WR #	GSCN Name	Effective Date
18-317	Gen Specs section 2,3,4,5 updates (continuous improvement program)	**12-Dec-2018**

Associated Work Request (WR) Number:

18-317 Continuous Improvement Program Gen Specs v19

Background:

Section 2:

- Simplification of GS1 key and attributes information
- Simplification of Data carrier specification
- Move GTIN-8 rules to section 4.
- Optimisation of Direct Marking section, move technical detail to section 5.
- Harmonisation of subsection names

Section 3:

- Harmonisation of AI association rules and references to section 4.

GS1 General Specification Change:

The recommended changes are highlighted below, relative to GS1 General Specifications version 18.

Disclaimer

2 Application standards

2.1 Trade items

2.1.1 Introduction

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

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

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

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

The serialised identification of trade items, which enables total connectivity of information and communication systems, is achieved through the use of GS1 Application Identifier AI (01) GTIN and AI (21) serial number.

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

2.1.1.1 Physical or non-physical trade items

Non-physical trade items are usually called services. Services may be identified with a unique GS1 identification key for use in open trade applications or in restricted distribution environments.

2.1.1.2 Open or restricted distribution

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

2.1.1.3 Fixed or variable measure

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

2.1.1.4 General retail consumer trade item, regulated healthcare retail consumer trade item or non-retail trade item

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

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

2.1.1.5 Books and serial publications

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

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

2.1.1.6 Single item or trade item grouping

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

2.1.1.7 Trade item assortments

Three kinds of assortments exist:

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

2.1.1.8 Regulated healthcare trade items (RHTI)

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

2.1.1.8.1 Marking levels of regulated healthcare trade items

For regulated healthcare trade items (RHTI) three levels of identification have been developed:

- Minimum Level of AIDC marking.
- Enhanced Level of AIDC marking.
- Highest Level of AIDC marking.

The identification solution for each of these levels may differ between the category of "pharmaceuticals" (which includes biologics, vaccines, controlled substances, clinical trial pharmaceuticals, and therapeutic nutritional products) versus the category of "medical devices" (which includes all classes of medical devices) and may also differ by configuration or packaging level (trade items direct marked, primary packaging, secondary packaging, case/shipper, pallet, logistics unit). The standards in section 2.1.6~~2.1.6~~~~2.1.7~~ define the data required by packaging level and by product type. For purposes of AIDC marking the brand owner is responsible for determining the proper assignment of each particular regulated healthcare retail consumer trade item to either the pharmaceutical or medical device category in accordance with local regulatory requirements. Additionally within some use cases, or under the requirement of some regulations, certain medical devices will require direct part marking (DPM) of the AIDC data carrier. For more details on the application of DPM with medical devices see section 2.1.8~~2.1.8~~~~2.1.9~~.

2.1.1.8.2 National Healthcare Reimbursement Numbers

National Healthcare Reimbursement Number (NHRN) is the term for identification numbers used on pharmaceutical and/or medical devices, where required by national or regional regulatory organisations, for product registration purposes and/or for the management of reimbursement. For compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the current need, the trade item SHALL be identified with GTIN and the applicable GS1 Application Identifier for NHRN.

See sections 2.1.5~~2.1.5~~~~2.1.6~~, 2.1.6~~2.1.6~~~~2.1.7~~ and 3.8.17 for a complete description of the structure and rules of use of the GS1 Application Identifier for NHRN.

2.1.1.9 Single trade items composed of several physical parts

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

2.1.1.10 GTIN data string

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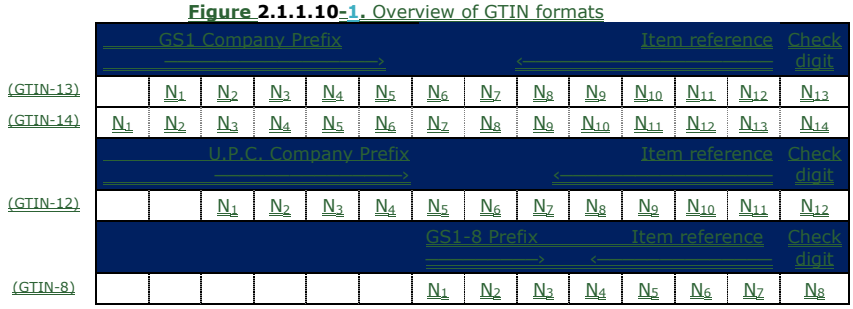
A GTIN may be an eight, twelve, thirteen or fourteen-digit string as explained in the sections below. These strings will be unique when they incorporate a GS1 Company Prefix, U.P.C. Company Prefix or GS1-8 Prefix as required, and if they are always treated as a data string of digits plus a final check digit. The check digit is explained in section 7.9. Its verification ensures that the number is correctly composed.

Figure 2.1.1.10-1. Overview of GTIN formats



When any of these GTINs is encoded in a data carrier that must encode a fixed-length data string of 14-digits, the GTINs less than 14-digits in length must be prefixed by leading zeroes that simply act as filler digits.

Figure 2.1.1.10-2. 14-digit representation of the four GTIN formats

	added zero(es) <—						right aligned GTIN string —>							
(GTIN-8)	0	0	0	0	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8
(GTIN-12)	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
(GTIN-13)	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}
(GTIN-14)	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

The presence or lack of these leading zeroes does not change the GTIN concerned.

Note: GTINs may be stored with or without leading zeroes in the same database field, depending on the requirements of the particular application.

Note: A GTIN-12 may start with one, two or three leading zeros. These zeroes are meaningful since they are part of the U.P.C. Company prefix, and therefore these must be preserved when storing the GTIN-12 in a database field. For the list of U.P.C. Prefix ranges see section *1.4*.

2.1.2 Fixed measure trade items – open supply chain

Fixed measure trade items are those that are always produced in the same version and composition (e.g., type, size, weight, contents, design). The identification number identifies the item unambiguously. Every trade item that is different from another in any respect is assigned a separate Global Trade Item Number (GTIN).

2.1.3 Fixed measure ~~General retail consumer~~ trade items scanned at~~in general~~ retail ~~at~~ POS

A ~~general~~ fixed measure ~~retail~~ consumer trade item that is intended to be read at high-volume retail POS. The ~~general retail consumer~~ trade item must be identified with a GTIN-8, GTIN-12, or GTIN-13. It must carry a barcode from the EAN/UPC symbology family or ~~and in limited circumstances a symbol from~~ the GS1 DataBar® Retail POS family ~~(*)~~. ~~Therefore, these trade items support only GTIN-8, GTIN-12, or GTIN-13s.~~

~~Some point-of-sale scanning systems may be able to handle symbologies other than the EAN/UPC symbology. However, in an open environment, it is not possible to predict the type of scanner that will be used. Therefore, items that may be scanned at point-of-sale must be marked with an omnidirectional barcode.~~ To support new applications additional GS1 approved data carriers (encoding additional data with the GTIN) may be applied ~~with mutual agreement between trading partners~~. For information on how to manage multiple barcodes see section *4.16*.

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

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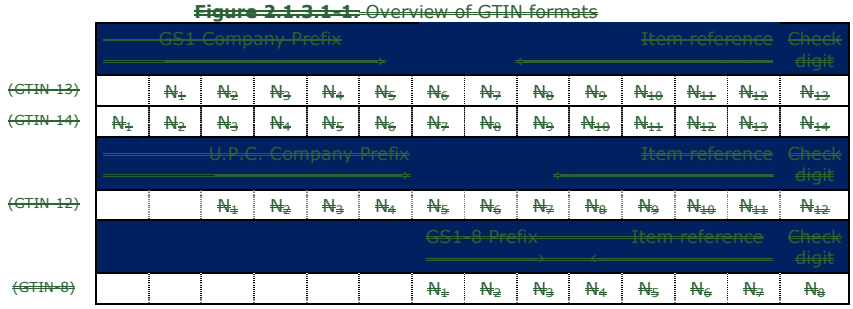
Commented [CJ13]: WR18-cip2

~~2.1.3.1 1.1.1.1 GTIN data string~~

~~A GTIN may be an eight, twelve, thirteen or fourteen-digit string as explained in the sections below. These strings will be unique when they incorporate a GS1 Company Prefix, U.P.C. Company Prefix or GS1-8 Prefix as required, and if they are always treated as a data string of digits plus a final check digit. The check digit is explained in section 7.9. Its verification ensures that the number is correctly composed.~~

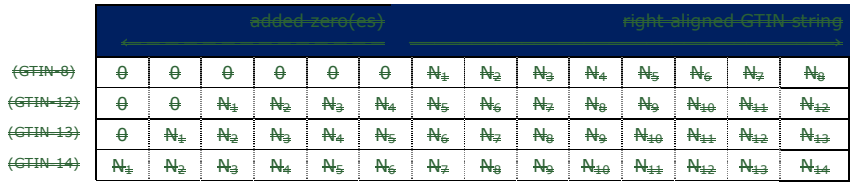
Field Code Changed

~~**Figure 2.1.3.1-1.** Overview of GTIN formats~~



~~When any of these GTINs is encoded in a data carrier that must encode a fixed-length data string of 14 digits, the GTINs less than 14 digits in length must be prefixed by leading zeroes that simply act as filler digits.~~

~~**Figure 2.1.3.1-2.** 14-digit representation of the four GTIN formats~~



~~The presence or lack of these leading zeroes does not change the GTIN concerned.~~

~~**Note**: GTINs may be stored with or without leading zeroes in the same database field, depending on the requirements of the particular application.~~

~~**Note**: A GTIN-12 may start with one, two or three leading zeros. These zeroes are meaningful since they are part of the U.P.C. Company prefix, and therefore these must be preserved when storing the GTIN-12 in a database field. For the list of U.P.C. Prefix ranges see section *1.4*.~~

Field Code Changed

~~2.1.3.2~~2.1.3.1 Fixed measure trade items scanned at retail POS using GTIN-12 and GTIN-13

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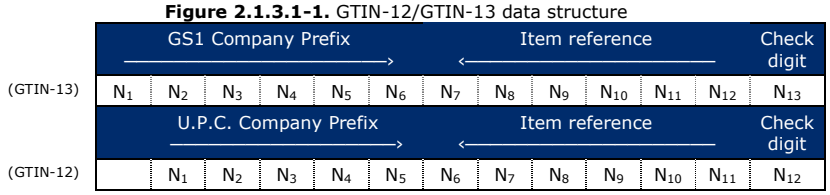
Application description

Figure 2.1.3.1-1. GTIN-12/GTIN-13 data structure



The GS1 Company Prefix is allocated by a GS1 Member Organisation to a system user. It makes the ID number unique worldwide but does not identify the origin of the item. Any valid GS1 Company Prefix, other than ones starting with a zero, may be used to issue a GTIN-13 and any valid U.P.C Company Prefix may be used to issue a GTIN-12. The GS1 Prefixes used for this purpose can be found in section *1.4*.

The item reference is assigned by the system user, who must observe the rules in section 4.

The check digit is explained in section 7.9. Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

GS1 key

~~Definition~~~~Required~~

The allowed key formats for this application are:

- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

Rules

All the GTIN rules described in section ~~4.2.1~~4.

Attributes

Required

Not applicable

Optional

For all the GS1 Application Identifiers (AI) that can be used with a GTIN, see section 3.

Rules

Not applicable

Data carrier specification

Carrier choices

The data carriers for this element string are:

- UPC-A barcode (carrying a GTIN-12).
- EAN-13 barcode (carrying a GTIN-13).
- GS1 DataBar Retail POS family (carrying GTIN-12 or GTIN-13 represented in a fixed-length data string of 14 digits by adding leading zeroes) ~~(*)~~.

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

~~The system recognises this element string by the symbology identifier **]E0** and **]e0** (*) and a valid GS1 Company Prefix (also see section 1.4).~~

~~The data transmitted from the barcode reader means that one fixed measure trade item with a GTIN-13 or GTIN-12 has been captured.~~

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

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*~~, and section 5.9.3.3, *GS1 symbol specification table 3*~~.

Symbol placement

All the symbol placement guidelines are defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

Commented [CJ15]: WR18-cip1

Commented [CJ16]: WR18-cip2

~~2.1.3.3~~2.1.3.2 Fixed measure trade items scanned at retail POS using GTIN-12 ~~Carried~~ carried by a UPC-E barcode

Commented [CJ17]: WR18-cip5

Application description

Some GTIN-12s beginning with the U.P.C. Prefix 0 may be represented in a small symbol called the UPC-E barcode. The GTIN-12 is condensed into a barcode consisting of six symbol character positions. For application processing, the GTIN-12 must be transformed into its full length by the barcode reader software or by the application software. There is no six-digit UPC-E barcode. See section *7.10* for UPC-E barcode options.

GS1 key

~~***Definition***~~***Required***

- ~~The 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~GTIN-12

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Rules

All the GTIN rules described in section ~~*4.2.1*~~4.

Attributes

~~***Required***~~

Commented [CJ19]: WR18-cip1

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

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

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Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.1*, *GS1 symbol specification table 1*.

Symbol placement

All the symbol placement guidelines defined in section *6*.

Unique application processing requirements

For a description of processing requirements, see section *7*.

~~2.1.3.4~~2.1.3.3 Fixed measure trade items scanned at retail POS using GTIN-8 ~~carried by an EAN-8 barcode~~

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Commented [CJ22]: WR18-cip2

Application description

The GTIN-8 is available for items whose packaging does not include enough available space to permit the use of an EAN-13 symbol. GTIN-8s are individually assigned by GS1 Member Organisations on request. figure *2.1.3.3~~2.1.3.32.1.3.4~~-1* shows the data structure of a GTIN-8.

Figure 2.1.3.3-1. GTIN-8 data structure

GS1-8 Prefix →				← Item reference			Check digit
N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8

The GS1-8 Prefix is a unique string of three digits issued by GS1 Global Office. See section *1.4.3* for the GS1-8 Prefixes used in this element string.

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

The check digit is explained in section *7.9*. Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

GS1 key

~~***Definition***~~***Required***

- ~~The 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items.~~GTIN-8

Rules

In addition to the GTIN rules described in section *4*

~~, the following guidelines should be observed. Before deciding to use a GTIN-8 as opposed to a GTIN-13 or GTIN-12, companies, working jointly with their printer, should consider options such as:~~

- ~~Whether the barcode can be reduced in size; e.g., printed at a lower X-dimension, taking into account the minimum barcode print quality requirements (see section *5.9*).~~
- ~~Whether the label or artwork can reasonably be changed to enable the inclusion of an EAN-13 or a UPC-A barcode or a symbol from the GS1 DataBar Retail POS family.~~
- ~~For example, redesigning the label and increasing the label size may be an option, especially when the existing label is small in comparison with the pack area.~~
- ~~Whether a truncated barcode can be used.~~

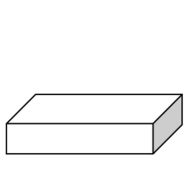
~~**Note**: A truncated barcode (normal length, but reduced in height) may only be used if there is absolutely no possibility of printing a full size barcode. Truncation removes the omnidirectional scanning capability. A barcode with excessive truncation will not be of any practical use. Users considering this option should consult their customers to see if an acceptable compromise can be reached.~~

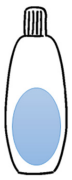
~~Pack size constraints~~

~~The use of a GTIN-8 is authorised when:~~

- ~~The total printable area of the product packaging is less than 80 cm², or~~
- ~~The area of the largest label for the item is less than 40 cm², or~~
- ~~The product is cylindrical with a diameter less than 30 mm.~~

~~**Figure 2.1.3.4-2.** GTIN-8 pack size constraints~~





1. Total printable area less than 80 cm2	2. Largest label less than 40 cm2	3. Product diameter less than 30 mm

Attributes

Required

Not applicable

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Commented [CJ24]: WR18-cip3

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Field Code Changed

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Optional

For all the GS1 Application Identifiers (AI) that can be used with a GTIN, see section 3.

Rules

Not applicable

Data carrier specification

Carrier choices

- EAN-8 (carrying a GTIN-8)
- GS1 DataBar Retail POS family (carrying a GTIN-8)

~~The data carriers for a GTIN-8 are the EAN-8 barcode or a symbol from the GS1 DataBar Retail POS family (*).~~

~~The system recognises this element string by the symbology identifier **]E4 or]e0** (*) and by N_1 not being 0 or 2. The data transmitted from the barcode reader means that one fixed measure trade item with a GTIN-8 has been captured.~~

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

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.3.5~~2.1.3.4 Hardcover books and paperbacks~~: ISBN, GTIN-13, and GTIN-12~~ scanned at~~in general~~ retail ~~at~~ POS using ISBN, GTIN-13, or GTIN-12

Application description

When identifying books and paperbacks a company may identify them in the same manner as any other retail trade items (see section 2.1.3). However, the recommended option is to use the International Standard Book Number (ISBN numbering system). The GS1 Prefixes 978 and 979 (*) have been allocated to ISBN (*http://www.isbn-international.org/*), which allocates numbers from these 'Bookland' prefixes.

(*) Within GS1 Prefix 979 a subset 9790 has been allocated to the International ISMN Agency for notated music.

Note: ISBNs SHALL NOT be allocated to non-book products even if the products are related to a book (e.g., teddy bears, coffee mugs, T-shirts, etc. related to a book launch). Such non-book products SHALL be identified and barcoded in the same manner as any other retail trade item (see section 2.1.3). A trade item grouping of identical book items would normally be identified according to section 2.1.7.2~~2.1.7.22.1.8.2~~. However, an ISBN may also be used to create a 14-digit GTIN with an indicator to identify a trade item grouping of identical book items (refer to section 2.1.7.2~~2.1.7.22.1.8.2~~) provided that the publisher that issues the 14-digit GTIN is a member of a GS1 organisation or is authorised to act through an agreement between its local GS1 Member Organisation and the local organisation representing publishers.

GS1 key

~~***Definition***~~***Required***

The allowed key formats for this application are:

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Commented [CJ26]: WR18-cip1

- ISBN using GS1 Prefix 978 or 979
- GTIN-12
- GTIN-13

~~The Global Trade Item Number® (GTIN) is the GS1 identification key used to identify trade items. The key comprises a GS1 Company Prefix, an item reference and a check digit.~~

Rules

All the GTIN rules described in section *4*.

Attributes

Required

Not applicable

Optional

Some publishers may wish to communicate additional information in a barcode in order to meet their internal requirements. For example, publishers may wish to include an edition variant (e.g., unchanged reprint, price increase), which is not distinguished by the ISBN, GTIN-13, or GTIN-12. The GS1 system provides an additional two- or five-digit symbol, called an add-on symbol that can be included on the item just to the right of the main barcode.

A two-digit or five-digit ~~serial~~ add-on number provides more information about a particular publication of the printed item, but it is not required for the identification of the title itself. This figure shows the format of a two-digit add-on:

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Figure 2.1.3.4-1. Two-digit add-on format

Supplementary information	
N_1	N_2

The supplementary information consists of numeric data of any structure and meaning. It is the publisher's responsibility to define the numbering scheme.

The data carrier for this element string is the two-digit add-on symbol.

The system recognises this element string by the symbology identifier **]E1**. The two-digit add-on symbol must be jointly used with a UPC-A, UPC-E or EAN-13 barcode. It is never scanned alone, and the data from both barcodes can be used together for processing.

This figure shows the format of a five-digit add-on:

Figure 2.1.3.4-2. Five-digit add-on format

Supplementary information				
N_1	N_2	N_3	N_4	N_5

The supplementary information consists of numeric data of any structure and meaning. It is the publisher's responsibility to define the numbering scheme. The data carrier for this element string is the five-digit add-on symbol.

The system recognises this element string by the symbology identifier **]E2**. The five-digit add-on symbol must be jointly used with a UPC-A, UPC-E or EAN-13 barcode. It is never scanned alone, and the data from both barcodes can be used together for processing.

Rules

Add-on symbols involve the following constraints:

- They SHOULD NOT contain information that should rightly be looked up using the item's GTIN-13 (or GTIN-12).
- The reading of the add-on symbol by the retailer's point-of-sale system is optional.
- The use of the add-on symbol is the responsibility of each publisher.

Data carrier specification

Carrier choices

Individual books and paperbacks SHOULD be marked with an EAN-13, UPC-A, or UPC-E barcode that complies with the print quality specifications applicable to all GS1 system barcodes. The EAN/UPC 2-digit or 5-digit Add-on symbols are options used with the above EAN/UPC symbols.

Groupings of identical book items and paperbacks SHOULD be marked with GS1-128 or ITF-14, see section *2.1.7.2~~2.1.7.22.1.8.2~~ Trade item groupings of identical trade items*.

Note: When identifying serial publications, see section *2.1.3.5~~2.1.3.52.1.3.6~~* Serial publications: ISSN, GTIN-13, and GTIN-12.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.1*, *GS1 symbol specification table 1*.

Symbol placement

All the symbol placement guidelines defined in section *6.4*.

Unique application processing requirements

For description of processing requirements, see section *7*.

~~2.1.3.6~~2.1.3.5 Serial publications~~: ISSN, GTIN-13, and GTIN-12~~ scanned ~~in general~~at retail ~~at~~ POS using ISSN, GTIN-13, or GTIN-12

Application description

The first and recommended option is to make use of the ISSN numbering system. The GS1 Prefix 977 is used for encoding the ISSN assigned to a particular item without its check digit.

The second option is to identify serial publications in the same manner as any other trade item: using the GTIN-13 or GTIN-12 data structure.

The third option involves using a special GS1 Company Prefix (assigned by a GS1 Member Organisation within its territory), the publication number, and the price of the publication (provided that the national legislation allows this). With this option, the price is placed in clearly defined positions and is directly usable in the country of publication. However, as soon as the item leaves the country, the price has no direct significance, and the GTIN must be interpreted in a general way without being broken down internally.

Figure 2.1.3.5-1. Format of the element string

GS1 Prefix	ISSN (without its check digit)							Variant		Check digit
9 7 7	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The variant digits N_{11} and N_{12} may be used to express variants of the same title for issues with a different price or to identify different issues of a daily within one week. Normal title takes value 00.

GS1 key

~~Definition~~*~~Required~~*

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The allowed key formats for this application are:

- ISSN using GS1 Prefix 977
- GTIN-12
- GTIN-13

~~The Global Trade Item Number (GTIN) is the GS1 identification key used to identify trade items. The key comprises a GS1 Company Prefix, an item reference and a check digit.~~

Rules

All the GTIN rules described in section 4.

Attributes

Required

Not applicable

Optional

Some publishers may wish to communicate additional information in a barcode in order to meet their internal requirements.

A two-digit or five-digit ~~serial~~ add-on number provides more information about a particular publication of the printed item, but it is not required for the identification of the title itself.

Commented [CJ29]: ERv18-008

This figure shows the format of a two-digit add-on:

Figure 2.1.3.5-2. Two-digit add-on format

Supplementary information	
N_1	N_2

GS1 recommends the use of the following number assignment:

- Dailies (or more generally publications with several issues a week): The publications of each day of the week are considered separate trade items that must be identified with a separate identification number represented in an EAN-13, UPC-A, or UPC-E symbol. The two-digit ~~serial~~ add-on number should only be used to represent the applicable week, which, together with the GTIN-13 or GTIN-12, establishes the day within the year.
- Weeklies: Number of the week (01 – 53).
- Bi-weeklies: Number of the first week of the respective period (01 – 53).
- Monthlies: Number of the month (01 – 12).
- Bi-monthlies: Number of the first month of the respective period (01 – 12).
- Quarterlies: Number of the first month of the respective period (01 – 12).
- Seasonal period: First digit = last digit of the year; second digit = 1 spring, 2 summer, 3 autumn, 4 winter.
- Bi-annual period: First digit = last digit of the year; second digit = number of the first season of the respective period.
- Annuals: First digit = last digit of the year; second digit = 5.
- Special intervals: Consecutively numbered from 01 to 99.

The ~~serial~~ add-on number is carried by a two-digit add-on symbol that is placed to the right of the symbol and parallel to it. The add-on symbol must comply with the print quality specifications applicable to all GS1 system barcodes. For example, the X-dimension applied to the main barcode must also be applied to the add-on symbol.

Serial publications can also use a five-digit ~~serial~~ add-on number carried by a five-digit add-on symbol. The reading of the add-on symbol at a point-of-sale is optional. The add-on symbol must not be used to encode information that should be contained within the Global Trade Item Number (GTIN). The add-on symbol provides additional information about a particular publication of a printed item, and it is the publisher's responsibility to define the numbering scheme. This figure shows the format of a five-digit add-on:

Figure 2.1.3.5-3. Five-digit add-on format

Supplementary information				
N_1	N_2	N_3	N_4	N_5

Information that can be encoded in the five-digit add-on symbol includes the actual date of issue, in order to differentiate between successive issues.

The five-digit add-on symbol is placed to the right of the main barcode and parallel to it. The add-on symbol must comply with the print quality specifications applicable to all GS1 system barcodes. For example, the X-dimension applied to the main symbol also must be applied to the add-on symbol.

Rules

When using a five-digit add-on symbol, a two-digit add-on symbol cannot also be used.

Data carrier specification

Carrier choices

Serial Publications SHOULD be marked with an EAN-13, UPC-A, or UPC-E barcode that complies with the print quality specifications applicable to all GS1 system barcodes. The EAN/UPC two~~2~~-digit or five~~5~~-digit a~~A~~dd-on symbols are options used with the above EAN/UPC symbols.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.1*, *GS1 symbol specification table 1*.

Symbol placement

All the symbol placement guidelines defined in section *6.4*.

Unique application processing requirements

For a description of processing requirements, see section *7*.

~~2.1.4~~2.1.3.6 Fixed measure f~~F~~resh food trade items scanned at~~in general~~ retail ~~at~~ POS

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Application description

Fresh foods includes product categories such as: fruits, vegetables, meat, seafood, bakery and ready-to-serve food such as cheeses, cold cooked or cured meats, and salad, etc.

In this application there are different scenarios:

- Loose produce: Picked as an each – sold as an each.
- Fresh food: Pre-packed with same weight or count.

Loose produce trade items sold as an each

Loose produce are fruits and vegetables which are delivered to the store loose, in boxes or cases. Loose produce can then be displayed on the shelf allowing for the consumer to pick the product quantities needed. If loose produce has been defined to be sold by the each then they are treated in the same way as the retailer sells a can of soup or beans.

From a brand owner's perspective, the trade item is a fixed measure trade item identified with a GTIN with no additional attributes necessary to complete transaction.

Pre-packed fresh food trade items

When fresh foods trade items, whether loose produce or cut from a bulk item or cut into pieces are pre-packaged as a fixed measure trade item then the trade item is also treated like any other fixed measure trade item identified with a GTIN with no additional attributes necessary to complete transaction.

GS1 key

~~*Definition*~~*Required*

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The allowed key formats for this application are:

- ~~The~~ GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~

- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

Rules

All the GTIN rules described in section 4.

~~For human readable interpretation rules see section 4.15.~~

Attributes

Required

Not applicable

Optional

For all the GS1 Application Identifiers (AI) that can be used with a GTIN, see section 3.

Rules

Not applicable.

Data carrier specification

Carrier choices

The data carriers for this element string are:

- UPC-A barcode (carrying a GTIN-12).
- EAN-8 barcode (carrying GTIN-8).
- EAN-13 barcode (carrying a GTIN-13).
- GS1 DataBar Retail POS family (carrying GTIN-12 or GTIN-13) (*).

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

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~~The system recognises this element string by the symbology identifier **]E0** and **]e0** (*) and the GS1 Prefixes starting with 000 to 019, 030 to 039, 060 to 099, 100 to 139, 300 to 969, or 977 to 979.~~

~~The data transmitted from the barcode reader means that one fixed measure trade item with a GTIN-13 or GTIN-12 has been captured.~~

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

The GS1 DataBar symbols encode a 14-digit numeric string. When encoding GTIN-8, GTIN-12 or GTIN-13 in GS1 DataBar symbols zero-fill with six, two, or one zeros to the left of the GTIN.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

There are no specified rules for symbol placement on loose produce scanned at POS.

Unique application processing requirements

Not applicable

~~2.1.5~~2.1.4 Fixed measure t~~T~~rade items scanned~~intended for~~ in general distribution and at retail POS

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Trade items intended for general distribution and point-of-sale scanning must carry a barcode of the EAN/UPC or GS1 DataBar symbology. Therefore, these trade items support GTIN-12s or GTIN-13s (see section ~~2.1.3.2~~2.1.3). For symbol X-dimensions, minimum symbol height, and minimum symbol quality, see section 5.9.3.3, *GS1 symbol specification table 3*

To support new applications additional GS1 approved data carriers (encoding additional data with the GTIN) may be applied with mutual agreement between trading partners. For information on how to manage multiple barcodes see section 4.16.

~~2.1.6~~2.1.5 Healthcare primary packaging (non-retail trade items)

Application description

Healthcare primary packaging trade items are pharmaceutical and medical products or their packages presented to support the point-of-care (direct consumption based on right product, dose, and route of administration). Because the product is never scanned at retail POS the use of symbologies beyond EAN/UPC and the use of GTIN-14 data structure is permitted. These products, which may be packaged in a sterile packaging system or in a non-sterile packaging system, are only marked when the package is intended for dispensing to the consumer in a hospital or equivalent facility (e.g., field hospital, nursing home, home healthcare). See section 4.16.1 (*Multiple barcode management practices for consumer trade items – all sectors*), then 4.16.3 (*Multiple barcode management practices for healthcare*) if the product is intended for scanning at general retail and also must meet regulatory requirements for this application section based on multiple market use.

If an item is a regulated healthcare retail consumer trade item and also a non-retail trade item then the barcode marking for regulated healthcare retail consumer trade items is required at a minimum.

GS1 key

~~***Definition***~~***Required***

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The allowed key formats for this application are:

- ~~The~~ GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items~~.

Rules

All the GTIN rules described in section 4.

If the regulated healthcare retail consumer trade item to be marked on the primary packaging does not also have secondary packaging, then the primary packaging markings in this section do not apply and are replaced by the required markings in the secondary packaging section (2.1.6~~2.1.62.1.7~~).

> ***Example:*** *a bottle of 50 pharmaceutical tablets (the primary package) is not enclosed into a carton (which would represent the secondary packaging). In this instance, the secondary packaging markings are required on the primary packaging level.*

If the required AIDC marks are placed directly on the part, then those AIDC marks (e.g., barcode, human readable interpretation) satisfy the requirements for primary package marking. If those marks are functional (scannable) through the primary packaging, then no additional AIDC marks are required on the primary package.

If the product to be marked has primary packaging that is a blister pack containing several individual pharmaceutical items, for instance a blister pack of 12 pills or tablets, the following rules apply:

- GTIN is the only required mark.
- In addition to the GTIN rules described in section 4, see section ~~2.1.3.4~~4.3.7 for rules on deploying GTIN-8.

Attributes

Required

Figure 2.1.5-1. Overview of required attributes

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Minimum (pharmaceutical only)	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	No	No	No	None
Enhanced (med device only)	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	No	None
Highest – pharmaceutical brand owner AIDC marking	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	No	No	No	No
Highest – medical device - brand owner AIDC marking	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	Yes	Active potency, AI (7004), for kits with pharmaceuticals
Highest – hospital AIDC marking of pharmaceutical	GTIN-8, GTIN -12, GTIN -13, or GTIN -14	No	Yes, Expiration date and time, AI (7003), if needed for short life items	Yes	None
Highest – hospital AIDC marking of certain medical devices (see section 2.1.8~~2.1.82.1.9~~)	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	No	No	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	

To manage healthcare data requirements within GS1 EPC/RFID tags, see section 3.11 and the most recent version of the *EPC Tag Data Standard*.

Optional

For compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the need, a regulated healthcare trade item may be identified with GTIN and AI (710), AI (711), AI (712), AI (713), and AI (714) National Healthcare Reimbursement Number. See section 3.8.17 for details on the use of AI (710), AI (711), AI (712), AI (713), and AI (714).

Rules

All the GTIN rules described in section 4.

National Healthcare Reimbursement Number AI (710), AI (711), AI (712), AI (713), and AI (714) must always be used with the GTIN.

Human readable interpretation

For human readable interpretation rules see section 4.15. For HRI rules specific to regulated healthcare retail consumer trade items, see section 4.15.1.

Data carrier specification

Carrier choices

Figure 2.1.5-2. Carrier choices

Preferred option(s) (this is the long-term direction for AIDC marking)	GS1 DataMatrix symbology GS1-128 symbology GS1 DataBar symbology **NOTE:** If a product package serves multiple markets and in one market the specifications in section 2.1.3 apply, then the specification for 2.1.3 must be followed for encoding GTIN (at a minimum) and the rules for use of multiple symbols in section 4.16 apply.
Option in addition to the barcode	EPC/RFID tag. GS1 expects the barcode as the minimum requirement for packaging however EPC RFID is an approved AIDC carrier which can be deployed in addition to the barcode.
Other acceptable options (GS1 strongly supports existing options for symbol marking as a guiding principle and therefore supports all previous AIDC marking specifications)	The following symbols have been permitted by GS1 and therefore could appear on some existing packages. For that reason, GS1 does not want to preclude them as an option, particularly where GTIN without additional data (Minimum ID) is required. With that said, symbols that allow all the data to be concatenated into one symbol are the preferred option. EAN/UPC symbology family (UPC-A, UPC-E, EAN-8 and EAN-13) may be used to encode the GTIN-8, GTIN-12 or GTIN-13 Identification. ITF-14 symbols may be used where printing conditions require the application of a less demanding symbology. It may not be used when attribute information is required. ITF-14 symbols can encode the GTIN-8, GTIN-12, GTIN-13, or GTIN-14 of the item. It is not used to encode attribute information. GS1 Composite Component is also used in combination with linear symbols by GS1 and therefore remains a legitimate option however, GS1 DataMatrix is preferred based on its ability to encode all information in one symbol and do so efficiently in terms of print speed and panel size.

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Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.6 *GS1 symbol specification table 6*

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.7~~2.1.6 Healthcare secondary packaging (regulated healthcare retail consumer trade items)

A regulated healthcare retail consumer trade item (RHRCTI) trade item not intended to be scanned in high volumes per consumer transaction at retail, but does require additional data beyond GTIN to support regulatory requirements. This means, these trade items support:

- GTIN-8, GTIN-12, or GTIN-13 data structures.
- GTIN attributes such as batch/lot number, expiration dates, or serial numbers.

They may be marked with 2D matrix barcodes that require imaging-based scanners or linear symbologies such as GS1 DataBar or GS1-128. If an item is a general retail consumer trade item and regulated healthcare retail consumer trade item, then the barcode marking for general retail is required at a minimum.

GS1 key

~~***Definition******Required***~~

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The allowed key formats for this application are:

- ~~The~~ GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items~~.

GS1 firmly endorses the use of GTIN in all markets, however there are instances where GS1 Member Organisations have allocated a portion of their numbering capacity to identification schemes administered nationally by external agencies.

These coding schemes while recognised within the GS1 system framework by the assignment of a GS1 Prefix are defined, in Healthcare, as National Trade Items Numbers (NTINs) rather than Global Trade item Numbers (GTINs). NTINs are unique with respect to GTINs as their values are a subset of all possible values of GTIN. However, their definition, allocation and lifecycle rules are defined by an organisation external to GS1.

The degree to which NTIN definitions and rules are compatible with those of GTIN is specific to each National definition. Whilst NTIN will always provide globally unique identification within the GTIN pool of numbers, this does not mean NTIN provides the same level of interoperability as GTIN with other GS1 standards, such as GDSN and ONS. In markets where NTIN is adopted exclusively of GTIN the reciprocal nature of GTIN identification and marking across markets is lost and becomes problematic where one package which should serve multiple markets (e.g., common language) requires multiple NTINs rather than one GTIN.

Rules

In addition to the GTIN rules described in section 4, see section 2.1.3.3~~2.1.3.3~~~~2.1.3.3~~~~2.1.3.4~~ for rules on deploying GTIN-8.

Attributes

Required

Figure 2.1.6-1. Overview of required attributes

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Minimum – Pharmaceutical & medical device	GTIN-8, GTIN-12, or GTIN-13	Yes	Yes	No	None
Enhanced – Pharmaceutical & medical device	GTIN-8, GTIN-12, or GTIN-13	Yes	Yes	No	None
Highest – Brand owner AIDC marking	GTIN-8, GTIN-12, or GTIN-13	Yes	Yes	Yes	Potency AI (7004) (for pharmaceutical, and for medical device kits with pharmaceuticals)
Highest – Hospital AIDC marking of pharmaceuticals	GTIN-8, GTIN-12, or GTIN-13	No	Yes, AI (7003) if needed for short life items	Yes	None

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Highest - Hospital AIDC marking of certain medical devices (see section 2.1.8~~2.1.82.1.9~~)	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	No	No	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	

To manage healthcare data requirements within EPC/RFID tags, see section 3.11 and the most recent version of the *EPC Tag Data Standard*.

Optional

For compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the need, a Regulated Healthcare Trade Item may be identified with GTIN and AI (710), AI (711), AI (712), AI (713), and AI (714) National Healthcare Reimbursement Number. See section 3.8.17 for details on the use of AI (710), AI (711), AI (712), AI (713), and AI (714).

Rules

National Healthcare Reimbursement Number AI (710), AI (711), AI (712), AI (713), and AI (714) must always be used with the GTIN.

Data carrier specification

Carrier choices

See the "data carrier specification carrier choices" recommendations on preferred options, options in addition to the barcode and other acceptable options found at the end of section 2.1.5~~2.1.52.1.6~~.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

For regulated healthcare consumer trade items scanned in retail pharmacy and general distribution or non-retail pharmacy and general distribution see section 5.9.3.8, *GS1 symbol specification table 8*.

