol (see Figure 5).

Figure 4: GTIN with attribute information in separate bar codes.
GTIN-13 represented in an EAN-13 Bar Code, along side a serial number represented in a GS1-128 Bar Code.



Note: The attribute information represented in the above figure will NOT scan at the Point-of-Sale and bar code size is not to scale.

Figure 5: Concatenated GS1-128 Bar Code Symbol



(01)GTIN (17) Expiration Date (10) Batch Number

Note: The bar code symbol represented in the above figure will NOT scan at the Point-of-Sale and bar code size is not to scale.



4.2.2 Formats for Attribute Information

A Global Trade Item Number (GTIN) can be used alone on a fixed measure non-retail trade item (trade unit).

Where additional information is required to be bar coded using the GS1-128 Bar Code Symbol, the appropriate AIs must accompany the GTIN.

4.2.2.1 Application Identifiers (AIs) for Carcasses and Carton Products

The table below shows the mandatory, i.e. minimum, recommendations for variable measure meat products (including part carcase or wrapped carcase), including the GTIN-14.

Table 1: Mandatory Application Identifiers

AI	Attribute Information	Data Format	Example
(01)	Global Trade Item Number Item Identification. (Primary identification of the product, either carcase or carton)	n14- 14 digits numeric (fixed length)	99312345678904 NB: The Indicator (Logistical Variant) of 9 is reserved for Variable Measure Trade Items.
(310n)	Net Weight - Kilograms NB: Weight information is mandatory if the item is a variable weight trade item. (n indicates that the position of the decimal point is n places to the left of the end of the number e.g. 3102)	n6 - 6 digits numeric (fixed length)	002720 (Variable measure is 27.20 kg)
(11)	Production Date* (YYMMDD) *Referred to as Kill Date in the Meat Industry and only applicable to the carcase label Not required if Packaging Date AI(13) is used	n6 - 6 digits numeric (fixed length)	050721 (21 st July 2005)
(13)	Packaging Date* (YYMMDD) *For use when carcasses or part carcasses are to be wrapped at a later stage or boned and packed into cartons. Not required if Production Date AI(11) is used	n6 - 6 digits numeric (fixed length)	050725 (25 th July 2005)
(21)	Serial Number NB: If a generic product is produced by more than one manufacturer and bar coded with a customer's item identification number, then possible duplication of serial numbers could exist. It may be necessary in this	An...20 - Alpha numeric up to 20 characters (variable length)	0000403L



	case to use a SSCC to ensure global uniqueness.		
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Table 2: Optional Application Identifiers (AIs) after Mandatory AIs have been bar coded

AI	Attribute Information	Data Format	Example
(17)	Expiration Date * (YYMMDD) (Use By Date) * Either AI(15) or AI(17) could be used at the discretion of the supplier.	n6 - 6 digits numeric (fixed length)	051001 1 st October 2005
(15)	Best Before Date* (YYMMDD) (Sell By Date) * Either AI(15) or AI(17) could be used at the discretion of the supplier.	n6 - 6 digits numeric (fixed length)	050930 30 th September 2005
(10)	Batch/Lot Number	an...20 Alpha numeric up to 20 characters (variable length)	24500001
(30)	Variable Count (Refers to the number of primal cuts in the carton or trade unit item, where the number is >1) NB: Used when the GTIN refers to a Variable Measure Trade Item.	n...8 Numeric up to 8 digits (variable length)	6

4.2.3 GS1 Application Identifiers recommended for use by the Australian Meat Industry

4.2.3.1 Serial Number AI (21) - Mandatory

A Serial Number is a unique alpha or alpha-numeric number assigned by a company to each carcase ticket or carton label and may include bulk bins. This guideline requires that all carcase tickets and carton labels have a unique Serial Number, expandable up to 20 digits.

While there is no need to re-use Serial Numbers, this uniqueness in Serial Numbers within a plant is for at least 2 years, even if reprinted. If a ticket or label is reprinted a new Serial Number is to be generated. Inventory records must include Serial Number for carcase tickets and carton labels that have been destroyed/ reprinted. The carcase ticket or carton label Serial Number is the basis for unit traceability for food safety and product recall.

When a Serial Number is applied to a carcase, the industry recognises that the Serial Number may include the body number and side/portion of the carcase, e.g. 0403L, where 0403 for whole body, 04031 to 04034 for each quarter of a carcase. The industry acknowledges that the Serial Number can be other than reference to body and side. It can be any unique numbering system for the carcase or carcase part.

Note that the uniqueness of the Serial Number cannot be guaranteed if more than one manufacturer produces a generic product and the carton is bar coded with the customer's item identification number.



It may be necessary in this case to use a Serial Shipping Container Code (SSCC) to ensure global uniqueness.

4.2.3.2 Production Date AI (11) - Mandatory (if AI (13) not used)

This date is used to signify the kill date for carcase product. This AI is only applicable to unwrapped carcasses. Use Packaging Date, for cartons and if the carcase is to be packed into an outer covering at a later stage.

The standard length of a date is six digits, in format year, month, day (YYMMDD). Please refer to Section 4.2.4 for GS1 Date Coding.

4.2.3.3 Packaging Date AI (13) - Mandatory (if AI (11) not used)

This date is used to signify the date of processing, wrapping, packaging and/or label generation for carton products and wrapped meats (whole or part carcase). This is not the kill date.

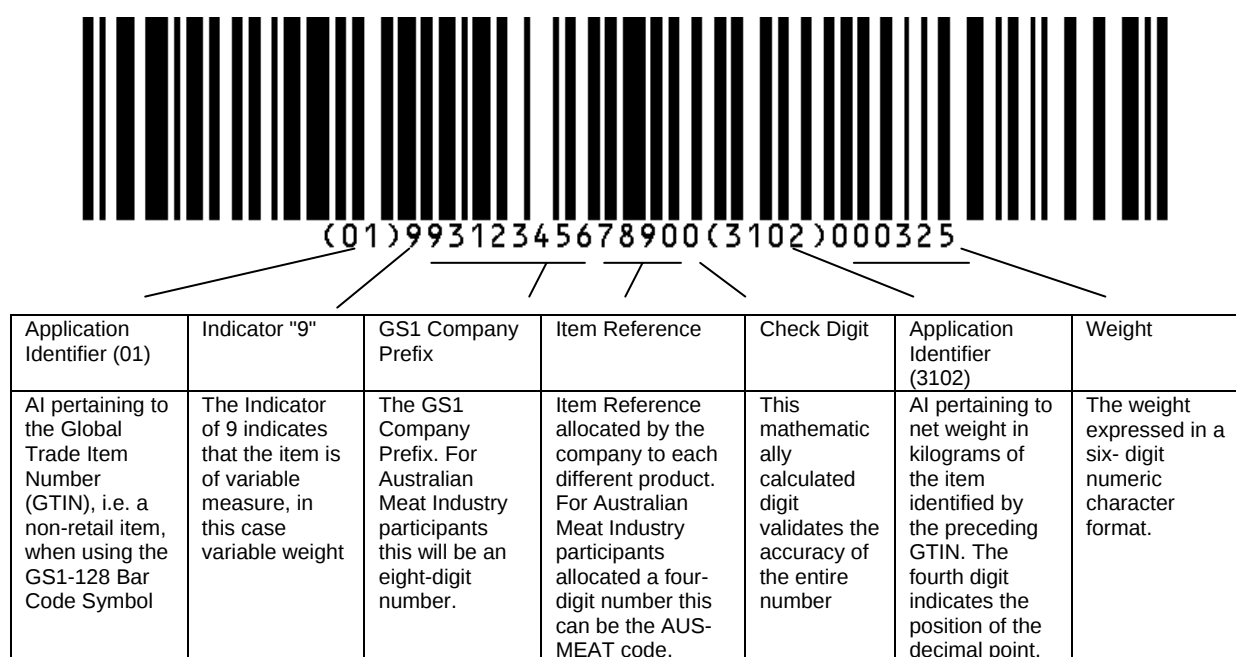
The standard length of a date is six digits, in format year, month, day (YYMMDD). Please refer to Section 4.2.4 for GS1 Date Coding.

4.2.3.4 Numbering and Bar Coding of Non-Retail Variable Measure Trade Items - Mandatory

Non-Retail Variable Measure Trade Items are those items which have at least one characteristic that varies, for example they may not have a standard weight. A GTIN-14 with the indicator 9 is used to identify a Variable Measure Trade Item. The presence of variable measure information is mandatory for the complete identification of a particular variable measure trade item. The digit 9 in the first position is an integral part of the GTIN-14. In [Figure 6](#), the additional information relates to the variable weight of the item, which can only be represented in the GS1-128 (previously UCC/EAN-128) Bar Code Symbol. **Carton product even if defined as a fixed weight product, is still to use the variable weight AI in the bar code symbol.**

The format for Variable Measure Trade Items is as follows:

Figure 6: Variable measure GTIN with a net weight of 3.25kg



The above information is for a representative sample bar code symbol only; refer to the **GS1 Australia User Manual - Numbering and Bar Coding** for specific instructions.

4.2.3.5 Net Weight, Kilograms (AI (3100) through (3109)) – Mandatory – Data Format n6

There are a number of AIs for net weight (KGs or Pounds). Assign AI (310n) to identify the net weight in kilograms of a trade item.

The fourth digit of the AI ("n") represents the decimal point indicator, which shows where the decimal point belongs in the actual value. For example, the digit 0 means that there is no decimal point, and the digit 1 means that the decimal point is between n5 and n6. For further explanation see the **GS1 Australia User Manual - Numbering and Bar Coding**.

For carton products and carcasses the AI for net weight is always to be used. This is to facilitate inventory management through the supply chain. This bar code field can also be used for accurate loading of trucks to capacity, assuming known packaging weight.

4.2.3.6 Batch/ Lot Number AI (10) – Optional - Data Format n...20

This guideline provides for the use of Batch/ Lot Numbers on carton labels. When printed on carcass tickets the Batch/ Lot Number will refer to the Slaughter floor lot number. For carcasses, the Batch/Lot is intended to provide for traceability to the supplier of the animals to the Slaughter floor.

The Batch/ Lot Number for carton labels is determined at the discretion of the plant/ processor and is based on a unique eight numeric character number. This uniqueness in Batch/ Lot Numbers within a plant is for a minimum of five years. The Batch/ Lot Number can range from one Batch/ Lot Number per carton to one Batch/ Lot Number per day.

The objectives of Batch/ Lot Numbers are for food safety and product recall for a group of carcasses or carton product. If a product recall requirement occurs, it would be easier identifying cartons which carry Batch/ Lot Numbers, for recall purposes. Examples of data which would make up a Batch/ Lot are:

- Carton numbers
- Shift numbers
- Time of production (packing)
- Date of production (packing)

4.2.3.7 Expiration Date AI (17) – Optional – Data Format n6

AI (17) is used to indicate the limit of consumption or use of an item. It is a statement about public safety and is often referred to as a "Use by date" or "Expiry date".

If such information is to be used, then either AI (17) or AI (15) can be chosen at the discretion of the supplier.

Refer to Section 4.2.4 for the GS1 Date Coding.

4.2.3.8 Best Before Date AI (15) – Optional – Data Format n6

AI(15) is used to indicate the minimum durability date for the ideal consumption or best effective use of an item. This is a statement about the quality of the item, and is often referred to as a "Best before date" or "Sell by date".

If such information is to be used, then either AI (17) or AI (15) can be chosen at the discretion of the



supplier.

Refer to Section 4.2.4 the GS1 Date Coding.

4.2.3.9 Variable Count AI (30) – Optional – Data Format n...8

AI (30) is used to identify a variable count in a variable length format of up to eight digits. This information completes the identification of variable quantity items. AI (30) must always be used in conjunction with AI (01) (a GTIN-14 starting with 9) or with AIs (02) (a GTIN-14 starting with 9) and (37). Variable measure containers are identified using a GTIN and an Indicator digit of '9'. When the variable measure is a count (or number of units), AI (30) is used. For variable weight meat cartons AI (30) may be used to specify the number of primal pieces in the carton.

4.2.3.10 Concatenation of GS1 Application Identifiers

Multiple AIs and their fields can be efficiently combined into a single bar code symbol (concatenation), as illustrated in the example below of a variable weight item. Where this is done, the standard specifications for individual AIs apply as they normally would.