For regulated healthcare retail consumer trade items not scanned in general distribution see section 5.9.3.10, *GS1 symbol specification table 10*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.8~~2.1.7 Fixed measure t~~T~~rade items scanned in~~intended for~~ general distribution ~~scanning only~~

Every trade item that is different from another in any respect is assigned a unique Global Trade Item Number (GTIN). This includes trade item groupings of retail and non-retail trade items that are also trade items, and non-retail single units. For example, each of the packaging types in the figure below, if traded, is assigned a separate GTIN.

Figure 2.1.7-1. Example of GTIN numbering options

Trade item	GTIN numbering options			
	GTIN-8	GTIN-12	GTIN-13	GTIN-14
Single product A	X	X	X	
50 x product A (Trade item grouping)		X	X	X
50 x product A (Trade item grouping, e.g., display case)		X	X	X
100 x product A (Trade item grouping)		X	X	X
Single product B	X	X	X	
50 x product A 50 x product B		X	X	

If, at any time, the trade item is shipped or transported as an independent logistic unit, at the time of shipment it SHOULD additionally be identified with an SSCC. The combination of a GTIN and a serial number (also known as SGTIN) does not replace the SSCC as the identifier of a logistic unit.

~~2.1.8.1~~2.1.7.1 Identification of a trade item that is a single product

Application description

The manufacturer or supplier has the option of assigning a unique GTIN-8, GTIN-12, GTIN-13 or in the case of regulated healthcare trade items and trade items used in manufacturing and maintenance, repair & overhaul (MRO) processes, a GTIN-14 to a trade item that is a single product as shown in figure 2.1.7~~2.1.7~~2.1.8-1. Restricted Circulation Numbers (RCNs) must not be used in this element string.

GS1 key

~~Definition~~Required

The allowed key formats for this application are:

- ~~The~~ GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items~~.
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- For regulated healthcare trade items and trade items used in manufacturing and maintenance, repair & overhaul (MRO) processes~~:~~ ~~the~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items~~.

Rules

See ~~In addition to~~ the GTIN rules described in section 4~~., the following guidelines should be observed: GTIN-8 can only be used when all other pack size constraints are met.~~

~~Before deciding to use a GTIN-8 as opposed to a GTIN-12, GTIN-13, or in the case of regulated healthcare trade items, GTIN-14, companies, working jointly with their printer, should consider options such as:~~

- ~~Whether the barcode can be reduced in size (e.g., printed at a lower X-dimension, taking into account the minimum barcode print quality requirements (see section 5.9).~~

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- Whether the label or artwork can reasonably be changed to enable the inclusion of an EAN-13 or a UPC-A barcode or a symbol from the GS1 DataBar Retail POS family.
- For example, redesigning the label and increasing the label size may be an option, especially when the existing label is small in comparison with the pack area.
- Whether a truncated barcode can be used.

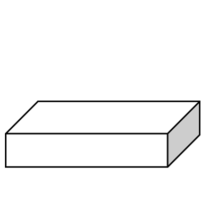
Note: A truncated barcode (normal length, but reduced in height) may only be used if there is absolutely no possibility of printing a full size barcode. Truncation removes the omnidirectional scanning capability. A barcode with excessive truncation will not be of any practical use. Users considering this option should consult their customers to see if an acceptable compromise can be reached.

Pack size constraints

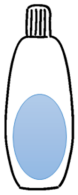
The use of a GTIN-8 is authorised when:

- The total printable area of the product packaging is less than 80 cm², or
- The area of the largest label for the item is less than 40 cm², or
- The product is cylindrical with a diameter less than 30 mm.

Figure 2.1.8.1-1. GTIN-8 pack size constraints



1. Total printable area less than 80 cm2



2. Largest label less than 40 cm2

3. Product diameter less than 30 mm

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Attributes

Required

For regulated healthcare consumer trade items the following levels of AIDC marking are specified.

Figure 2.1.7.1-112. Overview of required attributes

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Minimum	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	No	None
Enhanced	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	No	None
Highest – Brand owner AIDC marking	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	Yes	Potency AI (7004) for pharmaceutical, and for medical device kits with pharmaceutical (cases only for both situations)
Highest – Hospital AIDC marking of pharmaceutical	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	No	AI (7003) for short-life products	Yes	None

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Hospital AIDC marking of medical devices	No	No	No	No	None

To manage healthcare data requirements within EPC/RFID tags, see section 3.11 and the most recent version of the *EPC Tag Data Standard*.

Optional

Not applicable

Rules

Not applicable

Data carrier specification

Carrier choices

- Symbols from the EAN/UPC symbology family (UPC-A, UPC-E, may be used to encode the GTIN-12, EAN-13 to encode the GTIN-13 and, if the size requirements are met, EAN-8 to encode the GTIN-8 of the trade item that is a single product).
- ITF-14 symbols may be used where printing conditions require the application of a less demanding symbology. ITF-14 symbols can encode the GTIN-12, or GTIN-13 of the item.
- A GS1-128 barcode or GS1 DataBar barcode ~~(*)~~ with GS1 Application Identifier (01) may be used to encode a GTIN that identifies the trade item if the printing conditions allow. The choice of one of these symbologies is particularly relevant if there is a need to encode attribute information in addition to the identification number.

Note: A GS1 DataBar barcode SHALL NOT be used to encode a GTIN-14 constructed from an ISBN.

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

For trade items used in manufacturing and maintenance, repair & overhaul (MRO) processes the following data carrier choices take precedence over the carrier choices above: GS1-128, GS1 DataMatrix, GS1 QR Code and EPC/RFID.

For healthcare, the following carrier selections take precedence over the carrier choices above and apply to all regulated healthcare retail consumer trade items.

Figure 2.1.7.1-2~~3~~. Healthcare carrier choices

Preferred option(s) (this is the long-term direction for AIDC marking)	First preference: GS1-128 symbology. After Jan 2010, GS1 DataBar is permitted for use on all trade items and therefore may be encountered in general distribution however use of GS1-128 is preferred as the scanners in the field today pervasively support it. Second preference: When one linear symbol cannot accommodate the field length of the data (exceeds 48 characters), two symbols should be used. Third option: Where the package or label size does not permit the use of the first two options, GS1 DataMatrix symbology are permitted but should be avoided wherever possible if the package could be scanned by a mounted conveyorised scanner.
Option in addition to the barcode	See the "data carrier specification carrier choices" recommendations on options in addition to the barcode at the end of section 2.1.5~~2.1.5~~2.1.6.
Other acceptable options (GS1 strongly supports existing options for symbol marking as a guiding principle and therefore supports all	See the "data carrier specification carrier choices" recommendations on other acceptable options found at the end of section 2.1.5~~2.1.5~~2.1.6.

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previous AIDC marking specifications)	

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

For multi-sector use except for retail or regulated healthcare trade items see section 5.9.3.2, *GS1 symbol specification table 2*.

For regulated healthcare non-retail consumer trade items see section 5.9.3.8, *GS1 symbol specification table 8*.

For manufacturing and MRO processes see 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.8.2~~2.1.7.2 Trade item groupings of identical trade items

Application description

A trade item grouping that is a predefined grouping of identical trade items. The manufacturer or supplier has the option of either assigning a unique GTIN-13 or GTIN-12 to each trade item grouping or assigning a unique GTIN-14. These 14-digit GTINs incorporate the GTIN (less its check digit) of the trade item contained in each grouping. The check digit for each GTIN-14 is then recalculated.

The indicators have no meaning. The digits do not have to be used in sequential order, and some may not be used at all. The GTIN-14 structure for trade item groupings creates extra numbering capacity. ~~Indicators can be reused~~.

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Figure 2.1.7.2-1. GTIN-14 data structures

	Global Trade Item Number (GTIN)													
	Indicator	GTIN of contained trade items (without check digit)												Check digit
GTIN-8 based	N_1	0	0	0	0	0	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}
GTIN-12 based	N_1	0	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}
GTIN-13 based	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

The indicator is a digit with a value of 1 to 8. It is assigned as required by the company that constructs the identification number. It can provide up to eight separate GTIN-14s to identify trade item groupings.

For packaging configuration hierarchies which include a retail consumer trade item identified with a GTIN-13, GTIN-12, or GTIN-8, this GTIN must always be one of the relevant levels of packaging contained, usually the lowest level (see note below related to GTIN-14 assignment on the primary packaging). Restricted Circulation Numbers must not be used in this element string.

Note: For regulated healthcare trade items on the primary packaging, the phrase "usually the lowest level" SHALL be interpreted as allowing for the use of GTIN-14 on packaging configurations below the retail consumer trade item level, if one exists. This interpretation may not be applied to other trade item categories such as Do It Yourself (DIY) or Foodservice.

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Any product package which will encounter scanning or product listing for sale at point-of-sale SHALL be identified according to retail point-of-sale specifications.

Commented [CJ41]: ERv18-010, removed from Note above

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When a GTIN change at the retail consumer trade item level is required, the GTIN change must be made at all configuration levels above the retail consumer trade item level. Where there is an association between primary packaging and retail consumer trade item levels and GTIN -14 assignment is used on the primary packaging, the GTIN-14 assigned to the primary packaging is based on the retail level GTIN. There are three scenarios to consider for the relationship of these GTIN assignments:

- If changes to the primary packaging drive the change of the GTIN assigned to the retail consumer trade item level, the GTIN of the primary packaging will change.
- If changes to retail consumer trade item level GTIN are not caused by a change in primary packaging, the GTIN at the primary package level may or may not change per the discretion of the brand owner.
- If additional retail level package(s) are introduced beyond the original retail package or replace the original retail package, the GTIN-14 on the primary packing may remain tied to the original retail level GTIN.

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The check digit is explained in section 7.9. Its verification, usually carried out automatically by the barcode reader, ensures that the number is correctly composed.

Figure 2.1.7.2-2. Different groupings of the same trade item

Indicator	GTIN of trade item contained in the grouping, less its check digit	New check digit	Description	Quantity
	061414112345	2	Trade item	Single
1	061414112345	9	Trade item grouping	A grouping
…	…	…	…	…
8	061414112345	8	Trade item grouping	Another grouping
Indicators 1 to 8 may be used to create new GTIN-14s. When these eight indicators have been used, further groupings must be identified with either a GTIN-13 or GTIN-12. (Indicator digit 9 is reserved for variable measure trade items). (See section 2.1.5).				

GS1 key

~~***Definition***~~***Required***

The allowed key formats for this application are:

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- ~~The~~ GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items~~
- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

Rules

All the GTIN rules described in section 4.2.1.

Attributes

Required

For regulated healthcare consumer trade items the following levels of AIDC marking are specified:

Figure 2.1.7.2-3. Required attributes

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Minimum	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	No	None
Enhanced	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	No	None
Highest – Brand owner AIDC marking	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	Yes	Potency AI (7004) for pharmaceutical, and for medical device kits with pharmaceutical (cases only for both situations)
Highest – Hospital AIDC marking of pharmaceutical	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	No	AI (7003) for short-life products	Yes	None
Hospital AIDC marking of medical devices	No	No	No	No	None

To manage healthcare data requirements within EPC/RFID tags, see section *3.11* and the most recent version of the *EPC Tag Data Standard*.

Optional

Not applicable

Rules

Not applicable

Data carrier specification

Carrier choices

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- For multi-sector use symbols from the EAN/UPC symbology family (UPC-A, UPC-E, and EAN-13) may be used to encode the GTIN-12 or GTIN-13 of the trade item grouping. If used, the GTIN-8 is encoded in an EAN-8 barcode. GTIN-8 can only be used when all other pack size constraints are met, see section ~~*2.1.3.4*~~*4.3.7*. ~~The system recognises this element string by the symbology identifier **]E0**.~~

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- ITF-14 symbols may be used on trade item groupings where printing conditions require the application of a less demanding symbology. ITF-14 symbols can encode the GTIN-12, GTIN-13, or GTIN-14 of the item. ~~The system recognises this element string by the symbology identifier **]I1** and the number of digits decoded (14).~~
- A GS1-128 barcode or GS1 DataBar barcode ~~(*)~~ with GS1 Application Identifier (01) may be used to encode a GTIN-12, GTIN-13, or GTIN-14 that identifies the trade item if the printing conditions allow. The choice of one of these symbologies is particularly relevant if there is a need to encode attribute information in addition to the identification number. ~~The system recognises this element string by the symbology identifier (**]C1** for GS-128, **]e0** for GS1 DataBar) and the GS1 application identifier.~~

Note: A GS1 DataBar barcode SHALL NOT be used to encode a GTIN-14 constructed from an ISBN.

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

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For trade items used in manufacturing and maintenance, repair & overhaul (MRO) processes the following data carrier choices take precedence over the carrier choices above: GS1-128, GS1 DataMatrix, GS1 QR Code and EPC/RFID.

For healthcare the carrier selections noted at the end of section 2.1.7.1~~2.1.7.12.1.8.1~~ take precedence over the carrier choices above and apply to all regulated healthcare retail consumer trade items.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

For multi-sector use other than regulated healthcare trade items see section 5.9.3.2, *GS1 symbol specification table 2*.

For regulated healthcare non-retail consumer trade items see section 5.9.3.8, *GS1 symbol specification table 8*.

For manufacturing and MRO processes see 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.8.3~~2.1.7.3 Trade item groupings of mixed trade items

Application description

A trade item grouping that is a predefined grouping of two or more different trade items.

For example:

- Product C is a grouping of Product A (GTIN 'A') and Product B (GTIN 'B'), and is identified with either a GTIN-12 or GTIN-13, GTIN 'C.'
- GTIN 'C' could then be used to construct a GTIN-14 for a trade item grouping comprised of Product C.

As shown in figure 2.1.7.3~~2.1.7.32.1.8.3~~-1, the GTIN-12s 614141234561 and 614141345670 identify the two trade items in the assortment identified by the GTIN 614141456789.

Figure 2.1.7.3-1. Example of trade item grouping of mixed trade items

Indicator	GTIN of trade item less its check digit	Check digit	Description	Quantity
	061414123456 061414134567	1 0	Retail consumer trade item (Product A) Retail consumer trade item (Product B)	Single Single
	061414145678	9	Retail consumer trade item (Product C)	Assortment
1	061414145678	6	Trade item grouping	A grouping of the assortment
…	…	…	…	…
8	061414145678	5	Trade item grouping	Another grouping of the assortment
The indicators 1 to 8 may be used to create new GTIN-14s. When these eight indicators have been used, further groupings must be identified with either a GTIN-13 or GTIN-12. (Indicator digit 9 is reserved for variable measure trade items). (See section 2.1.5).				

GS1 key

~~Definition~~Required

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The allowed key formats for this application are:

- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items~~.

- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items~~

Rules

All the GTIN rules described in section 4.2.1; in addition, the GTIN-14 is valid for trade item groupings only when the trade item contained is a mixed assortment of two or more different trade items.

Attributes

Required

Not applicable

Optional

Not applicable

Data carrier specification

Carrier choices

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- Symbols from the EAN/UPC symbology family (UPC-A, UPC-E, and EAN-13) may be used to encode the GTIN-12 or GTIN-13 of the trade item grouping. ~~The system recognises this element string by the symbology identifier **]E0**.~~ Formatted: GS1_Bullet_1
- ITF-14 symbols may be used on trade item groupings where printing conditions require the application of a less demanding symbology. ITF-14 symbols can encode the GTIN-12, GTIN-13, or GTIN-14 of the item. ~~The system recognises this element string by the symbology identifier **]I1** and the number of digits decoded (14).~~
- A GS1-128 barcode or GS1 DataBar barcode ~~(*)~~ with GS1 Application Identifier (01) may be used to encode a GTIN-12, GTIN-13, or GTIN-14 that identifies the trade item if the printing conditions allow. The choice of one of these symbologies is particularly relevant if there is a need to encode attribute information in addition to the identification number. ~~The system recognises this element string by the symbology identifier (**]C1** for GS1-128, **]e0** for GS1 DataBar) and the GS1 Application Identifier.~~

Note: A GS1 DataBar barcode SHALL NOT be used to encode a GTIN-14 constructed from an ISBN.

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

For trade items used in manufacturing and maintenance, repair & overhaul (MRO) processes the following data carrier choices take precedence over the carrier choices above: GS1-128, GS1 DataMatrix, GS1 QR Code and EPC/RFID.

For healthcare, the carrier selections noted at the end of section 2.1.7.1~~2.1.7.12.1.8.1~~ take precedence over the carrier choices above and apply to all regulated healthcare retail consumer trade items.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

For multi-sector use other than regulated healthcare trade items see section 5.9.3.2, *GS1 symbol specification table 2*.

For regulated healthcare non-retail consumer trade items see section 5.9.3.8, *GS1 symbol specification table 8*.

For manufacturing and MRO processes see 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.9~~2.1.8 Medical devices (non-retail trade items)

Application description

Within this application are the rules and recommendations for the direct part marking (DPM) of medical devices for the Automatic Identification and Data Capture (AIDC) management, including medical devices that are reprocessed (within the micro-logistics cycle of use, including cleaning and sterilisation).

Medical devices SHOULD be identified with GTIN and any appropriate GS1 Application Identifiers used for production control, as determined by the responsible entity for the device. For medical devices that are reprocessed, GTIN and serial number are recommended for manufacturers that use DPM to enable traceability throughout the product lifecycle.

Also, for hospitals or instrument owners that mark medical devices that are reprocessed, GTIN and serial number are recommended for all hospital/instrument owner marking. Some existing in-house legacy systems already use GS1 asset identifiers (GIAI or GRAI, see section 2.3), which are compliant with GS1 standards.

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

GS1 key

~~**Definition**~~**Required**

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The allowed key formats for this application are:

- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GRAI ~~is the GS1 identification key used to identify returnable assets. The key is comprised of a GS1 Company Prefix, asset type, check digit, and optional serial number.~~
- ~~The~~ GIAI ~~is the GS1 identification key used to identify an individual asset. The key is comprised of a GS1 Company Prefix and an individual asset reference.~~

Rules

- All the GTIN rules described in section 4.2.1.
- All the GIAI and GRAI application rules described in section 4.2.3.
- If the AIDC marking on the medical device may be seen and scanned when placed in the protective packaging after sterilisation, the protective packaging will not have to be AIDC marked.

Attributes

Required

Not applicable

Optional

When using GTIN-12, GTIN-13, or GTIN-14 to identify a medical device that is reprocessed, a serial number is recommended to complete the identification. To manage GS1 healthcare data requirements within EPC/RFID tags, see section 3.11 and the *EPC Tag Data Standard*.

Rules

Not applicable

Data carrier specification

Carrier choices

Medical devices (non-retail trade items), when direct marked, SHALL be marked with GS1 DataMatrix symbology. See section 2.1.10~~2.1.10~~2.1.11 for more details.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.7, *GS1 symbol specification table 7*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

~~2.1.10~~2.1.9 Fixed measure trade items packed in several individual pieces not scanned at retail POS

Application description

The trade item includes two or more pieces that are marked for ~~other~~ non-POS scanning purposes such as inventory management, theft prevention, or quality control. The identifier of each individual piece consists of the Global Trade Item Number (GTIN) of the trade item, the piece number, and the total count of pieces in the trade item. The GTIN on all pieces of the trade item must be the same.

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GS1 key

~~***Definition***~~***Required***

Commented [CJ49]: WR18-cip1

The Global Trade Item Number (GTIN) is the GS1 identification key used to identify trade items. For the identification of pieces of a trade item, additional information is provided with a piece number and the total number of pieces. See section 3.2, Identification of an individual trade item piece: AI (8006).

Rules

- AI (8006) SHALL NOT be used for the identification of a single trade item piece.
- AI (8006) SHALL NOT be used for the identification of pieces that are themselves trade items, such as spare parts.
- The value of AI (8006) of all pieces of a trade item SHALL contain the same GTIN, the same total number of pieces and a different piece number.
- When the pieces of a trade item are packaged together, the value of the GTIN marked on the package SHALL be the same as the GTIN marked on the contained physical units.
- For trade items that pass the point-of-sale, all of the pieces of the trade item SHALL be packaged or presented together and identified with the GTIN.

Also see the GTIN rules described in section 4.2.1.

Attributes

Required

Not applicable.

Optional

See section 3 for an overview of all GS1 Application Identifiers and their intended usage.

Rules

See section *4.14 Data relationships* for rules on valid and invalid associations of element strings.

If used, optional AIs on all pieces of a trade item and on the trade item itself SHALL be identical.

Data carrier specification

Carrier choices

For multi-sector use except for regulated healthcare retail consumer trade items, data carriers used to represent each individual piece using the GS1 Application Identifier AI (8006) are GS1-128, GS1 DataMatrix, GS1 QR Code and EPC/RFID.

For healthcare, the following carrier selections take precedence over the carrier choices above and apply to all regulated healthcare retail consumer trade items.

Figure 2.1.9-1. Healthcare carrier choices

Preferred Option	GS1-128 symbology
Option in addition to the barcode	See the "Data Carrier Specification Carrier Choices" recommendations on Options in Addition to the barcode at the end of section 2.1.5~~2.1.5~~~~2.1.6~~

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See sections *5.9.3.2*, *GS1 symbol specification table 2*, and *5.9.3.4*, *GS1 symbol specification table 4*.

Symbol placement

All the symbol placement guidelines defined in section *6*.

Unique application processing requirements

For a description of processing requirements, see section *7*.

~~2.1.11~~2.1.10 Permanently marked items~~Direct marking~~

Commented [CJ50]: WR18-cip4 -- section still to be moved to 2.6 Special Applications

Application description

Some applications require ~~Direct marking is the process of applying~~ a permanent mark on~~to~~ the ~~trade~~ item, in order for it to be identified during its full lifetime independent of its packaging.

Three methods exist for the permanent~~direct~~ marking of ~~trade~~ items:

1. Direct part marking (DPM): The process of marking a symbol directly onto an item using an intrusive or non-intrusive method instead of applying a label or using another indirect marking process.
2. Durable labelling: The process of marking a symbol onto a label that is intended to permanently stay on the trade item.
3. Durable RFID-tagging: The process of applying an RFID-tag that is intended to permanently stay on the trade item.

GS1 key

~~***Definition***~~***Required***

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The allowed key formats for this application are:

- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items~~.

- ~~The~~ GRAI ~~is the GS1 identification key used to identify returnable assets. The key is comprised of a GS1 Company Prefix, asset type, check digit, and optional serial number~~.
- ~~The~~ GIAI ~~is the GS1 identification key used to identify an individual asset. The key is comprised of a GS1 Company Prefix and an Individual Asset Reference.~~

Rules

GTIN rules are described in section *4.2.1*.

Attributes

Required

For regulated healthcare consumer trade items the following levels of AIDC marking are specified:

Figure 2.1.10-1. AIDC marking levels for regulated healthcare consumer trade items

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Highest – Brand owner AIDC marking of certain medical devices	GTIN-12, GTIN-13, or GTIN-14	No	No	Yes	None
Highest - Hospital AIDC marking of certain medical devices (see section *2.1.8~~2.1.8~~2.1.9*)	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	No	No	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	

To manage healthcare data requirements within EPC/RFID tags, see section *3.11* and the most recent version of the *EPC Tag Data Standard*.

Optional

See section *3* for all the GS1 Application Identifiers (AIs) that can be used with a GTIN. Since the GTIN identifies a grouping of items, the optional attributes apply to the grouping as well.

Rules

~~All the GTIN rules described in section *4.2.1*~~Not applicable.

Data carrier specification

Carrier choices

- GS1 DataMatrix
- GS1 QR Code
- EPC/RFID

For healthcare, the following carrier selection applies to regulated healthcare retail consumer trade items.

Figure 2.1.10-2. Carrier choices for regulated healthcare retail consumer trade items

Preferred option	GS1 DataMatrix symbology
Option in addition to the barcode	See the "Data carrier specification carrier choices" recommendations on options in addition to the barcode at the end of section *2.1.5~~2.1.5~~2.1.6*

Figure 2.1.10-3. Example of GS1 DataMatrix symbol encoded with GTIN and AIs (17) and (10) per section 2.1.5~~2.1.52.1.6~~

(01) 0 9501101 53000 3
(17) 150119
(10) AB-123

Figure 2.1.10-4. Example of GS1 DataMatrix symbol encoded with GTIN and serial number AI (21)

(21) ABCDEFG123456789

(01) 04012345678901

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

Direct part marking:

The use of GS1 DataMatrix and GS1 QR Code in direct part marking applications is endorsed by GS1 for those applications that require permanent marking for cradle-to-grave history of the part's lifecycle. For regulated healthcare trade items including medical devices, GS1 DataMatrix is the only GS1 data carrier approved for direct part marking application.

Some sources express the height of the 2D cell in terms of a Y dimension. For GS1 DataMatrix and GS1 QR Code the cells are considered the same size under optimal print conditions so that X = Y.

Symbol size is determined by the amount of data and the number of rows and columns required encoding the data for the X-dimensions selected (see figures 5.6.3.2-1 and 5.6.3.2-2).

Consult *GS1 symbol specification table 7*, section 5.9.3.7, for minimum and maximum X-dimensions and other sizing requirements.

Durable labelling:

See section 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

General principles on placement of barcodes are described in section 6.

The majority of uses for these symbols will be on very small items with curved surfaces such as vials, ampoules, and very small bottles. For guidance in locating these symbols on curved surfaces, refer to section 6.2.

Unique application processing requirements for direct part marking

See section 7 and section 5.9.X.

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~~***Marking methods***~~

~~It is important to analyse the selected method of marking in relation to several considerations:~~

- ~~Finishes that cause an excess of shadowing or glare.~~
- ~~Surfaces that do not provide sufficient contrast – less than 20 percent difference in surface reflectance.~~
- ~~Safety critical parts that cannot be marked with intrusive methods.~~

- Marking method must comply with the users' requirements.
- Location of the symbol should not be:
  - In direct air/water (streams, etc.).
  - On sealing surfaces.
  - On surfaces subject to wear or exposure to heavy contact.

Intrusive (subtractive methods)

Intrusive marking refers to methods that remove or alter the material of the host.

- Abrasive blast.
- Dot peen.
- Electro-chemical marking, colouring, or etching.
- Engraving/milling.
- Fabric embroidery/weaving.
- Direct laser marking.
- Laser shot peening.
- Laser Inducted Surface Improvement (LISI).
- Gas Assisted Laser Etch (GALE).
- Laser Induced Vapour Deposition (LIVD).

Non-intrusive (additive methods)

Non-Intrusive marking does not affect the host material; it usually involves the addition of material.

- Cast, forge, mold.
- Inkjet
- Laser bonding.
- Liquid metal jet.
- Silk screen.
- Stencil

Host (substrate) surface

Direct part marking of GS1 DataMatrix or GS1 QR Code SHOULD be reserved for surfaces no rougher than 250 micro inches (millionths of an inch) and for surfaces that are no smoother than 8 micro inches. Surfaces that fall outside these parameters need to be re-surfaced or marked using an alternative method.

Consideration of the surface colour must be taken. A minimum 20 percent difference in contrast between the host and the symbol is required. Altering the cell size in relation to the surface roughness should provide adequate contrast on cast surfaces.

(Cell size = (0.00006 X roughness) + 0.0067); (see figure *2.1.11-5*)

Field Code Changed

Figure 2.1.11-5: Cell size in relation to surface roughness

Average roughness	Cell size minimum
0,508 micrometres (20 micro inches)	0.1905 mm (0.0075 in.)
1,524 micrometres (60 micro inches)	0.2286 mm (0.009 in.)
3,048 micrometres (120 micro inches)	0.381 mm (0.015 in.)
5,08 micrometres (200 micro inches)	0.508 mm (0.020 in.)
7,62 micrometres (300 micro inches)	0.635 mm (0.025 in.)
10,668 micrometres (420 micro inches)	0.762 mm (0.030 in.)

Substrate surface thickness

A minimum host surface thickness is recommended as is a maximum marking depth. Both are outlined in the table below.

Figure 2.1.11-6. Marking depth and surface thickness by method

Method	Min. thickness	Max marking depth
Dot Peen	1.016 mm (0.04 in.)	0.102 mm (0.004 in.)
Laser Shot peening	0.508 mm (0.02 in.)	0.051 mm (0.002 in.)
Laser Bonding	0.025 mm (0.001 in.)	Surface Mark
Abrasive Blast	0.076 mm (0.003 in.)	0.008 mm (0.0003 in.)
Electro-Chemical Colouring	0.508 mm (0.02 in.)	0.051 mm (0.002 in.)
Laser Etch	0.762 mm (0.03 in.)	0.076 mm (0.003 in.)
LISI	1.016 mm (0.04 in.)	0.102 mm (0.004 in.)
Laser Engraving	1.27 mm (0.05 in.)	0.127 mm (0.005 in.)
Electro-Chemical Etch	2.54 mm (0.1 in.)	0.254 mm (0.01 in.)
Micro-Milling	31.75 mm (1.25 in.)	3.175 mm (0.125 in.)

Human readable interpretation

For human readable interpretation rules see section *4.15*. For HRI rules specific to regulated healthcare retail consumer trade items, see section *4.15.1*.

2.1.12 2.1.11 Variable measure trade items ~~– packages/containers not~~ scanned in general ~~retail at point of sale~~ distribution ~~only~~

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Application description

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

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

A trade item must be considered a variable measure trade item if its measure is variable at any point in the supply chain. For example, a supplier may sell and invoice chickens in cases of 15 kilograms each; therefore, the quantity of contained chickens will vary. The customer, a retailer in this example, may need to know the exact number of chickens contained in each case in order to organise the distribution to his stores. In this example, the supplier should source mark the trade item by using a variable measure Global Trade Item Number (GTIN) and the variable count element string.

See section *3* for the use of AI (242) Made-to-Order variation number and its use in the manufacturing and maintenance, repair & overhaul (MRO) environment.

Variable measure trade items not scanned at POS are identified with a GTIN-14 beginning with '9'. The digit 9 in the indicator position indicates that the item identified is a variable measure trade item that is not scanned at POS.

Unlike GTIN-14s beginning with indicator 1 to 8 which are used to identify fixed measure trade items (see section *2.1.7.2* ~~*2.1.7.22.1.8.2*~~ *Trade item groupings of identical trade items*), this GTIN-14 is not derived from the GTIN (without check digit) of the contained trade items.

The GTIN-14 must be processed in its entirety and not broken down into its constituent elements.

Figure 2.1.11-1. Format of the element string

	Global Trade Item Number (GTIN)													
	Indicator	GS1 Company Prefix →								Item reference ←				Check digit
(GTIN-14)	9	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

The check digit is explained in section 7.9. Its verification, usually carried out automatically by the barcode reader, ensures that the number is correctly composed. The symbology identifier shows whether or not the check digit has been validated. If it has not, the check digit verification must be programmed in the application software.

Any trade item of a given composition where the quantity/measure information cannot be pre-determined for any reason is a variable measure trade item. The most frequent types are shown in the figure below.

Figure 2.1.11-2. Main types of variable measure trade items

Type	Item description
A	Items traded in bulk, neither portioned nor pre-packed for retail sale, ordered in any quantity, and that are delivered as variable measure trade items (e.g., fish, fruit, vegetables, cables, carpets, timber, fabrics) The identification number denotes the item as a trade entity containing any quantity of the given product and, if applicable, the form of packaging. Weight or dimensions complete the identification of the individual unit.
B	Trade items ordered and delivered by piece (wrapped or unwrapped) and invoiced by weight or measure because weight or measure varies due to the nature of the product or due to the manufacturing process (e.g., whole cheese, sides of bacon, beef carcasses, fish, sausages, ham, chicken, cauliflower, motion picture films) The identification number denotes the item as a particular predefined entity and, if applicable, denotes the form of packaging. Price or weight or dimensions complete the identification of the individual item.
C	Portioned trade items, pre-packed for sale by weight to the consumer, not fixed in quantity. (e.g., meat, cheese, vegetables, fruit, fillets of fish, sliced poultry, cold cuts) The identification number denotes the item type according to business practice and the form in which it is packed. Price weight or dimension completes the identification of the individual unit.
D	Trade items with selectable dimensions where GS1 system standard numbering does not make sense to cover the multiplicity of all variations (e.g., wooden planks, carpeting) The identification number denotes the predefined basic trade item. The applicable dimension(s) completes the identification of the individual unit.
E	Composition of a fixed number of trade items that are Type B or Type C (e.g., a trade item containing 10 chickens (Type B).) The identification number denotes the trade item grouping as an entity and, if applicable, its form of packaging. The total weight of all items contained completes the identification of the particular trade item.
F	Trade items made to customer specifications, restricted in use to the Maintenance, Repairs and Operations industrial supply sector, and sold business-to-business. The identification number denotes a base custom item. The specific variation is identified by the Made-to-Order variation number. (See in section 3.2 for the list of all GS1 Application Identifiers).

GS1 key

~~**Definition**~~**Required**

- ~~The~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an~~with indicator digit (9)~~, GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

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Rules

The GTIN-14 with the indicator 9 is used to identify a variable measure trade item. The presence of the variable measure information is mandatory for the complete identification of a particular variable measure trade item. The digit 9 in the first position is an integral part of the GTIN.

The GTIN-14 data structure beginning with indicator 9 is not used on an item intended to cross the Point-of-sale. Numbering of variable measure fresh food trade items intended to cross point-of-sale is defined in section 2.1.13~~2.1.13~~~~2.1.14~~.

Attributes

Required

The GTIN-14 identifies a variable measure trade item with respect to its fixed attributes or characteristics. To complete the identification of a variable measure trade item, the presence of an element string representing a trade measure is mandatory.

Optional

Applicable trade measures depend on the nature of the product. They may be a quantity, a weight, or any dimension.

- An element string with GS1 Application Identifier (30) is used if the variable measure of the trade item is the number of items contained. In order to generate a short barcode, always enter an even number of digits in the data field "variable count of items" by inserting a leading zero if necessary. Concatenation of this element string with the GTIN of the item enhances the accuracy of the application (see section 3.6.1, *Variable count of items: AI (30)*).
- An element string with GS1 Application Identifiers (31nn), (32nn), (35nn), and (36nn) is used if the variable measure of the respective trade item is weight, dimension, area, or volume. Only one element string of a given unit of measure may be applied on a particular item. Several element strings containing trade measures are possible on a particular item if the item is available in either unit of measure and if the applicable unit of measure is not distinguished for ordering and billing. This might apply if weight must be expressed in kilograms and pounds (see section 3.2, *Trade measures: AIs (31nn, 32nn, 35nn, 36nn)*.

  Note: The fourth (and last) digit of the AI indicates the implied decimal point position. The value 0 means that the measurement is expressed in the basic unit of measure associated with the AI (e.g., kilograms). A value of 1 decreases the measurement by a factor of 10, a value of 2 by a factor of 100, and so on. For example, this enables metric weights to be represented from 999 kilograms to 1/1000 of a milligram.

- An element string with GS1 Application Identifier (8001) contains the predefined variable fields of a roll product and it may be used for those variable roll products where the trade measures AI (31nn), (32nn), (35nn), (36nn) are not sufficient. The GTIN-14 can denote a basic roll product.

Rules

An element string with GS1 Application Identifier (30) SHOULD never be used to indicate the quantity contained in a fixed measure trade item. However, if it appears on a fixed measure trade item, it SHOULD NOT invalidate the trade item identification.

An element string with GS1 Application Identifier (8001) must never be used together with other element strings representing trade measures.

Data carrier specification

Carrier choices

Variable measure trade items not crossing a point-of-sale SHOULD be marked with an ITF-14 barcode, GS1-128 barcode or GS1 DataBar ~~(*)~~ barcode.

~~**Note**: A GS1 DataBar barcode SHALL NOT be used to encode a GTIN-14 constructed from an ISBN.~~

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

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.2, *GS1 symbol specification table 2*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

Examples of variable measure trade item numbering and symbols

In the examples in the subsections that follow, the following factors apply:

- In order to be illustrative, all examples show the same presentation (e.g., price list, order, delivery, invoice, and recording in a data file).
- GS1-128 barcodes are used.
- The examples are given to demonstrate the correct use of a given GS1 Application Identifier when used. When AI (02) is not used, information about the shipment must be received using Electronic Data Interchange (EDI) or other means prior to its physical receipt.

Example 1: Traded by Piece

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

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

Figure 2.1.11-3. Example 1: Traded by piece, invoiced by weight

Process	Description	Element strings used/symbol marking of the items
Supplier's catalogue	1 Salami ~ 500 g	GTIN 97612345000018
Order	100 salamis	100 x 97612345000018
Delivery	three logistic units Unit 1 = 33 salamis, 16.7 kg Unit 2 = 33 salamis, 16.9 g Unit 3 = 34 salamis, 17.1 kg	Unit 1: 00 376123450000010008 02 97612345000018 3101 000167 37 33 Unit 2: 00 376123450000010015 02 97612345000018 3101 000169 37 33 Unit 3: 00 376123450000010022 02 97612345000018 3101 000171 37 34
	If delivery is made on a pallet	Pallet: 00 376123450000010039 02 97612345000018 3101 000507 37 0100
Invoice	GTIN of items and the total weight (50.7 kg) + the price per kg	100 x 97612345000018; 50.7 kg x price per kg

Data file logistic units	Identification of logistic unit (SSCC)	GTIN of contained trade items	Total trade weight of content (grams)	Number of units contained
Either pallet	376123450000010039	97612345000018	50700	100
or individual units	376123450000010008	97612345000018	16700	33
	376123450000010015	97612345000018	16900	33
	376123450000010022	97612345000018	17100	34

Data file trade items	GTIN of trade item	Total trade weight (grams)	Number of trade items
One record per identification number	97612345000018	50700	100

An element string with an GS1 Application Identifier (410) represents the Global Location Number (GLN) of the recipient of a logistic unit. The GLN refers to the address where a particular transport unit identified with an SSCC is to be delivered. This element string is used in single leg transport operations. A logistic unit may include a barcode carrying the GLN of the unit's intended destination. When scanning this element string, the data transmitted may be used to retrieve the related address and/or to sort the item by destination.

Example 2: Traded by trade item grouping

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

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

Figure 2.1.11-4. Example 2: Traded by trade item grouping, invoiced by weight

Process	Description	Element strings used/symbol marking of the items
Supplier's catalogue	1 case of 20 steaks ~ 200 g vacuum packed	GTIN 97612345000117
Order	Three cases	3 x 97612345000117
Delivery	Three trade items Unit 1: weight = 4.150 kg Unit 2: weight = 4.070 kg Unit 3: weight = 3.980 kg	 Unit 1: 01 97612345000117 3102 000415 Unit 2: 01 97612345000117 3102 000407 Unit 3: 01 97612345000117 3102 000398
	If delivery is made on a pallet	Pallet: 00 376123450000010091 02 97612345000117 3102 001220 37 03
Invoice	GTIN of items and the total weight (12.20 kg) + the price per kg	3 x 97612345000117; 12.2 kg x price per kg

Data file logistic units	Identification of logistic unit (SSCC)	GTIN of contained trade items	Total trade weight of content (Grams)	Number of units contained
Pallet	376123450000010091	97612345000117	12200	3

Data file trade items	GTIN of trade item	Total trade weight	Number of trade items
One Record	97612345000117	12200	3

Example 3: Traded in bulk

The following example shows an order and delivery of an item traded in bulk.

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

Figure 2.1.11-5. Example 3: Traded in bulk

Process	Description	Element strings used/symbol marking of the items
Supplier's catalogue	Cabbage unwrapped sold in bulk by kilogram	GTIN 97612345000049
Order	100 kg of cabbage	100 kg x 97612345000049
Delivery	Two trade items Unit 1: weight = 42.7 kg Unit 2: weight = 57.6 kg	 Unit 1: 01 97612345000049 3101 000427 Unit 2: 01 97612345000049 3101 000576
	If delivery is made on a pallet	Pallet: 00 376123450000010107
Invoice	GTIN of item and the total weight (100.3 kg) + the price per kg	97612345000049 100.3 kg x price per kg

Data file logistic units	Identification of logistic unit (SSCC)	GTIN of contained trade items	Total trade weight of content (Grams)	Number of units contained
Pallet	376123450000010107	97612345000049 97612345000049	42700 57600	1 1

Data file trade items	GTIN of trade item	Total trade weight (grams)	Number of trade items
One record per trade item	97612345000049 97612345000049	42700 57600	1 1

Example 4: Traded by trade item grouping

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

- The supplier's catalogue contains one entry: one case of ~ 10 cabbages sold by piece.
- The order is for two cases. Each case delivered is marked with the Global Trade Item Number (GTIN) of a single case followed by the actual count of the items contained.

- The two cases may be stored on a pallet that may itself be marked with an SSCC (Serial Shipping Container Code) and, optionally, with information on the contents of the pallet, expressed as follows:
  - AI (02) indicates the variable measure GTIN of the units contained within the pallet.
  - AI (30) indicates the total count of the items contained within the pallet.
  - AI (37) indicates the count of cases contained within the pallet.
- The invoice refers to the GTIN as ordered and delivered and the total count of items.

Figure 2.1.11-6. Example 4: Traded by trade item grouping, invoiced by piece

Process	Description	Element strings used/symbol marking of the items
Supplier's catalogue	Case containing ~10 cabbages sold by pieces	GTIN 97612345000285
Order	Two cases	2 x 97612345000285
Delivery	Unit 1: 11 pieces Unit 2: 12 pieces	Unit 1: 01 97612345000285 30 11 Unit 2: 01 97612345000285 30 12
	If delivery is made on a pallet	Pallet: 00 376123450000010138 02 97612345000285 30 23 37 02
Invoice	GTIN of the trade item and the total quantity	2 x 97612345000285 23 pieces x price per piece

Data file logistic units	Identification of logistic unit (SSCC)	GTIN of contained trade items	Total number of pieces contained in the trade item	Number of units contained
Pallet	376123450000010138	97612345000285	23	2

Data file trade items	GTIN of trade item	Total number of pieces	Number of trade items
One Record	97612345000285	23	2

Example 5: Traded in Bulk

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

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

Figure 2.1.11-7. Example 5: Traded in bulk

Process	Description	Element strings used/symbol marking of the items
Supplier's catalogue	Cable T49 sold in any length in MTR	GTIN 97612345000063
Order	One trade item of 150 MTR	97612345000063 x 150 MTR
Delivery	One trade item, 150 MTR	01 97612345000063 3110 000150
Invoice	GTIN of the trade item and the total quantity	1 x 97612345000063 150 x price per MTR

Data file trade items	GTIN of trade item	Total trade length (metres)
One record	97612345000063	150

~~2.1.13~~2.1.12 Fixed measure trade items – restricted distribution applications

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This section describes applications where the item identification is defined only in a closed environment. Therefore, the distribution of trade items marked in this way is restricted to a given geographic region or for use within a company. However, within their closed environment these items may be processed along with trade items identified with Global Trade Item Numbers (GTINs) defined for open trade.

The regulations established by GS1 Member Organisations for their country or assigned area should be observed for the allocation of these Restricted Circulation Numbers.

When assigned to company internal use, the structure and management of the numbers represented in the element strings of this section are the responsibility of the user. Number changes and reuse of expired numbers must be managed by the user based on their requirements.

When centrally administrated within a geographic area, the GS1 Member Organisation determines the structure and manages number allocation based on user requirements.

These identification numbers are known as Restricted Circulation Numbers and may be 8, 12, or 13 digits in length. Eight-digit numbers are known as RCN-8s, 12-digit numbers as RCN-12s, and 13-digit numbers as RCN-13s.

Restricted circulation fixed measure trade items are defined only in a closed environment. Therefore, the distribution of trade items marked in this way is restricted to a given geographic region or for use within a company. These items are either marked in the store by the retailer or are marked at the source by the supplier.

GS1 Member Organisations may assign one or several of the GS1 Prefixes 02, 20 through 29 for the identification of fixed measure trade items with RCN-13s, or RCN-12s for use within a given geographic region or for use within a company.

~~2.1.13.1~~2.1.12.1 Company internal numbering – RCN-8 Prefix 0 or 2

Application description

This element string uses an RCN-8 Prefix of 0 or 2. It provides two million identification numbers, which can be assigned for internal use in a company. When the RCN-8 Prefix is 0, the element string is sometimes called a velocity code because it is quicker to key enter.

This element string is for internal use in a company. The numbers are assigned by individual companies and do not provide unique identification if they leave the company premises.

Figure 2.1.12.1-1. Data structure RCN-8 Prefix 0 or 2

RCN-8 Prefix	Item reference						Check digit
N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8

The RCN-8 Prefixes 0 or 2 are system identifiers that show that the item identification number is under the sole control of the assigning company and that it is for internal item distribution.

The item reference is allocated by the company that uses the element string. The positions N_2 to N_7 may contain any digit.

The check digit is explained in section 7.9. Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

The data transmitted from the barcode reader means that one fixed measure trade item with a GTIN-8 has been captured.

Note: In addition to trade item identification, this element string may be used for any purpose that is supported by the company's equipment supplier.

Note: In some environments where numbers may have to be key entered, the EAN-8 barcode carrying RCN-8s (and the RCN-8 Prefix 0) may be confused with the numbers carried by a UPC-E barcode. If such a risk exists, it is preferable to use the RCN-8 Prefix 2 capacity for internal use.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

- ~~The data carrier for this element string is the~~ EAN-8 (carrying a GTIN-8) ~~barcode. The system recognises this element string by the symbology identifier]E4 and by N_1 being 0 or 2.~~

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

Not applicable

~~2.1.13.2~~2.1.12.2 Company internal numbering – RCN-13 GS1 Prefix 04 (RCN-12 U.P.C. Prefix 4)

Application description

Any company in the world may use this element string for company internal trade item numbering. If the RCN-12 U.P.C. Prefix 4 is being applied, the user company may structure the trade item number.

Although this element string is mainly used for the identification of trade items, it may be used for any purpose as long as it is kept within a restricted environment. This element string is for a company's internal use. Because any company may use this element string, it does not provide unique identification of a trade item if it leaves the company's premises.

Figure 2.1.12.2-1. Data structure RCN-13 Prefix 04

GS1 Prefix	Item reference										Check digit
0 4	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The GS1 Prefix 04 is a system identifier showing that the identification number is under the sole control of the assigning company and that it is for internal trade item distribution.

The item reference is assigned by the company that uses the element string. Positions N_3 to N_{12} may contain any digit.

The check digit is explained in section 7.9. Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

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The data transmitted from the barcode reader means that one fixed measure trade item with a RCN-13 or RCN-12 has been captured.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

- ~~The data carriers for this element string are the~~ EAN-13 (carrying RCN-13)
- ~~and~~ UPC-A (carrying RCN-12)~~barcodes.~~

~~The system recognises this element string by the symbology identifier]E0.~~

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

Not applicable

~~2.1.13.3~~2.1.12.3 Company internal numbering – RCN-12 U.P.C. Prefix 0 (LAC and RZSC)

Application description

The U.P.C. Company Prefix 0 includes a reserved capacity for company internal numbering, using Local Assigned Codes (LACs) or Retailer Zero-Suppression Codes (RZSCs), which are carried by a UPC-E barcode. U.P.C. Company Prefixes 000000 and 001000 to 007999 are used in this feature. For details, see the figure below.

Although this element string is mainly used for the identification of trade items in restricted distribution, it may be used for any purpose as long as it is kept within a restricted environment.

This element string is for a company's internal use. Because any company may use this element string, it does not provide unique identification of a trade item if it leaves the company's premises.

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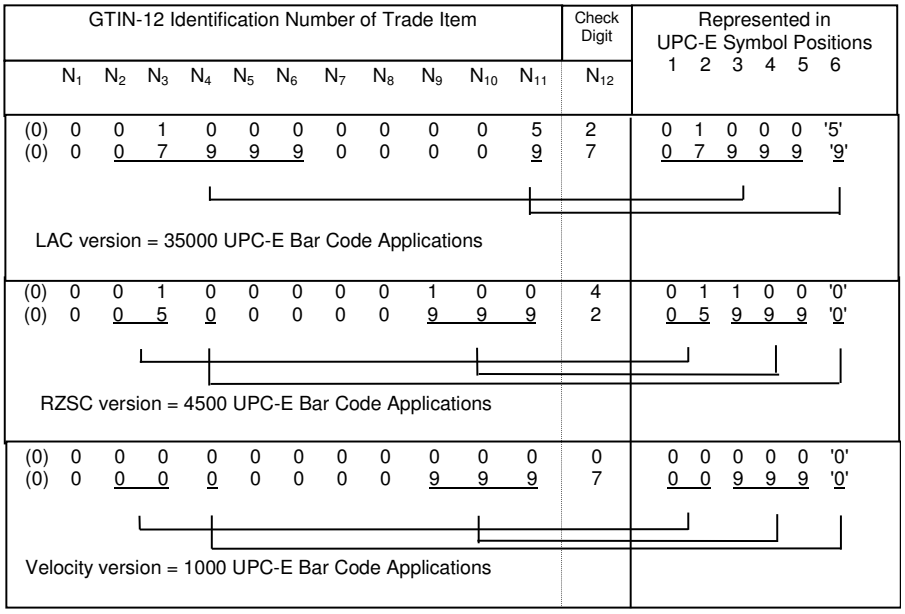
Figure 2.1.12.3-1. UPC-E barcode option for the identification of GTINs for company internal distribution



In figure 2.1.12.3~~2.1.12.32.1.13.3~~-1, each number position must only contain the digits shown in the upper and lower lines of each section and those in-between. On decoding, the extension to full length is determined by the value of the number in single quotes in the column represented in UPC-E barcode positions.

The check digit, calculated as described in section 7.9, applies to the entire length of the RCN-12. In the UPC-E barcode, it is implicitly represented by the parity combination of the six symbol characters that are actually encoded. The check digit is explained in section 7.9. Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed

GS1 key

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~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

~~The data carrier for this element string is the~~ UPC-E ~~barcode. The system recognises this element string by the symbology identifier **]E0** and~~(carrying RCN-12 with GS1 Prefix 00 and~~with the~~ digits 01 to 07 in the next two positions).

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Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.1*, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

It is possible to create a false UPC-E barcode if the encodation rules are not properly observed. Whether the digits represented in a UPC-E barcode can be expanded correctly to an RCN-12 may be verified by the tests shown in section *7.10*.

~~2.1.13.4~~2.1.12.4 GS1 Prefixes 02, 20 to 29 - Restricted Circulation

Application description

The GS1 Prefixes 02, 20 to 29 are reserved for identification purposes within a restricted geographic area. Each GS1 Member Organisation is entitled to assign the prefixes to be used for these element strings in its country or assigned area:

- for the identification of variable measure trade items or fixed measure trade items
- for internal numbering of variable measure trade items or fixed measure trade items by a particular company

Note: Suppliers manufacturing their own label products for several different customers should use unique GS1 system numbering to distinguish their customers. If this is not done, the supplier will not be able to use Electronic Data Interchange (EDI) or electronic catalogues.

Although this element string is mainly used for the identification of trade items, it may be used for any purpose as long as it is kept within a restricted environment.

This element string is for use within a GS1 Member Organisation's geographic region. The GS1 Member Organisation may assign a company a GS1 Prefix for use externally throughout a region or may assign the prefix for use internally within a region. The numbers are never unique if they leave the region and, if assigned for a company's internal use, are not unique if they leave the company or region.

Figure 2.1.12.4-1. Format of the element string

GS1 Prefix	Item reference	Check digit
0 2	N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}	N_{13}
2 N_2	N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}	N_{13}

The GS1 Prefix must be in the series 02, 20 to 29. A particular prefix may be assigned either for use on fixed measure trade items for restricted distribution or for variable measure trade items (see section *2.1.13~~2.1.13~~2.1.14*).

The item reference is assigned by the company that uses the element string. Positions N_3 to N_{12} may contain any digit.

The check digit is explained in section *7.9*. Its verification, carried out automatically by the barcode reader, ensures that the number is correctly composed.

The data transmitted from the barcode reader means that one fixed measure trade item with a RCN-13 or RCN-12 has been captured.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

- ~~The data carrier for this element string is an~~ EAN-13 ~~barcode.~~

~~The system recognises this element string by the symbology identifier]E0 and the GS1 Prefix assigned by the relevant GS1 Member Organisation.~~

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

Not applicable

~~2.1.14~~2.1.13 Variable measure trade items scanned at ~~in general~~ retail ~~at~~ POS

This section describes applications for variable measure trade items that are scanned at point-of-sale. Two main applications exist:

- Variable measure fresh food trade items using a GTIN and additional attributes encoded with GS1 DataBar Expanded or Expanded Stacked. See section 2.1.13.1~~2.1.13.12.1.14.1~~.
- Variable measure trade items using a Restricted Circulation Number (RCN) encoded with the EAN/UPC symbology family. See section 2.1.13.2~~2.1.13.22.1.14.2~~.

Note: GTINs SHALL be encoded with AI (01). Restricted Circulation Numbers (RCNs) SHALL NOT be encoded with AI (01) as RCNs are not GTINs.

To support new applications additional GS1 approved data carriers (encoding additional data with the GTIN) may be applied with mutual agreement between trading partners. For information on how to manage multiple barcodes see section 4.16.

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~~2.1.14.1~~2.1.13.1 Variable measure fresh food trade items scanned ~~in general~~at retail ~~at~~ POS using GTIN

Application description

Like a fixed measure trade item, a variable measure trade item is an entity with predefined characteristics, such as the nature of the product or its contents. Unlike a fixed measure trade item, a variable measure trade item has one measure that varies continuously while other characteristics remain the same. In the case of fresh food trade items variable measure may be weight, length, number of items contained, or volume. There are different ways to handle the process for v~~V~~ariable measure fresh food. For example:

- Consumer puts loose produce items into a bag and barcoded label is produced and attached by the consumer.
- Staff attaches a barcode label, produced in store to pre-packed loose produce trade item.
- At the POS, loose produce is weighed and the price is calculated.

It is in the discretion of the retailer how the price is calculated and which process is chosen.

Variable measure fresh food

Variable measure loose produce trade items are trade items which may be identified with a GTIN and additional data. The retailer decides how to handle Variable measure fresh food trade items sold at POS. Generally the individual item(s) (i.e. loose produce) are put into a bag by the customer or by staff and are scanned (if a label is generated in store) or weighed at POS to generate the price. The attributes of variable measure trade items are barcoded when the trade item is weighed or measured in store. If the variable measure trade item is weighed at POS when presented to the cashier the price is generated in the register and directly added to the other products to complete the transaction.

Variable measure pre-packed fresh food trade items

These are Variable measure fresh foods trade items, either loose produce or cut from a bulk item, that are pre-packaged with differing weight or other variable measure using GTIN and attributes. The label put on the trade item encoding GTIN plus variable measure information and/or price is determined by the retailer.

GS1 key

~~***Definition***~~***Required***

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The allowed key formats for this application are:

- ~~The~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~The~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

Rules

All GTIN rules described in section *4.2.1*.

Reference human readable interpretation rules in section *4.15*.

Attributes

Required

See section *3.2*, a variable count or a trade measure (AIs 30, 31nn, 32nn, 35nn, 36nn)

Optional

- See section *3.2* - *GS1 Application Identifiers in numerical order* for a complete list of all GS1 Application Identifiers.
- For more details related to GS1 Application Identifiers for fresh foods, refer to the *Fresh Foods Implementation Guide*.

Rules

For human readable interpretation rules see section *4.15*.

Data carrier specification

Carrier choices

- GS1 DataBar Expanded
- GS1 DataBar Expanded Stacked

Note: The GS1 DataBar symbols encode a 14-digit numeric string. When encoding GTIN-12 or GTIN-13 in GS1 DataBar symbols, zero-fill with two or one zeros to the left of the GTIN.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.1*, *GS1 symbol specification table 1*.

Symbol placement

None

Unique application processing requirements

None

~~2.1.14.2~~2.1.13.2 Variable measure trade items scanned in at~~general~~ retail ~~at~~ POS using ~~Restricted Circulation Numbers~~RCN

Application description

Restricted circulation variable measure trade items are those sold in random quantity against a fixed price per unit quantity and intended to cross a point-of-sale (e.g., apples sold at a fixed price per kilogram). These items are either marked in the store by the retailer or are marked at the source by the supplier. National solutions are available for this purpose.

GS1 Member Organisations SHOULD assign one or several of the GS1 Prefixes 02, 20 through 29 for the identification of variable measure trade items in their territory. GS1 Member Organisations SHOULD make part of this capacity available to user companies for company internal applications.

The data fields available after the relevant GS1 Prefix (defined by the GS1 Member Organisation for their territory) can be structured in a variety of ways to represent the product type, net weight, calculated price, or number of units. Equipment is commercially available for automatically weighing items, calculating an item price from the unit price, and printing the information as a barcode label. The scanning equipment and applications can then be programmed to use the prefix as an instruction to decode the ensuing data fields according to the particular structure adopted.

The first row in the figure below shows the structure specified by GS1 US for North America. The same structure is used by many other GS1 Member Organisations. The next two rows do not show predetermined structures. Examples of recommended structures are given in figure *2.1.13.2*~~*2.1.13.22.1.14.2*~~*-2*. GS1 Member Organisations choose appropriate structures for use within their geographic area.

Figure 2.1.13.2-1. Format of the element string

GS1 Prefix	Item reference	Price verifier digit	Item price	Check digit
0 2	N_3 N_4 N_5 N_6 N_7	N_8	N_9 N_{10} N_{11} N_{12}	N_{13}
0 2	N_3 N_4 N_5 N_6 N_7 N_8 N_9	N_{10} N_{11} N_{12}		N_{13}
2 N_2	N_3 N_4 N_5 N_6 N_7 N_8 N_9	N_{10} N_{11} N_{12}		N_{13}

The item reference is usually assigned by the company that scans the element string at its point-of-sale. However, some countries may specify their own standard numbering systems for variable measure products administered by their GS1 Member Organisation or by a trade association.

The price verifier digit is the result of a special calculation, and its verification ensures correct reading of the price. For details, see section 7.9. Security of reading this element string without a price verifier digit depends on the element string's check digit (see section 7.9).

The item price is the price of the trade item in the relevant currency with an implied decimal point defined by the trading partners or the relevant GS1 Member Organisation. A different format is required for each position of the implied decimal point. Multiple formats require an unambiguous way to differentiate each format, and separate GS1 Prefixes may be assigned to accomplish this.

The check digit is explained in section 7.9. Its verification, carried out automatically by the barcode reader, ensures that the data corresponds with the verification rules.

Figure 2.1.13.2-2. Examples of alternative data structures

Item reference	Price verifier digit	Item price
Item reference		Item price
Item reference	Measure verifier digit	Item measure
Item reference		Item measure

When the price (or weight) of an item is encoded using this element string, a price verifier digit or a measure verifier digit SHOULD be used. The measure verifier digit is calculated from the digits in the item measure field in the same way that the price verifier digit is calculated from the item price digits (see section 7).

The item measure is a measurement of the trade item with a defined unit of measure and an implied decimal point position. The unit of measure and decimal point position are defined within the relevant geographic area for each GS1 Prefix and/or format code. The item measure may be weight only if local weights and measures regulations permit.

The data transmitted from the barcode reader means that data about a variable measure trade item has been captured. The barcode reader normally performs the price verifier digit and the measure verifier digit calculation. Failing this, the calculation must take place in the application software.

Although each GS1 Member Organisation and/or user is free to develop a solution for numbering variable measure trade items, the GS1 system provides recommended structures that provide a degree of equipment standardisation. These formats may include an item reference, the retail price of the item, and a price check digit. The recommended structures are shown in the figure below.

Figure 2.1.13.2-3. Recommended data structures

GS1 Prefix	Recommended data structures (exact structure determined by GS1 Member Organisation)	Check digit
0 2	I I I I I V P P P P	C
or	I I I I V P P P P P	C
2 0 – 2 9	I I I I I I P P P P	C
	I I I I I P P P P P	C

The GS1 Prefix is administered by each GS1 Member Organisation and denotes the format and meaning of a particular element string, where:

- **I..I** = Item reference.
- **V** = Price check digit calculated according to the algorithm specified in section 7.9.
- **P..P** = Price in local currency.
- **C** = Check digit calculated according to the standard algorithm in section 7.9.

Note: The price field may contain zero, one, or two implied decimal places depending on the monetary unit used. The decimal point, which is not included in the barcode, must

nevertheless be taken into account by the marking equipment when printing the human readable interpretation on the label.

GS1 Member Organisations may choose to implement a national solution for variable measure trade items branded by the supplier for retail. Any national branded variable measure solution requires GS1 Member Organisations to manage the allocation of the item number at a national level.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

- ~~The data carriers for this element string are:~~ UPC-A
- ~~barcodes and~~ EAN-13 ~~barcodes.~~

~~The system recognises this element string by the symbology identifier **]E0**, the GS1 Prefix 02 or 20 to 29, and the structure defined by the GS1 Member Organisation in which it is operating.~~

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

Not applicable

~~2.1.15~~2.1.14 Trade item extended packaging applications

The information obtained from a consumer trade item's packaging can be extended when consumers using mobile devices scan barcodes on the package, which leads them to more information or an application. This standard provides a standardised packaging solution, which will lead to brand owner authorised information.

Independent of whether a trade item is retail or non-retail, fixed or variable measure, if it is sold to the end consumer and utilises GTIN-based identification, then it is within the scope of this application. GTIN is the primary GS1 key used to access GS1 B2C Trusted Source of Data infrastructure and all GS1 application standards for consumer trade items require GTIN, therefore this standard makes normative reference to the sections in the *GS1 General Specifications* related to consumer trade items in figure 2.1.14~~2.1.142.1.15-1~~. In addition to using GTIN and indirect mode to reach trusted data, the URL AI (8200) with GTIN can be used to reach brand owner authorised information or applications via direct mode. GTIN and AI (8200) are encoded as separate data elements in the barcode but once decoded they are processed in a standard fashion by

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concatenating the following three strings: the contents of AI (8200), followed by a slash (/) character, followed by the GTIN expressed as 14 numeric digits. For example, where a trade item's GTIN, when expressed as 14 digits is 01234567890128 and the URL for direct mode access to information is *http://example.com/01234567890128*.

When encoded in the symbol, the sequence for encoding is (01) 01234567890128 (8200) *http://example.com*, but when processed the URL, a slash, and the GTIN are combined to arrive at *http://example.com/01234567890128*.

The example provided is not intended to constrain the brand owner to the use of http URL schema, the .com top-level domain, or the specific structure of URL illustrated. Any URL may be used, and in processing the slash character and 14-digit GTIN are appended.

These values are also expressed in non-HRI text on the label (see section *4.15*, Rule 9). If GTIN attributes beyond AI (8200) are encoded together with GTIN and PRODUCT URL they are processed and expressed in text on the label as *http://brandownerassignedURL.com/gtin/serialnumber* where serial number equals up to 20 alphanumeric digits.

Figure 2.1.14-1. Overview of related normative sections

Section	Title	General retail POS	Regulated healthcare: retail POS	Regulated healthcare: non-retail / POC
2.1.3	General retail consumer trade items	Yes		
2.1.3.6~~2.1.3.62.1.4~~	Loose produce trade items scanned at POS	Yes		
2.1.4~~2.1.42.1.5~~	Trade items intended for general distribution and POS	Yes		
2.1.5~~2.1.52.1.6~~	Healthcare primary packaging (non-retail trade items)			Yes
2.1.6~~2.1.62.1.7~~	Healthcare secondary packaging (regulated healthcare retail consumer trade items)		Yes	
2.1.7.1~~2.1.7.12.1.8.1~~	Trade items intended for general distribution scanning only/identification of a trade item that is a single product			Yes
2.1.13.1~~2.1.13.12.1.14.1~~	Variable measure fresh food trade items scanned at point-of-sale using GTIN	Yes		

GS1 key

~~*Definition*~~*Required*

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The allowed key formats for this application are:

- ~~For all applications above,~~ GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1 8 Prefix, item reference, and check digit used to identify trade items.~~
- ~~For all applications above,~~ GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- ~~For all applications above,~~ GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items~~.
- For regulated healthcare non-retail applications also: ~~above,~~ GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

Rules

All existing rules in the sections that appear in figure *2.1.14~~2.1.142.1.15~~-1* apply as described in each section.

Attributes

Required

Not applicable

Optional

For the purpose of indirect mode, all attributes in the sections which appear in the figure in section 2.1.14~~2.1.14~~2.1.15 apply as described in each section.

For the purpose of direct mode, AI (8200) must be used in combination with GTIN when brand owners provide extended packaging information or applications.

Rules

All rules in the sections that appear in the figure in figure 2.1.14~~2.1.14~~2.1.15-1 apply as described in each section.

Data carrier specification

Carrier choices

For the purpose of supporting indirect mode, all carrier choices in the sections which appear in the figure 2.1.14~~2.1.14~~2.1.15-1 apply as described in each section.

For the purpose of direct mode, in addition to the symbol required for indirect mode, when AI (8200) is used, GS1 DataMatrix and GS1 QR Code are the only approved data carriers. In the case of regulated healthcare consumer trade items, only GS1 DataMatrix is approved.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

To determine the appropriate specifications for printing and quality control, see the GS1 symbol specification table(s) referred to in each application standard shown in figure 2.1.14~~2.1.14~~2.1.15-1. See note below figure 5.9.3.1-2 *GS1 symbol specification table 1 addendum for AI (8200)* related to reverse and mirror-image representation constraint.

Symbol placement

None defined.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.2 Logistic units

A logistic unit is an item of any composition established for transport and/or storage that needs to be managed through the supply chain.

Tracking and tracing logistic units in the supply chain is a major application of the GS1 system. Scanning the standard identification number, marked on each logistic unit, allows the physical movement of units to be individually tracked and traced by providing a link between the physical movement of items and the associated information flow. It also opens up the opportunity to implement a wide range of applications, such as cross docking, shipment routing, and automated receiving.

Logistic units are identified with a GS1 identification number called the SSCC (Serial Shipping Container Code). The SSCC is the only GS1 key that SHALL be used as the identifier of a logistic unit. The SSCC ensures that logistic units are identified with a number that is unique worldwide.

If, in addition to being a logistic unit, the item is regarded as a trade item by the brand owner, it may additionally be identified with a GTIN. The combination of a GTIN and a serial number must not replace the SSCC as the identifier of a logistic unit.

If, in addition to being a logistic unit, the item is part of a consignment and or a shipment, it may also be associated with the GINC and or the GSIN.

Attribute information, such as a Global Identification Number for Consignment, AI (401), may be optionally encoded using internationally agreed data structures and a barcode symbology that allow unambiguous interpretation.

2.2.1 Individual logistic units

Application description

A logistic unit is an item of any composition established for transport and/or storage that needs to be managed through the supply chain. The identification and symbol marking of logistic units enables a large number of user applications. In particular, the SSCC (Serial Shipping Container Code) provides a link between the physical logistic unit and information pertaining to the logistic unit that is communicated between trading partners using Electronic Data Interchange (EDI).

The SSCC element string AI (00) is used for the identification of logistic units (see section 3). Each individual logistic unit is allocated a unique number, which remains the same for the life of the logistic unit. When assigning an SSCC, the rule is that an individual SSCC number must not be reallocated within one year of the shipment date from the SSCC assignor to a trading partner. However, prevailing regulatory or industry organisation specific requirements may extend this period.

In principle, the SSCC provides a unique reference number that can be used as the key to access information regarding the logistic unit in computer files. However, attributes relating to the logistic unit (e.g., ship to information, logistic weights) are also available as standardised element strings.

GS1 key

~~***Definition***~~***Required***

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- ~~The~~ SSCC ~~is the GS1 identification key used to identify logistics units. The key is comprised of an extension digit, the GS1 Company Prefix, serial reference, and check digit.~~

The GS1 Application Identifier for the SSCC is AI (00), see section 3.2. ~~for details of the SSCC and associated data elements.~~

Rules

All SSCC rules described in section 4.2.2.

Attributes

Required

Not applicable

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~~Fixed measure AI (02) or routing code AI (403) are used when:~~

- ~~A logistic unit is a grouping of trade items, it is sometimes useful to indicate the Global Trade Item Number (GTIN) of the contained items in association with the SSCC. See section *3.2*, *Identification of trade items contained in a logistic unit - fixed measure*, AI (02), and *Count of trade items contained in a logistic unit*, AI (37).~~
- ~~Use of AI (02) and AI (37) with SSCC AI (00) is not the preferred option for regulated healthcare trade items. For regulated healthcare trade items, AI (02) + AI (37) is limited to bilateral use between trading partners for exception handling during a migration period to EDI implementation or if the product is sold as a non-regulated trade item within a retail distribution channel for certain markets. SSCC is the approach selected by healthcare and provides the appropriate level of identification when associated with EDI messaging to provide traceability inclusive of count for trade items contained. SSCC when associated with EDI is required for identification purposes to reach our extended goals for traceability.~~
- ~~The routing code, AI (403), is assigned by a parcel carrier. It is intended to provide a migration path to the adoption of a yet to be defined international, multi-modal solution. See section *3.2*, *Routing code*, AI (403).~~

Optional

~~The use of attribute information on logistic units is optional. However, when used, attribute information SHOULD be processed with the SSCC that identifies the logistic unit.~~

- ~~The element string *Ship to - Deliver to Global Location Number*, AI (410) has been designed to allow the automatic sortation of logistic units using the Global Location Number (GLN).~~
- ~~The element string *Ship for - Deliver for - Forward to Global Location Number*, AI (413), has been designed to allow the cross docking of logistic units using the Global Location Number (GLN). It is used in conjunction with the element string AI (410) to indicate the cross docking station and the final destination of the logistic unit.~~
- ~~The element string *Ship to - Deliver to Postal Code within a Single Postal Authority*, AI (420) has been designed to allow the automatic sortation of logistic units using the postal code in a single postal area.~~
- ~~The element string *Ship to - Deliver to Postal Code with Three-Digit ISO Country Code,* AI (421) has been designed to allow the automatic sortation of logistic units using the postal code. As the postal code is prefixed by the ISO country code, it may be used internationally.~~

~~For~~ all the GS1 Application Identifiers that may be used with an SSCC, ~~s~~See section *3.2*. ~~for more details and the list of all GS1 Application Identifiers.~~

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Note: Although the use of AI (02), Identification of trade items contained, and AI (37), Count of trade items contained, is common in some sectors to describe the content of a logistic unit, the healthcare sector prefers the use of the SSCC alone. The SSCC is used with EDI communications to enable identification and traceability.

Rules

~~Refer to section *4.14* for the mandatory associations.~~Not applicable.

Data carrier specification

Carrier choices

The mandatory data carrier used to represent ~~GS1 system~~ individual logistic units is the GS1-128 barcode symbology.

A GS1 DataMatrix or GS1 QR Code symbol MAY be included in addition to the GS1-128 symbol. When used, the GS1 2D symbol SHALL include all element strings included in the GS1-128 symbol(s), and MAY include additional element strings.

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For healthcare, see the recommendations at the end of section *2.1.5~~2.1.5~~2.1.6* in figure *2.1.5~~2.1.5~~2.1.6-2 Carrier choices*.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.5*, *GS1 symbol specification table 5*.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.2.2 Multiple logistic units – Global Identification Number for Consignment

Application description

- Consignments can comprise one or many logistic units. If the consignment comprises more than one physical object there is no requirement that they are attached together. A consignment number identifies a logical grouping. When a consignment number is read the message is that this physical unit should be associated with any other physical units carrying the same consignment number. Individual physical units carry the SSCC as described in the previous section.
- The Global Identification Number for Consignment is assigned by the freight forwarder or carrier of the transport units and is referenced in the relevant transport messages and documents (e.g., waybill). It may be used as a communication reference by all parties in the transport chain, such as in Electronic Data Interchange (EDI) messages where it can be used as a consignment reference and/or freight forwarders or carriers loading list. See section 3.2, Global Identification Number for Consignment (GINC): AI (401).

Note: Shipment and consignment are terms, which may be used interchangeably within the transport and logistics sector however for the purposes of clarity, when referring to multiple logistic unit identification for trade, GS1 uses the term shipment and when referring to multiple logistic unit identification for transport, GS1 uses the term consignment

GS1 key

~~***Definition***~~***Required***

- ~~The Global Identification Number for Consignment~~GINC~~, AI (401), identifies a logical grouping of goods (one or more physical entities) that has been consigned to a freight forwarder or carrier and is intended to be transported as a whole. Refer to section 3.2 for the list of GS1 Application Identifiers with detailed information.~~

The GS1 Application Identifier for the GINC is AI (401), see section 3.2

Rules

The data transmitted means that the element string denoting a Global Identification Number for Consignment has been captured. The Global Identification Number for Consignment may be processed as stand-alone information where applicable or with other identification data appearing on the same unit. See section 2.2.1 for use of the GINC in combination with the SSCC.

~~See section 4.9.~~

Attributes

Required

Not applicable

Optional

Not applicable

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Data carrier specification

Carrier choices

The data carriers used to represent the Global Identification Number for Consignment ~~is~~ are the GS1-128, GS1 DataMatrix, or GS1 QR Code barcode symbologies~~y~~.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section ~~*5.9.3.2,*~~ *5.9.3.5, GS1 symbol specification table 5.~~*GS1 symbol specification table 2.*~~

Symbol placement

All the symbol placement guidelines defined in section *6*.

Unique application processing requirements

For a description of processing requirements, see section *7*.

2.2.3 Multiple logistic units – Global Shipment Identification Number

Application description

- Shipments can comprise one or many logistic units. If the shipment comprises more than one physical object there is no requirement that they are attached together. A shipment number identifies a logical grouping. When a shipment number is read the message is that this physical unit should be associated with any other physical units carrying the same shipment number. Individual physical units carry the SSCC as described in the previous section.
- The Global Shipment Identification Number (GSIN) is assigned by a seller (sender) of the goods and is referenced in the despatch advice and bill of lading, etc. It is a globally unique number that identifies a logical grouping of physical units in a transport shipment. It may be used as a communication reference by all parties in the transport chain, such as in Electronic Data Interchange (EDI) messages where it can be used as a shipment reference and/or a consignor's loading list.
- Note: Shipment and consignment are terms which may be used interchangeably within the transport and logistics sector, however for the purposes of clarity, when referring to multiple logistic unit identification for trade, GS1 uses the term shipment and when referring to multiple logistic unit identification for transport, GS1 uses the term consignment.

GS1 key

~~***Definition***~~***Required***

- ~~The Global Shipment Identification Number (bill of lading~~GSIN ~~) is a number assigned by a seller (sender) of the goods. It provides a globally unique number that identifies a logical grouping of physical units for the purpose of a transport shipment.~~

The GS1 Application Identifier for the GSIN is AI (402), see section *3.2*.

Rules

The data transmitted means that the element string denoting a shipment identification number has been captured. The Global Shipment Identification Number may be processed as stand-alone information where applicable or with other identification data appearing on the same unit. See section 2.2.1 for use of the GSIN in combination with the SSCC.