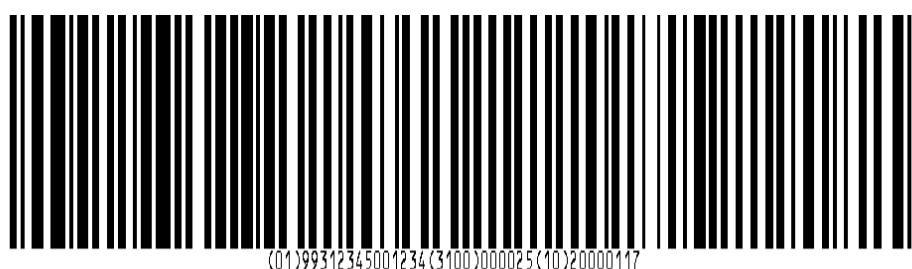
Three parameters have to be taken into consideration for defining the maximum length of a GS1-128 Bar Code Symbol:

1. The physical length
2. The number of characters encoded
3. The number of auxiliary characters

The maximum length of any GS1-128 Bar Code Symbol must be within the following limits:

- The physical length cannot exceed 165mm including Quiet Zones (Light Margins)
- The maximum number of encoded data characters including the AI, but excluding the auxiliary characters (refer to the Glossary on its definition), is 48

Figure 7: Example showing a Concatenated GS1-128 Bar code identifying Item of Variable Measure, weight and Batch Number.



Note: Bar code size is not to scale

Further information on this symbology is contained in the **GS1 Australia User Manual - Numbering and Bar Coding**.



4.2.4 GS1 Date Coding

To encode a date the GS1-128 Bar Code Symbology and the appropriate AI are used. The date is structured with a fixed length of six digits, in the format YYMMDD.

- The **year** (YY) is shown as the last two digits of the appropriate calendar year
- The **month** (MM) is represented by two digits, January “01” through to December with the value “12”
- The **day** (DD) is always shown as two digits. However, if the day is not required “00” is used to mean “day not specified”

Using this logic:

1st of July 1997	=	970701
August 2006	=	060800
25th May 2008	=	080525

The format YYMMDD is always used to **encode** a date. However, users will process and store this information according to their individual business needs

Example

The following example uses the **Application Identifier (17)**. AI(17) has been defined to indicate the limit of consumption (or use) of a product. It is often referred to as “**Use by date**” or “**Expiry date**”. Using the GS1 Standards, the information “Use by 21 MARCH 2002” will be encoded as follows:

Figure 8: Application Identifier (17) Use By Date



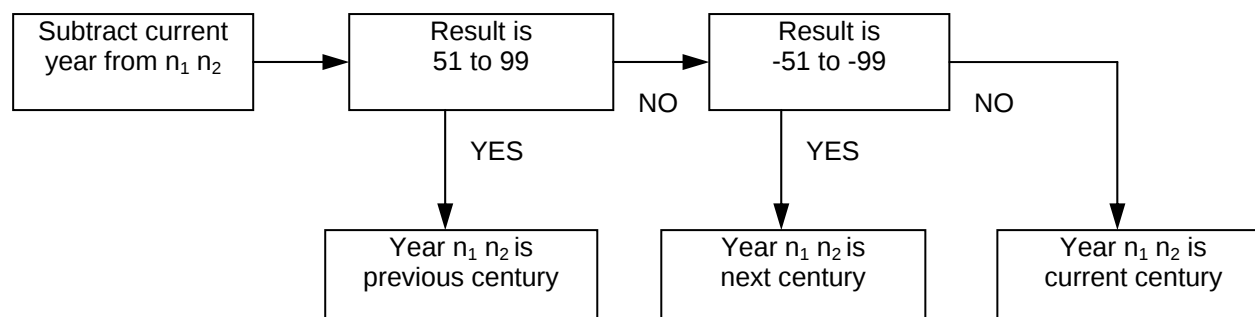
* FNC1 is mandatory for GS1-128 Bar Code Symbology



4.2.4.1 GS1 Date Coding in the Year 2000 and Beyond

Since the data field “year” consists of two positions, the century is established by the following procedure:

Figure 9: Calculation of Year



4.2.5 GS1 International provision for Source Animal Traceability & UN/ECE Meat Carcasses and Cuts

In addition to the AIs listed above, GS1 Global Office has provided two AIs which may be used by the meat industry.

One AI is called Reference to Source Entity. This AI provides the ability to reference the trade unit (e.g. carcass) back to the original item from which the trade unit was derived (the bovine animal). The issuer of the trade item must indicate through other means the source entity to which the data refers. While the Australian Meat Industry has not identified this AI in its minimum set at this stage, details of this AI are provided below for reference.

Another AI is called the UN/ECE Meat Carcasses and Cuts Classification. This UN/ECE Meat Carcasses and Cuts Code² is an attribute of the GTIN that denotes an alternative international trade description of the product. As it is an attribute of a trade item it should not be processed on its own, but together with the GTIN of the trade item to which it relates.

Note: The use of this AI is only for use, within the context of the UN/ECE Standards for the quality of meat carcasses and cuts (Bovine, Porcine, Ovine and Caprine)

Table 3: AIs for Source Animal Traceability & UN/ECE Meat Carcasses and Cuts

AI	Attribute Information	Data Format	Example
(251)	Reference to Source Entity	an...30 - Alpha numeric up to 30 characters (variable length)	V456XYZ
(7002)	UN/ECE Meat Carcasses and Cuts Classification	an...30 - Alpha numeric up to 30 characters (variable length)	1234567890123

Consult the **GS1 Australia User Manual - Numbering and Bar Coding** or contact GS1 Australia for further information on Application Identifiers.

² For more details about the UN/ECE Meat Carcasses and Cut Code refer to Aus-Meat



4.3 Difference between Numbering and Bar Coding

4.3.1 Numbering

The GS1 System provides Identification Keys for different applications. The application will determine how the number is to be used. The data structure of the GS1 Identification Keys guarantees worldwide uniqueness within the relevant area of application. There are nine GS1 Identification Keys that support the identification of items, services, logistic units, returnable containers, etc. Each of the GS1 Identification Keys provides a link between the items (a physical product, place, thing or service) and information pertaining to them.

For more information on the GS1 Identification Keys, please refer to the **GS1 Australia User Manual – Numbering and Bar Coding**.

4.3.2 Bar Coding

All of the identification numbers used in the GS1 System can be represented in data carriers and of these, bar codes are the most commonly used. Bar codes are a means of representing data in machine readable form, and allow automatic data capture at each point where an item leaves or enters premises.

With improvements in the technology and new application requirements, new data carriers such as GS1 DataBar, GS1 DataMatrix, and RFID have been introduced.

Bar codes are usually included in the production process, at the producer site. They may be pre-printed with other information present on the packaging, a label can be affixed to the item at the production line, or they can be printed directly on to the packaging online.

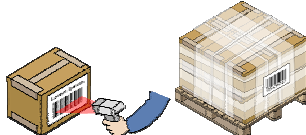
For more information on the Bar Code symbologies used within the GS1 System, please refer to section 4.4 or the **GS1 Australia User Manual – Numbering and Bar Coding**.

Figure 10: GTIN-13 vs. EAN-13



4.4 Numbering, Bar Coding and packaging levels

Table 4: Guide to choosing the numbering and bar coding options for a particular application

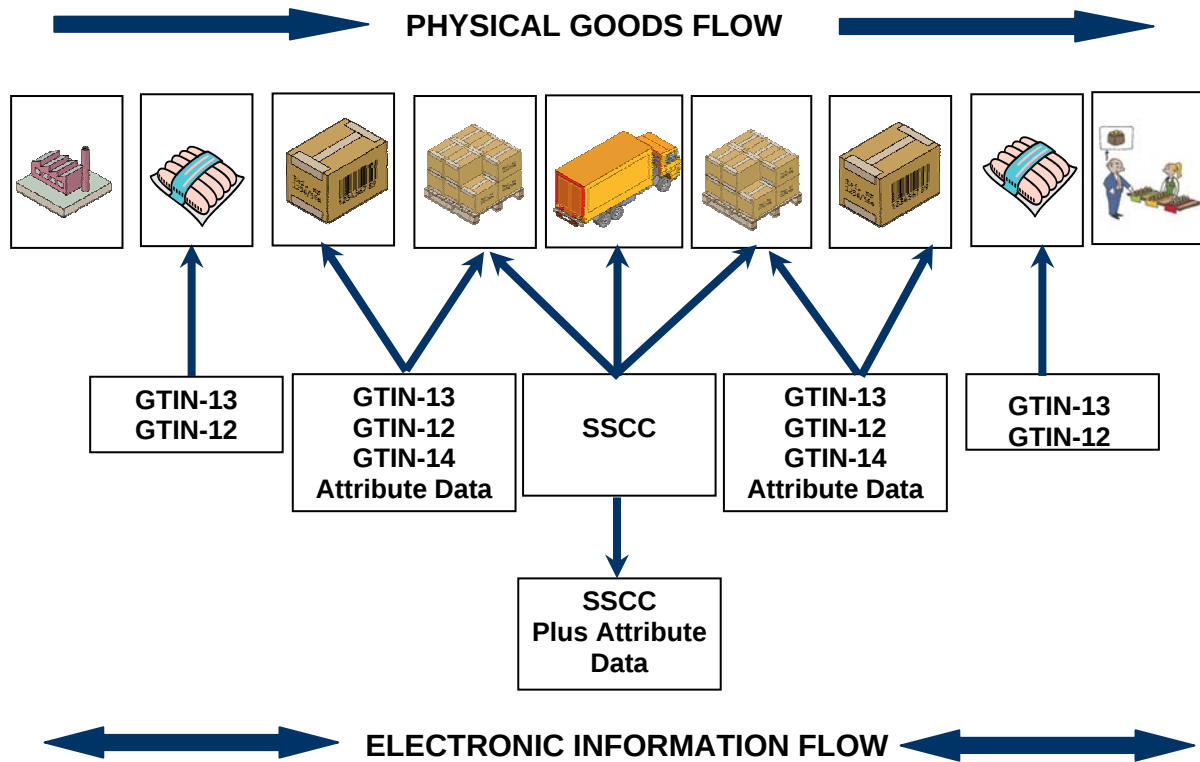
Application Areas	Encoded GTIN and/ or attribute information	Symbol	Industry Recommendation
Retail Point-of-Sale only 	GTIN-13 GTIN-12 may be required for North America/Canada GTIN-12 or GTIN-13 + attribute data ³ VMN-13	EAN-13 (or GS1 DataBar ⁴) UPC-A (or GS1 DataBar ⁴) GS1 DataBar ⁴ EAN-13	GTIN-13 encoded in EAN-13 Bar Code for fixed measure items VMN-13 encoded in EAN-13 Bar Code for variable weight products
Retail Point-of-Sale only - small items 	GTIN-8 a zero-suppressed GTIN-12 GTIN-8 + attribute data ³	EAN-8 (or GS1 DataBar ⁴) UPC-E GS1 DataBar ⁴	Used for fixed measure items that cannot fit an EAN-13 Bar Code
Retail Point-of-Sale and General Distribution 	GTIN-13 GTIN-12 may be required for North America/Canada	EAN-13 UPC-A	Applicable to fixed measure items only
Non-Retail (General Distribution), ideal for printing on corrugate 	GTIN-13 GTIN-12 GTIN-14	ITF-14 ITF-14 ITF-14	In some instances, retailers request this option
Non-Retail (General Distribution), can encode attribute data, ideal for printing on labels 	GTIN-12, GTIN-13 or GTIN-14 GTIN-12, GTIN-13 or GTIN-14 + attribute data	GS1-128 GS1-128	GTIN-14 + attribute data required for carcase and export carton labelling encoded in GS1-128

Note: Depending on the Sector, there might be Industry specific requirements that need to be fulfilled (e.g. GS1 DataMatrix in the Healthcare sector).

³ Attribute data will not be captured at the Retail Point of Sale, unless encoded in a GS1DataBar. Please refer to footnote 1 on page 9 for further information.

⁴ see footnote 1 on page 9

Figure 11: an example illustrating Identification across the Supply Chain



4.5 Fixed Measure Trade Items Sold at Retail Point-of-Sale (POS)

Any trade item which is intended to be sold to the final consumer through retail Point-of-Sale (POS) is more commonly known as a RETAIL ITEM or CONSUMER UNIT.

Fixed Measure Trade Items are items that are always produced in the same version and composition such as type, size, weight, contents; e.g. 500gm pack of sausages, 1kg pack of sausages.

Trade items, scanned at retail POS can be identified with a GTIN-13, GTIN-12 or GTIN-8 as described in the following sections. To be scanned at the Point-of-Sale, these GS1 Identification Keys must be encoded in EAN-13, EAN-8, UPC-A, UPC-E or GS1 DataBar⁵ Bar Code symbology.

Note: All variations (different pack size, pack type, marinades etc) require a separate GTIN.

4.5.1 GTIN-13

Trade items that are sold at POS are generally allocated a GTIN-13.

The format of the GTIN-13 for the Australian Meat Industry members who identify themselves as meat industry participants complying with the AMI Guidelines is:

GS1 Company Prefix:	The GS1 Company Prefix is allocated by GS1 Member Organisations. GS1 Australia allocates either a 7 or 9-digit GS1 Company Prefix ¹
Item Reference:	A unique number either 3, 4 or 5 digits for each individual trade item. ²
Check Digit:	Validates the accuracy of the entire number by mathematical formula

¹ Historically members of the Australian Meat Industry who identify themselves as meat industry participants complying with the AMI Guidelines may have been assigned an eight-digit GS1 Company Prefix with an Item Reference range from 0000 to 9999 (10,000 numbers).