~~See section *4.10*.~~

Attributes

Required

Not applicable

Commented [CJ76]: WR18-160

Commented [CJ77]: ERv18-037

Commented [CJ78]: WR18-cip1

Commented [CJ79]: WR18-160

Optional

Not applicable

Data carrier specification

Carrier choices

The data carriers used to represent the Global Shipment Identification Number ~~is~~ are the GS1-128,GS1 DataMatrix, or GS1 QR Code barcode symbologiesy.

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

See section *5.9.3.5, GS1 symbol specification table 5*~~*.5.9.3.2, GS1 symbol specification table 2.*~~

Symbol placement

All the symbol placement guidelines defined in section *6*.

Unique application processing requirements

For a description of processing requirements, see section *7*.

Commented [CJ80]: WR18-cip2

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Commented [CJ82]: ERv18-037

2.3 Assets

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. Each company holding a GS1 Company Prefix may assign asset identifiers to the assets or trade items supplied to their customers.

Each company holding a GS1 Company Prefix may assign a Global Returnable Asset Identifier (GRAI) or Global Individual Asset Identifier (GIAI). If the asset is manufactured on behalf of a company best practice may dictate that the manufacturing company applies the GRAI or GIAI during the manufacturing process on behalf of this customer.

Note: Where assets of the same type need to be ordered a GTIN is required for the ordering process. There is no conflict when a GTIN and a GRAI (GS1 Company Prefix, asset type and check digit) have the same digits, because the data carrier (EDI qualifier, GS1 barcode with GS1 Application Identifier, or EPC/RFID) will distinguish between the two GS1 identification keys.

The GS1 asset identifiers act as keys to access the characteristics of an asset stored in a computer file and/or to record movements of assets.

Note: The attributes of the asset should be recorded and shared digitally using the GS1 asset identifier as the key to the information. Examples of the type of information held include the party who owns the asset, the value of the asset, the location of the asset, and the life-cycle history of the asset.

Asset identifiers may be used for applications, such as the location and usership of a given asset (e.g., a personal computer or returnable transport item) or for complex applications, such as recording the characteristics of a returnable asset (e.g., a reusable beer keg), its movements, its life-cycle history, and any relevant data for accounting purposes.

2.3.1 Global Returnable Asset Identifier (GRAI): AI (8003)

Application description

A returnable asset is a reusable package or transport equipment of a certain value, such as a beer keg, a gas cylinder, a plastic pallet, or a crate. The GS1 system identification of a returnable asset, the Global Returnable Asset Identifier (GRAI), enables tracking as well as recording of all relevant data.

The element string comprises the GRAI. The GRAI is composed of the GS1 Company Prefix of the company assigning the asset identifier and of the asset type. The latter is assigned to uniquely identify, together with the GS1 Company Prefix, a particular kind of asset. The GRAI remains the same for all identical Returnable Assets. Although consecutive numbering is recommended, the structure is left to the discretion of the assigning company. An optional serial component may be used to distinguish ~~I~~individual a~~A~~ssets within a given asset type.

A typical application using this element string is in tracking returnable beer kegs. The owner of the beer keg applies a barcode carrying a GRAI to the keg using a permanent marking technique. This barcode is scanned whenever the keg is supplied full to a customer and scanned again when it is returned. This scanning operation allows the beer keg owner to automatically capture the life-cycle history of a given keg and to operate a deposit system, if desired.

Note: This element string identifies a physical entity as a returnable asset. When such a physical entity is used to transport or to contain a trade item, the element string AI (8003) must never be used to identify the transported or contained trade item.

GS1 refers to the GRAI in section 2.1.8~~2.1.82.1.9~~, which deals with medical devices for the Automatic Identification and Data Capture (AIDC) management of these items within the micro-logistics cycle of use, cleaning and sterilisation. See section 2.1.8~~2.1.82.1.9~~ for more details.

GS1 key

~~***Definition***~~***Required***

- ~~The Global Returnable Asset Identifier (~~GRAI~~) is the GS1 identification key used to identify returnable assets. The key is comprised of a GS1 Company Prefix, asset type, check digit, and optional serial component.~~

The ~~structure of the element string for a~~ GRAI ~~can~~ includes two parts: the mandatory asset type identification and an optional serial component.

The GS1 Application Identifier to indicate the Global Returnable Asset Identifier (GRAI) is AI (8003), see~~. See~~ section *3.2* ~~for the list of all GS1 Application Identifiers~~.

Rules

See section *4.5*.

Attributes

~~***Required***~~

~~Not applicable.~~

~~***Optional***~~

~~Not applicable.~~

~~***Rules***~~

~~See section 4, Application rules.~~Not applicable

Data carrier specification

Carrier choices

The GS1 data carriers that can be used to represent the GRAI are:

- GS1-128.
- GS1 DataMatrix.
- GS1 QR Code.
- EPC/RFID.

When encoding an asset identifier for medical devices see section *2.1.8*~~*2.1.8*~~*2.1.9*.

When applying direct part marking, also see the information in section *2.1.10*~~*2.1.10*~~*2.1.11*.

Symbol X-dimension, minimum symbol height, and minimum symbol quality

For GS1-128, GS1 DataMatrix and GS1 QR Code, see section *5.9.3.9 GS1 symbol specification table 9* and section *5.9.3.7 GS1 symbol specification table 7* (direct part marking).

Symbol placement

Not applicable.

Unique application processing requirements

For a description of processing requirements, see section *7*.

2.3.2 Global Individual Asset Identifier (GIAI): AI (8004)

Application description

In the GS1 system, an individual asset is considered a physical entity made up of any characteristics.

This element string identifies a particular physical entity as an asset. It must not be used for other purposes and must be unique for a period well beyond the lifetime of the relevant asset records. Whether or not the assigned Global Individual Asset Identifier (GIAI) may remain with the asset

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when changing hands depends on the particular business application. If it remains with the asset it SHALL never be reused.

The GIAI comprises the GS1 Company Prefix of the company assigning the asset identifier and an individual asset reference (see section 3). The individual asset reference is alphanumeric. Its structure is left to the discretion of the asset owner or manager.

This element string might, for example, be used to record the life-cycle history of aircraft parts. By symbol marking the GIAI, AI (8004), on a given part, aircraft operators are able to automatically update their inventory database and track assets from acquisition until retirement.

GS1 refers to GIAI in the section 2.1.8~~2.1.82.1.9~~, which deals with Automatic Identification and Data Capture (AIDC) for medical devices within the micro-logistics cycle of use, cleaning and sterilisation. See section 2.1.8~~2.1.82.1.9~~ for more details.

GS1 key

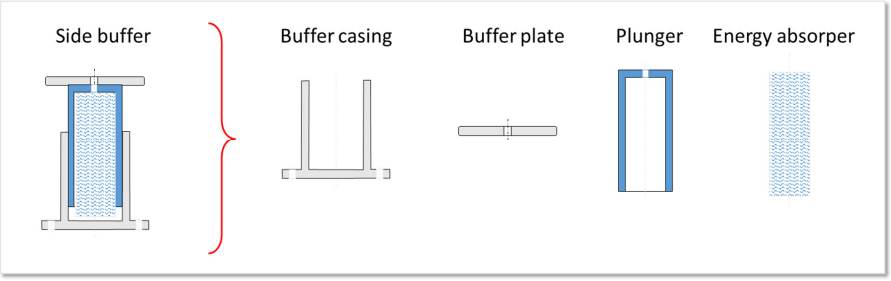
~~**Definition**~~**Required**

- ~~The Global Individual Asset Identifier (~~GIAI~~) is the GS1 identification key used to identify an individual asset. The key is comprised of a GS1 Company Prefix and an individual asset reference.~~

The GS1 Application Identifier to indicate the Global Individual Asset Identifier (GIAI) is AI (8004), see~~. See~~ section 3.2~~. for the list of all GS1 Application Identifiers~~.

Note: The GIAI of assemblies (composite components) may need to be marked on a component of the assembly (the so called leading part) when there is no dedicated space to mark the GIAI on the assembly itself. For example, the GIAI of a *side buffer* of a rail vehicle may be included in a separate marking on the *buffer casing*, in addition to the marking of the *buffer casing* itself. To be able to recognise the marking of the assembly AI (7023) SHALL be used to indicate the GIAI of the assembly.

Figure 2.3.2-1. Example: Side buffer (assembly) with buffer casing (leading part)



Rules

See section 4, Application rules.

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

~~See section 4, Application rules (none is currently identified).~~Not applicable

Commented [CJ85]: WR18-cip1

Commented [CJ86]: ERv18-012

Data carrier specification

Carrier choices

The GS1 data carriers that can be used to represent the GIAI are:

- GS1-128.
- GS1 DataMatrix.
- GS1 QR Code.
- EPC/RFID.

When encoding an asset identifier for medical devices see section 2.1.8~~2.1.8~~2.1.9.

When applying direct part marking, also see the information in section 2.1.10~~2.1.10~~2.1.11.

Symbol X-dimension, minimum symbol height, and minimum symbol quality

For GS1-128, GS1 DataMatrix and GS1 QR Code, see section 5.9.3.9 *GS1 symbol specification table 9* and section 5.9.3.7 *GS1 symbol specification table 7* (direct part marking).

Symbol placement

Not applicable

Unique application processing requirements

For a description of processing requirements, see section 7.

2.4 Locations and parties

The Global Location Number (GLN) provides a unique and unambiguous identification of:

1. Physical Locations - A site (an area, a structure or group of structures) or an area within the site where something was, is, or will be located.

The identification of physical locations is an essential element for supply chain visibility. A GLN assigned to a physical location always has a permanent and identifiable geographical address regardless of any business process roles conducted at the site.

2. Digital Locations - A digital location represents an electronic (non-physical) address that is used for communication between computer systems.

Just as the exchange of physical goods is a transaction between companies, the exchange of data is a transaction between systems, for example the delivery of an invoice by EDI or email to an accounting system.

3. Legal Entities – Any business, government body, department, charity, individual or institution that has standing in the eyes of the law and has the capacity to enter into agreements or contracts.

4. Functions – An organisational subdivision or department based on the specific tasks being performed, as defined by the organisation.

Legal entities and functions can engage as **parties** in business processes. The use of Global Location Numbers (GLNs) in these areas is driven by the exact role of each party within a given business process.

2.4.1 GLN definition

The GLN enables the unique and unambiguous identification of any type of location used in business processes. Identification in this manner is a prerequisite for efficient communication between trading partners. A GLN acts as a database key which references location specific information that is repeatedly applied. Its function is to reduce input errors and increase efficiency.

Each company or organisation that is a member of a GS1 Member Organisation may use GLNs to identify locations under the terms of its membership. Contact details for all GS1 Member Organisations are available on the GS1 website, *www.gs1.org*.

In some countries, GS1 Member Organisations administer national GLN databases, known as GLN registries, provide a common list of GLNs registered within that country. However, the company issuing these GLNs is responsible for keeping business partners informed of all GLNs related to the trading relationship. Special care is needed if company ownership or structure changes (see section *1.6*).

In business operations, location numbers are of no value if they are not associated with business attributes. The attributes of the location ideally should be established as part of master data management using the GLN as the key to the information.

For rules on GLN allocation, see section *4.2.4*.

2.4.2 GLN in electronic data sharing standards

The GLN is widely used in the sharing of electronic data between companies, since it enables unambiguous identification of the parties, locations and systems. Therefore the GLN is a foundational key in the related GS1 standards.

Note: The *GS1 General Specifications* provides a high level overview of the electronic data sharing standards and applications. For further information, please consult the relevant GS1 standard.

EDI

Electronic Data Interchange (EDI) ideally uses Global Location Numbers (GLNs) to identify all trading partners and physical locations involved. Also the EDI mailbox or network address for

companies is often identified with a GLN. The EDI standards promoted by the GS1 system (EANCOM, GS1 XML) make full use of GLNs to simplify the automation of business messaging.

GLNs and associated information of trading partners are communicated at the start of the relation through the party information message (PARTIN). GLNs are then used during the trading relationship in any other business message, such as invoice, order, pay, or deliver.

GDSN

Data pools and the GS1 Global Registry that links them for the purpose of global data synchronisation mandate the use of GLNs to identify each party that provides information to any data pool or who requires information about products and locations.

Note: The *GS1 General Specifications* do not provide details on business messages or the Global Data Synchronisation Network (GDSN). For further information, please consult the relevant GS1 standard.

EPCIS

Electronic Product Code Information Services (EPCIS) is a GS1 Standard that defines a common data model for visibility data and interfaces for capturing and sharing visibility data within an enterprise and across an open supply chain. GS1 EPCIS implementations use the GLN to identify Read Points and Business Locations. A Read Point indicates the specific location at which an event took place, and thereby the whereabouts of objects at the time of a given event. A Business Location indicates the specific place of objects following a given event.

2.4.3 Application overview

The GLN is used in applications that cover the electronic sharing of location information and the automatic identification and data capture (AIDC). The following applications focus on the use of the GLN in AIDC applications. Three broad categories of use of the GLN exist:

1. Identification of a physical location, for example through a label attached to a loading dock or to a shelf location in a warehouse.
2. Specification of a delivery location, for example a ship to location on a logistics label.
3. Specification of a party, for example the invoicing party on a payment slip.

2.4.4 Identification of a physical location

Application description

The following GS1 Application Identifiers enable the identification of a physical location using a data carrier present at the location itself:

- AI (414) Physical Location
- AI (254) GLN extension component

AI (414) Physical location

The GLN can be used to identify a physical location represented in a data carrier on the location itself. Physical locations may, for example, be a room, a door of a warehouse, an x-ray room in a hospital, or a control point.

The element string may be used to record and confirm presence at a given location for any purpose. An equivalent field will hold this information in electronic messages.

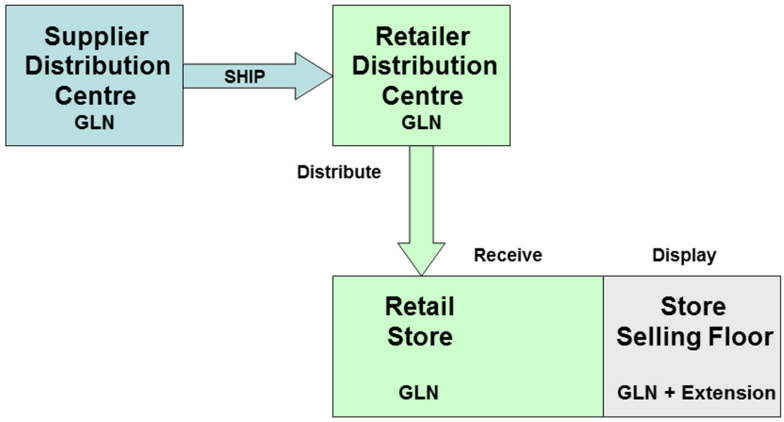
AI (254) GLN extension component

Business processes causes objects (products, assets, or other equipment) to move from one physical location to another. The ability to have visibility of these movements is an essential element in any supply chain. These physical locations can be a site such as a distribution centre or a specific location within the site such as a selling floor, a room in a hospital or a yard of a warehouse; it can even be as granular as a specific area on a shelf.

The GLN extension component may be used to identify internal physical locations within a location identified with a GLN (e.g., stores, factories, buildings). A company may alternatively choose to assign a unique GLN, without an extension component, as a way to identify these locations.

The following figure illustrates just one likely example; it is not the only normative solution.

Figure 2.4.4-1. Physical locations in a logistic process



Important:

- The use of GLN + GLN extension component is restricted to physical locations.
- The GLN extension component may be communicated to trading partners, by mutual agreement.
- If the GLN + GLN extension component are used to identify locations within the site, each sub-location identification SHALL follow the same allocation rules defined for the physical location GLN, see section *4.2.4*.

GS1 key

~~***Definition***~~***Required***

Commented [CJ87]: WR18-cip1

- ~~The Global Location Number (~~GLN~~) is the GS1 identification key used to identify physical locations or parties. The key is comprised of a GS1 Company Prefix, location reference, and check digit.~~

~~Identification of a Physical Location - Global Location Number: AI (414)~~

Rules

All GLN rules described in section *4.2.4*.

Attributes

Required

Not applicable

Optional

The extension component may be used to identify internal physical locations within a location identified with a GLN (e.g., stores, factories, buildings). The use of GLN extension component is restricted to physical locations.

The GLN extension component may be communicated to trading partners, by mutual agreement.

The GS1 Application Identifier (254) is used to represent the GLN extension component in conjunction with AI (414).

For more information, see section 3.2 for the list of GS1 Application Identifiers.

Rules

See section 004.14.2.

Data carrier specification

Carrier choices

The GS1 data carriers that can be used to represent the GLN or GLN + GLN extension component are:

- GS1-128
- GS1 DataMatrix
- GS1 QR Code
- EPC/RFID

Note: GS1's *EPC Tag Data Standard* (TDS) defines the SGLN as a Global Location Number (GLN), with or without the optional extension (AI 254), which is used to identify physical locations. Examples of such locations include a specific building or unit of shelving within a warehouse. For more information on EPC carriers see the *EPC Tag Data Standard*

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.9, *GS1 symbol specification table 9*.

Note: For location marking barcodes may be printed at a higher maximum X-dimension: GS1-128 at 1.016 mm (0.0400 inches), GS1 DataMatrix and GS1 QR Code at 1.520 mm (0.0600 inches).

Symbol placement

Not applicable

Unique application processing requirements

For a description of processing requirements, see section 7.

2.4.5 Specification of a physical location

Application description

The following GS1 Application Identifiers enable the specification of a physical location on a label or document, relative to its role in a business process:

- AI (410) Ship to - Deliver to.
- AI (413) Ship for - Deliver for.
- AI (416) Production or service location

AI (410) Ship to - Deliver to

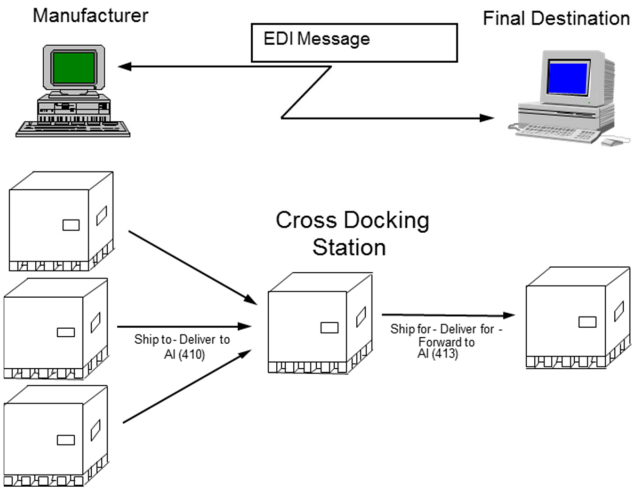
An element string with GS1 Application Identifier AI (410) represents the Global Location Number (GLN) of the recipient of a logistic unit. The GLN refers to the address where a particular transport unit identified with an SSCC is to be delivered. This element string is used in single leg transport operations. A logistic unit may include a barcode carrying the GLN of the unit's intended destination. When scanning this element string, the data transmitted may be used to retrieve the related address and/or to sort the item by destination.

AI (413) Ship for - Deliver for

An element string with GS1 Application Identifier AI (413) is used by the consignee for determining the internal or subsequent final destination of a physical unit.

Cross docking is a typical application using this element string. Here, a barcode carrying the element string AI (410) is placed on a logistic unit at the point of creation to direct the goods to the intermediate destination (e.g., a distribution centre). The element string AI (413) is also carried by the barcode to direct the goods to their final destination (e.g., a retail store served by the distribution centre).

Figure 2.4.5-1. Example of a cross docking application



AI (416) GLN of the production or service location

An element string with a GS1 Application Identifier AI (416) represents the Global Location Number (GLN) of the production or service location. It may for example be used to specify the location where a trade item or asset was produced or refurbished.

GS1 key

Commented [CJ88]: WR18-cip1

~~***Definition***~~***Required***

- ~~The Global Location Number (~~GLN~~) is the GS1 identification key used to identify physical locations or parties. The key is comprised of a GS1 Company Prefix, location reference, and check digit~~.

Rules

All GLN rules described in section 4.2.4.

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

If the GLN is carried in a barcode or EPC/RFID tag on a product, the rules for trade item applications apply, see section 2.1.

If the GLN is carried in a barcode on a GS1 Logistics Label, the rules for logistic unit applications apply, see section 2.2.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.4.6 Specification of a party

Application description

The following GS1 Application Identifiers enable the specification of a party on a label or document, relative to its role in a business process:

- AI (411) Bill to - Invoice to.
- AI (412) Purchased From.
- AI (415) Invoicing Party.
- AI (703*) Approval Number of processor (with ISO country code '999').

AI (411) Bill to – Invoice to

An element string with GS1 Application Identifier AI (411) represents the Global Location Number (GLN) of the addressee of an invoice. The GLN refers to the name and address of the business partner to which an entity shall be invoiced and includes accounting-related information that may be used wherever required.

AI (412) Purchased from

In business it is sometimes important to know from where a particular item was purchased. Applied on a trade item, an element string with GS1 Application Identifier AI (412) provides the Global Location Number (GLN) of the company from which the respective trade item has been purchased.

AI (415) Invoicing party

An element string with GS1 Application Identifier AI (415) is used to indicate the Global Location Number (GLN) of the invoicing party. The GLN is mandatory information for the payment slip application (see section 2.6.6).

AI (703*) Number of processor

An element string with GS1 Application Identifier (703s) represents the ISO country code and approval number or GLN of the processor of a trade item. If '999' is entered as the ISO country code it signifies that the subsequent data is a Global Location Number (GLN), and not an 'approval number'.

As an attribute of a trade item the number of processor must be processed together with the GTIN of the trade item to which it relates. See section 3.8.16 for more information.

GS1 key

~~***Definition***~~***Required***

Commented [CJ89]: WR18-cip1

- ~~The Global Location Number (~~GLN~~) is the GS1 identification key used to identify physical locations or parties. The key is comprised of a GS1 Company Prefix, location reference, and check digit.~~

Rules

All GLN Rules described in section 4.2.4.

Attributes

Commented [CJ90]: WR18-cip1

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

If the GLN is carried in a barcode on a product, the rules for trade item applications apply, see section 2.1.

If the GLN is carried in a barcode on a GS1 Logistic~~s~~ Label, the rules for logistic unit applications apply, see section 2.2.

If the GLN is carried in a barcode on a payment slip the rules for the payment slips application apply, see section 2.6.6.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.5 Service relationships

Application description

The Global Service Relation Number (GSRN) is a non-significant number used to identify the relationship between an organisation offering services and the individual entities providing or benefitting from the services. The GSRN provides unique and unambiguous identification. It is the key to accessing information, stored on computer systems, relevant to service(s) provided and received and in some cases, these services could be recurring. The GSRN may also be used for referencing information transferred via Electronic Data Interchange (EDI).

When using the GSRN, often two types of relationships may need to be captured in one transaction:

1. The relationship between the organisation offering the service and the actual recipient of the service.
2. The relationship between the organisation offering the service and the actual provider of the service.

It should be noted that the GSRN is not meant to identify a single service as a trade item, neither is it used to identify a physical unit as a trade item. It may identify a physical unit for service purposes (e.g., a computer with a service agreement).

2.5.1 Global Service Relation Number – Provider: AI (8017)

An element string with GS1 Application Identifier AI (8017) represents the Global Service Relation Number of a relationship between the organisation offering the service and the provider of the service. Some examples of how the GSRN can be used to identify the service relationships are:

- A medical procedure, where it could be used to identify an individual medical provider by role. For identification of the individual provider of care, the hospital or the appropriate authority generates a GSRN with AI (8017) for each of its caregivers and encodes it in an appropriate GS1 Data carrier (barcode) symbol on the caregiver's ID card, work station, work order, etc. In this case, the GSRN would ensure non-significant identification management, securing identification uniqueness and also allowing linkage to local rule management systems.
- A service agreement, where it could be used to manage agreed upon services, such as maintenance services for a television or computer.
- A loyalty program required to identify the service relationship between the loyalty program and the service provider (i.e. company providing merchandise due to use of loyalty points).
- A hospital administration can identify the service relationship between hospital and the doctor, nurses, etc.

GS1 key

~~***Definition***~~***Required***

Commented [CJ91]: WR18-cip1

- ~~The Global Service Relation Number is the GS1 identification key used to identify the relationship between an organisation offering services and the recipient or provider of services. The key is comprised of a GS1 Company Prefix, service reference and check digit.~~GSRN

See section *3.2*, *Global Service Relation Number AI (8017) and AI (8018)* for the definition of the GS1 Application Identifier.

Rules

See section *4.2.5*, *GSRN rules*.

Attributes

Required

Not applicable

Optional

AI (8019) *Service Relation Instance Number*, section *3.2*

Rules

Not applicable

Data carrier specification

Carrier choices

The data carrier~~s~~ choices for this application are:

~~the Global Service Relation Number (GSRN) are the~~

- GS1 DataBar Expanded~~,~~
- GS1 DataBar Expanded Stacked~~,~~
- GS1-128~~,~~
- GS1 DataMatrix ~~and~~
- GS1 QR Code ~~symbologies.~~

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section *5.9.3.11*, *GS1 symbol specification table 11*

Symbol placement

No standard placement is required.

Unique application processing requirements

For a description of processing requirements, see section *7*.

2.5.2 Global Service Relation Number – Recipient: AI (8018)

An element string with GS1 Application Identifier AI (8018) represents the Global Service Relation Number of a relationship between the organisation offering the service and the recipient of the service. Some examples of how the GSRN can be used to identify the service relationships are:

- A hospital admission, where it could be used to identify a subject of care globally and uniquely for AIDC purposes and establish an identification uniqueness that does not harm privacy. For identification of the subject of care (patient) the hospital generates a GSRN with AI (8018) for each of its patients and encodes it in an appropriate GS1 Data carrier (barcode) on the patient's wristband as well as his or her corresponding medical record, pathology samples, etc. The GSRN may then be used as the key to link multiple or specific instances of treatment, room charges, medical tests, and patient charges.
- A membership in a frequent flyer programme, where it could be used to record awards, claims, and preferences.
- A membership in a loyalty scheme, where it could be used to record visits, purchase value, and awards.
- A membership in a club, where it could be used for recording entitlements, use of facilities, and subscriptions.
- A loyalty program required to identify the service relationship between the loyalty program and the recipient of the loyalty program (the end user or customer who earns loyalty points).
- Patient admission to a hospital can identify the service relationship between the hospital and the patient.
- Utility networks, such as those providing electricity, gas or water, where it could be used to identify the relationship between network service providers and suppliers of utility products.
- A GSRN could be used to give students access to other libraries that have formed a cooperative lending agreement. A typical application is the identification of membership in a student library. The library would issue all members a card that includes a unique GSRN identifying the relationship between the library and a student. The library would then scan the GSRN whenever a book was lent or returned. The Electronic Message from the scanner would then be used to

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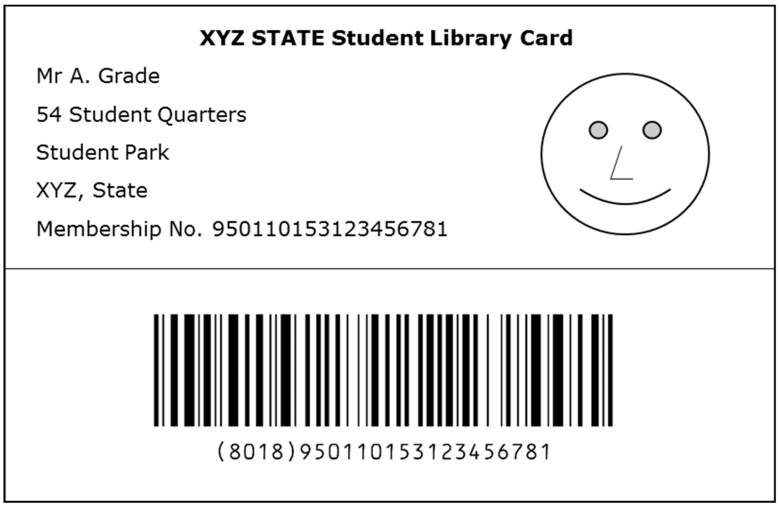
automatically update the library's stock management database. See the figure below for an example of how the service relationship identifier would appear on this membership card.

Figure 2.5.2-1. Example of GSRN on a membership card



GS1 key

~~***Definition***~~***Required***

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- GSRN~~The Global Service Relation Number is the GS1 identification key used to identify the relationship between an organisation offering services and the recipient or provider of services. The key is comprised of a GS1 Company Prefix, service reference and check digit.~~

See section *3.2*, *Global Service Relation Number AI (8017) and AI (8018)* for the definition of the GS1 Application Identifier.

Rules

See section *4.2.5*, *GSRN rules*.

Attributes

Required

Not applicable

Optional

AI (8019) Service Relation Instance Number, see section *3.2*.

Rules

Not applicable

Data carrier specification

Carrier choices

The data carrier choices for this application are:~~s for the Global Service Relation Number (GSRN) are the~~

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- GS1 DataBar Expanded~~,~~
- GS1 DataBar Expanded Stacked~~,~~

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- GS1-128~~,~~
- GS1 DataMatrix
- ~~, and~~ GS1 QR Code ~~symbologies.~~

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.11, *GS1 symbol specification table 11*

Symbol placement

No standard placement is required.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.5.3 Service Relation Instance Number: AI (8019)

When a product or service is administered (e.g., a particular treatment is given) it can easily be associated with the patient by scanning the Global Trade Item Number (GTIN) of the product or service as well as the caregiver's GSRN (barcoded with AI (8017)) and the patient's GSRN (barcoded with AI (8018)). If the subject of care identification needs to, optionally, be made more granular with a sequence indicator corresponding to each encounter during the episode of care, attribute data in the form of a Service Relation Instance Number (GS1 Application Identifier AI (8019), see section 3.2) may be added. This would, for example, allow differentiation of subject of care identification captured from an identification band, both before and after its replacement (i.e. radiology examination). If the treatment plan requires different instances of care, such as chemotherapies, and when a record should be captured for each instance, the SRIN linked to the GSRN may be used.

2.6 Special applications

2.6.1 Coupons

A coupon is a digital or paper based voucher that can be redeemed at the point-of-sale for a cash value or free item. Coupon identification is organised at the local level. Determining the data structure of a coupon is, therefore, the responsibility of the GS1 Member Organisations for their area of jurisdiction.

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

All GS1 system coupon standards presented here allow for coupon validation (e.g., to check whether the item(s) covered by the coupon is within the customer's order).

If either validation or value look up is performed, manufacturers must advise their distributors and retailers of the impending issue of a coupon so that retailers' files can be updated to process the information at the point-of-sale.

A GS1 system coupon number is used for numbering promotional coupons for manufacturers and retailers as well as tokens with monetary value, such as gift tokens, book tokens, food stamps, luncheon vouchers, and social security tokens.

The structure of GS1 system coupon numbers ensures uniqueness against all other GS1 system numbers only when used within the monetary area of the appropriate GS1 Member Organisation(s).

2.6.2 Coupons identified using the Global Coupon Number

2.6.2.1 Paper coupons

Application description

A paper coupon is a physical representation that is distributed and presented in hard-copy form, and can be exchanged for a financial discount or for loyalty points when making a purchase.

Paper coupons may be identified by a Global Coupon Number (GCN) assigned by the coupon issuer. The GCN comprises a GS1 Company Prefix followed by a coupon reference. It may be supplemented by an optional serial number.

Before implementing the Global Coupon Number to identify paper coupons, it is advised that the issuer of the coupons confirm the acceptance of the Global Coupon Number with their trading partners. Several options exist for coupons with restricted geographic distribution that may be preferred method of identifying coupons, see section 2.6.3.

GS1 key

~~***Definition***~~***Required***

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- ~~The Global Coupon Number is the GS1 identification key that provides a globally unique identification for a coupon, with an optional serial number.~~GCN.

The GS1 Application Identifier to indicate the Global Coupon Number (GCN) is AI (255) (see section 3.2 ~~for a list of all GS1 Application Identifiers~~).

Rules

All the GCN application rules described in section 4.

Attributes

Required

Not applicable

Optional

To provide additional information to the Global Coupon Number, the following AIs can be used: AI (17) Expiration date, AI (390N) Coupon value – Single monetary area or AI (394n) Percentage discount of a coupon or AI (8111) Loyalty points of a coupon (see section 3).

Data carrier specification

Carrier choices

- GS1 DataBar

Symbol placement

Not applicable

Examples

Example 1 Coupon with GCN

Coupon barcode contains AI (255) GCN (serialised) which serves as database access to all relevant coupon data.

Example 2 Coupon with GCN and free gift amount

Coupon barcode contains AI (255) GCN (serialised) and AI (3900) AMOUNT with value "000" which indicates a free gift. In order to process this coupon value correctly as free gift the till software needs to be adjusted accordingly.

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Example 3 Coupon with GCN, expiration date and coupon value

Coupon barcode contains AI (255) GCN, AI (17) EXPIRY and AI (3902) AMOUNT (two decimals)

Example 4 Coupon with GCN and loyalty points

Coupon barcode contains AI (255) GCN (serialised) and AI (8111) POINTS

Example 5 Coupon with GCN and percentage discount

Coupon barcode contains AI (255) GCN and AI (3941) PRCNT OFF (one decimal)

2.6.2.2 Digital coupons

Application description

A digital coupon is an electronic presentation that is distributed and presented without manifesting as "paper" or in other hard-copy form, and can be exchanged for a financial discount or for loyalty points when making a purchase. GS1 global standards enable efficient digital coupon processes for the benefit of:

Brands who can execute offers in the same way in multiple countries and with multiple retailers. Brands can have more relevant/targeted marketing and campaign opportunities tied to specific factors (ex. Location, consumer, products, interest, and interaction with media).

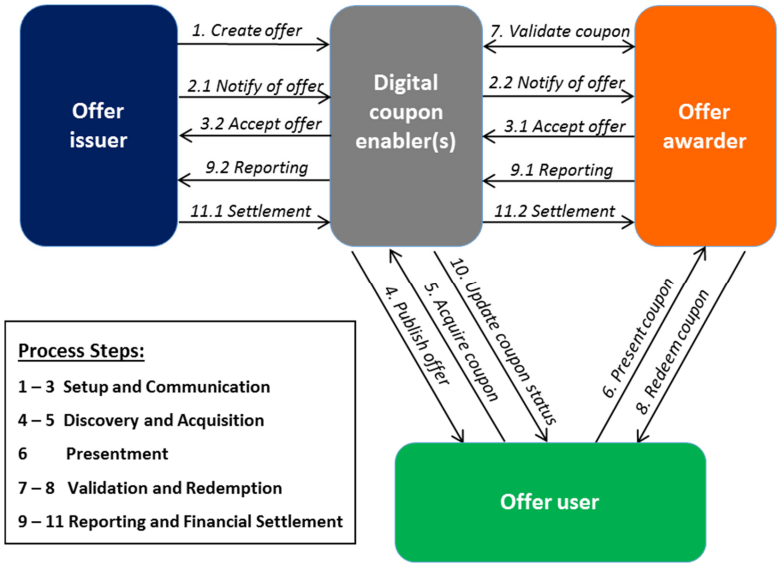
Mobile industry and solution providers who will have a baseline and one standard to implement rather than multiple.

Retailers who can accept offers from coupon issuers in one rather than multiple ways and can understand how to configure (and possibly upgrade) the POS system. Retailers can also accept digital coupons acquired from multiple distributions channels, process them in a uniform and standard way, and integrate where appropriate with their loyalty system.

Consumers who will have a consistent and a satisfying experience when they manage their coupon offers (digital coupons are searchable, sort-able, allowing customers to browse by merchant, category, offer date, and other criteria).

The following diagram illustrates the digital coupon management process. The process is specified in detail in the *Digital Coupon Management Standard Specification Document*.

Figure 2.6.2.2-1. Digital coupon management process



2.6.2.2.1 Relation with existing coupon specifications

The digital coupons specification will co-exist in the foreseeable future with coupon specifications described in section 2.6.3 that are restricted to national or common currency regional applications specified by the respective GS1 Member Organisations.

2.6.2.2.2 Identification requirements for digital coupons

The digital coupon management process specifies the following identification requirements:

- Parties, e.g., offer issuer, digital coupon enabler, retailer, SHALL be identified with a GLN.
- Digital coupons are always related to offers and promotions on products or services. Products as well as services shall be identified with a GTIN.
- Digital coupons may be managed in conjunction with loyalty cards. If appropriate, consumer loyalty cards accounts may be identified with a GSRN.

Digital coupons SHALL be identified by a Global Coupon Number assigned by the coupon issuer. The GCN comprises a GS1 Company Prefix followed by a coupon reference. It may be supplemented by an optional serial number.

GS1 key

~~***Definition***~~***Required***

Commented [CJ96]: WR18-cip1

- ~~The Global Coupon Number (GCN) is the GS1 identification key that provides a globally unique identification for a coupon, with an optional serial number.~~GCN

The GS1 Application Identifier to indicate the Global Coupon Number (GCN) is AI (255) (see section *3.2* for a list of all GS1 Application Identifiers).

Rules

All the GCN Application Rules described in section *4*.

Attributes

Required

Not applicable

Optional

Not applicable

Data carrier specification

Carrier choices

Data carrier specifications for the GCN were out of scope and therefore not addressed when this standard was developed. Local implementations may choose to use the GS1 DataBar to carry the coupon identifier, as it is the only carrier that is capable of holding the identifier structure that is approved for POS use within the GS1 system.

Symbol placement

Not applicable

2.6.3 Coupons with restricted geographic distribution

2.6.3.1 General rule

GS1 system coupon identification specifications are flexible and have been designed to cater to current and future requirements.

Due to the nature of coupon numbering, a range of national solutions is offered, each of which is defined by the respective GS1 Member Organisation. National coupon solutions are not unique worldwide and must be operated in the restricted area defined by the GS1 Member Organisation.

In the interest of consistency and to avoid misinterpretation by equipment vendors, when defining national specifications, GS1 Member Organisations SHOULD include appropriate mention of all GS1 system coupon data structures.

Coupon reference numbers must not be reused for a period of three years.

2.6.3.2 Recommendation on allocating coupon reference numbers

The exact method used to allocate GS1 system coupon reference numbers is left to the discretion of the issuing organisation. However, the GS1 US Coupon Code must be unique for each individual promotion. For ease of administration, coupon reference numbers SHOULD be allocated sequentially.

2.6.3.3 Coupon identification for restricted geographic distribution (GS1 Prefix 99)

Application description

A coupon is a voucher with a cash value that is deducted at the point-of-sale. It is sometimes associated with a specific trade item. Coupon identification is organised on a national level and is therefore not unique worldwide. The specification of the coupon data structure in the element string is the responsibility of each GS1 Member Organisation. The internationally agreed standard for GS1 system coupon numbers is shown in the figure below.

Figure 2.6.3.3-1. Format of the element string

GS1 Prefix	Coupon data (structure determined by GS1 Member Organisation)	Check digit
9 9	N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}	N_{13}

The GS1 Prefix 99 denotes the element string for GS1 coupon identification.

The structure of the coupon data field is determined according to the needs of a particular country. Mandatory components are the coupon issuer number and the coupon reference number. Other useful data are the redemption value in real or encoded format and codes for the decimal point or tax rates.

The check digit is explained in section *7.9*. Its verification, carried out automatically by the barcode reader, ensures that the data corresponds with the verification rules.

The data transmitted from the barcode reader means that the data of a coupon has been captured. Processing of coupons at a point-of-sale usually consists of validity checks and deduction of its value.

Within this agreed standard for GS1 system coupon numbers, each GS1 Member Organisation is free to develop a national coupon solution. Four recommended structures provide a degree of equipment standardisation. These recommended structures are shown in the figure below.

Figure 2.6.3.3-2. Recommended coupon data structures

GS1 Prefix	Recommended coupon data structures (exact structure determined by GS1 Member Organisation)	Check digit
9 9	Y Y Y Y R R R V V V	C
9 9	Y Y Y R R R V V V V	C
9 9	Y Y Y Y Y R R R T T	C
9 9	Y Y Y Y Y R R R R R	C

Where:

Y = Coupon issuer number (issued by the GS1 Member Organisation).

R = Coupon reference number (allocated by a coupon issuer).

V = Redemption value.

T = Value code (standardised by the GS1 Member Organisation).

C = Check digit calculated according to the standard algorithm.

The GS1 Member Organisations or retailers may require that the third digit of the coupon numbers (99*0* to 99*9*) be programmable in order to cope with specific demands such as:

- Taxable or non-taxable coupons.
- Different currencies.

- Indication of the decimal position.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

- ~~A coupon with the GS1 Prefix 99 is carried by the~~ EAN-13 ~~barcode.~~

~~The system recognises this element string by the symbology identifier **]E0** and the GS1 Prefix.~~

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

For a description of processing requirements, see section 7.

2.6.3.4 GS1 common currency coupon identification (GS1 Prefixes 981 to 983)

A coupon is a voucher with a cash value that is deducted at the point-of-sale. It is sometimes associated with a specific trade item. Coupon identification is normally organised on a national level using the GS1 Prefix 99. However, for a common currency area, coupon identification is organised between participating countries. Determining the coupon data structure in the element string is the responsibility of all the GS1 Member Organisations in the common currency area. The GS1 Prefixes 981 to 983 have been released for use with coupons expressing a value in a common currency.

The structure of the coupon data positions is determined according to the needs of a particular set of countries. Mandatory components are the coupon issuer number and the coupon reference number. Further useful data is the redemption value in real or encoded format and numbers for the decimal point or tax rates.

The check digit is explained in section 7.9. Its verification, carried out automatically by the barcode reader, ensures that the data corresponds with the verification rules. The internationally agreed standard for GS1 common currency coupon codes is shown in the figure below.

Figure 2.6.3.4-1. Format of the element string

GS1 Prefix	Coupon data (structure determined by GS1 MOs in common currency area)	Check digit
9 8 1 - **9 8 3**	N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}	N_{13}

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Within this structure, GS1 Member Organisations in a common currency area SHOULD develop a common coupon solution that is valid throughout the common currency area.

2.6.3.5 Use of GS1 common currency coupon code for the euro

Application description

At present the only application of GS1 Prefixes 981, 982 and 983 is for the euro. Within the euro area, coupon issuer numbers are administered by:

GS1 BELGIUM • LUXEMBOURG
Rue Royale 76 b1
1000 Brussels
Belgium
Tel: + 32.2.229.18.80
Fax: + 32.2.217.43.47
Contact: *info@gs1belu.org*

See the figure below for the coupon data structure in the euro area.

Figure 2.6.3.5-1. Format of the element string

GS1 Prefix	Coupon data			Check digit
9 8 1	Y_1 Y_2 Y_3 Y_4	R_1 R_2	E E **,** E	C
9 8 2	Y_1 Y_2 Y_3 Y_4	R_1 R_2	E **,** E E	C
9 8 3	Y_1 Y_2 Y_3 Y_4	R_1 R_2	E **,** E E	C

Y = Coupon issuer number (issued by a GS1 Member Organisation).
R = Coupon reference number (allocated by a coupon issuer).
E = Redemption value (expressed in euro); value 000 indicates free gift.
C = Check digit calculated according to the standard algorithm.

Note: The only difference between the two structures is the position of the implied decimal point.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

Carrier choices

- ~~A coupon with the GS1 Prefix 981, 982 or 983 is carried by the~~ EAN-13 ~~barcode.~~

~~The system recognises this element string by the symbology identifier **]E0** and the GS1 Prefix. The data transmitted from the barcode reader means that the data of a common currency coupon has~~

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been captured. Processing of coupons at a point-of-sale usually consists of validity checks and deduction of its value.

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

Processing of coupons at a point-of-sale usually consists of validity checks and deduction of its value.For a description of processing requirements, see section 7.

2.6.3.6 Coupon code identification for use in North America (AI 8110)

Application description

This GS1 Application Identifier has replaced the GS1 US Prefix 5 system in 2011. The new system has been rolled out for paper coupons.

See GS1 US for the *North American Coupon Application Guideline using GS1 DataBar Expanded Symbols* for detailed information on GS1 US coupon code data content.

A stimulus for change is the fact that GS1 US has begun issuing variable-length GS1 Company Prefixes and retailers are expected to accept imported products identified with GS1 Company Prefixes. Both changes will lead to an increasing number of coupon mis-redemptions if the full Company Prefix is not processed. This will impact retailers, manufacturers, and coupon processing agents.

The new coupon format has a large number of fields (many of them optional) for specifying the more complex coupon offers in use today. Data encoded in the coupon barcode is used to identify the source (typically a manufacturer) producing the coupon, the conditions for fulfilling the offer and the specific save value offered to the consumer.

2.6.3.7 Paperless Coupon code identification for use in North America (AI 8112)

Application description

See GS1 US for the North American Coupon Application Guideline using GS1 DataBar Expanded Symbols for detailed information on GS1 US coupon code data content.

When a transaction occurs at the point-of-sale the record of the transaction is the cash in the drawer, this is reconciled against the transaction log in the retailers accounting system. When a coupon is presented and redeemed, the coupon is treated just like cash and it also is used to reconcile the cashiers till. When a paperless coupon is accepted and redeemed at point of sale there is no record of the transaction as there is for paper coupons and cash transactions. If a paperless coupon is presented using the same GS1 Application Identifier as is used for paper coupons the reconciliation process and the audit requires the paper backup. If a paperless coupon is presented using its own AI, the requirement for a paper backup is not required, since the transaction log will note that the coupon is paperless.

The paperless coupon format has a large number of fields (many of them optional) for specifying the more complex coupon offers in use today. Data transmitted is used to identify the source (typically a manufacturer) producing the paperless coupon, the conditions for fulfilling the offer and the specific save value offered to the consumer.

2.6.4 Refund receipts

Application description

Refund receipts are vouchers produced to automate payment for returned empty containers. Refund receipts automate and expedite the handling of empty containers (e.g., bottles, crates) that have a refund value in a retail store.

When customers return empty containers (that have a refund value), the containers have to be checked and valued. This process can be done manually or by automated equipment capable of handling empty containers. When the returned containers have been valued, a refund receipt is printed and given to the customer. The customer presents the refund receipt at the store checkout, and the corresponding amount is refunded in cash or deducted from the customer's bill.

An EAN-13 barcode can be printed on the refund receipt to encode the required data including a security number and the monetary value.

The structure of refund receipts ensures uniqueness against all other GS1 system ID numbers only when used within the restricted environment defined by the appropriate GS1 Member Organisation.

The GS1 Prefix 980 has been released for use with refund receipt data. The internationally agreed standard for GS1 system refund receipt data is shown in the figure below.

Figure 2.6.4-1. Format of the element string

GS1 Prefix	Refund receipt data (structure determined by GS1 Member Organisation)	Check digit
9 8 0	N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}	N_{13}

Within this structure, each GS1 Member Organisation develops its own national refund receipt solution. The recommended structure shown in the figure below provides some degree of equipment standardisation.

Figure 2.6.4-2. Format of the element string

GS1 Prefix	Recommended structure	Check digit
9 8 0	S S S S S V V V V	C
S = Security number. This number is used to provide some security in the handling of the refund receipt. For example, it consists of a sequential number, which is incremented by 1, for each ticket generated. In this case, the point-of-sale system will be able to recognise a refund receipt that had already been refunded. The security number can also include a two-digit machine number and a three-digit sequential number, in the case where several machines are available to the customers at the same location. **V** = Monetary value of the refund. The scale factor (decimal places) will depend on the currency used. **C** = Check digit. Calculated according to the standard algorithm		

GS1 key

~~Definition~~Required

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Not applicable

Rules

Refund receipt specifications are flexible and have been designed to cater for current and future requirements.

Due to the nature of refund receipt identification, several national solutions are offered, each of which is defined by the respective GS1 Member Organisation. National refund receipt solutions are not unique worldwide and must be operated in the restricted circulation defined by the GS1 Member Organisation.

Data carrier specification

Carrier choices

- EAN-13 ~~barcodes are used with refund receipts.~~

Symbol s-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

For a description of processing requirements, see section 7.

2.6.5 Electronic serial identifier for cellular mobile telephones (CMTI): AI (8002)

Application description

The purpose of an electronic serial identifier, AI (8002), for cellular mobile telephones (CMTI) is to uniquely identify a cellular phone within a given jurisdiction.

The information from the barcode can be used to automate and speed up the capture of CMTIs. CMTIs are usually assigned by a national or pluri-national authority. Issuing authorities must ensure that the electronic serial identifier is unique for each cellular phone. However, because electronic serial identifiers are assigned by different issuing authorities, they are not unique worldwide. An electronic serial identifier, AI (8002), is assigned by the appropriate national or pluri-national body and can be carried by a barcode placed directly on the cellular phone. The electronic serial identifier, AI (8002), is unique for each cellular telephone within the jurisdiction of the issuing body.

GS1 key

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

Required

See section 3.2, Cellular mobile telephone identifier: AI (8002).

Optional

Not applicable

Rules

Not applicable

Data carrier specification

Carrier choices

- ~~The electronic serial identifier for cellular mobile telephones (CMTI), AI (8002), is carried by the~~ GS1-128 ~~barcode.~~

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

Not applicable

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Unique application processing requirements

Not applicable

2.6.6 Payment slips

Application description

A payment slip is that part of a paper invoice used to facilitate payment. Payment slips cover a wide range of payment demands, such as telephone bills, electricity bills, and insurance renewals. The payment slip is normally issued by a service provider (the invoicing party) to a final customer (the invoicee) and represents a payment demand. Normally the payment slip would outline in non-HRI text:

- Details of the customer.
- Details of the service provider.
- A detailed invoice for the service(s) provided.
- A reference number.
- The amount payable.
- The payment conditions (e.g., pay before date, where to pay).

GS1 key

Commented [CJ104]: WR18-cip1

~~***Definition***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Attributes

Required

- **Global Location Number of the invoicing party** – The GS1 Application Identifier (AI) to indicate the Global Location Number (GLN) of the invoicing party is AI (415) (see section 3). The GLN of the invoicing party identifies the issuer of the payment slip. It is used as a key to access database information about the invoicing party (normally held by the payment receiving agency). The same GLN is used for all payment slips issued by the invoicing party under identical payment conditions. The GLN of the invoicing party is used by the payment receiving agency to reference the characteristics of the contract with the invoicing party, such as:
  - Whether the payment can be accepted.
  - Contact details of the invoicing party.
  - Action to take if the due date has expired.
  - Transfer arrangement of funds to the invoicing party's bank.

  A different GLN SHALL be used whenever the payment conditions are different. For more information, see section 4.
- **International Bank Account Number (IBAN): AI (8007)** – The GS1 Application Identifier to indicate the International Bank Account Number (IBAN) is AI (8007). See section 3.2 for a list of all GS1 Application Identifiers.

  The bank account identifier of the invoicing party is defined in *ISO 13616*. It is used to identify where to send the payment and, in the receiving country, which bank holds the account for international bank payment.
- **Payment slip reference number: AI (8020)** – The GS1 Application Identifier to indicate a payment slip reference number is AI (8020). See section 3.2 for a list of all GS1 Application Identifiers.

By their nature, payment slips need to be individually tailored for the invoicee and, therefore, require a unique reference number, the payment slip reference number, AI (8020). Reminder notices SHOULD use the same number as the original notice. The payment slip reference number, AI (8020), is issued by the invoicing party and is a unique number in the system. Payment slip reference numbers, AI (8020), SHOULD be sequentially allocated.

The payment slip reference number, AI (8020), uniquely identifies the payment slip when used in conjunction with the Global Location Number (GLN) of the invoicing party. It is used to communicate details of payment among all the partners involved: invoicing party, invoicee, payment receiving agency, and banks. It is also used to access locally held information.

- **Amount payable** – There are two GS1 Application Identifiers to indicate the amount payable:
  - AI (390n) = amount payable for a single monetary area. See section 3.2 for a list of all GS1 Application Identifiers.
  - AI (391n) = amount payable with ISO three-digit currency code. See section 3.2 for a list of all GS1 Application Identifiers.

  (n = indicates the implied decimal point position)

  If the amount payable is expressed in a barcode, AI (391n) should be used, as this ensures the currency of the payment can be automatically processed and verified by the system. However, if the currency is unambiguously implied by the system, AI (390n) may be used. To avoid ambiguity, only one AI encoding the amount payable SHALL be used, and the currency must be clearly indicated in human readable form.

  Scanning systems should have the facility to override the amount payable. This functionality is required should the invoicee wish to make the minimum required payment, which could be less than the total amount due. The amount due is attribute information and, when used, must be processed with the Global Location Number (GLN) of the invoicing party.

- **Due date for amount on payment slip** – The GS1 Application Identifier to indicate the due date is AI (12). See section 3.2 for a list of all GS1 Application Identifiers.

  The due date indicates the date by which the invoice should be paid (by the invoicee). It is attribute information and, when used, must be processed with the Global Location Number (GLN) of the invoicing party.

  Note: The due date must be represented in the YYMMDD format in the barcode; however, the human readable interpretation can be presented in whatever form is appropriate.

Optional

Not applicable

Rules

See section ~~004.14.2~~, *Mandatory association of element strings*.

Data carrier specification

Carrier choices

- ~~The~~ GS1-128 ~~barcode is used with payment slips. They in no way replace the need for the human readable interpretation.~~

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Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

No standard placement. The figure below is an example.

Figure 2.6.6-1. Example of numbering and symbol marking for payment slips

Notes to the example in figure 2.6.6-1:

- **(415) 5412345678908** – AI (415) indicates the Global Location Number (GLN) of the invoicing party. The GLN is a fixed length 13-digit number terminated by a standard check digit. The rules for allocating GLNs ensure that this number is unique worldwide. GLNs are used by the payment receiving agent to distinguish between payment slips that can and cannot be accepted.
- **(12) 010425** – AI (12) indicates the due date by which the payment should made. The due date is always encoded YYMMDD; however, other formats may be used for the human readable interpretation equivalent. The use of the due date is optional, but if used, the payment receiving agent and the invoicing party SHOULD agree about what action will be taken if the due date has expired.
- **(3911) 710125** – AI (3911) indicates the amount payable with ISO currency number. From *ISO 4217*, "710" indicates South African Rand. It is strongly recommended to use the ISO currency number when encoding this optional data element. The fourth digit of this AI is the decimal point indicator. For example, the digit 1 in this position would indicate one digit after the decimal point; a 2 would indicate two digits after the decimal point.
- **(8020) ABC123** – AI (8020) indicates the payment slip reference number. The payment slip reference number, AI (8020), is a mandatory data element for this application. It is processed with the GLN of the invoicing party and provides a unique reference for all communications between the payment agent and the invoicing party.

Unique application processing requirements

Not applicable

2.6.7 Customer specific articles

2.6.7.1 Introduction

The GS1 system guidelines for trade items (see section 2.1) state that each item of trade is assigned a non-significant number that uniquely identifies the item in an unrestricted environment. The same number is used to identify a series of identical items, with every variant being allocated a separate unique identification number whenever the variation is apparent and significant between partners in the supply chain or to the final user.

This system enables the use of Automatic Data Capture (ADC) and Electronic Data Interchange (EDI) in an open environment, globally. However, in a number of business sectors, because of the

vast number of possible manifestations of certain made-to-order articles, pre-allocation of Global Trade Item Numbers (GTINs) at the lowest level is not feasible.

For organisations that trade in such made-to-order products, GS1 in association with trade representatives has developed the following guidelines. They have been designed to improve supply chain efficiency by enabling ADC and, in particular, efficient ordering via EDI.

These guidelines are fully compatible with, and should be treated as a special case of, the GS1 system recommendations for the numbering and symbol marking of trade items.

2.6.7.2 Application overview

2.6.7.2.1 Definition

A customer specific article (CSA) is broadly defined as any item where the supplier defines all possible manifestations of the article from which the customer may choose, and pre-allocation of article numbers at the lowest level is not feasible. CSAs are never made for stock, and hence are always made to order. However, made-to-order articles are not necessarily customer specific, but could be standard.

A typical example of a CSA is a chair that is available in 300 different types of upholstery for the seat, back, and armrest. This list of available upholstery could also be used for other types of furniture the supplier offers. There are 27,000,000 ordering possibilities for this chair (300 x 300 x 300). Typically the supplier's catalogue lists a generic style of chair as well as the 300 different upholstery options. The customer chooses the style of chair and selects upholstery for the seat, back, and armrest.

On receipt of order, the supplier produces the customer specific chair and makes it available to the customer. Because the supplier defines the customer's options, and because the customer must specify his or her choices based on those options, the order contains all the information the supplier requires to manufacture the chair. This example highlights four separate process steps:

- The supplier makes available all the possible manifestations of an article.
- The customer specifies the actual article required using the supplier catalogue.
- The supplier manufactures the article in accordance with the customer's specifications.
- The CSA is delivered.
- The GS1 system has formalised this process, enabling efficient Automatic Data Capture (ADC) and Electronic Data Interchange (EDI) throughout the supply chain. The CSA data model is based on the assumption that the supplier defines the possible components (either in a paper or electronic catalogue) and the customer specifies the actual article required.

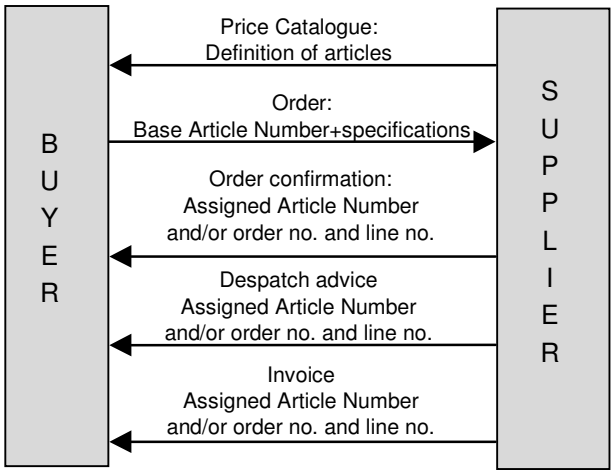
The processes for identifying and ordering the article are dealt with separately. Although these processes are closely related, each requires separate consideration in an open system.

2.6.7.2.2 Customer specific articles data flow

The data flow model is organised on a series of assumptions designed to ensure that the model is independent of the type of article and the sector: It is a generic model. Because many different procedures may be applied by various manufacturers, the generic model is meant to be a general guide. By using this model, companies can communicate in a standard way and (re)organise the automated handling of customer specific article (CSA) specification according to this guideline.

The model assumes that the supplier informs the customer of all available ordering options and specifications. This is achieved by means of an electronic catalogue (see the figure below). From this catalogue the customer can determine which article(s) to order. In the order message the base article number and the chosen specifications are communicated.

Figure 2.6.7.2.2-1. Customer Specific Articles - data flow



In the order confirmation, the supplier may confirm that the article ordered can be manufactured (that is, that the buyer has made a correct combination of specifications). This should be the case assuming the customer has up-to-date database information. The order confirmation may also be used to notify the customer of the assigned article number. The assigned article number may be used in all subsequent communications. For example, the despatch advice and invoice messages use the assigned article number and, if required, the order number plus the order line number to establish an unambiguous link with the CSA.

The article produced may not be numbered with a string of numbers representing the base article number plus the applicable specifications (see section *2.6.7.3.8*).

2.6.7.3 Allocating system numbers for customer specific articles

2.6.7.3.1 General rule

Each different product must be identified by a unique number. This implies that each variant of a product is assigned a different number. For example, each different size or colour of a garment has its own individual identification number. Article numbers SHOULD be sequentially allocated for this purpose.

2.6.7.3.2 Ordering of customer specific articles

The ordering process of customer specific articles (CSAs), the customer specification process, is based on a supplier's catalogue definitions. Internal identification systems are often manual and become increasingly complex and prone to error as the number of trading partners increases. In addition, the use of internal codes can be cumbersome, inflexible, and prone to duplication among different suppliers. These recommendations, which are based on the open systems principle, seek to avoid internally-based systems. Catalogue products using GS1 system identification numbers are guaranteed to be uniquely identifiable worldwide.

A customer specific articles EANCOM user profile for the price catalogue (PRICAT), orders (ORDERS), and the response to order (ORDRSP) messages have been published that use the numbering system outlined in the following subsections.

2.6.7.3.3 Base article number

A supplier assigned base article number is given to each generic product type for ordering purposes. A GTIN-12 or GTIN-13 is used for this functionality. The GTIN is defined by the supplier and must be

unique with respect to all other GS1 system identification numbers. Because it does not identify an item, the base article number will never be carried by a barcode on an article. It is solely used for ordering purposes.

The base article number indicates to the customer that a number of supplier defined questions have to be answered by the customer. These specifications (questions and associated answers), which are relevant to a base article number, are communicated via an electronic catalogue. The specifications available for each different article are defined by the supplier.

2.6.7.3.4 Specifications

Specifications are linked to the different base article numbers for the purposes of ordering. The same specifications may be used with different base article numbers. Specifications fall into one of the categories described in the following subsections.

2.6.7.3.5 Option

An option is a specification with a discrete value that is predefined by the supplier and associated with a base article number.

Each option may be identified with a GTIN-12 or GTIN-13. The GTIN is defined by the supplier and must be unique with respect to all other GS1 system identification numbers. An ID number of an option will never be carried by a barcode on an article. It solely is used for communication purposes.

Options, such as red leather seat covers may be valid for different base articles.

2.6.7.3.6 Parameter

A parameter is a specification within a range of values (e.g., dimensions) ranging from a minimum to a maximum and including a step size.

Each parameter may be identified with a GTIN-12 or GTIN-13. The GTIN is defined by the supplier and must be unique with respect to all other GS1 system identification numbers. The parameter identification will never be carried by a barcode on an article. It is solely used for ordering purposes. Parameters SHOULD be communicated using the standard EANCOM syntax and SHOULD be related to a base article number.

2.6.7.3.7 Part

A part is a physical article that may also be ordered separately. Parts are identified within Global Trade Item Numbers (GTINs). The GTIN-12 or GTIN-13 for the part may be used in association with a base article number to create a composite, an article made up of one or more individual parts. A part may be associated with a number of different base articles.

2.6.7.3.8 External references

An external reference is often required for a customer-designed or custom-made item. External references are specified through a separate, non-EDI communication channel, such as a fax or CAD/CAM drawing. A secondary source can be used to communicate a set of customer-defined specifications (not predefined by the supplier).

2.6.7.3.9 Data carrier

GS1 system identification numbers used to identify customer specific articles (CSAs) for ordering purposes may never be carried by a barcode on the physical article. However, suppliers may wish to utilise barcode scanning as part of the order process. This may be achieved by representing base articles and identification numbers in machine readable form in a paper catalogue. GS1-128 barcodes, utilising an GS1 Application Identifier for internal applications, SHOULD be used for this purpose.

2.6.7.4 Identification of the physical article actually produced

Application description

In environments with automated systems the physical article needs to be identified and the identification of the produced article is required in machine readable form (as a barcode). The identification of the physical article must be communicated from the supplier to the customer. Both supplier and customer should be able to use the same identification number and each need to keep a record of this number.

For open systems, the most appropriate identification number is the GTIN-12 or GTIN-13. Identifying a physical article with a GTIN and a barcode allows customer specific articles (CSAs) to be integrated within a system that manages all other items identified using the GS1 system. During order confirmation, the supplier assigns the GTIN-12 or GTIN-13 to the product. It is not necessary to pre-assign numbers to all possible articles, only to those that are actually produced.

Each different product must be identified by a unique number. This implies that each variant of a product is assigned a different number. For example, each different size or colour of a garment has its own individual identification number. Article numbers SHOULD be sequentially allocated for this purpose.

GS1 key

~~***Definition***~~*Required*

Commented [CJ106]: WR18-cip1

- ~~The Global Trade Item Number (~~GTIN~~) is the GS1 identification key used to identify trade items.~~

Rules

All the GTIN rules described in section *4*.

Attributes

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

Not applicable

Data carrier specification

Carrier choices

The barcode requirements for customer specific articles (CSAs) are the same as those for trade items. The data carrier used to carry the GS1 system identification number of a physical article SHALL be one of the following:

- EAN-13 or UPC-A ~~barcode.~~
- ITF-14 ~~barcode.~~
- GS1-128 ~~barcode~~ (attribute information always uses GS1-128 barcodes).

With CSAs, the choice of data carrier is left to the discretion of the organisation responsible for issuing the GS1 system identification number. Trade items that will be scanned at a point-of-sale always SHOULD be marked using the EAN/UPC symbology.

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section *5.9.3.1*, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

For a description of processing requirements, see section *7*.

2.6.8 Custom trade item

2.6.8.1 Allocating system numbers for custom trade items

2.6.8.1.1 General rule

Customer specific items, as described in the previous section, (section 2.6.7) are configured from a wide variety of known parameters. Things like colour, size, model, and various materials are listed and uniquely identified. A customer specific item is created when a selection is made from each category, sufficient to create the item. Customer specific items may be intended for the end consumer (e.g., furniture) and can be marked with a GTIN and data carrier appropriate for point-of-sale (POS).

Custom made-to-order trade items are different from customer specific items in that they are one-of-a-kind, made-to-order items that are strictly sold from business to business. Their use is approved for the manufacturing and maintenance, repair & overhaul (MRO) environment. Examples include custom abrasive belts, special adhesives, and made-to-order cutting tools needed for a specific machine and cutting application. Their specifications may be called out in a series of blue prints or other technical documents.

Each different product must be identified by a unique number. If a trade item is a stock trade item, it is assigned the appropriate fixed measure GTIN. If any trade item, custom or not, will be scanned at POS, then it must be assigned a GTIN-12, GTIN-8, or GTIN-13 and represented in a barcode symbology approved for POS. At the discretion of the supplier, it is always acceptable to use a GTIN-12, GTIN-8 or GTIN-13 to identify a trade item, whether custom or not. In other words, a supplier or manufacturer is not required to use the method described below to identify a custom item. They may give each and every different trade item a unique GTIN. However, this will deplete their pool of possible GTIN more quickly.

This method of assigning unique product identification uses a base GTIN-14, indicator digit 9 which signifies a GTIN with a variable component (i.e. it is a custom, made-to-order item), followed by a Made-to-Order variation number. The Made-to-Order variation number is a variable length, numeric field up to six digits. This allows each base GTIN-14, indicator digit 9 to be used for 1,000,000 different custom variations. Multiple items, made to the same specifications could have the same combination of the base GTIN-14, indicator digit 9 and Made-to-Order variation number.

2.6.8.1.2 Ordering of custom trade items

A supplier or manufacturer may indicate in their paper or electronic catalogue that certain items can be ordered based on customer specifications. A GTIN-14, indicator digit 9 can be assigned to denote that it is possible to order a customized version of this trade item. However, in this case, no physical item exists. When the order is accepted for the made-to-order custom item, a Made-to-Order Variation number is assigned to this specific version. Multiples of this same item may be ordered at one time. It is the combination of the GTIN-14, indicator digit 9 and the Made-to-Order variation number that uniquely identifies the custom items.

2.6.8.1.3 Custom trade item number

A GTIN-14, indicator digit 9 indicates a variable measure trade item. Additional information is needed to complete the identification of the trade item. A custom trade item number is the combination of a GTIN-14, indicator digit 9, and the Made-to-Order variation number. This combination is used in electronic business transactions and in barcode representation. When many items with the exact same specifications are manufactured at one time, they will each carry the same combination of GTIN-14, indicator digit 9 and Made-to-Order variation number.

2.6.8.1.4 Base GTIN-14

To indicate that a trade item is available in a custom format, a base GTIN-14, indicator digit 9, is used. A base GTIN-14, indicator digit 9 may appear in the supplier's paper or electronic product catalogue to indicate the possibility of a custom item. This GTIN does not identify a specific trade item, but a general category of possible custom trade items. The description indicates that this is a custom, made-to-order item. A manufacturer may create one GTIN-14, indicator digit 9 to represent

any and all made-to-order trade items, or they may assign one for each category of custom items (custom abrasive belts, custom abrasive pads, etc.). Further a manufacturer may choose to create a GTIN-14 indicator digit 9 for sub-categories (custom abrasive belts, 1 to 2 Inches Wide; custom abrasive belts, 2 to 3 inches wide, and so on).

2.6.8.1.5 Made-to-Order variation number

Once the specifications for a custom trade item are agreed upon between the customer and the manufacturer, the manufacturer will assign a Made-to-Order variation number to that custom item. A Made-to-Order variation number is always used with a GTIN-14, indicator digit 9.

The Made-to-Order variation number is communicated from the manufacturer to the customer during the Request for Quote/Response to Request for Quote process or on a Purchase Order Acknowledgement or by some other mutually agreed upon method. In a barcode representation, GS1 Application Identifier AI (242) is used to denote a Made-to-Order variation number. The Made-to-Order variation number is numeric and variable length up to, and including, six digits.

A Made-to-Order variation number will never appear alone, but must always be associated with the appropriate GTIN-14, indicator digit 9. Further, a Made-to-Order variation number may not be used with GTIN-8, GTIN-12, GTIN-13, and GTIN-14 indicator digit 1 through 8.

The use of a GTIN-14, indicator digit 9 and a Made-to-Order variation number is only approved for the manufacturing and maintenance, repair & overhaul (MRO) environment.

2.6.8.1.6 Data carrier

GS1 system identification numbers used to identify custom made-to-order items in the manufacturing, pick, pack, shipping, receiving and inventory management process may be carried by a barcode on the physical article. This may be achieved by representing identification numbers in machine readable form. GS1 barcodes, utilising GS1 Application Identifiers, should be used for this purpose.

2.6.8.2 Identification of the physical article actually produced

Application description

In environments with automated systems the physical article needs to be identified and the identification of the produced article is required in machine readable form (e.g., as a barcode). The identification of the physical article must be communicated from the supplier to the customer. Both supplier and customer should be able to use the same identification number and each need to keep a record of this number.

For open systems, the appropriate identification number for a custom trade item is the base GTIN-14 indicator digit 9, followed by a Made-to-Order variation number. During order confirmation, the supplier assigns the Made-to-Order variation number to this version of the product.

Products made to the same specifications can carry the same combination GTIN-14, indicator digit 9, and Made-to-Order variation number.

GS1 key

~~***Definition***~~***Required***

Commented [CJ107]: WR18-cip1

~~The Global Trade Item Number (~~GTIN~~) is the GS1 identification key used to identify trade items.~~

Rules

The base GTIN-14, indicator digit 9 in combination with the Made-to-Order variation number comprises the key for a custom trade item. The base GTIN-14 is comprised of indicator digit 9, GS1 Company Prefix followed by an item reference and a check digit. The Made-to-Order Variation number is variable length, numeric, up to and including six digits.

Attributes

Commented [CJ108]: WR18-cip1

~~***Required***~~

~~Not applicable~~

~~***Optional***~~

Not applicable

Data carrier specification

Carrier choices

~~The combination of a GTIN-14, indicator digit 9, and a Made-to-Order variation number, can be carried by using the appropriate GS1 Application Identifiers in the following symbologies~~Carrier choices for this application:

- GS1–128
- GS1 DataBar
- GS1 DataMatrix
- GS1 QR Code

AI (01) is used for the GTIN-14, indicator digit 9, plus AI (242) for the Made-to-Order variation number when the item is considered a trade item. The combination of AI (02) plus AI (242) and AI (37) Count of trade items contained in a logistic unit, is used in conjunction with an (00) Serial Shipping Container Code when marking a logistics unit of custom trade items.

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section 5.9.3.4, *GS1 symbol specification table 4*.

Symbol placement

Not applicable

2.6.9 Global Document Type Identifier for document control

Introduction

The Global Document Type Identifier is the GS1 identification key used to identify documents, electronic messages and digital files for the purposes of document control. Any aspect of referenced modification, version control, specific instance recording would fall into the process of document control, either internal or externally with trade partners, where unique identification is required

The term "document" is applied broadly to cover any paper(s) or digital file(s). The Global Document Type Identifier (GDTI) can be used to identify any type of document including but not limited to:

- commercial documents (e.g., invoice, purchase order)
- documents that infer a right (e.g., proof of ownership)
- documents that infer an obligation (e.g., notification or call for military service)
- identification documents (e.g., driver's licence, passport); and
- digital files
- electronic messages

Application description

Physical documents and electronic messages used in communications with other parties often include a unique number that can be used as a reference. Also digital files shared with other parties may require a unique identifier to ensure the use of the right type and version. The issuer of the document is normally responsible for the identification of the document.

The GDTI enables issuers to assign globally unique identifiers to documents and, where applicable, to physically mark these on the physical version(s) in barcode or EPC/RFID format.

Examples of documents that can be identified with the GDTI include, but are not limited to:

- Land registration papers
- Tax demands
- Proof of shipment/receipt forms
- Custom's clearance forms
- Insurance policies
- Internal invoices
- National press documents
- Educational papers
- Transporting company documents
- Mail company documents
- Images

GS1 key

~~***Definition***~~***Required***

- GDTI

The GS1 Application Identifier to indicate the Global Document Type Identifier (GDTI) is AI (253), ~~(~~see section *3.2* ~~for a list of all GS1 Application Identifiers)~~.

Rules

See section *4.8*, *GDTI rules*.

Attributes

Required

Not applicable

Optional

Not applicable

Data carrier specification

Carrier choices

- ~~The~~ GS1-128~~,~~
- GS1 DataMatrix ~~or~~
- GS1 QR Code ~~symbology is used to represent the GDTI in barcoded format.~~

Symbol X-dimension, minimum symbol height, and minimum symbol quality

See section *5.9.3.9*, *GS1 symbol specification table 9*.

Symbol placement

No standard placement. The following are examples of numbering and symbol marking for document control:

Unique application processing requirements

For description of processing requirements, see section *7*.

Commented [CJ109]: WR18-cip1

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Example 1: Legally required declaration prior to travel

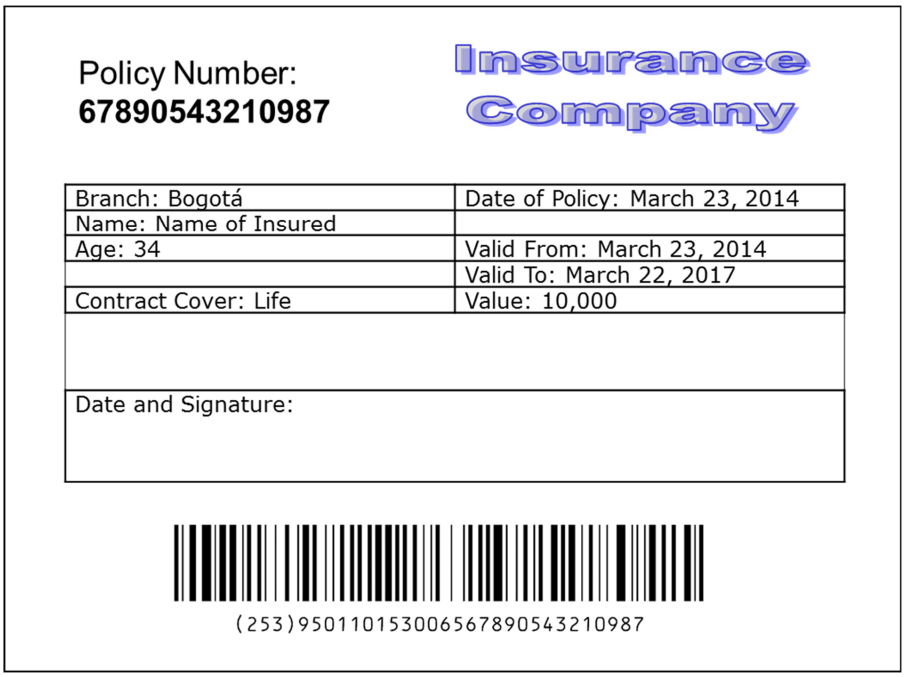
This example shows how GS1-128 barcodes can be used to automate the capture of information for traveller who enters or leaves the country.