² The four-digit Item Reference field provided participants in the Australian Meat Industry with the ability to include the AUS-MEAT³ code relevant to the item. Alternatively a non-significant number should be assigned to the item.

³ AUS-MEAT code is a four-digit code assigned by AUS-MEAT Limited to each different cut of meat.

A GTIN-13 can be represented in an EAN-13 or GS1 DataBar⁵ Bar Code.

For details regarding the EAN-13 Bar Code, including dimensions, please refer to EAN-13 Bar Code specifications in the **GS1 Australia User Manual-Numbering and Bar Coding**.

Figure 12: Example of an EAN-13 Bar Code representing the GTIN-13

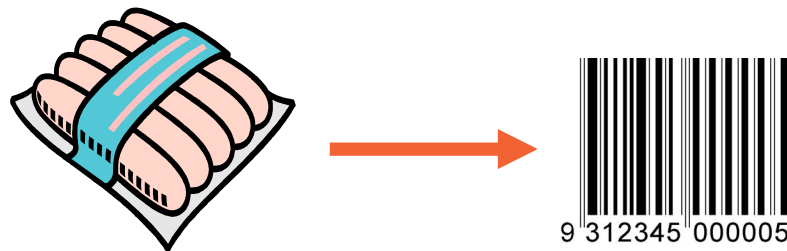


Note: Bar code size is not to scale.

⁵ see footnote 1 on page 9



Figure 13: Example of a trade item carrying a GTIN-13 represented in an EAN-13 Bar Code



Note: Bar code size is not to scale.

4.5.2 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 allocated as a complete eight digit number. A GTIN-8 can be represented in an EAN-8 or GS1 DataBar⁶ Bar Code.

For details regarding the EAN-8 Bar Code, including dimensions, please refer to EAN-8 Bar Code specifications in the **GS1 Australia User Manual-Numbering and Bar Coding**.

Figure 14: Example of an EAN-8 Bar Code representing the GTIN-8



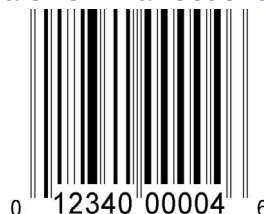
Note: Bar code size is not to scale.

4.5.3 GTIN-12

If your trade item is to be sold within the United States and/or Canada, a GTIN-12 may be required. A GTIN-12 can be represented in a UPC-A or GS1 DataBar⁶ Bar Code.

For more information on the GTIN-12 and for details of the UPC-A Bar Code, including dimensions, please refer to the **GS1 Australia User Manual – Numbering and Bar Coding**.

Figure 15: Example of a UPC-A Bar Code representing the GTIN-12



Note: Bar code size is not to scale.

⁶ see footnote 1 on page 9



4.6 Variable Measure Trade Items Sold at Retail Point-of-Sale (POS)

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

There is currently no global solution for Variable Measure Trade Items sold at POS but work is underway to develop global standards for these items, particularly in the area of Fresh Foods.

There is, however, a **national** solution for Variable Measure Trade Items sold at POS; manufacturers who wish to label and apply bar code symbols to Variable Measure Trade Items must apply to GS1 Australia for standard variable measure company item numbers. The latter are used to construct a 13-digit number known as a VMN-13 (Variable Measure Number). For details on VMN-13s and the EAN-13 Bar Code in which they are encoded, please refer to the **GS1 Australia User Manual – Numbering and Bar Coding**.

4.6.1 Format of the VMN-13 – Variable Measure

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 however these numbers must not be used outside of Australia. For further information on GS1's migration strategy from VMN-13 to GTIN identification using GS1 DataBar please contact GS1 Australia.

GS1 Australia has reserved prefixes 28, 29, 22 and 24 specifically for use in Variable Measure Numbers (VMNs). These numbers are represented in EAN-13 Bar Code Symbols. Equipment suppliers should ensure that Point-of-Sale (POS) equipment recognises the prefixes listed above as being variable measure with price and a significant Check Digit.

Manufacturers who wish to label and apply bar code symbols 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 (a thirteen-digit Variable Measure number) 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 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. Below are the details of the structure of a VMN-13.

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

The Company and Item Identification – 4 digits identify the company/packer and the item that it is allocated to.

The Price Verifier Digit – 1 digit validates the accuracy of the following five digit price.

The Price - 5 digits, represents 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 – the last digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the bar code symbol.

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



4.7 Fixed Measure Trade Items Non-Retail (General Distribution)

4.7.1 Definition

Trade items not sold at POS are either single items or any standard grouping of items made up to facilitate the operations of handling, storing, order preparation, shipments etc and may often be referred to as **NON-RETAIL TRADE ITEMS**.

Where a trade item is sold at the retail POS (i.e. the packet of sausages), the option described in Section 4.5 is applicable. However if the trade item is then bundled into a stable grouping (i.e. a box of sausages) but this unit itself **not** sold at POS, this section is applicable.

For an overview on what GS1 Identification Keys and what Bar Code symbology are used for non-Retail Trade Items, please refer to section 4.4 or go to the ***GS1 Australia User Manual – Numbering and Bar Coding***.

It is recognised that beyond the trade item sold at retail POS, there can be many different levels of packaging of trade items. The next level of packaging, which is not likely to be sold at retail POS, is often referred to as an **INNER OR INTERMEDIATE** pack. The last level of packaging (the outer most) is considered to be the highest level; this is up to but not including the pallet. However, this does not preclude suppliers from issuing GTINs to pallets if they wish to identify the pallet itself as a trade item.

Note: Each individual level of trade item must be uniquely identified with a different GTIN. Every variation (different pack size, pack type, different cuts of meat, marinades or varieties etc) requires a separate GTIN. If the variations vary for every different order, a variable measure GTIN should be assigned.

4.7.2 Options for Trade Items NOT sold at Retail Point-of-Sale (POS)

A trade item **not** sold at retail POS can be numbered and bar coded with:

- GTIN-14 represented in either the ITF-14 or GS1-128 Bar Code
- GTIN-13 represented in an EAN-13, ITF-14 or GS1-128 Bar Code

For items sold in North America, refer to the *GS1 Australia User Manual-Numbering and Bar Coding*.

4.7.2.1 GTIN-14

This option is only available for homogenous groupings of standard trade items, where all units contained in the group are identical. It involves using an Indicator with the GTIN and recalculating the Check Digit.

An Indicator can be any number from one to eight. Indicators are used to create up to eight unique GTIN-14s to distinguish between different packaging levels or pack quantities of the same trade item. They are chosen at the discretion of the company allocating the number.

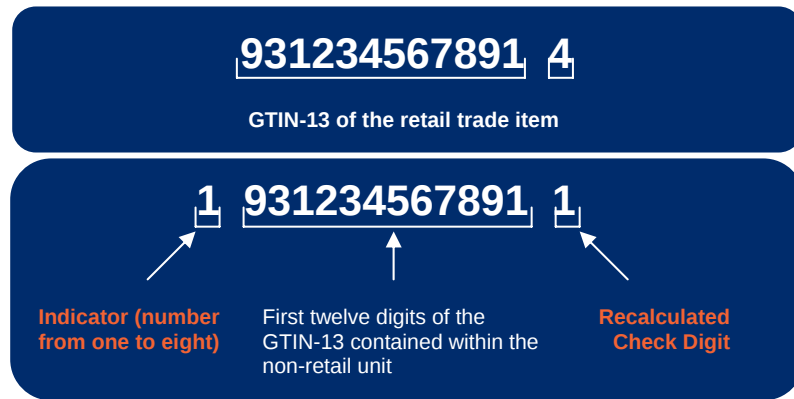
Note: The Indicator 9 is reserved for variable measure trade items (see Section 4.5)

How to form a GTIN-14 if a Trade Item Sold at Retail Point-of-Sale (Retail Trade Item) Carries a GTIN-13

Choose the GTIN-13 on the retail unit that is the lowest level of packaging within the non-retail trade item. To form the GTIN-14, put an Indicator in front of the first twelve digits of this GTIN-13 then recalculate the Check Digit. A Check Digit Calculator Program is available on our website www.gs1au.org.



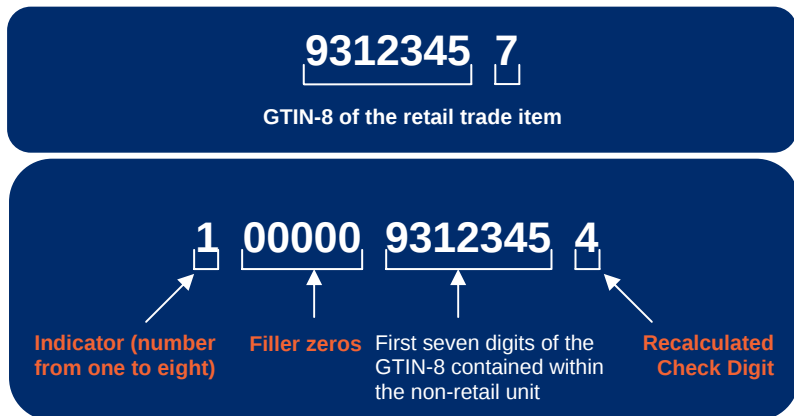
Figure 16: structure of GTIN-14 based on GTIN-13



How to form a GTIN-14 if a Retail Trade Item Carries a GTIN-8

Choose the GTIN-8 on the retail unit that is the lowest level of packaging within the non-retail trade item. To form the GTIN-14, put an Indicator followed by five filler zeros in front of the first seven digits of the GTIN-8 then recalculate the Check Digit. A Check Digit Calculator Program is available on our website www.gs1au.org

Figure 17: structure of GTIN-14 based on GTIN-8



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

Table 5: example of GTIN-14 created out of GTIN-13 or GTIN-8

Item		GTIN	Bar Code
Consumer unit/retail item		931234500000 5	EAN-13
		9312345 7	EAN-8
Box of 20 identical retail items		1 931234500000 2	GS1-128 / ITF-14
		1 000009312345 4	
Box of 50 identical retail items		2 931234500000 9	GS1-128 / ITF-14
		2 000009312345 1	

Note: Only allowed with identical products in the non-retail item.



Figure 18: ITF-14 Bar Code

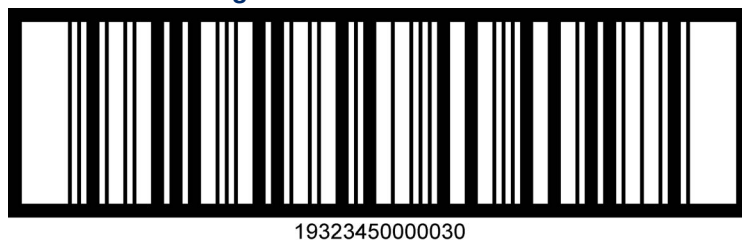


Figure 19: GS1-128 Bar Code



Note: Bar code size is not to scale.

4.7.2.2 GTIN-13

If desired, a GTIN-13 can be allocated to a non-retail trade item. The method used to allocate this number is the same as for allocating a number to a retail trade item; refer to the **GS1 Australia User Manual - Numbering and Bar Coding**, located on our website - www.gs1au.org.

If there is any possibility of the non-retail trade item being sold at retail level, it *must* carry a GTIN-13 represented in an EAN-13 Bar Code. Ensure that a non-retail trade item is not allocated the same GTIN as a retail trade item.

If the non-retail trade item is NOT crossing Retail Point-of-Sale, it can be encoded in an ITF-14 or GS1-128 Bar Code, provided that a filler zero is added in front of the GTIN-13.

The ITF-14 Symbology is better suited for printing onto corrugated fibreboard.

Figure 20: EAN-13 Bar Code



Figure 21: ITF-14 Bar Code

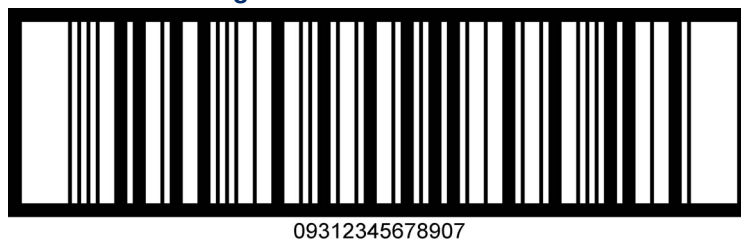


Figure 22: GS1-128 Bar Code



Note: Bar code size is not to scale.



4.8 Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

Trade items may be of variable measure either because the production process does not guarantee consistency in weight, size or length (carcasses of meat, lengths of timber etc) or because the items are created to meet a special order which states a quantity (e.g. cuts of meat by count).

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

The use of a variable measure GTIN enables the identification of the variable piece of data to be included within the bar code symbol. Within the Meat Industry certain trade items fall within the above mentioned definition. These include meat portions sold by count, meat sold by weight, etc.

Note: This solution will not be available for trade items that are sold through a traditional retail POS environment as POS scanners are not set up to scan the GS1-128 (previously UCC/EAN-128) Bar Code Symbol required for this application.

The GTIN-14 formed with the Indicator “9” is used to identify a Variable Measure Trade Item. The presence of variable measure information is mandatory for the complete identification of a particular Variable Measure Trade Item. The digit “9” in the first position is an integral part of the fourteen digit Variable Measure GTIN.

Note: Variable measure information represented in the following manner **cannot** be scanned at the retail Point-of-Sale (POS).

The format of one example of a variable measure GTIN-14 is:

Application Identifier (01)	Used to identify that the data following is a fourteen-digit GTIN when encoded in a GS1-128 Bar Code.
Indicator “9”	Indicates that the trade item is of variable measure.
GS1 Company Prefix:	The GS1 Company Prefix is allocated by GS1 Member Organisations. GS1 Australia allocates nine- or seven-digit GS1 Company Prefixes. Some members of the Meat Industry may have an eight digit company prefix.
Item Reference:	Item Reference allocated by the company to each different item.
Check Digit:	Calculated using a mathematical formula
Application Identifier (310n)⁷	Used in a GS1-128 Bar Code to identify that the information following is the weight in kg. The last digit, n, of the AI indicates the decimal point position.
Format	Six fixed numeric characters used to represent the length in metres

Figure 23: Variable Measure Trade Item with a weight of 3.25kg represented in a GS1-128 Bar Code



Note: Bar code size is not to scale.

⁷ The Application Identifier (310n) has been used as an example. Any of the measure AIs available can be used.



4.9 GTIN Considerations for Meat Industry Trade Items

4.9.1 GTIN Options

Regardless of the manner in which the trade item is sold, whether it is a pre-packed tray of meat with a standard count, or a standard weight or the selling of meat at variable weights, each variation must be assigned its own unique GTIN or variable weight number. For example if beef ribs are sold in packs of 10 and 15 each variation must be assigned its own unique GTIN. If these trade items are then packed into cartons of 100 and 50 respectively, these two variations also would be assigned a separate GTIN.

The decision of which GTIN structure and what data carrier to use is generally left to the discretion of each individual company. The choices made are ultimately governed by factors such as requirements within the company for the marking of additional information, the path of the trade item through the supply chain and whether the trade item will be sold in a retail Point-of-Sale environment.

4.9.1.1 GTIN Implementation Issues

The implementation process often identifies anomalies that exist with certain product types where the standard application of the GS1 Standards is either not feasible or not practical. This in no way indicates that the system is not used, merely identifies that standard methodologies currently available do not fit within the scope of that particular product.

For instance the application of GTINs to hides is practical and feasible, however the physical application of the GTIN represented by the relevant bar code symbol to the actual unit itself may not be realistic or practical.

4.9.2 GTIN Allocation Rules

The GTIN Allocation Rules can be viewed at <http://www.gs1.org/1/gtinrules/>

4.9.3 How Numbers are entered into Trading Partners Systems

The following five steps give a broad outline to synchronising product data with that of all trading partners in the supply chain.

- Step 1: Brand Owner assigns a number to the product
- Step 2: Enter the product number / description / attribute into your product database
- Step 3: Forward this information to trading partners via hardcopy, softcopy or via a suitable e-catalogue such as GS1 Australia's GS1net
- Step 4: Trading partner will enter this information into their own database
- Step 5: Product is scanned and system looks up item records in the retailer's database.



4.10 Label Requirements

The label requirement detailed below only relates to the GS1 System. Legislative or statutory requirements for the meat industry have not been included, for the reasons of simplification.

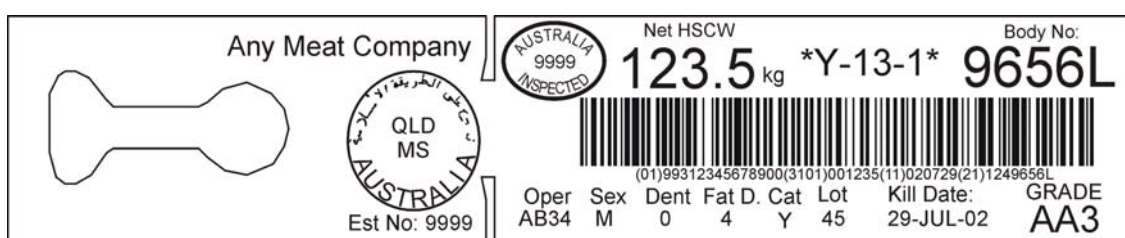
4.10.1 Carcase Ticket

For carcase products (including part carcase or wrapped carcase) the recommended information to be represented in the GS1-128 Bar Code Symbol is:

- GTIN-14 including AI (01) - e.g. (01)99312345678900.
- Variable weight AI (310n) - e.g. (3102)002720
- Production Date (or Kill Date) AI (11) - e.g. (11)020721.
- Packaging Date AI (13) - e.g. (13)020721 is to be used where the carcase is to be packed with an outer covering at a later stage
- Serial Number AI (21) - e.g. (21)0000403L (Unique for every carcase label for at least 2 years, even if reprinted Refer to Appendix C on the industry's recommendations for the Serial Number)

Other human readable information may be printed on the carcase ticket, which may not be bar coded. These requirements have not been included in this document and are left to the trading partners, some of which may be for statutory requirements.

Figure 24: Carcase ticket with GS1-128 Bar Code Symbol (Example Only)



9.5.5.1 Carton Label

Below are the minimum requirements to be on carton labels for carton products (including bulk packs), which are represented in one Bar Code Symbol. Other optional information to be bar coded as listed below should be printed in a secondary bar code symbol below the primary bar code symbol.

Bar Code Symbol I (Mandatory data, to a maximum of 48 characters⁸)-

- Variable measure GTIN-14 including AI (01) – e.g. (01)99312345678917
- Variable weight AI (310n) – e.g. (3102)004770
- Packaging Date (date that the carton was packed i.e. carcase was boned) AI (13) (YYMMDD)– e.g. (13)000105
- Serial Number AI (21)(unique for every carton label for at least 2 years, even if reprinted. Refer to Section 9.3.1 on the industry's recommendations for the Serial Number) - e.g.

⁸ The maximum number of encoded human readable characters for one GS1-128 Bar Code Symbol is 48. This number includes A's and function characters when used as field separator characters, but excludes auxiliary characters and the symbol check character.



(21)12345678.

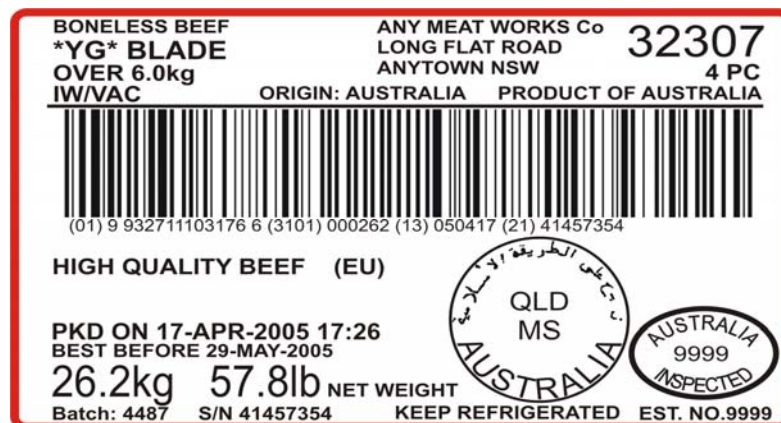
Bar Code Symbol II (Optional data. Only required when agreed between trading partners)-

- Expiration Date* (use by date) AI (17)(YYMMDD) – e.g. (17)021001
- Batch/ Lot Number (unique lot number generated by plant ranging from one per carton to one for a day's production) AI (10) - e.g. (10)12345678
- Variable Quantity (number of pieces) AI (30) - e.g. (30)6
- Others as required by trading partners
- At the discretion of the supplier AI (17) could be substituted for AI (15) which refers to Best Before Date (sell by date). AI (15)(YYMMDD) - e.g. (15)020901

Other human readable information may be printed on the carton ticket, which may not be bar coded. These requirements have not been included in this document and left to the trading partners, some of which may be for statutory requirements.

If a carton is to be treated as a logistics unit, i.e. a shipment in its own right, then refer to Section 5 on applying a SSCC to the carton level logistic unit.

Figure 25: Carton label [Example Only]



In the meat industry the minimum bar height is 13mm. For scanning in a General Distribution (automated scanning) environment, the minimum bar height for a GS1-128 Bar Code Symbol is 32mm.



4.11 Location of the Bar Code on Trade Items

Productivity and scanning accuracy improve considerably when the bar code location is predictable. Consistency in the location of the bar code achieves maximum productivity in any scanning environment.

4.11.1 Trade Items Sold at Retail Point-of-Sale (POS)

Where the trade item sold at retail POS is to be bar coded, the **general** location for bar codes on trade items is the lower right quadrant of the back respecting the Quiet Zones around the bar code and the edge rule.

The **edge rule** stipulates that the bar code must not be closer than 8mm or further than 100mm from any edge of the package/container.

In the event that trade items are of an irregular or unusual shape, a common sense approach should be taken; the bar code should be located as close as possible to the recommended guidelines thereby ensuring that its location does not affect its ability to be scanned.

More detailed guidelines for specific types of retail trade items can be found in **GS1 Australia User Manual - Numbering and Bar Coding**.

4.11.2 Trade Items NOT Sold at Retail Point-of-Sale (POS)

The bar codes on units not intended for retail POS should be upright (i.e. in picket fence orientation) and placed on the sides of the unit. Each item shall have at least one bar code, with two or more highly recommended. The bar codes should be kept away from any vertical edges so that they are less likely to be accidentally damaged in transit.

ALL ATTEMPTS SHOULD BE MADE TO MAINTAIN 100% SCANNABILITY AT ALL TIMES.

Note 1: It should be noted that the Australian Meat Industry has for a number of reasons traditionally located all bar code symbols and regulatory information on the end panel of the carton. Changes to this location should not be made without consultation with regulators, customers and warehouses.

Note 2: The suggested locations mentioned above are recommended subject to space and size limitations on Meat Industry cartons. To meet the minimum GS1 System recommendation, the "one-side" location on a carton can be one end panel. Note comments above.

Note 3: For the Carcase ticket the location is less critical than for the carton product, as carcase scanning is not generally automated but are manually scanned.

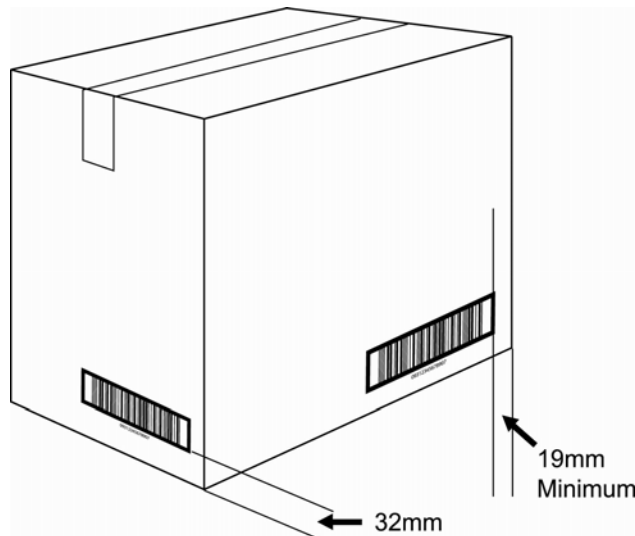
GS1 Location Specifications:

- The lower edge of the vertical bars (not the bottom of the surrounding horizontal bearer bar of an ITF-14 Bar Code) are exactly 32mm from the lower edge of the base of the carton
- No part of the bar code (including the Bearer Bars on an ITF-14 Bar Code, and Quiet Zones) is closer than 19mm to any vertical edge

The above location recommendations apply to cartons carrying an EAN-13, GS1-128 or an ITF-14 Bar Code Symbol.



Figure 26: Location of an ITF-14 Bar Code on a Trade Item

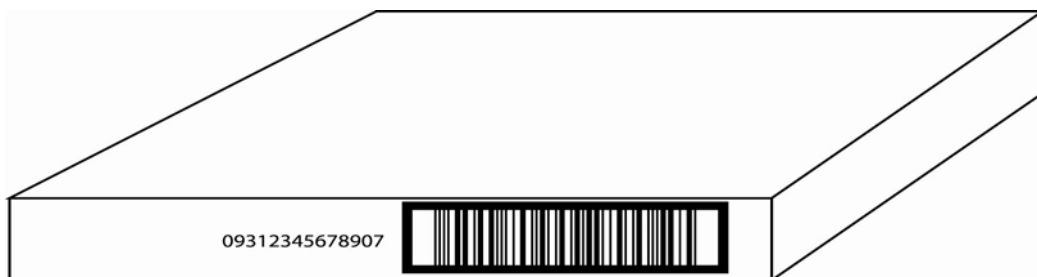


Shallow Trays

If the height of the non-retail unit is less than 50mm, making it impossible to print a full height bar code with the Human Readable Interpretation below the bars, or if the construction of the unit is such that the full height bar code cannot be accommodated, the following options should be considered (in order of preference):

- Place the Human Readable Interpretation to the left of the bar code, outside the Quiet Zones as shown in Figure 27
- When the height of the unit is less than 32 mm, the bar code may be placed on the top of the package, with the bars perpendicular to the shortest side, no closer than 19mm from any edge

Figure 27: Symbol Placement on Shallow Trays



5 How to Number and Bar Code Logistic Units

5.1 Serial Shipping Container Code (SSCC)

A logistic unit is an item of any composition established for transport and/or storage, which needs to be managed through the supply chain. The use of the SSCC can enable the unique identification of every logistic unit. Within the Meat Industry sector this includes the identification of Pallets (cartons/tubs), Module Lots, and shipments (containers/truck loads).