Figure 2.6.9-1. Legally required travel declaration

Example 2: Insurance policy

This example shows how GS1-128 barcodes can be used to automate the capture of information on insurance policies. This standard solution provides benefit for the insurer, the insured, and any potential beneficiaries as well as facilitates the automation of any monitoring and inspection of the requirement to fulfil the legal norms.

Figure 2.6.9-2. Insurance policy



Example 3: Application form

This example shows how GS1-128 barcodes can be used to automate the capture of information on application forms. Many organisations require their clients to complete an application form.

Figure 2.6.9-3. Membership application form

Example 4: Freight-forwarding authorisation

This example shows how GS1-128 barcodes can be used to automate the capture of information on freight-forwarding forms. Many organisations require documentary evidence that goods have been dispatched prior to making payment.

Figure 2.6.9-4. Freight-forwarding authorisation

2.6.10 Internal applications

The GS1 system provides ten GS1 Application Identifiers for internal applications.

Data carrier specification

GS1 data carriers that can be used to represent GS1 Application Identifiers for internal applications are:

- GS1 DataBar Expanded Versions
- GS1-128
- GS1 DataMatrix
- GS1 QR Code
- EPC/RFID

Data carrier specifications (e.g., size, quality, placement) are to be determined internally, however GS1-128 symbols SHALL NOT be used for symbols that require more than 48 data characters and GS1 DataBar Expanded Versions SHALL NOT be used when symbols require more than 74 numeric or 41 alphabetic characters of data.

Though the definition of AIs (91) to (99) in the GS1 Tag Data Standard (TDS) allows for larger fields, to ensure compatibility with the General Specification, AI (91) to (99) character values encoded in the User Memory of an EPC/RFID tag SHOULD NOT exceed 90 characters in length.

2.6.10.1 Information mutually agreed between trading partners: AI (90)

Element string AI (90) may be used to represent any information that has been mutually agreed between two trading partners. The agreement may include the use of FACT DIs (Data Identifiers). If a FACT DI is used, it SHOULD appear immediately after the AI (90), followed by the appropriate data. The use of FACT DIs gives little security to users.

The data carrier containing this element string SHOULD be removed from any item that leaves the jurisdiction of the trading partners. Failure to remove the symbol may cause problems if another trading partner using the same AI for a separate internal application scans the item.

2.6.10.2 Company internal information: AIs (91 to 99)

Element strings AI (91) to (99) may contain any internal information relevant to a company's internal applications.

The data carrier containing these element strings SHOULD be removed from any item that leaves the jurisdiction of the company. Failure to remove the symbol may cause problems if a trading partner using the same AI for a separate internal application scans the item.

2.6.11 Consumer trade item production control

This application standard utilises GTIN and a GTIN attribute which are used by consumer trade item manufacturers to ensure the proper association of packaging components during production of a finished consumer trade item. The attribute is called a Packaging Component Number (PCN). The PCN identifies a packaging component which is used by only one manufacturer and is an attribute of the GTIN of the finished consumer trade item. For example, a bottle of cough syrup has a front and back label. It is critical the declarations on the labels match the product filled in the bottle. By using a different PCN on each label during packaging for a specific trade item identified with a GTIN, the manufacturer can ensure the right labels are used to produce the product (GTIN to PCN associations). PCN may be encoded as a standalone symbol or the PCN and GTIN may be encoded together. Package components shared between two or more manufacturers are not covered by this standard. Manufacturers and their packaging component suppliers will have to manage this situation. The PCN is assigned by the manufacturer (possibly under the direction of the brand owner).

GS1 key

~~*Definition*~~*Required*

Commented [CJ111]: WR18-cip1

The following key formats are allowed in this application:

- GTIN-8 ~~is the 8-digit GS1 identification key composed of a GS1-8 Prefix, item reference, and check digit used to identify trade items.~~
- GTIN-12 ~~is the 12-digit GS1 identification key composed of a U.P.C. Company Prefix, item reference, and check digit used to identify trade items.~~
- GTIN-13 ~~is the 13-digit GS1 identification key composed of a GS1 Company Prefix, item reference, and check digit used to identify trade items.~~
- For regulated healthcare non-retail applications~~:~~, GTIN-14 ~~is the 14-digit GS1 identification key composed of an indicator digit (1-9), GS1 Company Prefix, item reference, and check digit used to identify trade items.~~

Rules

GTIN of the finished consumer trade item SHALL NOT be used to identify packaging components (e.g., bottle, bottle cap, front label, back label) for the purpose of trade item production control; however GTIN is specified as the GS1 key for consumer trade item production control as the GTIN determines which packaging components are used in production.

Attributes

Required

The GS1 Application Identifier to indicate the Packaging Component Number is AI (243) (see section *3.2* for a list of all GS1 Application Identifiers).

Rules

PCN SHALL NOT replace GTIN for pricing, ordering, or invoicing upstream packaging components from the manufacturer's upstream suppliers. Per section *0~~04~~.14.2*, PCN has a mandatory association with one or more finished consumer trade item GTIN(s). The PCN and GTIN may or may not be encoded in the same symbol.

PCN is used only on packaging components used by one manufacturer. There may be more than one PCN associated with one GTIN. One PCN may be associated with multiple GTINs

There SHALL only be one PCN per each packaging component for the lifespan of the packaging component and one packaging component may change while another does not. For example a front and back label would each have a unique PCN and the front label may change while the back label does not.

Over a GTIN's lifespan, there may be more than one PCN per packaging component (e.g., front label).

Optional

Not applicable

Data carrier specification

Carrier choices

Figure 2.6.11-1. Carrier choices

Symbol options by consumer trade item type	Type of consumer trade item		
	General retail POS	Regulated healthcare POS (retail)	Regulated healthcare POC (non-retail)
GTIN and PCN in one symbol	GS1 DataBar	GS1 DataBar or GS1 DataMatrix	GS1 DataBar, GS1 DataMatrix, GS1-128, Composite Component
PCN standalone	GS1 symbol selection/size specifications left to the manufacturer's discretion		
GTIN, PCN, & Extended Packaging URL in one symbol	(*) GS1 DataMatrix or GS1 QR Code	GS1 DataMatrix	GS1 DataMatrix
(*) For general retail consumer trade items where PCN is combined with AI (8200) GS1 DataMatrix or GS1 QR Code may be used according to the specifications in figure 5.9.3.1-2 *GS1 symbol specification table 1 Addendum.*			

Symbol X-dimensions, minimum symbol height, and minimum symbol quality

To determine the appropriate specifications for printing and quality control, see the GS1 symbol specification table(s) referred to in each Application Standard.

Symbol placement

When the PCN is encoded together with GTIN, symbol placement rules for consumer trade item apply. If the production line scanning of the PCN prohibits use of this symbol placement, the PCN must be encoded in a separate barcode.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.6.12 Component/part identification

2.6.12.1 Application description

This application is subject to the following restrictions:

- The Component & Part Identifier is available for business processes where products are identified by the buyer. The buyer instructs his suppliers on how to identify and mark the products delivered to him.
- The identifier SHALL NOT be used in open supply chains. It is restricted to use by mutual agreement. The GTIN is the only GS1 standard identifier for trade items in open supply chains.

A Component/Part (C/P) is defined as an item that is intended to undergo at least one further transformation process to create finished goods for the purpose of downstream consumption. C/P examples may include:

- Drive motor for washing machine
- Fan assembly for a jet engine
- Pipe/tube
- Printed circuit board for television
- Starter motor for vehicle
- Magnetic coil for a Magnetic Resonance Imaging (MRI) machine
- Wheel axle

Several industry sectors use established systems for the identification of C/P in the supply chain. Very often, companies use alphanumeric identifiers for their C/P, which may be serialised. Many IT systems rely on the identifiers structure that includes limited meaningful information. Time-critical processes (material resource planning, delivery schedules, etc.) do not allow for a mapping of the identification schemes to other identifiers. In addition, there is often no ubiquitous network access available. Network failures can happen in reality and could lead to production interruptions which in turn lead to tremendous economic losses. For that reason, technical industries have implemented autonomous assembly lines, which are controlled by dedicated control terminals that need no permanent network access.

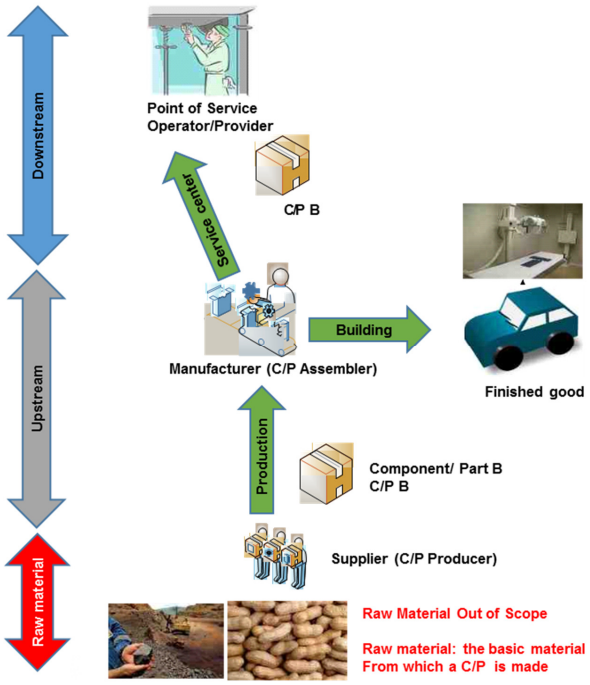
This application specifies a C/P Identifier that is available for the following processes:

- The C/P Identifier may be used by an OEM for their C/P procurement. The typical scenario is that an Original Equipment Manufacturer (OEM) assigns identifiers to Components/Parts necessary to build finished goods, such as automobiles. The C/P production is contracted to suppliers who use the C/P Identifier assigned by their customer, the OEM.
- The OEM and/or agents make use of the C/P Identifier in their production process.
- C/P Identifiers are also available to points of service for after sales services and maintenance activities, including procurement.

Note: GTIN remains the mandatory solution for items crossing aftermarket retail points of sale.

The following diagram illustrates the three main business processes where C/P Identifiers may be appropriate:

Figure 2.6.12.1-1. Business processes where C/P Identifiers may be appropriate



2.6.12.2 Identification requirements

Components/Parts that meet the requirements described above can be identified by a C/P Identifier that has the following characteristics:

- The C/P Identifier comprises a GS1 Company Prefix and C/P reference assigned by the GS1 Company Prefix holder.
- The C/P reference format is variable length. The Component/Part reference SHALL only consist of numeric, alphabetic upper-case or special characters "#", "-", or "/"
- The total length of the identifier SHALL NOT exceed 30 characters.
- The C/P Identifier would be classified as a "GS1 key" according to the current GS1 definitions. However it is not to be used in open supply chains but can be used as primary identifier in barcoding applications, EPC/RFID and EPCIS.

GS1 key

~~***Definition***~~***Required***

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- ~~The C/P Identifier would be classified as a "GS1 key" according to the current GS1 definitions. However it is not to be used in open supply chains.~~ CPID

The GS1 Application Identifier to indicate the Component/Part Identifier (CPID) is AI (8010) (see section *3.2* for a list of all GS1 Application Identifiers).

Rules

The C/P Identifier would be classified as a "GS1 key" according to the current GS1 definitions. However it is not to be used in open supply chains.~~See above~~

Attributes

Required

Not applicable

Optional

The C/P Identifier may be supplemented by an optional serial number. The format of the serial number is numeric only, maximum 12 digits. See GS1 Application Identifier (8011) Component/Part Identifier in section *3.9.11*~~section 3~~.

Field Code Changed

Data carrier specification

Carrier choices

The GS1 data carriers that can be used for this application ~~to represent the C/P Identifier and the optional serial number~~ are:

- GS1-128
- GS1 DataMatrix
- GS1 QR Code
- EPC/RFID

Data carrier specifications are to be provided by the OEM to its partners.

Symbol placement

Not applicable

Unique application processing requirements

Not applicable

2.6.13 Global Model Number (GMN)

Application description

A product model is a base product design or specification from which a trade item is derived. The trade item inherits major features/functions from the base model. The GS1 Global Model Number (GMN) is the GS1 identification key used to identify product models from which trade items are derived. The GMN comprises the GS1 Company Prefix and a model reference. The model reference is alphanumeric and its structure is left to the discretion of the brand owner who assigns it.

This element string, once assigned to one product model, SHALL NOT be reissued to another. The GMN SHALL NOT be used to identify a trade item.

For regulated healthcare medical devices, the following applies:

When used for the unique identification of medical devices, the GMN's default, global data title SHALL be Basic UDI-DI or BUDI-DI. Other data titles which occur at local levels may be recorded in GS1 guidelines.
In regulated healthcare, the Basic UDI-DI (BUDI-DI) serves as the key element to allow the linkage of the different modules of the European Database for Medical Devices (EUDAMED). Per the EU Regulations, BUDI-DI is "The primary identifier of a device model. It is the DI assigned at the level of the device unit of use[1]. It is the main key for records in the UDI database and is referenced in relevant certificates and EU declarations of conformity. (As defined by the European Medical Devices Regulation (EU MDR) and European *In-Vitro* Diagnostic Medical Devices Regulation (EU IVDR)."

[1] "device unit of use" pertains to the device "model" to be identified as stated in the previous sentence of the definition. It does not pertain to the term Unit of Use UDI-DI (UoU UDI-DI) or its UoU UDI-DI use on trade items.

By providing an identifier for the medical device model, the BUDI-DI will link medical device trade items identified by GTINs in the UDI database to pre-market, post-market activities (e.g., Device Registration, Certificates, Declaration of Conformity, Vigilance, Market Surveillance and Clinical Investigations).

The following points highlight the relationship between BUDI-DI (GMN) and UDI-DI (GTIN.)

- BUDI-DI (GMN) is used for medical device registration and is assigned independent of packaging/labelling and is different from the identifier for trade items in the supply chain (UDI-DI/GTIN.)
- All BUDI-DI level attributes (registration database) are common for all GTINs associated with it.
- All attributes across all GTINs associated with one BUDI-DI may not be common.
- BUDI-DI is used for device registration in the registration database. UDI-DI is used for trade item identification in the UDI database. UDI-DI and BUDI-DI allocation may occur before, in parallel, or after each other and attribution and/or linkage between the entities is only possible once both entities exist. For this reason, allocation of UDI-DI and BUDI-DI shall be made independent of one another.
- Brand owners are responsible for the assignment of BUDI-DI (GMN) and UDI-DI (GTIN.)

GS1 key

~~***Definition***~~***Required***

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- ~~The Global Model Number is the GS1 identification key used to identify a product model. The key comprises a GS1 Company Prefix and a model reference. The GMN must be processed in its entirety and not broken down into its constituent elements.~~GMN

The GS1 Application Identifier to indicate the Global Model Number is AI (8013),

s~~S~~ee section *3.2* ~~for the list of all GS1 Application Identifiers~~.

Rules

See section *4*, *Application rules and management practices*.

- The Global Model Number SHALL NOT be used as a replacement for the GTIN.

- The GTIN SHALL NOT be used as a replacement for the Global Model Number.

For regulated healthcare medical devices, the following applies:

- At any given time, the relationship between BUDI-DI and UDI-DI is 1:n (can be one to one or one to many), meaning a BUDI-DI can be related to more than one UDI-DI.
- BUDI-DI (GMN) SHALL NOT be used for supply chain identification or transactional purposes (e.g., labels, orders, deliveries, payments) which SHALL be supported by UDI-DI (GTIN) in the supply chain.
- UDI-DI (GTIN) SHALL NOT be used as a replacement for BUDI-DI (GMN).
- In documentation, BUDI-DI shall be displayed as a single data field, but formatting such as bold or italics may be used within text representation of the identifier to increase efficiency and accuracy of key-entry. Spaces are not permitted as characters in the GS1 BUDI-DI identifier.

Attributes

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~~***Required***~~

~~Not applicable~~

~~***Optional***~~

~~Not applicable~~

~~***Rules***~~

Not applicable

Data carrier specification

There are currently no data carrier specifications as the Global Model Number has only been approved for regulated healthcare identification of medical devices.

For medical devices, the BUDI-DI (GMN) SHALL NOT be used in any labelling, physical marking, or GS1 AIDC data carrier on trade items associated with the BUDI-DI. For this reason, there are no barcode specifications below and only data content, format, and data title in figure *3.2-1* apply.

Carrier choices

Symbol X-dimension, minimum symbol height, and minimum symbol quality

Not applicable

Symbol placement

Not applicable

Unique application processing requirements

Not applicable.

2.7 Summary of applications and operative scanning environments for GS1 system symbols

The figure below provides a cross-reference for all system applications defined in section 2 and the GS1 symbol specification tables (SSTs) in section 5. The application where the barcode will be used SHALL be determined prior to locating the correct symbol specification table (SST) entry. Use the "SST(s)" column to find the SST appropriate for the application area. Because most application areas provide a reference to two symbol specification tables based on the operative scanning environment, a decision must be made between the two. See the decision tree in figure 5.9.2.6-2 to determine the correct symbol specification table.

Figure 2.7-1. Areas of GS1 system application

Application	See section	SST(s)	Carrier choices
Fixed measure trade items – general retail consumer trade items scanned in general retail at POS:	2.1.3		
▪ GTIN-12 and GTIN-13	2.1.3.1~~2.1.3.12.1.3.2~~	1	UPC-A, EAN-13, GS1 DataBar Retail POS family
▪ GTIN-12 carried by a UPC-E barcode	2.1.3.2~~2.1.3.22.1.3.3~~	1	UPC-E
▪ GTIN-8 carried by an EAN-8 barcode	2.1.3.3~~2.1.3.32.1.3.4~~	1	EAN-8, GS1 DataBar Retail POS family
▪ Hardcover books and paperbacks: ISBN, GTIN-13, and GTIN-12	2.1.3.4~~2.1.3.42.1.3.5~~	1	EAN-13, UPC-A, UPC-E. Options: EAN/UPC 2-digit or 5-digit add-on symbols
▪ Serial publications: ISSN, GTIN-13, and GTIN-12	2.1.3.5~~2.1.3.52.1.3.6~~	1	EAN-13, UPC-A, UPC-E. Options: EAN/UPC 2-digit or 5-digit add-on symbols
Fixed measure trade item - fresh food trade items scanned at POS	2.1.3.6~~2.1.3.62.1.4~~	1	GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional, UPC-A, EAN-13, EAN-8
Trade Items intended for general distribution and POS	2.1.4~~2.1.42.1.5~~	3	EAN/UPC, GS1 DataBar Retail POS family
Healthcare primary packaging (non-retail trade items)	2.1.5~~2.1.52.1.6~~	6	GS1-128, GS1 DataMatrix, GS1 DataBar, EAN/UPC, ITF- 14, Composite Component
Healthcare secondary packaging (regulated healthcare retail consumer trade items)	2.1.6~~2.1.62.1.7~~	8 or 10	GS1-128, GS1 DataMatrix, GS1 DataBar, EAN/UPC, ITF-14, Composite Component
Trade items intended for general distribution scanning only	2.1.7~~2.1.72.1.8~~	2	EAN/UPC, ITF-14, GS1-128, GS1 DataBar
▪ Trade items intended for general distribution scanning only – regulated healthcare trade items	2.1.7~~2.1.72.1.8~~	8	GS1-128, GS1 DataBar, GS1 DataMatrix, EAN/UPC, ITF-14
▪ Trade items intended for distribution scanning in manufacturing, maintenance, repair and overhaul processes.	2.1.7~~2.1.72.1.8~~	4	GS1-128, GS1 DataMatrix, GS1 QR Code
Medical devices (non-retail trade items)	2.1.8~~2.1.82.1.9~~	7	GS1 DataMatrix
Fixed measure trade items packed in several individual pieces not scanned at POS	2.1.9~~2.1.92.1.10~~	2, 4	GS1-128, GS1 DataMatrix, GS1 QR Code
▪ Fixed measure trade items packed in several individual pieces not scanned at POS – Healthcare	2.1.9~~2.1.92.1.10~~	8 or 10	GS1-128
Direct marking	2.1.10~~2.1.102.1.11~~	4, 7	GS1 DataMatrix, GS1 QR Code
Variable measure trade items – Packages/containers not scanned in general retail at POS	2.1.11~~2.1.112.1.12~~	2	GS1-128, GS1 DataBar Expanded, GS1 DataBar Expanded Stacked, ITF-14

Application	See section	SST(s)	Carrier choices
Fixed measure trade items – Restricted distribution	2.1.12~~2.1.1 22.1.13~~		
▪ Company internal numbering – RCN-8 Prefix 0 or 2	2.1.12.1~~2.1. 12.12.1.13. 1~~	1	EAN-8
▪ Company internal numbering – RCN- 13 GS1 Prefix 04 (RCN-12 U.P.C. Prefix 4)	2.1.12.2~~2.1. 12.22.1.13. 2~~	1	EAN-13, UPC-A
▪ Company internal numbering – RCN- 12 U.P.C. Prefix 0 (LAC and RZSC)	2.1.12.3~~2.1. 12.32.1.13. 3~~	1	UPC-E
▪ GS1 Prefixes 02, 20 to 29 - Restricted Circulation	2.1.12.4~~2.1. 12.42.1.13. 4~~	1	EAN-13 symbols
Variable measure fresh food trade items scanned at point-of-sale using GTIN	2.1.13.1~~2.1. 13.12.1.14. 1~~	1	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked
Variable measure trade items scanned at point-of-sale using Restricted Circulation Numbers	2.1.13.2~~2.1. 13.22.1.14. 2~~	1	EAN-13, UPC-A
Trade Item extended packaging (general retail trade items)	2.1.14~~2.1.1 42.1.15~~	1 Adden-dum	GS1 DataMatrix, GS1 QR Code
▪ Trade item extended packaging (regulated healthcare trade items)	2.1.14~~2.1.1 42.1.15~~	6, 7, 8,or 10	GS1 DataMatrix only
Logistics units - individual logistic units	2.2.1	5	GS1-128
Logistics units - multiple logistic units (GSIN, GINC)	2.2.2, 2.2.3	52	GS1-128
Assets – Global Returnable Asset Identifier (GRAI)	2.3.1	9	GS1-128, GS1 DataMatrix, GS1 QR Code
▪ Direct marking of GRAI	2.3.1 2.1.10~~2.1.1 02.1.11~~	7	GS1 DataMatrix, GS1 QR Code
Assets – Global Individual Asset Identifier (GIAI)	2.3.2	9	GS1-128, GS1 DataMatrix, GS1 QR Code
▪ Direct marking of GIAI	2.3.2 2.1.10~~2.1.1 02.1.11~~	7	GS1 DataMatrix, GS1 QR Code
Locations and parties - Identification of a physical location	2.4.4	9	GS1-128, GS1 Data Matrix, GS1 QR Code, EPC/RFID
Service relationships	2.5	11	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked, GS1-128, GS1 DataMatrix, GS1 QR Code
Coupons identified using the Global Coupon Number	2.6.2	1	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked
Coupon identification for restricted geographic distribution (GS1 Prefix 99) GS1 common currency coupon identification (GS1 Prefixes 981 to 983)	2.6.3.3 2.6.3.4 2.6.3.5	1	EAN-13
Coupon code identification for use in North America (AI 8110, 8112)	2.6.3.6 2.6.3.7	(*)	GS1 DataBar Expanded, GS1 DataBar Expanded Stacked or digitally transmitted
Refund receipts	2.6.4	1	EAN-13
Electronic serial identifier for cellular mobile telephones (CMTI): AI(8002)	2.6.5	4	GS1-128
Payment slips	2.6.6	4	GS1-128
Customer specific articles	2.6.7	1	EAN-13, UPC-A, ITF-14, GS1-128

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Application	See section	SST(s)	Carrier choices
Custom trade item	2.6.8	4	GS1–128, GS1 DataBar, GS1 DataMatrix, GS1 QR Code
Global Document Type Identifier for document control	2.6.9	9	GS1-128, GS1 DataMatrix, GS1 QR Code
Internal applications	2.6.10	N/A	GS1–128, GS1 DataBar Expanded, GS1 DataMatrix, GS1 QR Code
Consumer trade item production control	2.6.11	N/A	GS1 DataBar, GS1 DataMatrix, GS1 QR Code, GS1-128, Composite Component
Component/part identification	2.6.12	N/A	GS1-128, GS1 DataMatrix, GS1 QR Code
Global Model Number	2.6.13	N/A	N/A
(*) See *US Coupon Application Guideline Using GS1 DataBar Expanded Symbols* for the appropriate SST.			

Note: GS1 DataBar has the capacity to carry GTIN-14, GTIN-14 is not intended for use at point-of-sale (POS) applications; therefore GS1 DataBar symbols for POS must not encode GTIN-14.

3 GS1 Application Identifier definitions

3.1 Introduction

This section describes the meaning, structure, and function of the GS1 system element strings so they can be correctly processed in users' application programmes. An element string is the combination of a GS1 Application Identifier and a GS1 Application Identifier data field. The allowable character set to be used for GS1 Application Identifier element strings is defined in section *7.11*. There are AIs that have additional syntax restrictions, e.g., numerical only; see below definition for each AI.

Automatic processing of element strings in business applications requires information about the type of transaction to which the transferred data refers. See section *7* for an explanation of this process. Element strings can be carried by GS1-128, GS1 DataBar symbology, GS1 Composite, GS1 DataMatrix and GS1 QR Code symbols. The rules for use and interrelationships between the GS1 Application Identifiers are contained in section 2 and 4.

When a predefined length GS1 key and attributes are encoded together, the GS1 key SHOULD appear before the attributes. In most cases predefined length element strings SHOULD be followed by non-predefined element strings. The sequence of predefined and non-predefined element strings should be at the discretion of the creator of the element strings.

3.2 GS1 Application Identifiers in numerical order

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Figure 3.2-1. GS1 Application Identifiers

AI	Data Content	Format (*)	FNC1 required (****)	Data title
00	*Serial Shipping Container Code (SSCC)*	N2+N18		SSCC
01	*Global Trade Item Number (GTIN)*	N2+N14		GTIN
02	*GTIN of contained trade items*	N2+N14		CONTENT
10	*Batch or lot number*	N2+X..20	(FNC1)	BATCH/LOT
11 (**)	*Production date (YYMMDD)*	N2+N6		PROD DATE
12 (**)	*Due date (YYMMDD)*	N2+N6		DUE DATE
13 (**)	*Packaging date (YYMMDD)*	N2+N6		PACK DATE
15 (**)	*Best before date (YYMMDD)*	N2+N6		BEST BEFORE or BEST BY
16 (**)	*Sell by date (YYMMDD)*	N2+N6		SELL BY
17 (**)	*Expiration date (YYMMDD)*	N2+N6		USE BY OR EXPIRY
20	*Internal product variant*	N2+N2		VARIANT
21	*Serial number*	N2+X..20	(FNC1)	SERIAL
22	*Consumer product variant*	N2+X..20	(FNC1)	CPV
240	*Additional product identification assigned by the manufacturer*	N3+X..30	(FNC1)	ADDITIONAL ID
241	*Customer part number*	N3+X..30	(FNC1)	CUST. PART NO.
242	*Made-to-Order variation number*	N3+N..6	(FNC1)	MTO VARIANT
243	*Packaging component number*	N3+X..20	(FNC1)	PCN
250	*Secondary serial number*	N3+X..30	(FNC1)	SECONDARY SERIAL
251	*Reference to source entity*	N3+X..30	(FNC1)	REF. TO SOURCE
253	*Global Document Type Identifier (GDTI)*	N3+N13+X..17	(FNC1)	GDTI
254	*GLN extension component*	N3+X..20	(FNC1)	GLN EXTENSION COMPONENT
255	*Global Coupon Number (GCN)*	N3+N13+N..12	(FNC1)	GCN
30	*Variable count of items (variable measure trade item)*	N2+N..8	(FNC1)	VAR. COUNT
310n (***)	*Net weight, kilograms (variable measure trade item)*	N4+N6		NET WEIGHT (kg)
311n (***)	*Length or first dimension, metres (variable measure trade item)*	N4+N6		LENGTH (m)
312n (***)	*Width, diameter, or second dimension, metres (variable measure trade item)*	N4+N6		WIDTH (m)
313n (***)	*Depth, thickness, height, or third dimension, metres (variable measure trade item)*	N4+N6		HEIGHT (m)
314n (***)	*Area, square metres (variable measure trade item)*	N4+N6		AREA (m^2)
315n (***)	*Net volume, litres (variable measure trade item)*	N4+N6		NET VOLUME (l)
316n (***)	*Net volume, cubic metres (variable measure trade item)*	N4+N6		NET VOLUME (m^3)
320n (***)	*Net weight, pounds (variable measure trade item)*	N4+N6		NET WEIGHT (lb)
321n (***)	*Length or first dimension, inches (variable measure trade item)*	N4+N6		LENGTH (i)
322n (***)	*Length or first dimension, feet (variable measure trade item)*	N4+N6		LENGTH (f)

AI	Data Content	Format (*)	FNC1 required (****)	Data title
323n (***)	*Length or first dimension, yards (variable measure trade item)*	N4+N6		LENGTH (y)
324n (***)	*Width, diameter, or second dimension, inches (variable measure trade item)*	N4+N6		WIDTH (i)
325n (***)	*Width, diameter, or second dimension, feet (variable measure trade item)*	N4+N6		WIDTH (f)
326n (***)	*Width, diameter, or second dimension, yards (variable measure trade item)*	N4+N6		WIDTH (y)
327n (***)	*Depth, thickness, height, or third dimension, inches (variable measure trade item)*	N4+N6		HEIGHT (i)
328n (***)	*Depth, thickness, height, or third dimension, feet (variable measure trade item)*	N4+N6		HEIGHT (f)
329n (***)	*Depth, thickness, height, or third dimension, yards (variable measure trade item)*	N4+N6		HEIGHT (y)
330n (***)	*Logistic weight, kilograms*	N4+N6		GROSS WEIGHT (kg)
331n (***)	*Length or first dimension, metres*	N4+N6		LENGTH (m), log
332n (***)	*Width, diameter, or second dimension, metres*	N4+N6		WIDTH (m), log
333n (***)	*Depth, thickness, height, or third dimension, metres*	N4+N6		HEIGHT (m), log
334n (***)	*Area, square metres*	N4+N6		AREA (m^2), log
335n (***)	*Logistic volume, litres*	N4+N6		VOLUME (l), log
336n (***)	*Logistic volume, cubic metres*	N4+N6		VOLUME (m^3), log
337n (***)	*Kilograms per square metre*	N4+N6		KG PER m^2
340n (***)	*Logistic weight, pounds*	N4+N6		GROSS WEIGHT (lb)
341n (***)	*Length or first dimension, inches*	N4+N6		LENGTH (i), log
342n (***)	*Length or first dimension, feet*	N4+N6		LENGTH (f), log
343n (***)	*Length or first dimension, yards*	N4+N6		LENGTH (y), log
344n (***)	*Width, diameter, or second dimension, inches*	N4+N6		WIDTH (i), log
345n (***)	*Width, diameter, or second dimension, feet*	N4+N6		WIDTH (f), log
346n (***)	*Width, diameter, or second dimension, yard*	N4+N6		WIDTH (y), log
347n (***)	*Depth, thickness, height, or third dimension, inches*	N4+N6		HEIGHT (i), log
348n (***)	*Depth, thickness, height, or third dimension, feet*	N4+N6		HEIGHT (f), log
349n (***)	*Depth, thickness, height, or third dimension, yards*	N4+N6		HEIGHT (y), log
350n (***)	*Area, square inches (variable measure trade item)*	N4+N6		AREA (i^2)

AI	Data Content	Format (*)	FNC1 required (****)	Data title
351n (***)	*Area, square feet (variable measure trade item)*	N4+N6		AREA (f^2)
352n (***)	*Area, square yards (variable measure trade item)*	N4+N6		AREA (y^2)
353n (***)	*Area, square inches*	N4+N6		AREA (i^2), log
354n (***)	*Area, square feet*	N4+N6		AREA (f^2), log
355n (***)	*Area, square yards*	N4+N6		AREA (y^2), log
356n (***)	*Net weight, troy ounces (variable measure trade item)*	N4+N6		NET WEIGHT (t)
357n (***)	*Net weight (or volume), ounces (variable measure trade item)*	N4+N6		NET VOLUME (oz)
360n (***)	*Net volume, quarts (variable measure trade item)*	N4+N6		NET VOLUME (q)
361n (***)	*Net volume, gallons U.S. (variable measure trade item)*	N4+N6		NET VOLUME (g)
362n (***)	*Logistic volume, quarts*	N4+N6		VOLUME (q), log
363n (***)	*Logistic volume, gallons U.S.*	N4+N6		VOLUME (g), log
364n (***)	*Net volume, cubic inches (variable measure trade item)*	N4+N6		VOLUME (i^3)
365n (***)	*Net volume, cubic feet (variable measure trade item)*	N4+N6		VOLUME (f^3)
366n (***)	*Net volume, cubic yards (variable measure trade item)*	N4+N6		VOLUME (y^3)
367n (***)	*Logistic volume, cubic inches*	N4+N6		VOLUME (i^3), log
368n (***)	*Logistic volume, cubic feet*	N4+N6		VOLUME (f^3), log
369n (***)	*Logistic volume, cubic yards*	N4+N6		VOLUME (y^3), log
37	~~*Count of trade items*~~*Count of trade items or trade item pieces contained in a logistic unit*	N2+N..8	(FNC1)	COUNT
390n (***)	*Applicable amount payable or Coupon value, local currency*	N4+N..15	(FNC1)	AMOUNT
391n (***)	*Applicable amount payable with ISO currency code*	N4+N3+N..15	(FNC1)	AMOUNT
392n (***)	*Applicable amount payable, single monetary area (variable measure trade item)*	N4+N..15	(FNC1)	PRICE
393n (***)	*Applicable amount payable with ISO currency code (variable measure trade item)*	N4+N3+N..15	(FNC1)	PRICE
394n (***)	*Percentage discount of a coupon*	N4+N4	(FNC1)	PRCNT OFF
400	*Customer's purchase order number*	N3+X..30	(FNC1)	ORDER NUMBER
401	*Global Identification Number for Consignment (GINC)*	N3+X..30	(FNC1)	GINC
402	*Global Shipment Identification Number (GSIN)*	N3+N17	(FNC1)	GSIN
403	*Routing code*	N3+X..30	(FNC1)	ROUTE
410	*Ship to - Deliver to Global Location Number*	N3+N13		SHIP TO LOC

Field Code Changed

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AI	Data Content	Format (*)	FNC1 required (****)	Data title
411	*Bill to - Invoice to Global Location Number*	N3+N13		BILL TO
412	*Purchased from Global Location Number*	N3+N13		PURCHASE FROM
413	*Ship for - Deliver for - Forward to Global Location Number*	N3+N13		SHIP FOR LOC
414	*Identification of a physical location - Global Location Number*	N3+N13		LOC No
415	*Global Location Number of the invoicing party*	N3+N13		PAY TO
416	*GLN of the production or service location*	N3+N13		PROD/SERV LOC
420	*Ship to - Deliver to postal code within a single postal authority*	N3+X..20	(FNC1)	SHIP TO POST
421	*Ship to - Deliver to postal code with ISO country code*	N3+N3+X..9	(FNC1)	SHIP TO POST
422	*Country of origin of a trade item*	N3+N3	(FNC1)	ORIGIN
423	*Country of initial processing*	N3+N3+N..12	(FNC1)	COUNTRY - INITIAL PROCESS.
424	*Country of processing*	N3+N3	(FNC1)	COUNTRY - PROCESS.
425	*Country of disassembly*	N3+N3+N..12	(FNC1)	COUNTRY - DISASSEMBLY
426	*Country covering full process chain*	N3+N3	(FNC1)	COUNTRY – FULL PROCESS
427	*Country subdivision of origin*	N3+X..3	(FNC1)	ORIGIN SUBDIVISION
7001	*NATO Stock Number (NSN)*	N4+N13	(FNC1)	NSN
7002	*UN/ECE meat carcasses and cuts classification*	N4+X..30	(FNC1)	MEAT CUT
7003	*Expiration date and time*	N4+N10	(FNC1)	EXPIRY TIME
7004	*Active potency*	N4+N..4	(FNC1)	ACTIVE POTENCY
7005	*Catch area*	N4+X..12	(FNC1)	CATCH AREA
7006	*First freeze date*	N4+N6	(FNC1)	FIRST FREEZE DATE
7007	*Harvest date*	N4+N6..12	(FNC1)	HARVEST DATE
7008	*Species for fishery purposes*	N4+X..3	(FNC1)	AQUATIC SPECIES
7009	*Fishing gear type*	N4+X..10	(FNC1)	FISHING GEAR TYPE
7010	*Production method*	N4+X..2	(FNC1)	PROD METHOD
7020	*Refurbishment lot ID*	N4+X..20	(FNC1)	REFURB LOT
7021	*Functional status*	N4+X..20	(FNC1)	FUNC STAT
7022	*Revision status*	N4+X..20	(FNC1)	REV STAT
7023	*Global Individual Asset Identifier (GIAI) of an assembly*	N4+X..30	(FNC1)	GIAI – ASSEMBLY
703s	*Number of processor with ISO Country Code*	N4+N3+X..27	(FNC1)	PROCESSOR # s
710	*National Healthcare Reimbursement Number (NHRN) – Germany PZN*	N3+X..20	(FNC1)	NHRN PZN
711	*National Healthcare Reimbursement Number (NHRN) – France CIP*	N3+X..20	(FNC1)	NHRN CIP
712	*National Healthcare Reimbursement Number (NHRN) – Spain CN*	N3+X..20	(FNC1)	NHRN CN
713	*National Healthcare Reimbursement Number (NHRN) – Brasil DRN*	N3+X..20	(FNC1)	NHRN DRN
714	*National Healthcare Reimbursement Number (NHRN) – Portugal AIM*	N3+X..20	(FNC1)	NHRN AIM
... (*****)	*National Healthcare Reimbursement Number (NHRN) – Country "A" NHRN*	N3+X..20	(FNC1)	NHRN xxx

AI	Data Content	Format (*)	FNC1 required (****)	Data title
723s (******)	Certification reference	N4+X2+X..28	(FNC1)	CERT # s
8001	Roll products (width, length, core diameter, direction, splices)	N4+N14	(FNC1)	DIMENSIONS
8002	Cellular mobile telephone identifier	N4+X..20	(FNC1)	CMT No
8003	Global Returnable Asset Identifier (GRAI)	N4+N14+X..16	(FNC1)	GRAI
8004	Global Individual Asset Identifier (GIAI)	N4+X..30	(FNC1)	GIAI
8005	Price per unit of measure	N4+N6	(FNC1)	PRICE PER UNIT
8006	Identification of an individual trade item piece	N4+N14+N2+N2	(FNC1)	ITIP or GCTIN (******)
8007	International Bank Account Number (IBAN)	N4+X..34	(FNC1)	IBAN
8008	Date and time of production	N4+N8+N..4	(FNC1)	PROD TIME
8009	Optically Readable Sensor Indicator	N4+X..50	(FNC1)	OPTSEN
8010	Component/Part Identifier (CPID)	N4+X..30	(FNC1)	CPID
8011	Component/Part Identifier serial number (CPID SERIAL)	N4+N..12	(FNC1)	CPID SERIAL
8012	Software version	N4+X..20	(FNC1)	VERSION
8013	Global Model Number (GMN)	N4+X..30	(FNC1)	GMN or BUDI-DI (*******)
8017	Global Service Relation Number to identify the relationship between an organisation offering services and the provider of services	N4+N18	(FNC1)	GSRN - PROVIDER
8018	Global Service Relation Number to identify the relationship between an organisation offering services and the recipient of services	N4+N18	(FNC1)	GSRN - RECIPIENT
8019	Service Relation Instance Number (SRIN)	N4+N..10	(FNC1)	SRIN
8020	Payment slip reference number	N4+X..25	(FNC1)	REF No
8110	Coupon code identification for use in North America	N4+X..70	(FNC1)	-
8026	ITIP of contained pieces	N4+N18	(FNC1)	ITIP CONTENT
8111	Loyalty points of a coupon	N4+N4	(FNC1)	POINTS
8112	Paperless coupon code identification for use in North America (AI 8112)~~Paperless coupon code identification for use in North America (AI 8112)Paperless coupon code identification for use in North America (AI 8112)~~	N4+X..70	(FNC1)	-
8200	Extended Packaging URL	N4+X..70	(FNC1)	PRODUCT URL
90	Information mutually agreed between trading partners	N2+X..30	(FNC1)	INTERNAL
91 to 99	Company internal information	N2+X..90	(FNC1)	INTERNAL

NOTES:
(*): The first position indicates the length (number of digits) of the GS1 Application Identifier. The following value refers to the format of the data content. The following convention is applied:

- n implied decimal point position
- N numeric digit
- X any character in figure 7.11-1
- N3 3 numeric digits, predefined length
- N..3 up to 3 numeric digits
- X..3 up to 3 characters in figure 7.11-1

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(**): If only year and month are available, DD must be filled with two zeroes.