Transport Lot is a term used in the Australian Meat Industry as referring to a logistic or transportable unit.

There are also instances within the Meat Industry where the allocation of a GTIN is not feasible because the resulting permutations and combination of product is limitless and is generally governed by the customer's order.

Mixed pre-packaged meats fall into this category; with customers able to pick and choose what is required within their order and hence the allocation of a GTIN for each combination is unrealistic. With the use of scan packing, the solution for the marking of such a logistic unit is with the Serial Shipping Container Code (SSCC).

The Serial Shipping Container Code (SSCC) is a reference number or license plate used to uniquely identify logistics units. The SSCC acts as a "reference key" which can be stored in a computer system to which information can be added and shared amongst trading partners as the logistics unit moves throughout the supply chain. This unique "license plate" provides the opportunity to track and trace logistic units in the supply chain.

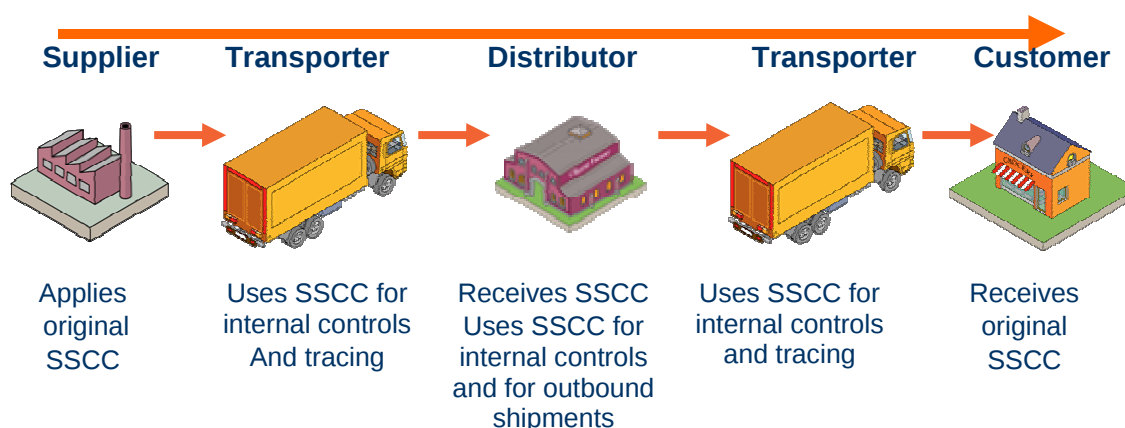
Scanning the SSCC marked on each logistic unit allows the physical movement of units to be individually tracked and traced by providing an information flow. It also opens up the opportunity to implement a wide range of applications such as cross docking, shipment routing, automated receiving etc.

The SSCC is used to uniquely identify goods on the way from sender to final recipient, and can be used by all participants in the transport and distribution chain. Each shipping container or logistic unit, at the time of its creation, is uniquely identified by the sender with an SSCC. A label encoding the SSCC is applied to the logistic unit using the appropriate AI and the GS1-128 Bar Code.

The SSCC uniquely identifies the entity (typically the shipping container or logistic unit to which the SSCC is applied) for the lifetime of that unit.



Figure 28: The Use of the SSCC throughout the supply chain



It is essential that the recipient, transport company, distributor or customer of the transport unit with the SSCC attached, receives prior advice about the details of the transport unit and the SSCC. This advice is usually communicated via eMessaging, which is the computer-to-computer exchange of business messages in a standard format.

There may be instances where all parties relevant to a particular shipment are not fully capable of eMessaging and where only some electronic messages are being exchanged. In this situation there may be a requirement to add additional information to the logistics label to facilitate the process of the logistic units through the supply chain. Alternatively the whole supply chain may be fully capable of eMessaging and the whole suites of shipping messages are being exchanged.

5.2 How to Allocate the Serial Shipping Container Code (SSCC)

The SSCC should be handled as an *eighteen digit non-significant number* uniquely identifying the unit to which it is attached. To ensure worldwide uniqueness, the following general code structure has been defined by GS1 Global Office:

The company responsible for the marking of the logistic unit is responsible for issuing the SSCC.

5.2.1.1 How to Allocate the Serial Shipping Container Code (SSCC) for the Australian Meat Industry participants complying with AMI Guidelines

Historically members of the Australian Meat Industry who identify themselves as meat industry participants complying with the AMI Guidelines, have upon joining GS1 Australia be assigned an eight-digit GS1 Company Prefix with an Item Reference range from 0000 to 9999 (10,000 numbers). Under normal circumstances, new GS1 Australia members are initially assigned a nine-digit GS1 Company. Prefix with an Item Reference range from 000 to 999 (1,000 numbers).

The format of the Serial Shipping Container Code for the Australian Meat Industry participants complying with AMI guidelines is:

Application Identifier (00):	Serial Shipping Container Code (SSCC)
Extension Digit:	A digit (0-9) used to increase the capacity of the serial reference within the SSCC. The company that constructs the SSCC assigns it to the logistic unit.
GS1 Company Prefix:	The GS1 Company Prefix is allocated by GS1 Member Organisations. GS1 Australia allocates a nine digit GS1 Company Prefix (in the past a seven digit GS1 Company Prefix was also issued) however the Australian Meat Industry an eight-digit GS1 Company Prefix may also apply. This number will remain fixed in the 18-digit SSCC.
Serial Reference:	A Serial Reference comprises of either seven, eight or nine digits and uniquely identifies each transport package or logistic unit. The method used to allocate a unique Serial Reference is at the discretion of the company coding the package.
Check Digit:	Calculated using a mathematical formula.

Figure 29: Serial Shipping Container Code (SSCC)



Note: Bar code size is not to scale.

5.3 The Logistics Label

The various trading partners involved in a distribution channel have different information needs. The information flow, which accompanies the physical flow of goods, is communicated between trading partners by various means. Electronic Commerce, or eMessaging, is the way to transmit information along the supply chain.

In practice, however, fully automated communication channels, which make it possible to rely exclusively on electronic files for retrieving information on the movements of goods, are not always available.

For this reason, there is a need to indicate relevant information on the goods themselves, in addition to their identification. The various fields of information need to be organised in a standard way in order to facilitate their interpretation and processing by all trading partners in the supply chain.

The purpose of the GS1 Logistics Label is to provide information about the unit to which it is fixed, clearly and concisely. The core information on the label should be represented both in machine (bar code) and human readable form. There may be other information, which is represented in human readable form only.



This GS1 Logistics Label can be applied to a single item, or a grouping of several items made up to facilitate the operation of handling, storing and shipping. This can be:

- A carton
- A pallet
- A group of shrink wrapped units
- A tray
- A container
- Or any other similar type of packaging created for the purpose of handling, storing or shipping.

The following information is a reference for the design of logistics labels. Application Identifiers (AIs) and the GS1-128 Symbology are important components of logistics labels and apply to all of the specifications relating to these labels.

The structure and layout for logistics labels is explained, however, emphasis is given to the basic requirements for practical application in an open trade environment. The major areas include:

- the unambiguous identification of logistic units
- the efficient presentation of text and machine readable data (bar codes)
- the information requirements of key partners in the supply chain—suppliers, customers and carriers
- technical parameters to ensure systematic and stable interpretation of the labels

This information is applicable to any type of logistic unit marked with a Serial Shipping Container Code (SSCC), which is used in logistic and transport applications where there is a need to track and trace individual units or a grouping of units being a part of the same transport transaction.

5.3.1 Components of the GS1 Logistics Label

Information represented on GS1 Logistics Labels has two basic forms:

- Information required to be utilised by people—usually comprising text and graphics, e.g. to and from addresses
- Bar codes (machine readable form) – a secure and efficient method of conveying structured data

The human readable text allows general access to basic information at any point in the supply chain. However, both methods of information representation provide value to the GS1 Logistics Label and often co-exist on the same label.

The mandatory field for all logistics labels is the Serial Shipping Container Code (SSCC) represented by the Application Identifier (00). The SSCC is a unique identification number assigned to each specific logistic unit. In principle the SSCC is sufficient for all logistic applications.

In an environment where eMessaging is used to transmit the detailed information pertaining to each logistic unit, or where the information is already within a database, the SSCC acts as the reference point to information. However, when eMessaging is not available at each point in the supply chain, or when redundancy is desired, certain additional elements of information are desirable. Each of these is also represented through the use of Application Identifiers (AIs).



5.3.2 Label Design

The design of the logistics label accounts for the supply chain process by grouping information into three logical sections. A section is a logical grouping of information that is generally known at a particular time.

- **Supplier section**

This section of the label contains information that is generally known at the time of packaging by the supplier. The SSCC is applied here as the unit identifier, along with the GTIN if used. Other information that may be of interest to the supplier but might also be useful for customers and carriers can be applied. This includes product-related information such as product variant; dates such as production, packaging, expiration, and best-before dates; and batch/lot and serial numbers.

- **Customer section**

The customer section of the label contains information that is generally known at the time of the order and order processing by the supplier. Typical information includes the ship to location, purchase order number, and customer-specific routing and handling information.

- **Carrier section**

The carrier section of the label contains information that is generally known at the time of shipment and is typically related to transport. Typical information includes AI (420) - Ship-to Postal Codes, AI (401) - Global Identification Number for Consignment.

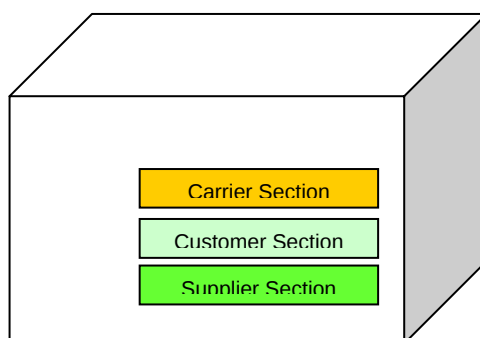
Each label section may be applied at a different point in time, as the relevant information becomes known. However should all relevant information be known at the time, the label is to be produced, it can be combined into one label, please refer to examples in Section 5.4.

Within each section bar coded information is separated from text information to facilitate separate processing by automatic data capture and people. Bar codes are represented in the lower part of each section, while human readable information is shown in the upper part of the section. This facilitates access to each component as required.

The organisation responsible for the printing and application of the label, determines the content format and dimensions of the label.

Further information regarding the type of data included in these sections can be obtained from the **GS1 Australia User Manual - Numbering and Bar Coding**.

Figure 30: Label sections represented separately on a logistic unit



Label Dimensions

The physical dimensions of the label are determined by the company applying the label to the logistic unit. However, the size of the label should be consistent with the information required in all sections of the label.

The business requirements for most users of GS1 Logistic Labels are met by using one of the following:

- A6 format (105mm x 148mm) which is particularly suitable when only the SSCC, or the SSCC and limited additional data is encoded.
- A5 (148 mm x 210 mm)

5.3.3 Technical Specifications

The following sections identify specific aspects of the format of the logistics label to assist in the initial processes of development. Not all technical aspects have been provided within this document and companies should ensure that they consult the **GS1 Australia User Manual - Numbering and Bar Coding** or contact GS1 Australia for further information.

5.3.3.1 Bar Codes

The GS1-128 Bar Code shall be used for all information on the GS1 Logistics Label.

The number of GS1-128 Bar Codes may be minimised by using concatenation (stringing data elements together) wherever possible. When not possible due to constraint of label size, data can be represented in multiple bar codes. The sequence of the bar coded data elements is irrelevant in terms of interpretation.

Note: The exception is the SSCC, which is the identifier for the logistic unit and the most fundamental element of the label. Due to the larger magnification recommended for the SSCC, concatenation is not feasible on a standard width label.

5.3.3.2 Bar Code Orientation and Placement

Bar codes shall be in picket fence orientation on logistic units, i.e. the bars and spaces shall be perpendicular to the base on which the logistic unit stands. In all cases, the SSCC shall be placed in the lowest portion of the label.

5.3.3.3 Text

There are three types of text information, which can appear on a logistics label:

- Plain text - text that is not encoded in the bar code but often required on a label e.g. name and address of the sender and receiver
- Human Readable Interpretation - the information encoded in the bar code that is required to support manual operations and to facilitate key entry.
- Data titles - the standard abbreviated descriptions of data fields used to denote the Human Readable Interpretation of data fields e.g. SERIAL is the data title of serial number.

Further details can be found in the **GS1 Australia User Manual - Numbering and Bar Coding**.



5.4 GS1 Logistics Label Formats for the Meat Industry

As described in Section 5.1 there is the ability to identify logistic units with the use of the Serial Shipping Container Code (SSCC). Where companies and/or industry sectors are not fully capable of eMessaging there is often a need to identify additional data represented on the GS1 Logistics Label to assist processing of shipments through the supply chain.

The following section describes the minimum data set required on a GS1 Logistics Label for the Australian Meat Industry for use on logistic units of the following configuration:

- **Logistic unit containing the same trade items** (See Figure 31)
This label format would be used in the instance where the trade items carry the same GTINs within the logistic unit. Data on this label is only applicable where the GTINs are all the same on the individual trade items, for example a pallet of 20 cartons of 10kg bacon.
- **Logistic unit containing the same configuration of trade items** (See Figure 32)
In the event that the logistic unit itself has been assigned a unique GTIN this label example can be used. This label format should be used when the trade item is a standard, stable and orderable trade item in itself. The logistic unit could consist of either a standard grouping of identical trade items or a standard mix of trade items, for example the orderable unit is a pallet of 20 cartons of 10kg bacon or 10 cartons of bacon 5kg and 10 cartons of bacon 10kg.
- **Mixed trade items on the logistic unit from the same Purchase Order** (See Figure 33)
When an order is picked and packed and is a mix of various trade items from one Customer Purchase Order this label format can be used.
- **Mixed trade items on the logistic unit from various Purchase Orders** (See Figure 34)
In the event that a back order/s is filled thus consisting of various Customer Purchase Orders this example logistics label is required. Note full use of eMessaging is required to advise the customer of the information linked to the SSCC.
- **Where full eMessaging is applicable** (See Figure 34)
In this example full use of eMessaging is applicable between trading partners. Here all the information is linked to the SSCC and this acts as the key to access all information about the logistic unit. This label format can be used on all types of logistic units from, standard groupings to mixed trade items. The only requirement is that eMessaging is fully operational between all trading partners throughout the supply chain.

Note: Information contained on the GS1 Logistics Label is negotiable between suppliers, customers and transporters/consolidators. These guidelines in no way limit any other information, which may be required by each party in the supply chain.

Note: The bar codes in Figure 31 to Figure 34 are not to scale.



Figure 31: Example of the GS1 Logistics Label Format standard pallets

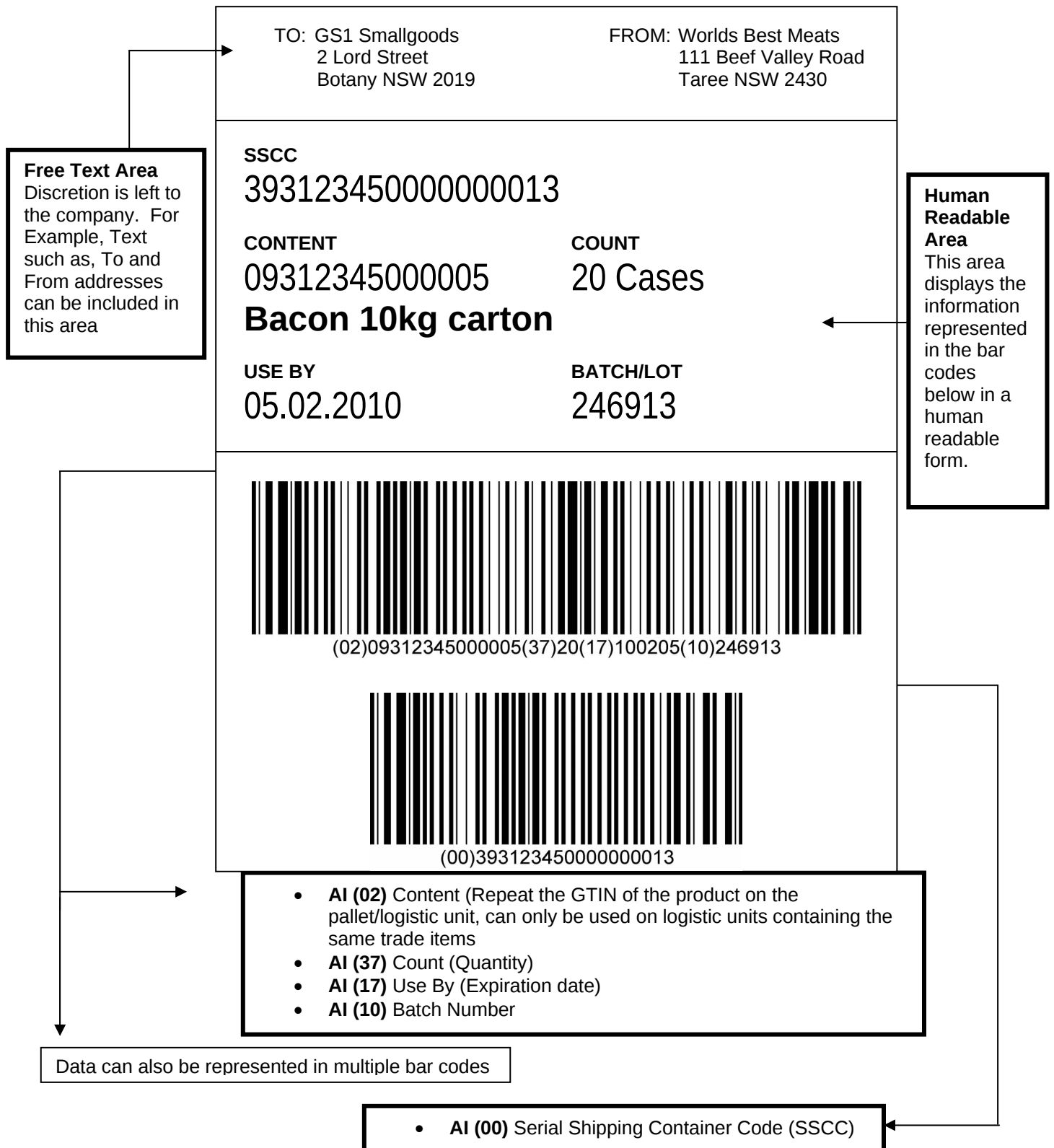


Figure 32: Example of the GS1 Logistics Label Format standard pallets

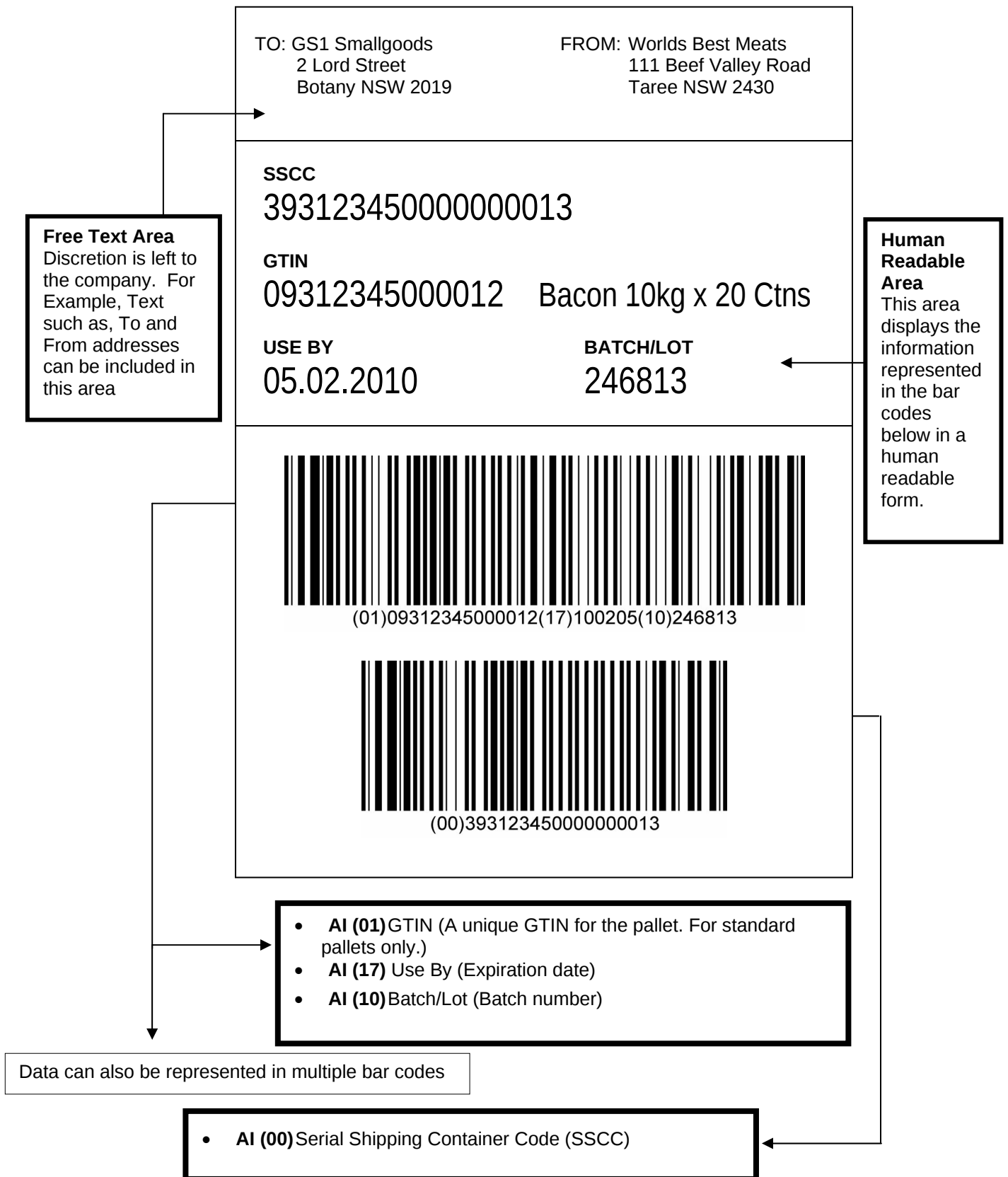


Figure 33: Example of a GS1 Logistics Label Format mixed orders same Customer Purchase Order