(***): The fourth digit of this GS1 Application Identifier indicates the number of decimal places (and in that way the implied decimal point position).

Example:

- 3100 Net weight in kg without a decimal point
- 3102 Net weight in kg with two decimal places

(****): All GS1 element strings that begin with GS1 Application Identifiers not contained in the predefined table shown in figure 7.8.4-2 SHALL be separated by a separator character unless this element string is the last one to be encoded in the symbol. For details on the separator character see section 7.8.3.

(*****) An example to illustrate future additional National Healthcare Reimbursement Numbers (NHRNs). If additional NHRN AIs are required, a request for a new NHRN AI SHALL be made through ~~the GS1~~ GSMP.

Commented [CJ120]: ERv18-032

(******) ITIP is the preferred data title for AI (8006) and GCTIN will have a sunset date of January 2020.

(*******) For medical devices, the default, global data title is BUDI-DI

(********) The fourth digit of this GS1 Application Identifier indicates the sequence number, allowing for multiple occurrences of the AI.

Commented [CJ121]: Note for editorial team: The current note references *, **, *** etc. should be replaced by numbered references (1) , (2), (3)

3.3 GS1 Application Identifiers starting with digit 0

3.3.1 Identification of a logistic unit (SSCC): AI (00)

The GS1 Application Identifier (00) indicates that the GS1 Application Identifier data field contains an SSCC (Serial Shipping Container Code). The SSCC is used to identify logistic units (see section 2.2).

The extension digit is used to increase the capacity of the serial reference within the SSCC. It is assigned by the company that constructs the SSCC. The extension digit ranges from 0-9.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the SSCC – here the physical builder or the brand owner of the logistic unit (see section 1.4.4). It makes the SSCC unique worldwide but does not identify the origin of the unit.

The structure and content of the serial reference is at the discretion of owner of the GS1 Company Prefix to uniquely identify each logistic unit.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.3.1-1. Format of the element string

GS1 Application Identifier	SSCC (Serial Shipping Container Code)																	
	Extension digit	GS1 Company Prefix →									Serial reference ←							Check digit
0 0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}	N_{15}	N_{16}	N_{17}	N_{18}

The data transmitted from the barcode reader means that the element string denoting the SSCC of a logistic unit has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **SSCC**

3.3.2 Identification of a trade item (GTIN): AI (01)

The GS1 Application Identifier (01) indicates that the GS1 Application Identifier data field contains a GTIN. The GTIN is used to identify trade items (see section 2.1 4).

The GTIN for trade items may be a GTIN-8, GTIN-12, GTIN-13 or a GTIN-14. See section 2.1 for the rules for GTIN formats and mandatory or optional attributes in the various trade item applications.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.3.2-1. Format of the element string

	GS1 Application Identifier	Global Trade Item Number (GTIN)													
		GS1-8 Prefix or GS1 Company Prefix →								← Item reference					Check digit
(GTIN-8)	0 1	0	0	0	0	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8
(GTIN-12)	0 1	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
(GTIN-13)	0 1	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}
(GTIN-14)	0 1	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

The data transmitted from the barcode reader means that the element string denoting the GTIN of a ~~fixed measure~~ trade item has been captured.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **GTIN**

3.3.3 Identification of trade items contained in a logistic unit: AI (02)

The GS1 Application Identifier (02) indicates that the GS1 Application Identifier data field includes the GTIN of the contained trade items. The GTIN is used to identify trade items (see section 4).

The GTIN for trade items may be a GTIN-8, GTIN-12, GTIN-13 or a GTIN-14. See section 2 for the rules for GTIN formats and mandatory or optional attributes in the various trade item applications.

The GTIN of the trade items contained is the GTIN of the highest level of trade item contained in the logistic unit.

Note: This element string SHALL be used only on a logistic unit if:

- the logistic unit is not itself a trade item; and
- all trade items that are contained at the highest level have the same GTIN.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.3.3-1. Format of the element string

	GS1 Application Identifier	Global Trade Item Number (GTIN)													
		GS1-8 Prefix or GS1 Company Prefix →								← Item reference					Check digit
(GTIN-8)	0 2	0	0	0	0	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8
(GTIN-12)	0 2	0	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
(GTIN-13)	0 2	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}
(GTIN-14)	0 2	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

The data transmitted from the barcode reader means that the element string denoting the GTIN of trade items contained in a logistic unit has been captured.

This element string must be processed together with the count of trade items, AI (37), which must appear on the same unit (see section 3.6.5). Restrictions apply to the use of AI (02) in combination with other AIs, see section 4.14 Data relationships.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **CONTENT**

Field Code Changed

Field Code Changed

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3.4 GS1 Application Identifiers starting with digit 1

3.4.1 Batch or lot number: AI (10)

The GS1 Application Identifier (10) indicates that the GS1 Application Identifier data field contains a batch or lot number. The batch or lot number associates an item with information the manufacturer considers relevant for traceability of the trade item to which the element string is applied. The data may refer to the trade item itself or to items contained. The number may be, for example, a production lot number, a shift number, a machine number, a time, or an internal production code. The data is alphanumeric and may include all characters contained in figure *7.11-1*.

Note: The batch or lot number is not part of the unique identification of a trade item.

Figure 3.4.1-1. Format of the element string

GS1 Application Identifier	Batch or lot number
1 0	X_1 ——————› variable length ——————› X_{20}

The data transmitted by the barcode reader means that the element string denoting a batch or lot number has been captured. As this element string is an attribute of a particular item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **BATCH/LOT**

Commented [CJ122]: WR18-cip6, there are several more additions and edits like this in section 3

3.4.2 Production date: AI (11)

The GS1 Application Identifier (11) indicates that the GS1 Application Identifier data field contains a production date. The production date is the production or assembly date determined by the manufacturer. The date may refer to the trade item itself or to items contained. The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros.

Note: When it is not necessary to specify the day (the day field is filled with two zeros), the resultant data string ~~shall~~ SHALL be interpreted as the last day of the noted month including any adjustment for leap years (e.g., "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

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Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.4.2-1. Format of the element string

GS1 Application Identifier	Production date		
	Year	Month	Day
1 1	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting a production date has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PROD DATE**

3.4.3 Due date for amount on payment slip: AI (12)

The GS1 Application Identifier (12) indicates that the GS1 Application Identifier data field contains the date by which an invoice should be paid. This data element represents an attribute of a payment slip reference number, AI (8020), and a Global Location Number (GLN) of the invoicing party. The structure is:

- Year: the tens and units of the year (e.g., 1998 = 98), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros.

Note: When it is not necessary to specify the day (the day field is filled with two zeros), the resultant data string SHALL be interpreted as the last day of the noted month including any adjustment for leap years (e.g., "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.4.3-1. Format of the element string

GS1 Application Identifier	Due date		
	Year	Month	Day
1 2	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting a due date has been captured. Restrictions apply to the use of this AI in combination with other AIs, see section *4.14 Data relationships*. ~~This element string must be processed together with a payment slip reference number, AI (8020), and a GLN of the invoicing party, AI (415).~~

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **DUE DATE**

3.4.4 Packaging date: AI (13)

The GS1 Application Identifier (13) indicates that the GS1 Application Identifier data fields contain a packaging date. The packaging date is the date when the goods were packed as determined by the packager. The date may refer to the trade item itself or to items contained. The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros.

Note: When it is not necessary to specify the day (the day field is filled with two zeros), the resultant data string ~~shall~~ SHALL be interpreted as the last day of the noted month including any adjustment for leap years (e.g., "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

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Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.4.4-1. Format of the element string

GS1 Application Identifier	Packaging date		
	Year	Month	Day
1 3	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting a packaging date has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PACK DATE**

3.4.5 Best before date: AI (15)

The GS1 Application Identifier (15) indicates that the GS1 Application Identifier data fields contain a best before date. Best before date on the label or package signifies the end of the period under which the product will retain specific quality attributes or claims even though the product may continue to retain positive quality attributes after this date. Best before date is primarily used for consumer information and may be a regulatory requirement.

Note: A retailer may use this to determine a date that after which, they will no longer merchandise the product. Currently, there are implementations of best before date which are interpreted in their processes as date to Sell By.

The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros.

Note: When it is not necessary to specify the day (the Day field is filled with two zeros), the resultant data string SHALL be interpreted as the last day of the noted month including any adjustment for leap years (e.g., "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.4.5-1. Format of the element string

GS1 Application Identifier	Best before date		
	Year	Month	Day
1 5	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting a best before date has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **BEST BEFORE** or **BEST BY**

3.4.6 Sell by date: AI (16)

The GS1 Application Identifier (16) indicates the date specified by the manufacturer as the last date the retailer is to offer the product for sale to the consumer. The product should not be merchandised after this date.

Note: This AI is to be used in sectors where the manufacturer has agreed to apply the SELL BY date for the customer's use.

The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros.

Note: When it is not necessary to specify the day (the Day field is filled with two zeros), the resultant data string SHALL be interpreted as the last day of the noted month including any adjustment for leap years (e.g., "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

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Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.4.6-1. Format of the element string

GS1 Application Identifier	Sell by date		
	Year	Month	Day
1 6	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting a sell by date has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **SELL BY**

3.4.7 Expiration date: AI (17)

The GS1 Application Identifier (17) indicates that the GS1 Application Identifier data fields contain an expiration date. The expiration date is the date that determines the limit of consumption or use of a product/coupon. Its meaning is determined based on the trade item context (e.g., for food, the date will indicate the possibility of a direct health risk resulting from use of the product after the date, for pharmaceutical products, it will indicate the possibility of an indirect health risk resulting from the ineffectiveness of the product after the date). It is often referred to as "use by date" or "maximum durability date."

The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros.

Note: When it is not necessary to specify the day (the day field is filled with two zeros), the resultant data string SHALL be interpreted as the last day of the noted month including any adjustment for leap years (e.g., "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.4.7-1. Format of the element string

GS1 Application Identifier	Expiration date		
	Year	Month	Day
1 7	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting an expiration date has been captured. As this element string is an attribute of a trade item or a coupon, it must be processed together with the GTIN ~~of the trade item~~ or the ~~Global Coupon Number (~~GCN~~)~~ ,,to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **USE BY or EXPIRY**

3.5 GS1 Application Identifiers starting with digit 2

3.5.1 Internal product variant: AI (20)

This element string may be used to distinguish an internal product variant from the usual item if the variation is not sufficiently significant to require a separate Global Trade Item Number (GTIN) and the variation is relevant only to the brand owner and any third party acting on its behalf.

The internal product variant is only for use by the brand owner and any third party acting on its behalf and not for dealings with any other trading partners. The product variant SHALL NOT be used where the variation would trigger the allocation of a different GTIN per the *GTIN Management Standard*.

Although the element string will not have meaning to all trading partners, the element string may remain on the item throughout distribution.

Figure 3.5.1-1. Format of the element string

GS1 Application Identifier	Internal product variant
2 0	N_1 N_2

The GS1 Application Identifier (20) indicates that the data field contains an internal product variant number.

The internal product variant number must only be assigned by the brand owner. It forms a subsidiary numbering facility that can be used in addition to the item's GTIN and allows the creation of 100 variants of a particular item.

The data transmitted from the barcode reader means that the element string denoting an internal product variant has been captured. The internal product variant must be processed together with the GTIN of the ~~same~~ trade item (see section *4.14.2*). ~~Beyond the brand owner and any third party acting on its behalf, it should be ignored.~~ When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **VARIANT**

3.5.2 Serial number: AI (21)

The GS1 Application Identifier (21) indicates that the GS1 Application Identifier data field contains a serial number. A serial number is assigned to an entity for its lifetime. When combined with a GTIN, a serial number uniquely identifies an individual item. The serial number field is alphanumeric and may include all characters contained in figure *7.11-1*. The manufacturer determines the serial number.

Figure 3.5.2-1. Format of the element string

GS1 Application Identifier	Serial number
2 1	X_1 ——— variable length ———› X_{20}

The data transmitted from the barcode reader means that the element string denoting a serial number has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **SERIAL**

3.5.3 Consumer product variant: AI (22)

This element string may be used to distinguish one variant of a retail consumer trade item from another if the change does not require the allocation of a different Global Trade Item Number (per the GTIN Management Standard), but communication between trading partners is required to support consumers. The brand owner is responsible for assigning the consumer product variant. The data is alphanumeric and may include all characters contained in figure *7.11-1*.

Figure 3.5.3-1. Format of the element string

GS1 Application Identifier	Consumer product variant
2 2	X_1 ——————— variable length ———————› X_{20}

The GS1 Application Identifier (22) indicates that the data field contains a consumer product variant.

Note: The consumer product variant, AI (22), differs from the internal product variant, element string AI (20), which is relevant only to the brand owner and any third party acting on its behalf.

The data transmitted from the barcode reader means that the element string denoting a consumer product variant has been captured. The consumer product variant must be processed together with the GTIN of the ~~same retail consumer~~ trade item (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **CPV**

3.5.4 Additional product identification assigned by the manufacturer: AI (240)

The GS1 Application Identifier (240) indicates that the GS1 Application Identifier data field contains additional item identification. The purpose of this element string is to enable identification data other than the Global Trade Item Number (GTIN) to be represented in a GS1 system data carrier. It is a cross-reference to previously used catalogue numbers. The additional item identification is considered an attribute of the GTIN (e.g., it facilitates migration to the GS1 system during a transitional period). However, it must not be used to replace the GTIN.

The additional item identification field is alphanumeric and may include all characters contained in figure *7.11-1*. Its content and structure are at the discretion of the company applying the element string.

Figure 3.5.4-1. Format of the element string

GS1 Application Identifier	Additional item identification
2 4 0	X_1 ——————— variable length ———————› X_{30}

The data transmitted from the barcode reader means that the element string denoting an additional item identification has been captured. This element string must be processed together with the GTIN of the ~~same~~ trade item (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **ADDITIONAL ID**

3.5.5 Customer part number: AI (241)

The GS1 Application Identifier (241) indicates that the GS1 Application Identifier data field contains a customer part number. The purpose of this element string is to enable identification data other than the Global Trade Item Number (GTIN) to be represented in a GS1 system data carrier. The element string SHOULD only be used between trading partners that are currently using the customer part number for ordering and who have agreed on a timetable to convert to the GTIN for their business purposes. Therefore, the use of the GTIN and the AI (241) on trade items is for transitional use during the conversion. The customer part number must not be used in place of the GTIN. The customer part number field is alphanumeric and may include all characters contained in figure *7.11-1*.

Figure 3.5.5-1. Format of the element string

GS1 Application Identifier	Customer part number
2 4 1	X_1 ——————variable length ——————›X_{30}

The data transmitted from the barcode reader means that the element string denoting a customer part number has been captured. This element string must be processed together with the GTIN of the ~~same~~ trade item (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **CUST. PART NO.**

3.5.6 Made-to-Order variation number: AI (242)

The GS1 Application Identifier (242) indicates that the data field contains a Made-to-Order variation number. The data is variable length numeric up to and including six digits.

The Made-to-Order variation number provides the additional data needed to uniquely identify a custom trade item (see section *2.6.8*).

There is a mandatory association of AI 242 with a GTIN-14, indicator digit 9. This association indicates that the GTIN-14, indicator digit 9 represents a custom trade item when paired with AI (242).

A Made-to-Order variation number may not be used with the following GTINs: GTIN-8, GTIN-12, GTIN-13, and GTIN-14 indicator digit 1 through 8. The use of a GTIN-14, indicator digit 9 and a Made-to-Order variation number is only approved for the manufacturing and maintenance, repair & overhaul (MRO) environment.

Figure 3.5.6-1. Format of the element string

GS1 Application Identifier	Made-to-Order variation number
2 4 2	N_1————— variable length————› N_6

The data transmitted by the barcode reader means that the element string denoting a Made-to-Order variation number has been captured. This element string must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*~~see section *3.3.2*~~). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD also be used ~~(see also section *3.2*)~~: **MTO VARIANT**

3.5.7 Packaging component number: AI (243)

The GS1 Application Identifier (243) indicates the GS1 Application Identifier data field contains a Packaging Component Number (PCN). A PCN is assigned to the packaging component for its lifetime. When associated with a GTIN, a PCN uniquely identifies the relationship between a finished consumer trade item and one of its packaging components.

The current use case for PCN is for internal use only however the PCN may be considered in future use cases for open supply chain applications. The Packaging Component Number field is alphanumeric and may include all characters contained in figure *7.11-1*.

Figure 3.5.7-1. Format of the element string

GS1 Application Identifier	Packaging Component Number
2 4 3	X_1 ——————› variable length——————› X_{20}

The data transmitted from the barcode reader means that the element string denoting a Packaging Component Number has been captured. As this element string is an attribute of a particular item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PCN**

3.5.8 Secondary serial number: AI (250)

The GS1 Application Identifier (250) indicates that the GS1 Application Identifier data field contains a secondary serial number. While the element string using AI (21) (see section *3.5.2*) contains the serial number of the trade item, the element string denoting a secondary serial number represents the serial number of a component of that item. The company applying the element string determines which component the element string refers to for a given trade item. The recognition of the meaning of the secondary serial number is accomplished via the GTIN and information provided by the issuer regarding the component to which the secondary serial number refers.

If this element string is being used, the trade item must be symbol marked with the following element strings:

- AI (01): representing the GTIN of the trade item.
- AI (21): representing the serial number of the trade item.
- AI (250): representing the serial number of a component of the trade item.

Only one element string with AI (250) may be associated with a particular GTIN.

The secondary serial number field is alphanumeric and may include all characters contained in figure *7.11-1*. The number and to what component it relates is determined by the issuer.

Figure 3.5.8-1. Format of the element string

GS1 Application Identifier	Secondary serial number
2 5 0	X_1 —————— variable length——————›X_{30}

The data transmitted from the barcode reader means that the element string denoting a secondary serial number has been captured. This element string must be processed together with the GTIN ~~of the trade item to which it relates~~ and the serial number of the trade item (see section *4.14.2*)~~AI (21)~~. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **SECONDARYSERIAL**

~~**Note**: The actual data title may be specified by the issuer of the data.~~

3.5.9 Reference to source entity: AI (251)

The GS1 Application Identifier (251) indicates that the GS1 Application Identifier data field consists of a reference to the original item. Reference to source entity is an attribute of a trade item used to refer to the original item from which the trade item was derived. The issuer of the trade item must indicate through other means the source entity to which the data refers.

For example, the original item could be an animal from which a carcass of beef is derived. This element string would enable reference to the original animal, so that, if the animal was found to be contaminated, all derived products could be isolated. In addition, this element string could also be used for regulatory compliance when recycling parts from various white goods, such as refrigerators, where it is necessary to refer to the original appliance. The reference to the source entity field is alphanumeric and may include all characters contained in figure *7.11-1*.

Figure 3.5.9-1. Format of the element string

GS1 Application Identifier	Reference to source entity
2 5 1	X_1 ——————variable length ——————› X_{30}

The data transmitted by the barcode reader means that the element string denoting a reference to source entity has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **REF. TO SOURCE**

~~**Note**: The actual data title may be specified by the issuer of the data.~~

3.5.10 Global Document Type Identifier (GDTI): AI (253)

The GS1 Application Identifier (253) indicates that the GS1 Application Identifier data field contains the Global Document Type Identifier (GDTI). The GDTI is used to identify a document type with an optional serial number.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GDTI – here the document issuer (see section *1.4.4*). It makes the number unique worldwide.

The structure and content of the Document Type is at the discretion of the document issuer, in order to uniquely identify each type of document.

The check digit is explained in section *7.9*. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

The optional serial component is assigned to a single document for its lifetime. When the serial component is included, the GDTI uniquely identifies an individual document. The serial component field is alpha-numeric and may contain up to 17 characters. It may contain all characters contained in figure *7.11-1*. The issuer of the document determines the serial component.

Figure 3.5.10-1. Format of the element string

GS1 Application Identifier	Global Document Type Identifier (GDTI)			
	GS1 Company Prefix ——————›	‹—————— Document type	Check digit	Serial component (optional)
2 5 3	N_1 N_2 N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}		N_{13}	X_1 —variable —› X_{17}

The data transmitted from the barcode reader means that the element string denoting a GDTI has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **GDTI**

3.5.11 GLN extension component: AI (254)

The GS1 Application Identifier (254) indicates that the data field contains an extension component of a Global Location Number (GLN). The use of AI (254) is optional, but when used it must appear in conjunction with AI (414), identification of a physical location.

The party who defined the location determines the extension component. Once determined, it is unchanged for the life of the associated GLN. The GLN extension component field is alphanumeric and may include all characters contained in figure *7.11-1*.

Figure 3.5.11-1. Format of the element string

GS1 Application Identifier	GLN extension component
2 5 4	X_1 ———— variable length ————› X_{20}

The data transmitted from the reader means that the element string denoting an extension component of a GLN has been captured. As this element string is an attribute of a physical location, it must be processed together with the GLN~~, AI (414),~~ to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **GLN EXTENSION COMPONENT**

3.5.12 Global Coupon Number (GCN): AI (255)

The GS1 Application Identifier (255) indicates that the GS1 Application Identifier data field contains the Global Coupon Number (GCN). The GCN provides a globally unique identification for a coupon, with an optional serial number.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GCN. It makes the number unique worldwide.

The structure and content of the coupon reference is at the discretion of the coupon issuer, in order to uniquely identify each type of coupon.

The check digit is explained in section *7.9*. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

The optional serial component is assigned to an individual instance of a coupon. The combination of GS1 Company Prefix, coupon reference and serial component uniquely identifies an individual coupon. The serial component field is numeric and may contain up to 12 digits. The issuer of the Global Coupon Number determines the serial component.

Figure 3.5.12-1. Format of the element string

GS1 Application Identifier	Global Coupon Number (GCN)			
	GS1 Company Prefix ⟶	⟵ Coupon reference	Check digit	Serial component (optional)
2 5 5	N_1 N_2 N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}		N_{13}	N_1 —variable —› N_{12}

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **GCN**

3.6 GS1 Application Identifiers starting with digit 3

3.6.1 Variable count of items: AI (30)

The GS1 Application Identifier (30) indicates that the GS1 Application Identifier data field contains the number of items contained in a variable measure trade item. This element string is used to complete the identification of a variable measure trade item and, therefore, should never be applied in isolation.

The variable count of items field represents the quantity contained in the respective trade item. It is of variable length and may have up to eight digits.

Note: This element string must not be used to indicate the contained quantity of a fixed measure trade item. However, if this element string appears on a fixed measure trade item (in error) it should not invalidate the item identification but should be treated as redundant data.

Figure 3.6.1-1. Format of the element string

GS1 Application Identifier	Variable count of items
3 0	N_1 ———variable length ———›N_8

The data transmitted from the barcode reader means that the element string denoting a quantity (variable count of items), which can be considered part of the identification of a variable measure

trade item, has been captured. This element string must be processed with the GTIN of the trade item to which it relates (see section 4.14.2)~~see section 3.3.2~~).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **VAR. COUNT**

3.6.2 Trade measures: AIs (31nn, 32nn, 35nn, 36nn)

The GS1 Application Identifiers (digits A1 to A4 – see figure below) indicate that the GS1 Application Identifier data field contains the quantity or dimension of a variable measure trade item. It also denotes the unit of measure. These element strings are used to complete the identification of a variable measure trade item. They contain information such as the weight, size, volume, or dimension of a variable measure trade item and, therefore, should never be applied alone. Several element strings are possible if the variables required are dimensions or weights expressed in kilograms and pounds.

The GS1 Application Identifier digit A4 indicates the implied decimal point position, where, 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. The "applicable value" field contains the variable measure that applies to the respective trade item.

Figure 3.6.2-1. Format of the element string

GS1 Application Identifier				Applicable value					
A_1	A_2	A_3	A_4	N_1	N_2	N_3	N_4	N_5	N_6

The GS1 Application Identifiers used with this element string are shown in the figure below.

Note: Other values of AI (3nnn) specify gross measures and logistic measures.

Figure 3.6.2-2. GS1 Application Identifiers for trade measures

A_1	A_2	A_3	A_4	Trade measure	Unit of measure
3	1	0	n	Net weight	Kilograms
3	1	1	n	Length or first dimension	Metres
3	1	2	n	Width, diameter, or second dimension	Metres
3	1	3	n	Depth, thickness, height, or third dimension	Metres
3	1	4	n	Area	Square metres
3	1	5	n	Net volume	Litres
3	1	6	n	Net volume	Cubic metres
3	2	0	n	Net weight	Pounds
3	2	1	n	Length or first dimension	Inches
3	2	2	n	Length or first dimension	Feet
3	2	3	n	Length or first dimension	Yards
3	2	4	n	Width, diameter, or second dimension	Inches
3	2	5	n	Width, diameter, or second dimension	Feet
3	2	6	n	Width, diameter, or second dimension	Yards
3	2	7	n	Depth, thickness, height, or third dimension	Inches
3	2	8	n	Depth, thickness, height, or third dimension	Feet
3	2	9	n	Depth, thickness, height, or third dimension	Yards
3	5	0	n	Area	Square inches
3	5	1	n	Area	Square feet
3	5	2	n	Area	Square yards
3	5	6	n	Net weight	Troy ounces
3	5	7	n	Net weight (or volume)	Ounces

A_1	A_2	A_3	A_4	Trade measure	Unit of measure
3	6	0	n	Net volume	Quarts
3	6	1	n	Net volume	Gallons (U.S.)
3	6	4	n	Net volume	Cubic inches
3	6	5	n	Net volume	Cubic feet
3	6	6	n	Net volume	Cubic yards

The data transmitted from the barcode reader means that the element string denoting a quantity, which can be considered part of the identification of a variable measure trade item, has been captured. This element string must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*)~~(see section *3.3.2*)~~. When indicating this element string in the non-HRI text section of a barcode label, the data title listed in section *3.2* SHOULD be used.

3.6.3 Logistic measures: AIs (33nn, 34nn, 35nn, 36nn)

Note: For AI(337) refer to section *3.6.4*

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The GS1 Application Identifiers (A1 to A4 see figure below) indicate that the GS1 Application Identifier data field contains the logistic quantity or dimension of a logistic unit or a variable measure trade item. They also denote the unit of measure.

Note: The GS1 system provides standards for logistic weights and measures in metric and other units of measure. In principle, a particular logistic measure SHOULD be applied in only one unit of measure on a given logistic unit. However, application of the same attribute in several units of measure does not impede the correct processing of the transmitted data.

The GS1 Application Identifier digit in field A4 indicates the implied decimal point position, where, 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. The Applicable Value field represents the measures of the respective unit.

Figure 3.6.3-1. Format of the element string

GS1 Application Identifier	Applicable value
A_1 A_2 A_3 A_4	N_1 N_2 N_3 N_4 N_5 N_6

The GS1 Application Identifiers used with this element string are shown in the figure below.

Figure 3.6.3-2. GS1 Application Identifiers for logistic measures

A_1	A_2	A_3	A_4	Definition of logistic measures	Unit of measure
3	3	0	n	Logistic weight	Kilograms
3	3	1	n	Length or first dimension	Metres
3	3	2	n	Width, diameter, or second dimension	Metres
3	3	3	n	Depth, thickness, height, or third dimension	Metres
3	3	4	n	Area	Square metres
3	3	5	n	Logistic volume	Litres
3	3	6	n	Logistic volume	Cubic metres
3	4	0	n	Logistic weight	Pounds
3	4	1	n	Length or first dimension	Inches
3	4	2	n	Length or first dimension	Feet
3	4	3	n	Length or first dimension	Yards
3	4	4	n	Width, diameter, or second dimension	Inches
3	4	5	n	Width, diameter, or second dimension	Feet

A_1	A_2	A_3	A_4	Definition of logistic measures	Unit of measure
3	4	6	n	Width, diameter, or second dimension	Yards
3	4	7	n	Depth, thickness, height, or third dimension	Inches
3	4	8	n	Depth, thickness, height, or third dimension	Feet
3	4	9	n	Depth, thickness, height, or third dimension	Yards
3	5	3	n	Area	Square inches
3	5	4	n	Area	Square feet
3	5	5	n	Area	Square yards
3	6	2	n	Logistic volume	Quarts
3	6	3	n	Logistic volume	Gallons (U.S.)
3	6	7	n	Logistic volume	Cubic inches
3	6	8	n	Logistic volume	Cubic feet
3	6	9	n	Logistic volume	Cubic yards

The data transmitted from the barcode reader means that the element string denoting a logistic measure has been captured. This element string must be processed with the SSCC of the logistic unit or the GTIN of the variable measure trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the data title listed in section *3.2* SHOULD be used.

3.6.4 Kilograms per square metre: AI (337n)

The GS1 Application Identifier (337n) indicates that the GS1 Application Identifier data field contains the kilograms per square metre of a particular trade item.

The GS1 Application Identifier digit shown as "n" indicates the implied decimal point position, where, 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.

The **kilograms per square metre** field contains the weight per area of the respective trade item. The unit of measure is kilograms.

Figure 3.6.4-1. Format of the element string

GS1 Application Identifier	Kilograms per square metre					
3 3 7 n	N_1	N_2	N_3	N_4	N_5	N_6

The data transmitted from the barcode reader means that the element string denoting kilograms per square metre has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **KG PER m²**

3.6.5 Count of trade items or trade item pieces contained in a logistic unit: AI (37)

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The GS1 Application Identifier (37) indicates that the GS1 Application Identifier data field contains the number of trade items contained in a logistic unit. This element string is a mandatory completion of AI (02) or AI (8026) described in sections *3.3.3* and *3.9.16*.

The count of ~~trade~~ items field contains the number of trade items or number of trade item pieces contained in the respective logistic unit. This information refers to the identification number of the contained ~~trade~~ items.

Figure 3.6.5-1. Format of the element string

GS1 Application Identifier	Count of ~~trade~~ items
3 7	N_1 ——variable length ——› N_8

The data transmitted from the barcode reader means that the element string denoting a number of trade items contained in a logistic unit has been captured. ~~This element string must be processed together with the GTIN represented in AI (02) (see section 3.3.3) or with the ITIP represented in AI (8026) (see section 3.9.16) appearing on the same logistic unit.~~ Restrictions apply to the use of AI (37) in combination with other AIs, see section *4.14 Data relationships*.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **COUNT**

3.6.6 Amount payable or coupon value - Single monetary area: AI (390n)

The GS1 Application Identifier (390n) indicates that the GS1 Application Identifier data field contains the amount payable of a payment slip or the coupon value.

The GS1 Application Identifier digit shown as "n" indicates the implied decimal point position, where the digit 0 means that there is no decimal point, and the digit 1 means that the decimal point is before the last position of the amount payable. See examples in figure below.

The applicable amount payable contains the sum to be paid with the respective payment slip (see section *2.6.6*) or the coupon value (see section *2.6.2*).

Figure 3.6.6-1. Format of the element string

GS1 Application Identifier	Applicable amount payable or coupon value
3 9 0 n	N_1 ——— variable length ———› N_{15}

Note: To aid unambiguous processing of payment slips, AI (391n), described in section *3.6.7*, SHOULD be used to indicate the currency in which the amount is expressed.

The figure below shows examples of the decimal point indication.

Figure 3.6.6-2. Decimal point indication examples

GS1 Application Identifier	Encoded value	Actual value
3 9 0 2	1 2 3 4 5 6 7	1 2 3 4 5 . 6 7
3 9 0 1	1 2 3 4 5 6 7	1 2 3 4 5 6 . 7 0
3 9 0 0	1 2 3 4 5	1 2 3 4 5 . 0 0

The data string transmitted from the barcode reader means that the element string denoting the amount payable of a payment slip or the coupon value has been captured. ~~This element string must be processed together with either:~~

- ~~the payment slip reference number, AI (8020) and the GLN of the invoicing party, AI (415).~~

~~the Global Coupon Number, AI (255).~~

Restrictions apply to the use of AI (390n) in combination with other AIs, see section *4.14 Data relationships.*

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **AMOUNT**

3.6.7 Amount payable and ISO currency code: AI (391n)

The GS1 Application Identifier (391n) indicates that the GS1 Application Identifier data fields consist of an ISO currency code and an applicable amount payable.

The GS1 Application Identifier digit shown as "n" indicates the implied decimal point position in the applicable amount payable field, where the digit 0 means that there is no decimal point, and the digit 1 means that the decimal point is before the last position of the amount payable. See examples in the figure below.

The ISO country code field contains the three-digit currency number of the numerical international standard *ISO 4217* and indicates the currency in which the amount payable is expressed. The

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applicable amount payable contains the sum to be paid with the respective payment slip (see section *2.6.6*).

Figure 3.6.7-1. Format of the element string

GS1 Application Identifier	ISO currency code	Applicable amount payable
3 9 1 n	N_1 N_2 N_3	N_4———variable length ———›N_{18}

Figure *3.6.7–2* shows examples of the decimal point indication.