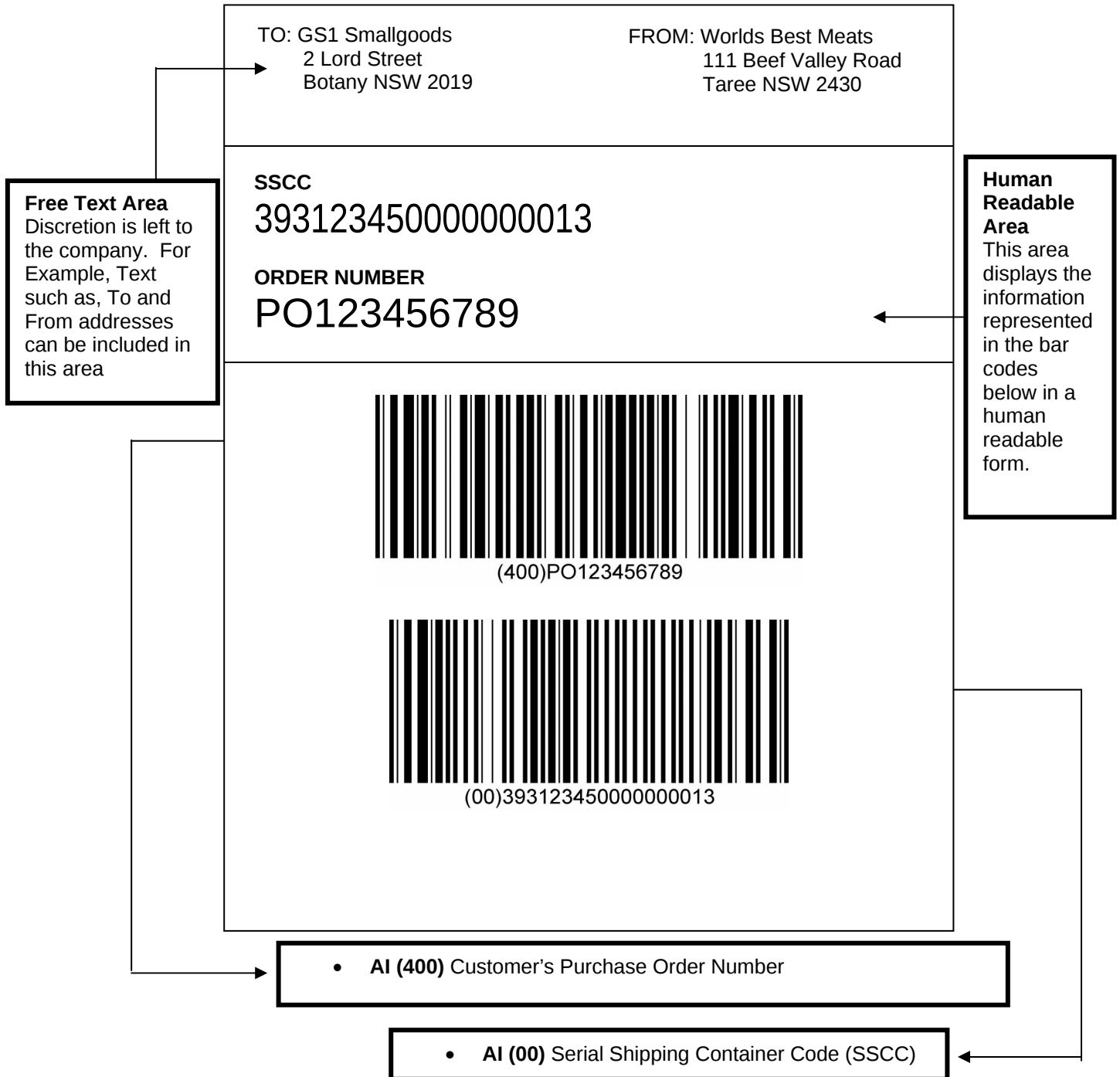
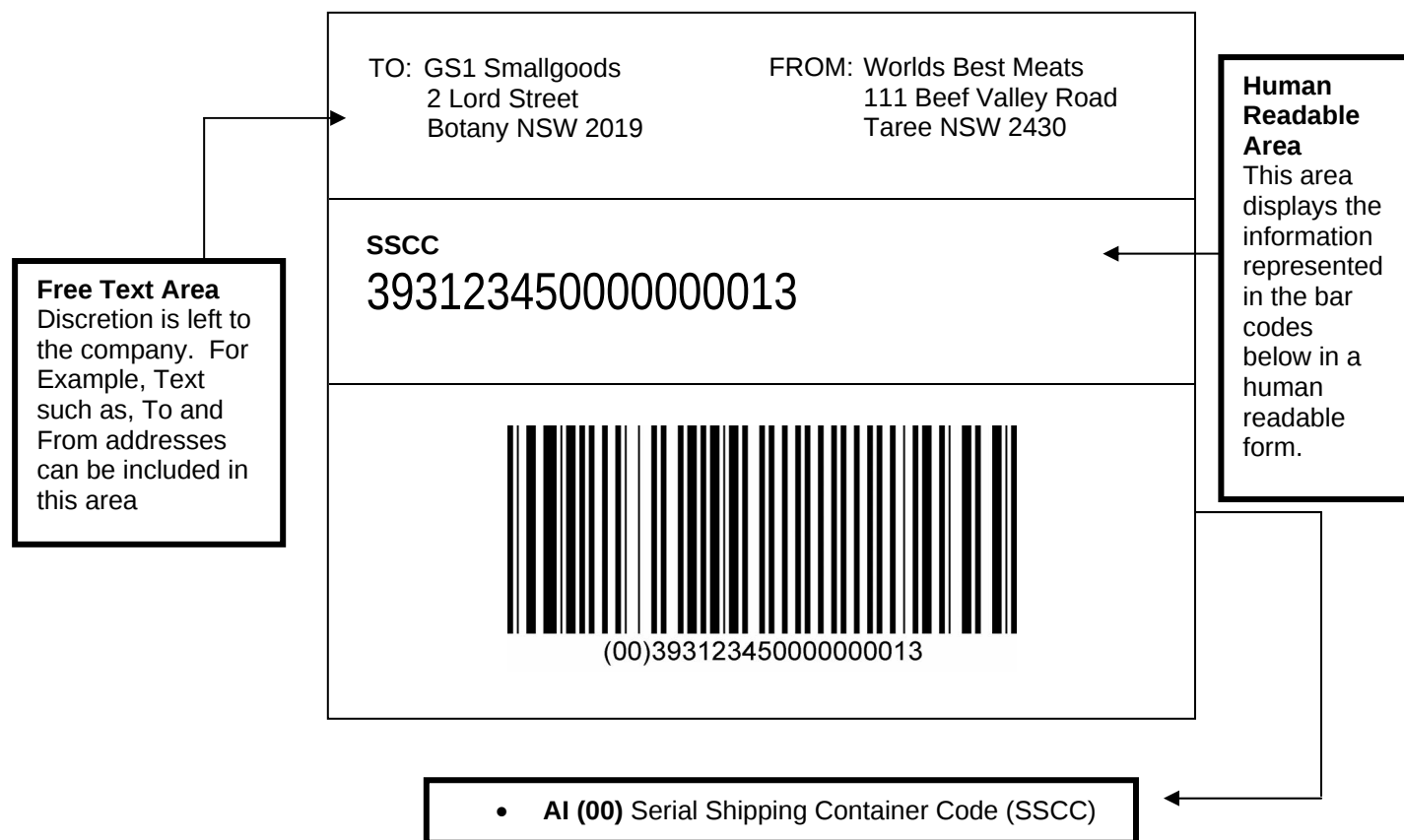


Figure 34: Example of a GS1 Logistics Label Format mixed trade items with different Customer Purchase Order Numbers



Note: Full use of eMessaging is required when using the above label format to advise the trading partner of the information linked to the SSCC.



5.5 Logistic Unit Label Positioning

The bar codes on units intended for General Distribution should be upright (i.e. in picket fence orientation) and placed on the sides of the unit. Each item shall have at least one bar code, and two are recommended.

In the event that the product is not a standard carton or pallet of uniform shape all efforts should be made to meet the recommendations. For shipments with an irregular or unconventional shape common sense should direct the location of any logistics labels to ensure that the label is visible at all times.

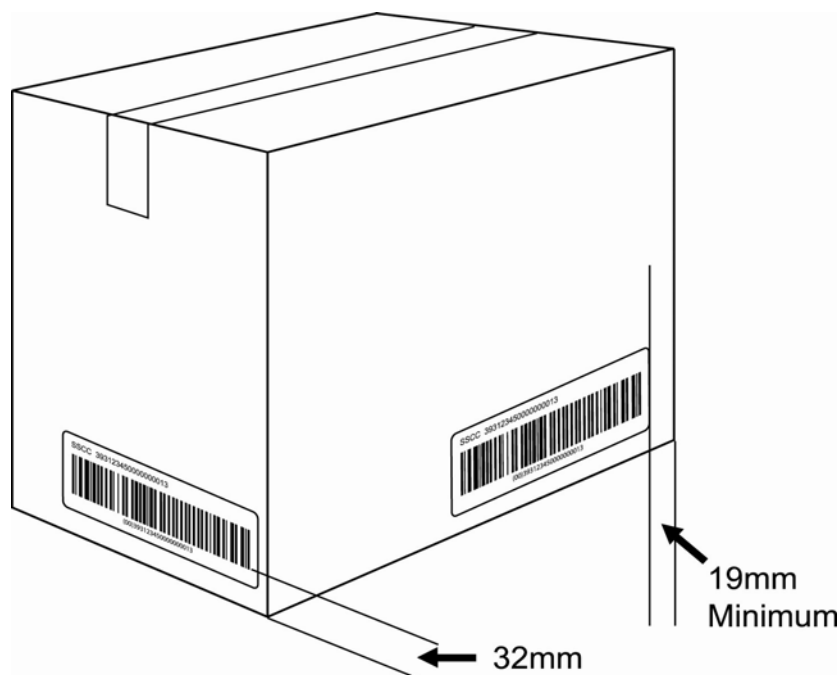
Note: If only one label is applied, the side chosen needs to take into consideration the way the pallet will be picked. In this instance the label should be applied to the “pick side” of the pallet. Before taking this option, consultation with all trading partners is advised.

Consult the **GS1 Australia User Manual - Numbering and Bar Coding** or contact GS1 Australia for further information on logistic label location.

5.5.1 Cartons and Outer Cases

For cartons and outer cases, logistic labels should be placed so that the lowest edge of the vertical bars of the GS1-128 Bar Code containing the SSCC is 32mm from the base of the unit. Ensure that no part of the bar code (Including Quiet Zones) is closer than 19mm from any vertical edge.

Figure 35: Location of the GS1 Logistics Label on a carton or unit less than 1 metre in height



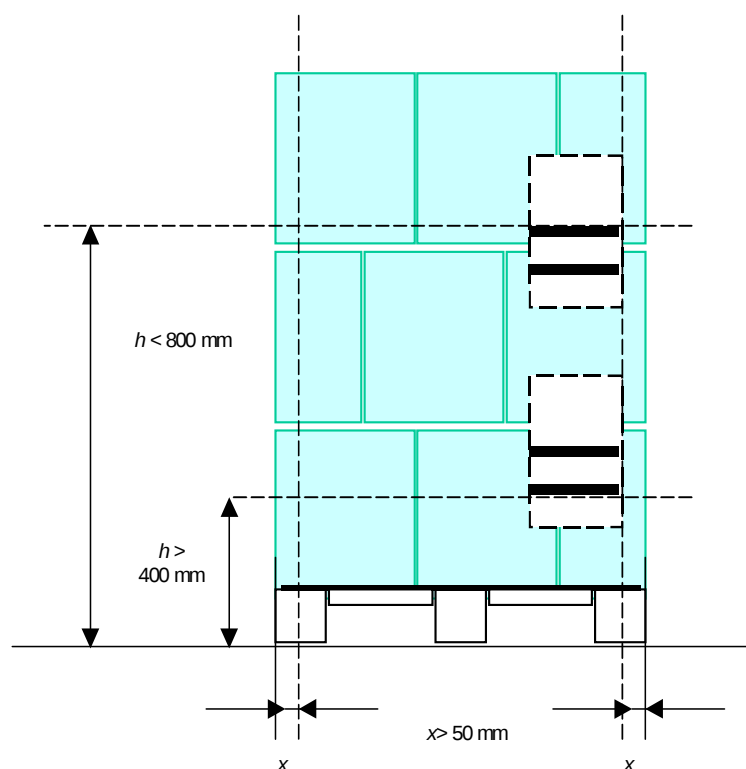
If the unit is already marked with an EAN-13, UPC-A, ITF-14 or GS1-128 Bar Code for trade item identification purposes, the label should be placed so as not to obscure the pre-existing bar code. The preferred location of the label in this case is to the side of the pre-existing bar code, so that a consistent horizontal location is maintained.

5.5.2 Pallets

For all types of pallets, including full pallets containing individual trade items and singular trade items (such as a fridge or washing machine), bar codes should be placed at a height between 400mm and 800mm from the base of the unit. Including Quiet Zones, the bar codes should be no closer than 50mm from any vertical edge to avoid possible damage.

For pallets less than 400mm in height, the bar codes should be placed as high as possible whilst protecting the logistics label.

Figure 36: Location of the GS1 Logistics Label on pallets



6 Global Location Numbers

6.1 Introduction

On a daily basis information related to parties and locations is generated and communicated throughout the business world in vast quantities. Names and addresses are put on envelopes for the mail, the point to which a delivery is to be made is put on transport documentation, EDI network addresses are provided in an electronic message, etc. These are just a few examples of the many applications in existence today, which identify parties or locations in trade or other communications.

With the advent of electronic communication, the need for the identification of parties and locations has become more acute. The use of numeric identification instead of full alphanumeric names and addresses is the key to the successful implementation of an eMessaging project.

Global Location Numbers (GLNs) offer an internationally recognised standard solution to the identification of parties and locations. Once assigned at source, i.e. in general by the party owning the location, the GLN becomes a unique and universal reference, which can be used by all.

6.2 Definition of the Global Location Number (GLN)

The GLN is a thirteen-digit non-significant reference number used to identify:

- Legal entities, e.g. registered companies
- Physical entities, e.g. a door of a warehouse, a particular room in a building

Global Location Numbers (GLNs) can be used to identify anything which is, or can be, addressed. Some examples of this would include companies, departments, rooms, factories, shelves, delivery points, network addresses, etc.

Details associated with a GLN, e.g. name and address, location type, contact persons, communications numbers, banking information, delivery requirements or restrictions, etc., are stored in the computer files of the system for later retrieval.

Although a GLN is strictly a reference key and does not carry any information on the location it identifies, it has a standard format and is structured to allow each GLN to be unambiguous and unique worldwide.

The format of a GLN is a thirteen-digit, fixed length numeric field, structured in the same way as a GTIN-13.

GLNs are mainly used in eMessaging to identify the sender and recipient of an electronic transmission and any party relevant to the transaction, e.g. buyer, seller, carrier etc.

GLNs can also be used in a bar code format to identify a physical location or to encode the identification of relevant parties in logistic applications, e.g. "Ship-to" location number. The GS1-128 Bar Code is used to encode a GLN but a filler zero must be added to the front of the GLN to create a 14 digit number. In addition, the appropriate Application Identifier should be used according to the rules specified in the **GS1 Australia User Manual – Numbering and Bar Coding**.

GS1 Australia member companies that have been allocated a GS1 Company Prefix for item identification can use the same GS1 Company Prefix for assigning GLNs.

Companies that are not members of GS1 Australia can still use GLNs. These companies should contact GS1 Australia for further information.



6.3 Implementation Timing

- All companies should be identified by a GLN in all electronic messages.
- All locations (warehouse, stores, manufacturing plants, etc.) in electronic messages should be identified by GLNs.

During a migration period, both GLNs and current internal numbers can be used at the discretion of the trading partners for identifying locations.



7 Asset Numbering

The GS1 System provides a method for the identification of assets. The object of asset identification is to identify a physical entity as an inventory item.

GS1 Global Returnable Asset Identifier (GRAI) – used to identify a reusable entity (eg Returnable Plastic Crate) that is normally used for transport and storage of goods.

GS1 Global Individual Asset Identifier (GIAI) – used to identify uniquely an entity that is part of the inventory of a given company (eg personal computer)

Within this guideline, Asset Numbering has not been covered in any more detail. If you require further information please consult the ***GS1 Australia User Manual-Numbering and Bar Coding*** or contact GS1 Australia.



8 Appendix

8.1 Bar Code Quality Check List

There are a number of aspects to printing the bar code to ensure that 100% readability is achieved and maintained. The checklist below itemises the things to check during the bar code generation and printing processes.

- Ensure that the correct bar code is used for the relevant product, application, and scanning environment
- Check that the bar code will remain readable in the environment in which the product will be stored, handled, and distributed
- Ensure that the Check Digit is correct
- Check the size of the bar code, both the magnification and the bar height
- Ensure that there are adequate Quiet Zones, and that any optional Quiet Zone Indicators are correctly placed
- Check that the contrast between the bars and the background is adequate, and that the colours chosen will scan
- Make sure that the colour of the contents of the packaging will not unduly affect the contrast between the bars and spaces
- Check the position of the bar code on the final, formed product
- Ensure that no shrink-wrap, tape, or other printing will obscure the bar code on the finished product
- Ensure that no other bar codes will be visible or show through from the inside of the pack
- Carry out routine verification at all levels of packaging to ensure that the bar code complies with the required quality standard, and to identify any potential problems
- Check the print quality regularly throughout the print run by verifying the bar code quality
- Notify trading partners of the GTINs and the products they identify in good time
- Consider having GS1 Australia prepare a Bar Code Verification Report on the artwork for you prior to the final print to help detect any errors or areas for improvement

Some in-house printing methods, particularly on-line ink jet printing, require attention to the total print process and on-going maintenance.

The GS1 specifications for printing bar codes are explicit in that if the specified procedures are followed, with routine quality control, you can produce bar codes that scan consistently.

Note: It is recommended that the quality of the bar codes be assessed. This can be achieved through the use of the GS1 Bar Code Verification Service. Please refer to section 8.4 for further information or contact GS1 Australia.

8.2 eMessaging

8.2.1 Introduction

The identification numbers used with the GS1 System are also used in Electronic Data Interchange (EDI) messages, this allows unique trade item identification associated with a transaction to be identified and exchanged between trading partners.

Today, the majority of data in commercial paper documents is generated from existing computer applications. These paper documents are printed and copied before the information they contain is finally communicated by fax or mail. In turn, the business partner re-keys all this information into another computer application for further processing. This process is extremely slow, costly and unreliable. The need for faster, cheaper and more accurate solution for exchanging business data is a priority for many companies and organisations.



In the traditional sense EDI can be conceptualised as paperless trading. A common and useful definition for EDI is the “transfer of structured data, by agreed message standards, from one computer application to another by electronic means and with a minimum of human intervention”.

Through the use of GS1 Australia’s eMessaging guidelines, GS1 EANCOM (subset of UN/EDIFACT standard) and GS1 Business Message Standard (XML syntax), data may be communicated quickly, efficiently and accurately, irrespective of users internal hardware or software.

For more information contact GS1 Australia.

8.3 Emerging Technologies

8.3.1 EPC Network & Radio Frequency Identification (RFID)

Global trade involves moving goods and tracking them around the world. GS1 Global Office through their joint venture EPCglobal are rolling out and supporting adoption of the EPC network, which combines low cost RFID technology, existing communications network infrastructure and the Electronic Product Code (EPC). The EPC Network will make organisations more effective through real and timely visibility of information about items in the supply chain. The EPC network was developed by the Auto-ID Centre, a global research team directed through the Massachusetts Institute of Technology (MIT) and with labs around the world.

The EPC network incorporates global standardisation of tags and readers, a common method for describing objects Physical Markup Language (PML), middleware for the filtering and interpretation of data and an Object Naming Service (ONS) registry for locating the source of specific item information. Global standards have been developed with direct input from the GS1 community and end users.

The use of RFID technology has some advantages over linear bar codes in that;

- It does not require line of sight
- Multiple items can be read
- Some tags have read/write ability and have larger data storage capacity
- Some tags have additional functionality such as temperature monitoring

8.3.2 GS1 DataMatrix

GS1 DataMatrix is a standalone two-dimensional matrix symbology that is made up of square modules arranged within a perimeter finder pattern. Data Matrix has been used in the public domain since 1994 mainly on very small items that require a symbology with a square aspect ratio and/or cannot be marked with the allocated packaging space by existing GS1 DataBar (formerly RSS) and Composite Symbols (see footnote 1 on page 9)

Some of the production processes that can be used to produce GS1 DataMatrix Symbols are as follows:

- Direct part marking, such as is done by dot peening on items, such as automotive, aircraft metal parts, medical instruments, and surgical implants
- Laser or chemically etched parts with low contrast or light marked elements on a dark background (e.g., circuit boards and electronic components, medical instruments, and surgical implants)
- High-speed ink jet printed parts and components where the marked dots cannot form a scannable linear symbol

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



8.4 Services Offered by GS1 Australia

8.4.1 Introduction

A new era demands new solutions and new solutions demand new services. Consequently GS1 Australia has invested heavily in a series of initiatives geared toward helping members successfully implement eCommerce based supply chain management strategies.

Through our specialised member assistance divisions: Industry Management, Accreditation, GS1net and Professional Services, we are positioned to respond more efficiently to member needs.

By utilising these services as appropriate, you can gain greater control over your business and prepare for the future.

8.4.2 The Services

8.4.2.1 *Industry Management*

The Industry Management Team provides assistance to GS1 Australia's Members, enabling them to equip themselves with the knowledge needed to adopt the GS1 Standards successfully.

Membership of GS1 Australia allows the use of the GS1 System for supply chain management and eCommerce processes.

It also provides you, the member, with a wide range of assist services, which include; assistance on how to apply numbers and bar codes, helpdesk support on GS1 System queries, onsite visits, advice on GS1 System implementation, industry guidelines and education & training.

As a member, you can call on the Industry Management Team as an invaluable resource for achieving greater control over day-to-day supply chain processes and business transactions.

As part of GS1 Australia's commitment to industry, Industry Management team is also responsible for the delivery of the 'Industry Engagement Program' that assists the industry wide adoption and education of the GS1 System. Currently GS1 works with eighteen industry sectors in Australia to improve supply chain efficiency between trading partners by utilising eCommerce and GS1 Global Standards.

8.4.2.2 *Testing Services - Bar Code Verification Reporting*

GS1 Australia offers a bar code verification report service to all members. Bar codes are tested for print quality against ISO standards to ensure they will be able to be scanned successfully through the supply chain. We also test the validity of the number encoded and ensure it is unique to this product and within the brand owner's available allocation.

A full Bar Code Verification Report is issued for each test that confirms compliance and makes educational suggestions for improvement where applicable.

8.4.2.3 *GS1net –Global Data Synchronisation Service*

Because integrity of data is crucial to eCommerce, GS1net has been developed as a secure on-line data synchronisation service, holding records of significant volumes of bar-coded items, including grocery, liquor, healthcare, hardware, auto aftermarket, general merchandise, office products and much more. Each record contains a broad range of fields that include product identifiers, images, description, dimensions, bar code testing status, customer specific pricing and trading terms.

The GS1net catalogue has been created to meet the following needs:

- Allow all trading partners to electronically synchronise data and remove errors associated with paper-based processes.
- Provide retailers, wholesalers, Healthcare jurisdictions and other industry stakeholders with an



inexpensive means of accessing information on available products and their master data attributes.

- Provide a single point of entry and retrieval data repository, to enable data integrity that is essential to minimising errors in eCommerce transactions.

Notably, GS1net has already been endorsed by major trading partners in the Australasian Healthcare, Grocery, Liquor and Hardware industries.

8.4.2.4 Professional Services

GS1 Australia members requiring additional onsite implementation support can benefit from GS1 Australia's Professional Services' expert and independent assistance. GS1 Professional Services provide dedicated consulting services covering all elements of the GS1 System for unique item identification, bar coding and RFID, electronic messaging and data synchronisation..

GS1 Professional Services' advisors offer a cost-effective and relevant means to come to terms with GS1 System processes and benefits. Professional Services can help you with all aspects of your implementation project, including:

- Project Planning, Management and Facilitation
- Business process analysis and design
- Selection of required hardware and software
- Development of functional specifications for systems integration
- Training and change management programs
- Compliance audits of internal processes, systems and applications to meet specific industry or trading partner requirements

GS1 Professional Services also offers a range of tailored programs designed to implement the GS1 System for internal operational improvements.

GS1 Professional Services' advisors not only have a deep technical understand of the GS1 System, but also have a wealth of implementation expertise across a number of industry sectors, including wholesale / retail, manufacturing, foodservices, automotive aftermarket, hardware, healthcare, liquor, building and agriculture. As a result, we can help to deliver complete end-to-end solutions by providing members with unbiased advice on hardware and software, facilitating implementation and training staff and management.

For more information on any of the above services, please contact GS1 Australia.

8.4.2.5 GS1 Locatenet

GS1 Locatenet is a central directory of GS1 Global Location Numbers (GLNs) which identify physical, operational and legal locations. GLNs may be assigned to pricing locations, ship-from locations, ship-to destinations, eMessaging addresses and more.

GS1 Locatenet delivers the ability for trading partners to communicate location master data using GS1 global standards. GS1Locatenet facilitates the dissemination of quality location data from a central, validated, electronic source, supported and administered by GS1 Australia.

Whilst developed initially for the Healthcare sector to support the National Product Catalogue (NPC), GS1 Locatenet is available to all users of GLNs, across all industries.

For further information on GS1 Locatenet, please visit <http://www.gs1au.org/services/locatenet/>

8.4.2.6 GS1 Recallnet

GS1 Recallnet is GS1 Australia's Recall & Withdrawal Notification Service.

GS1 Recallnet is a standardized, industry-driven communication tool enabling manufacturers to share real-time product recall and withdrawal notifications information with their trading partners in a secure and efficient manner.



This user-driven online tool is being developed through an industry consultation and collaboration process and is based on local and global best practices.

GS1 Recallnet enhances existing recall and withdrawal notification processes and leverages GS1 standards and GS1 keys, including Global Trade Item Number (GTIN), Global Location Number (GLN), Global Service Relation Number (GSRN), and the Global Document Type Identifier (GDTI).

For further information on GS1 Recallnet, please contact GS1 Australia on 1300 366 033.

8.4.2.7 Training Services

Four different training modes make GS1 learning convenient even for the busiest of schedules. An array of education options and training sessions allows members to get the supply chain management education they need, regardless of where they live or when they are available.

Members can select from:

8.4.2.7.1 Classroom Sessions

Traditional classroom training sessions offer the opportunity to learn from expert instructors. Classes run throughout the day and allow new and existing members to gain better insight and understanding of the GS1 System.

8.4.2.7.2 Online Courses

For members who find it difficult to travel to a classroom, GS1 Australia training is as close as the internet. An online training tool, GS1 LEARN allows members to take a series of courses on essential supply chain concepts, anywhere and at their own pace, 24 hours per day, seven days a week.

8.4.2.7.3 Web Interactive Training

New members can take advantage of GS1's web-interactive training, or "webinars" for an introduction to the GS1 System and all the information and tools needed to print bar codes on their products. The introductory multimedia presentation connects participants with a GS1 expert live via a telephone conference call, while following the presentation on the web page.

8.4.2.7.4 Knowledge Series 101

Members as well as non members can get a deeper understanding on some of the GS1 standards supporting electronic messaging, radio-frequency identification (RFID) and other technologies.

8.4.2.7.5 Sessions at the GS1's Supply Chain Knowledge Centre

Nothing can quite compare to the impact of a day spent at GS1 Australia's Supply Chain Knowledge Centre, which delivers a number of supply chain learning programs specifically developed for small, medium and large enterprises. The Supply Chain Knowledge Centre takes participants on an educational journey through the supply chain and is relevant to every sector of the economy. It demonstrates, in a clear and easily understandable manner, how sound supply chain management techniques can benefit your business and provide the foundation for current and future eCommerce strategies. The Supply Chain Knowledge Centre is a very effective way to introduce staff to the



fundamentals of supply chain management - from raw material, through manufacture, shipping and on to Point-of-Sale.