Figure 3.6.7-2. Decimal point indication examples

GS1 Application Identifier	ISO currency code	Encoded value	Actual value
3 9 1 2 3 9 1 1 3 9 1 0	7 1 0* 7 1 0* 9 7 8**	1 2 3 0 1 2 3 0 1 2 3	1 2 . 3 0 1 2 3 . 0 0 1 2 3 . 0 0
* South African Rand ** Euro			

The data string transmitted from the barcode reader means that the element string denoting the amount payable has been captured. Restrictions apply to the use of AI (391) in combination with other AIs, see section *4.14 Data relationships.*

~~This element string must be processed together with the payment slip reference number, AI (8020), and the GLN of the invoicing party, AI (415).~~

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **AMOUNT**

3.6.8 Amount payable for a variable measure trade item – Single monetary area: AI (392n)

The GS1 Application Identifier (392n) indicates that the GS1 Application Identifier data field contains the amount payable for a variable measure trade item.

The amount payable refers to an item identified by the Global Trade Item Number (GTIN) of a variable measure trade item and is expressed in local currency. This AI is an attribute of the GTIN and is always used in conjunction with it.

The GS1 Application Identifier digit shown as "n" indicates the implied decimal point position, where the digit 0 means that there is no decimal point, and the digit 1 means that the decimal point is before the last position of the amount payable. See examples in the figure below.

The applicable amount payable field contains the total to be paid for the variable measure trade item.

Figure 3.6.8-1. Format of the element string

GS1 Application Identifier	Applicable amount payable
3 9 2 n	N_1———variable length———›N_{15}

Figure 3.6.8-2. Decimal point indication examples

GS1 Application Identifier	Encoded value	Actual value
3 9 2 2 3 9 2 1 3 9 2 0	1 2 3 4 5 6 7 1 2 3 4 5 6 7 1 2 3 4 5	1 2 3 4 5 . 6 7 1 2 3 4 5 6 . 7 0 1 2 3 4 5 . 0 0

The data transmitted by the barcode reader means that the element string denoting the amount payable of a variable measure trade item has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see section *3.2*)~~: **PRICE**

3.6.9 Amount payable for a variable measure trade item and ISO currency code: AI (393n)

The GS1 Application Identifier (393n) indicates that the GS1 Application Identifier data field consists of an ISO currency code and an applicable amount payable. The amount payable refers to an item identified with the Global Trade Item Number (GTIN) of a variable measure trade item and is expressed in the indicated currency. This AI is an attribute of the GTIN and is always expressed in conjunction with it.

The GS1 Application Identifier digit shown as "n" indicates the implied decimal point in the applicable amount payable Field, where the digit 0 means that there is no decimal point, and the digit 1 means that the decimal point is before the last position of the amount payable. See examples in the figure below.

The ISO currency code field contains the three-digit currency number of the numerical international standard *ISO/IEC 4217* and indicates the currency in which the amount payable is expressed. The applicable amount payable field contains the sum to be paid for the variable measure trade item.

Figure 3.6.9-1. Format of the element string

GS1 Application Identifier	ISO currency code	Applicable amount payable
3 9 3 n	N_1 N_2 N_3	N_4 ——variable length——› N_{18}

Figure 3.6.9-2. Decimal point indication examples

GS1 Application Identifier	ISO currency code	Encoded value	Actual value
3 9 3 2	7 1 0*	1 2 3 0	1 2 . 3 0
3 9 3 1	7 1 0*	1 2 3 0	1 2 3 . 0 0
3 9 3 0	9 7 8**	1 2 3	1 2 3 . 0 0
* South African Rand		** Euro	

The data transmitted by the barcode reader means that the element string denoting the amount payable of a variable measure trade item has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PRICE**

3.6.10 Percentage discount of a coupon: AI (394n)

The GS1 Application Identifier (394n) indicates that the GS1 Application Identifier data field contains the percentage discount of a coupon.

The GS1 Application Identifier digit shown as "n" indicates the implied decimal point position, where the digit 0 means that there is no decimal point, and the digit 1 means that the decimal point is before the last position of the amount payable. See examples in figure below.

Figure 3.6.10-1. Format of the element string

GS1 Application Identifier	Percentage discount of a coupon
3 9 4 n	N_1 N_2 N_3 N_4

The data string transmitted from the barcode reader means that the element string denoting the percentage to be taken off the purchase amount has been captured. The purchase amount on which the percentage discount would be granted depends on the conditions of the promotion (can be the

purchase value of one item, can be the purchase value of a bundle of items or can even be on the total purchase value).

The figure below shows examples of the decimal point indication.

Figure 3.6.10-2. Decimal point indication examples

GS1 Application Identifier	Encoded value	Actual value
3 9 4 0	0 0 1 0	10 %
3 9 4 1	0 0 5 5	5.5 %

This element string must be processed together with the Global Coupon Number~~, AI (255)~~ of the coupon to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PRCNT OFF**

3.7 GS1 Application Identifiers starting with digit 4

3.7.1 Customer's purchase order number: AI (400)

The GS1 Application Identifier (400) indicates that the GS1 Application Identifier data field contains the customer's purchase order number, restricted for use between two trading partners.

The customer's purchase order number field is alphanumeric and may include all characters contained in figure *7.11-1*. It contains the number of the purchase order assigned by the company that issued the order. The composition and content of the order number is left to the discretion of the customer. For example, the purchase order number may include release and line numbers.

Figure 3.7.1-1. Format of the element string

GS1 Application Identifier	Customer's purchase order number
4 0 0	X_1 ————variable length————›X_{30}

The data transmitted by the barcode reader means that the element string denoting a customer's purchase order number has been captured. This element string may be processed as stand-alone information ~~where applicable or processed together~~or in combination with the GS1 identification ~~number~~ key to which it relates~~of the same unit~~.

Important: This element string must be removed from the unit before the unit leaves the premises of the customer.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used (see also section *3.2*): **ORDER NUMBER**

3.7.2 Global Identification Number for Consignment (GINC): AI (401)

The GS1 Application Identifier (401) indicates that the GS1 Application Identifier data field contains a Global Identification Number for Consignment (GINC). This number identifies a logical grouping of goods (one or more physical entities) that has been consigned to a freight forwarder and is intended to be transported as a whole. The consignment number must be allocated by a freight forwarder (or a carrier acting as a freight forwarder) or a consignor, but only if prior agreement of the freight forwarder is given. Typically AI (401) encodes a house waybill number.

According to the *GS1 Logistics Interoperability Model (LIM)*[1], a freight forwarder is a party that arranges the carriage of goods, including connected services and/or associated formalities, on behalf

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[1] *g/lim" https://www.gs1.org/lim*

of a shipper or consignee. A carrier is a party that undertakes the transportation of goods from one point to another. A consignor is the party that sends the goods. A consignee is the party that receives the goods.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GINC – here the carrier (see section 1.4.4). It makes the number unique worldwide.

The structure and content of the consignment reference is at the discretion of the carrier, in order to uniquely identify each consignment. It may contain all characters contained in figure 7.11-1.

Figure 3.7.2-1. Format of the element string

GS1 Application Identifier	Global Identification Number for Consignment (GINC)				
	GS1 Company Prefix →		Consignment reference →		
4 0 1	N_1 ...	N_i	X_{i+1} ...	variable length	$X_{j\ (j<=30)}$

The data transmitted by the barcode reader means the element string denoting a GINC has been captured. This element string may be processed as stand-alone information or in combination with the SSCC.

~~**Note**: If a new consignment is created, previously consignment number barcodes must be removed from the physical units.~~

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **GINC**

3.7.3 Global Shipment Identification Number (GSIN): AI (402)

The GS1 Application Identifier (402) indicates that the data field contains a Global Shipment Identification Number (GSIN).

The Global Shipment Identification Number (GSIN) is a number assigned by a consignor (seller) of goods. It provides a globally unique number that identifies a logical grouping of logistic units for the purpose of a transport shipment from that consignor (seller) to the consignee (buyer). It identifies the logical grouping of one or several logistic units each identified with a separate SSCC and containing trade items as being part of a specific seller/buyer relationship and that travels under one despatch advice and/or Bill of Lading. It may be used by all parties in the transport chain as a communication reference, for example, in Electronic Data Interchange (EDI) messages where it can be used as a shipment reference and/or a consignor's loading list. The GSIN fulfils the requirements of the UCR (Unique Consignment Reference) of the World Customs Organisation (WCO).

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GSIN – here the shipper (sender) (see section 1.4.4). It makes the number unique worldwide.

The structure and content of the shipper reference is at the discretion of the shipper, in order to uniquely identify each shipment. It SHOULD be sequentially allocated.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.7.3-1. Format of the element string

GS1 Application Identifier	Global Shipment Identification Number (GSIN)																
	GS1 Company Prefix →									← Shipper reference							Check digit
4 0 2	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}	N_{15}	N_{16}	N_{17}

The data transmitted by the barcode reader means that the element string denoting a GSIN has been captured. This element string may be processed as stand-alone information or in combination with the SSCC. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **GSIN**

3.7.4 Routing code: AI (403)

The GS1 Application Identifier (403) indicates that the GS1 Application Identifier data field contains a routing code. The routing code is assigned by the parcel carrier and is an attribute of the SSCC (Serial Shipping Container Code). It is intended to provide a migration path to the adoption of a yet-to-be-defined international, multi-modal solution. The routing code must not be used to encode information for which other element strings have been created (such as a ship to postal code).

The routing code field is alphanumeric and may include all characters contained in figure 7.11-1. Its content and structure are at the discretion of the parcel carrier issuing the code. If parcel carriers wish to enter co-operative agreements with other parcel carriers, then a mutually agreed indicator is required to designate the structure of the routing code.

Figure 3.7.4-1. Format of the element string

GS1 Application Identifier	Routing code
4 0 3	X_1 ——————variable length——————› X_{30}

The data transmitted from the barcode reader means that the element string denoting a routing code has been captured. As this element string is an attribute of a logistic unit, it must be processed together with the SSCC to which it relates (see section 4.14.2). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **ROUTE**

3.7.5 Ship to - Deliver to Global Location Number: AI (410)

The GS1 Application Identifier (410) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of the consignee.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN – here the addressee (see section 1.4.4). It makes the number unique worldwide.

The structure and content of the location reference is at the discretion of the party who defined the location, in order to uniquely identify each location.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.7.5-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ——————›							‹—— Location reference				Check digit
4 1 0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of the consignee of a physical item has been captured. This element string may be processed as stand-alone information ~~where applicable~~ or ~~processed together~~in combination with the GS1 identification ~~number~~ key to which it relates. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **SHIP TO LOC**

3.7.6 Bill to - Invoice to Global Location Number: AI (411)

The GS1 Application Identifier (411) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of the addressee of an invoice.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN – here the addressee (see section 1.4.4). It makes the number unique worldwide.

The structure and content of the location reference is at the discretion of the party who defined the location, in order to uniquely identify each location.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.7.6-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ⟶								⟵ Location reference				Check digit
4 1 1	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of the addressee of an invoice has been captured. This element string may be processed as stand-alone information ~~where applicable~~ or ~~processed together~~in combination with the GS1 identification ~~number~~ key to which it relates. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **BILL TO**

3.7.7 Purchased from Global Location Number: AI (412)

The GS1 Application Identifier (412) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of the company from which the respective trade item has been purchased.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN – here the supplier (see section *1.4.4*). It makes the number unique worldwide.

The structure and content of the location reference is at the discretion of the party who defined the location, in order to uniquely identify each location.

The check digit is explained in section *7.9*. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.7.7-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ⟶								⟵ Location reference				Check digit
4 1 2	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of the company that supplied the trade item has been captured. This element string may be processed as stand-alone information ~~where applicable~~ or ~~processed together~~in cmobination with the GS1 identification ~~number~~ key to which it relates.

When indicating this element string in the non-HRI text section of a barcode label the following data title SHOULD be used ~~(see also section 3.2)~~: **PURCHASE FROM**

3.7.8 Ship for - Deliver for - Forward to Global Location Number: AI (413)

The GS1 Application Identifier (413) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of the internal or subsequent final destination.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN – here the final recipient (see section *1.4.4*). It makes the number unique worldwide.

The structure and content of the location reference is at the discretion of the party who defined the location, in order to uniquely identify each location.

The check digit is explained in section *7.9*. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Note: This element string is for the internal use of the consignee and is not to be used by the carrier.

Figure 3.7.8-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ⟶								⟵ Location reference				Check digit
4 1 3	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of the final recipient of a physical item has been captured. This element string may be processed as stand-alone information ~~where applicable~~ or ~~processed together~~in ccombination with the GS1 identification ~~number~~ key to which it relates. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **SHIP FOR LOC**

3.7.9 Identification of a physical location - Global Location Number: AI (414)

The GS1 Application Identifier (414) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of a physical location (see section 2.4).

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN – here the holder of the physical location (see section 1.4.4). It makes the number unique worldwide.

The structure and content of the location reference is at the discretion of the party who defined the location, in order to uniquely identify each location.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.7.9-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ⟶							⟵ Location reference				Check digit
4 1 4	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of a physical location has been captured from the location itself. This element string may be processed as stand-alone information ~~where applicable~~ or ~~processed together~~in combination with the GS1 identification key~~number~~ to which it relates. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **LOC NO.**

3.7.10 Global Location Number of the invoicing party: AI (415)

The GS1 Application Identifier (415) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of the invoicing party.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN – here the invoicing party (see section 1.4.4). It makes the number unique worldwide.

The structure and content of the location reference is at the discretion of the party who defined the location, in order to uniquely identify each location.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Note: This element string is mandatory on a payment slip. Together with the payment slip reference number, AI (8020), it uniquely identifies a payment slip.

Figure 3.7.10-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ⟶							⟵ Location reference				Check digit
4 1 5	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of the invoicing party has been captured. This element string must be processed together with the payment slip reference number~~, AI (8020),~~ to which it relates (see section 4.14.2). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **PAY TO**

3.7.11 GLN of the production or service location: AI (416)

The Application Identifier (416) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of the production or service location.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GLN (see section *1.4.4*).

The structure and content of the location reference is at the discretion of the party that defined the location.

The check digit is explained in section *7.9*. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

Figure 3.7.11-1. Format of the element string

GS1 Application Identifier	GS1 Company Prefix ⟶						Location reference ⟵					Check digit
4 1 6	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}

The data transmitted from the barcode reader means that the element string denoting the GLN of production or service location has been captured. This element string may be processed as stand-alone information or in combination with the GS1 identification key to which it relates. ~~This element string SHALL be processed together with the GS1 identification key to which it relates.~~ When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PROD/SERV LOC**

3.7.12 Ship to - Deliver to postal code within a single postal authority: AI (420)

The GS1 Application Identifier (420) indicates that the GS1 Application Identifier data field contains the postal code of the addressee (national format). The postal code field contains the postal code of the addressee as defined by the appropriate postal authority. It is left justified and must not contain any fill characters.

Figure 3.7.12-1. Format of the element string

GS1 Application Identifier	Postal code
4 2 0	X_1⟵variable length⟶X_{20}

The data transmitted from the barcode reader means that the element string denoting the national version of a postal code of the addressee of the transport unit has been captured. This element ~~string is normally~~may be processed as stand-alone information or in combination with the GS1 identification key to which it relates. Restrictions apply to the use of AI (420) in combination with other AIs, see section *4.14 Data relationships.* When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **SHIP TO POST**

3.7.13 Ship to - Deliver to postal code with three-digit ISO country code: AI (421)

The GS1 Application Identifier (421) indicates that the GS1 Application Identifier data field contains the postal code of the addressee (international format). The ISO country code field contains the three-digit country number of the numerical international standard *ISO 3166*.

The national postal code field, which follows the three-digit ISO country code, contains the postal code of the addressee as defined by the appropriate postal authority. It is left justified and must not contain any fill characters.

Figure 3.7.13-1. Format of the element string

GS1 Application Identifier	ISO country code	Postal code
4 2 1	N_1 N_2 N_3	X_4⟵variable length⟶X_{12}

The data transmitted from the barcode reader means that the element string denoting the international version of a postal code of the addressee of the transport unit has been captured. This element string ~~is normally~~may be processed as stand-alone information or in combination with the GS1 identification key to which it relates. Restrictions apply to the use of AI (421) in combination with other AIs, see section *4.14 Data relationships.*

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **SHIP TO POST**

3.7.14 Country of origin of a trade item: AI (422)

The GS1 Application Identifier (422) indicates that the GS1 Application Identifier data field contains the ISO country code of the country of origin of the trade item. The ISO country code field contains the three-digit country number of the numerical international standard *ISO 3166* that is the country of origin.

Note: The country of origin is normally the country in which the trade item has been produced or manufactured. In meat supply chain applications AI (422) is used to indicate the country of birth of the animal. Due to a wide range of definitions for country of origin, which were created for different purposes, it is the manufacturer's responsibility to assign the correct country of origin.

Figure 3.7.14-1. Format of the element string

GS1 Application Identifier	ISO country code
4 2 2	N_1 N_2 N_3

The data transmitted from the barcode reader means that the element string denoting the ISO country code of the country of origin of the respective trade item has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates. Restrictions apply to the use of AI (422) in combination with other AIs, see section *4.14 Data relationships.*

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **ORIGIN**

3.7.15 Country of initial processing: AI (423)

The GS1 Application Identifier (423) indicates that the GS1 Application Identifier data field contains the ISO country code(s) of the country or countries of initial processing of the trade item.

The ISO country code field contains the three-digit country code(s) from the numerical international standard *ISO 3166* that indicates the country or countries of initial processing.

Note: The country of initial processing is normally the country in which the trade item has been produced or manufactured. In meat supply chain applications AI (423) is used to indicate the country/countries of rearing and fattening of the animal. In certain applications, such as livestock fattening, the country of initial processing may include up to five different countries, all of which should be indicated. It is the responsibility of the supplier to allocate the correct country code(s).

Figure 3.7.15-1. Format of the element string

GS1 Application Identifier	ISO country code(s)
4 2 3	N_1 N_2 N_3 .... N_{15}

The data transmitted from the barcode reader means that the element string denoting the ISO country code(s) of the country or countries of initial processing of the respective trade item has been captured. As this element string is an attribute of a trade item, it must be processed together

with the GTIN of the trade item to which it relates. Restrictions apply to the use of AI (423) in combination with other AIs, see section *4.14 Data relationships.*

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used (see also section *3.2*): **COUNTRY – INITIAL PROCESS**

3.7.16 Country of processing: AI (424)

The GS1 Application Identifier (424) indicates that the GS1 Application Identifier data field contains the ISO country code of the country of processing of the trade item.

The ISO country code field contains the three-digit country code of the numerical international standard *ISO 3166* that is the country of processing.

Note: It is the responsibility of the processor of the trade item to allocate the correct country code. In meat or fish supply chain applications AI (424) is used to indicate the country of slaughtering or processing.

Figure 3.7.16-1. Format of the element string

GS1 Application Identifier	ISO country code
4 2 4	N_1 N_2 N_3

The data transmitted from the barcode reader means that the element string denoting the ISO country code of the country of processing of the respective trade item has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates. Restrictions apply to the use of AI (424) in combination with other AIs, see section *4.14 Data relationships.*

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **COUNTRY – PROCESS**

3.7.17 Country of disassembly: AI (425)

The GS1 Application Identifier (425) indicates that the GS1 Application Identifier data field contains the ISO country code of the country or countries of disassembly of the trade item. The ISO country code field contains the three-digit country code(s) from the numerical international standard *ISO 3166* that indicates the country or countries of disassembly.

Note: In meat supply chain applications AI (425) is used to indicate the country of deboning. In certain applications, such as meat or fish process chains, the process of disassembly is a multi-stage process and the country of disassembly may include several different countries, all of which should be indicated. It is the responsibility of the party doing the disassembly of the trade item to allocate the correct country code(s).

Figure 3.7.17-1. Format of the element string

GS1 Application Identifier	ISO country code
4 2 5	N_1 N_2 N_3 …N_{15}

The data transmitted from the barcode reader means that the element string denoting the ISO country code(s) of the country or countries of disassembly of the respective trade item has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates. Restrictions apply to the use of AI (425) in combination with other AIs, see section *4.14 Data relationships.* When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **COUNTRY – DISASSEMBLY**

3.7.18 Country covering full process chain: AI (426)

The GS1 Application Identifier (426) indicates that the GS1 Application Identifier data field contains the ISO country code of the country where all the processing of the trade item took place. The ISO country code field contains the three-digit country code of the numerical international standard *ISO 3166* that is the country of full processing.

Note: If this AI is used, the full processing of a trade item must have taken place in a single country. This is particularly important in certain applications (e.g., covering a livestock animal's birth, fattening, and slaughter) where processing could take place in different countries. In situations like this, AI (426) may not be used. It is the responsibility of the supplier to allocate the correct country code.

Figure 3.7.18-1. Format of the element string

GS1 Application Identifier	ISO country code
4 2 6	N_1 N_2 N_3

The data transmitted from the barcode reader means that the element string denoting the ISO country code of the country of full processing of the trade item has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates. Restrictions apply to the use of AI (426) in combination with other AIs, see section *4.14 Data relationships*.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **COUNTRY – FULL PROCESS**

3.7.19 Country subdivision of origin code for a trade item: AI (427)

The GS1 Application Identifier (427) indicates that the GS1 Application Identifier data field contains the ISO based country subdivision code (e.g., provinces, states, cantons, etc.) of a country's local region origin of the trade item. The ISO country subdivision code field contains up to three alphanumeric characters after separator of *ISO 3166-2* that is the principal subdivision of origin.

Note: This GS1 AI is applicable to trade item groupings where the contents originate from only one region.

Note: The local region of origin is the principal subdivision in which the trade item has been produced or manufactured. Determination of the principle subdivision is the brand owner's responsibility.

Figure 3.7.19-1. Format of the element string

GS1 Application Identifier	ISO subdivision code
4 2 7	X_1——variable length——› X_3

The data transmitted from the barcode reader means that the element string denoting the ISO based country subdivision code of the trade item has been captured. This element string must be processed together with the GTIN of the trade item and the country of origin~~, AI (422),~~ to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **ORIGIN SUBDIVISION**

3.8 GS1 Application Identifiers starting with digit 7

3.8.1 Seven series AIs - Cautionary note

GS1 Application Identifiers issued in the 7 series represent a special case because they are restricted to:

- one or a small number of sectors (i.e. are not multi-sectoral) or
- a country or a region (i.e. are not global).

3.8.2 NATO Stock Number (NSN): AI (7001)

The GS1 Application Identifier (7001) indicates that the GS1 Application Identifier data field contains a NATO stock number.

The NATO stock number is the number allocated to any item of supply in the NATO Alliance. It is the responsibility of the country that manufactures or controls the design of the item to allocate the number.

Note: This element string is only for use within the context of the supply within the NATO Alliance. Use of it is subject to the rules and regulations of the Allied Committee 135 (AC/135), the NATO Group of National Directors on Codification.

Figure 3.8.2-1. Format of the element string

GS1 Application Identifier	NATO supply classification ——→	Assigning country ——→	Sequential number ——→
7 0 0 1	N_1 N_2 N_3 N_4	N_5 N_6	N_7 N_8 N_9 N_{10} N_{11} N_{12} N_{13}

The data transmitted from the barcode reader means that the element string denoting a NATO stock number has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **NSN**

3.8.3 UN/ECE meat carcasses and cuts classification: AI (7002)

The GS1 Application Identifier (7002) indicates that the GS1 Application Identifier data field contains a UN/ECE meat carcasses and cuts classification code.

The UN/ECE meat carcasses and cuts code is an attribute of a Global Trade Item Number (GTIN) that denotes the trade description of the product. It is an alphanumeric, variable length code up to 30 characters.

Note: This element string is only for use within the context of UN/ECE standards for the quality of meat carcasses and cuts (bovine, porcine, ovine, and caprine).

Figure 3.8.3-1. Format of the element string

GS1 Application Identifier	UN/ECE product classification
7 0 0 2	X_1——variable length——→X_{30}

The data transmitted from the barcode reader means that the element string denoting a UN/ECE meat carcasses and cuts code has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **MEAT CUT**

3.8.4 Expiration date and time: AI (7003)

The GS1 Application Identifier (7003) indicates that the data fields contain expiration date and time.

The manufacturer determines the expiration date and time, which is relevant only for short duration and for items that will not be sent on long distances and not outside of the time zone. A typical application of AI (7003) is in hospitals or public pharmacies for special, customised, products which may have a "life duration" shorter than one single day. The life duration varies according the pharmaceutical substances used in the treatment. The precise expiration date and time is defined at the end of the manufacturing process, and can be barcoded on the product label as an attribute to the item's GTIN. Where there is no business requirement to express the expiration date to the nearest hour (or less), AI (17) Expiration date should be used.

The structure is:

- **Year:** the tens and units of the year (e.g., 2007 = 07), which is mandatory.
- **Month:** the number of the month (e.g., January = 01), which is mandatory.
- **Day:** the number of the day of the relevant month (e.g., second day = 02), which is mandatory.
- **Hour:** the number of the hour based on local 24-hour time (e.g., 2 p.m. = 14), which is mandatory.
- **Minutes:** the number of the minutes based on local time (e.g., 15 minutes. = 15); if it is not necessary to specify the minutes, the field must be filled with two zeros. Time will then be interpreted as ending on the hour (e.g., 14:00 = expiry time at 14:00).

Figure 3.8.4-1. Format of the element string

GS1 Application Identifier	Expiration date and time				
	YY	MM	DD	HH	MM
7 0 0 3	N_1 N_2	N_3 N_4	N_5 N_6	N_7 N_8	N_9 N_{10}

The data transmitted from the barcode reader means that the element string denoting an expiration date and time has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **EXPIRY TIME**

Note: element string can only specify dates in the range from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

3.8.5 Active potency: AI (7004)

The GS1 Application Identifier (7004) indicates that the GS1 Application Identifier data field contains an active potency.

The active potency of certain healthcare products (e.g., certain biologics, such as haemophilia products) varies by batch, and this will vary, within agreed tolerances, from the nominal potency of the trade item. Both the nominal and active potency of the item are measured in International Units (IUs).

Figure 3.8.5-1. Format of the element string

GS1 Application Identifier	Active potency
7 0 0 4	N_1—variable length—› N_4

The data transmitted from the barcode reader means that the Active potency of a Trade Item has been captured. The a~~A~~ctive potency must be processed with the GTIN and batch or lot number of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **ACTIVE POTENCY**.

3.8.6 Catch area: AI (7005)

The GS1 Application Identifier (7005) indicates that the GS1 Application Identifier data field contains the Catch Area. The Catch Area identifies where the fisheries product was caught using the international fishing areas and subareas as defined by the United Nations Fisheries and Aquaculture Department of the Food and Agricultural Organization (FAO) A complete FAO Catch Area list can be accessed via: *http://www.fao.org/fishery/area/search/en*. It is assigned by the fishing vessel that has caught the fisheries product. These major fishing areas comprise:

- Major inland fishing areas covering the inland waters of the continents,
- Major marine fishing areas covering the waters of the Atlantic, Indian, Pacific, and Southern Oceans, with their adjacent seas.

Note: The major fishing areas, inland and marine, as well as the subareas can be identified when using this GS1 Application Identifier; FAO example: 27.8.e.2 West of Bay of Biscay Non-NEAFC Regulatory Area

Figure 3.8.6-1. Format of the element string

GS1 Application Identifier	Catch area
7 0 0 5	X_1 ———›variable length ———›X_{12}

The data transmitted from the barcode reader means that the element string denoting the Catch Area that has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **CATCH AREA**

3.8.7 First freeze date: AI (7006)

The GS1 Application Identifier (7006) indicates that the GS1 Application Identifier data field contains a first freeze date. The first freeze date is applicable to products that are frozen directly after slaughtering, harvesting, catching or after initial processing of the product. Examples include fresh meat, meat products or fishery products. The first freeze date is determined by the organisation conducting the freezing.

The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02); this field must always be filled.

Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.8.7-1. Format of the element string

GS1 Application Identifier	First freeze date		
	Year	Month	Day
7 0 0 6	N_1 N_2	N_3 N_4	N_5 N_6

The data transmitted from the barcode reader means that the element string denoting a first freeze date has been captured. As this element string is an attribute of a trade item, it must be processed together with the trade item GTIN to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **FIRST FREEZE DATE**

3.8.8 Harvest date: AI (7007)

The GS1 Application Identifier (7007) indicates that the GS1 Application Identifier data field contains a harvest date or date range. For example, the harvest date can be the date or date range when an animal was slaughtered or killed, a fish has been harvested, or a crop was harvested. This date or date range is determined by the organisation conducting the harvesting. Different organisations may use more specific terminology when referring to their specific needs and use terms such as: Date of catch or slaughter date. When referring to animals the date range refers to the whole animal and all meat or fish cuts derived from this animal.

The structure includes two distinct segments:

- Start date: This specifies the start of the time period being identified:
  - Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory.
  - Month: the number of the month (e.g., January = 01), which is mandatory.
  - Day: the number of the day of the relevant month (e.g., second day = 02); for a harvest date. This field must always be filled.
- End date: This specifies the end of the time period being identified:
  - Year: the tens and units of the year (e.g., 2003 = 03).
  - Month: the number of the month (e.g., January = 01).
  - Day: the number of the day of the relevant month (e.g., second day = 02); for a harvest date.

Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Note: In case the catch period spans one calendar day, the end date SHALL NOT be specified. In case the catch period spans multiple calendar days, both the start and end date must be specified, with the end date being greater than the start date.

Figure 3.8.8-1. Format of the element string

GS1 Application Identifier	Harvest start date			Harvest end date		
	Year	Month	Day	Year	Month	Day
7 0 0 7	N_1 N_2	N_3 N_4	N_5 N_6	N_7 N_8	N_9 N_{10}	N_{11} N_{12}

The data transmitted from the barcode reader means that the element string denoting a harvest date range has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **HARVEST DATE**

3.8.9 Species for fishery purposes: AI (7008)

The GS1 Application Identifier (7008) indicates that the GS1 Application Identifier data field contains the fish species according to the 3-alpha Aquatic Sciences and Fisheries Information System (ASFIS) list of species.

The United Nations Fisheries and Aquaculture Department of the Food and Agricultural Organization (FAO) Fisheries and Aquaculture Statistics and Information Service (FIPS) collates world capture and aquaculture production statistics at the species, genus, family or higher taxonomic levels in 2,119 statistical categories (2011 data) referred to as species items. ASFIS list of species includes 12,421 species items selected according to their interest or relation to fisheries and aquaculture. For each species item stored in a record, codes (International Standard Statistical Classification of Aquatic Animals and Plants group, taxonomic and 3-alpha) and taxonomic information (scientific name, author(s), family, and higher taxonomic classification) are provided. An English name is available for most of the records, and about one third of them have also a French and Spanish name. Information is also provided about the availability of fishery production statistics on the species item in the FAO

databases; example: IZX. This list can be accessed via: http://www.fao.org/fishery/collection/asfis/en

Figure 3.8.9-1. Format of the element string

GS1 Application Identifier	Species for fishery purposes code
7 0 0 8	X_1 —variable length—› X_3

The data transmitted from the barcode reader means that the element string denoting the species for fishery purposes that has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **AQUATIC SPECIES**

3.8.10 Fishing gear type: AI (7009)

The GS1 Application Identifier (7009) indicates that the GS1 Application Identifier data field contains the information on the fishing gear type.

It is assigned by the fishing vessel that has caught the fisheries product. The fishing gear type, as defined by the United Nations Fisheries and Aquaculture Department of the Food and Agricultural Organization (FAO), is used to identify the type of fishing gear used for catching the fisheries product. The fishing gear type list provides definitions of fishing gear of all kinds, grouped by categories. These definitions and classifications are valid on a world-wide basis for both inland waters and sea fisheries, as well as, for small-, medium-, and large-scale fisheries; example: 01.1.1 (one boat operated purse seines). This list can be accessed via: http://www.fao.org/fishery/cwp/handbook/M/en.

Figure 3.8.10-1. Format of the element string

GS1 Application Identifier	Fishing gear type
7 0 0 9	X_1———variable length———›X_{10}

The data transmitted from the barcode reader means that the element string denoting the fishing gear type that has been captured. This element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **FISHING GEAR TYPE**

3.8.11 Production method: AI (7010)

The GS1 Application Identifier (7010) indicates that the GS1 Application Identifier data field describes the production method.

It is assigned by the fishing vessel that has caught the fisheries product. The **production method** provides the production method for fish and seafood as specified by the Fisheries and Aquaculture Department of the Food and Agricultural Organization (FAO) of the United Nations; example: 01.

The allowed values, as defined by the Fisheries and Aquaculture Department of the Food and Agricultural Organization (FAO) of the United Nations are:

- 01 'Caught at Sea'.
- 02 'Caught in Fresh Water'.
- 03 'Farmed'.
- 04 'Cultivated'.

Figure 3.8.11-1. Format of the element string

GS1 Application Identifier	Production method

7 0 1 0	X_1—variable length—›X_2

The data transmitted from the barcode reader means that the element string denoting the production method has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PROD METHOD**

3.8.12 Refurbishment lot ID: AI (7020)

GS1 Application Identifier (7020) indicates that the GS1 Application Identifier data field contains a refurbishment lot ID.

Together with the GTIN of the trade item and the GLN of the production or service location, the refurbishment lot ID identifies a batch of items that were remanufactured to the original specifications using a combination of reused, repaired and new parts. It is an alphanumeric, variable length string of up to 20 characters.

Figure 3.8.12-1. Format of the element string

GS1 Application Identifier	Refurbishment lot ID
7 0 2 0	X_1————variable length————›X_{20}

The data transmitted from the barcode reader means that the element string denoting a refurbishment lot ID has been captured. It must be processed together with the GLN of the production/service location and the GTIN of the item to which it is related (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **REFURB LOT**

3.8.13 Functional status: AI (7021)

GS1 Application Identifier (7021) indicates that the GS1 Application Identifier data field contains the functional status.

The functional status of the trade item may need to be included by the manufacturer to meet regulatory or commercial requirements. For example requirements related to the type approval, allowing the trade item to be sold in a particular country.

Figure 3.8.13-1. Format of the element string

GS1 Application Identifier	Functional status
7 0 2 1	X_1————variable length————›X_{20}

The data transmitted from the barcode reader means that the element string denoting a functional status has been captured. As this element string is an attribute of a trade item, it must be processed in combination with the GTIN of the item to which it is related (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **FUNC STAT**

3.8.14 Revision status: AI (7022)

GS1 Application Identifier (7022) indicates that the GS1 Application Identifier data field contains the revision status.

The revision status of the trade item may need to be included by the manufacturer to meet regulatory or commercial requirements. For example, requirements related to the type approval, allowing the trade item to be sold in a particular country.

Figure 3.8.14-1. Format of the element string

GS1 Application Identifier	Revision status
7 0 2 2	X_1——————variable length——————›X_{20}

The data transmitted from the barcode reader means that the element string denoting a revision status has been captured. As this element string is subordinate to the functional status, it must be processed in combination with the functional status and the GTIN of the item to which it is related (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **REV STAT**

3.8.15 Global Individual Asset Identifier of an assembly: AI (7023)

GS1 Application Identifier (7023) indicates that the GS1 Application Identifier data field contains the GIAI (Global Individual Asset Identifier) of an assembly.

An additional barcode containing the GIAI of an assembly may need to be marked on a sub-component of the assembly (the so called leading part) in case the assembly does not have a surface that uniquely belongs to the assembly (and not to any of its sub-components). In order to distinguish between the identifier of the sub-component and the identifier of the assembly a separate GS1 application identifier is used for the latter.

The GS1 Company Prefix (see section *1.4.4*) is allocated by GS1 Member Organisations to the company that allocates the GIAI –the asset owner or manager of the individual asset.

The structure and content of the individual asset reference is at the discretion of the asset owner or manager. It may contain all characters listed in figure *7.11-1*.

Figure 3.8.15-1. Format of the element string

GS1 Application Identifier	Global Individual Asset Identifier (GIAI) of an assembly				
	GS1 Company Prefix ——————›		Individual asset reference ——————————›		
7 0 2 3	N_1 ...	N_i	X_{i+1} ...	variable length	$X_{j\ (j<=30)}$

The data transmitted from the barcode reader means that the element string denoting a parent GIAI has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **GIAI - ASSEMBLY**

3.8.16 Number of processor with three-digit ISO country code: AI (703s)

The GS1 Application Identifier (703s) indicates that the GS1 Application Identifier data fields contain the ISO country code and approval number or GLN of the processor of a trade item. The number of processor is an attribute to a Global Trade Item Number (GTIN). It designates the number of the company who did the processing.

As many processors may be involved, each with an individual approval number, the fourth digit of the AI (s in the figure below) indicates the sequence of the processors.

For a typical meat supply chain, the following sequence would be used:

- 7030: slaughterhouse.
- 7031: first deboning/cutting hall.
- 7032 to 7037: second through seventh processing location (cutting hall).
- 7038: slaughterhouse.
- 7039: slaughterhouse.

For a typical seafood supply chain, the following sequence would be used:

- 7030 vessel/aquaculture site.
- 7031 primary processor.

- 7032 secondary processor.

The ISO country code contains the three-digit country number of the numerical international standard *ISO 3166* that relates to the following approval number of processor.

If '999' is entered as the ISO country code it signifies that the subsequent data is a Global Location Number (GLN), and not an 'approval number'.

Note: The approval number is usually assigned by a national or pluri-national authority to processors in the food supply chain. These authorities may choose to use the Global Location Number (GLN) (see section *2.4*) for this purpose. The approval number (or GLN) remains with the item regardless of whether or not it changes ownership or function.

Figure 3.8.16-1. Format of the element string

GS1 Application Identifier	ISO country code	Number of processor
7 0 3 s	N_1 N_2 N_3	X_4 ——variable length——› X_{30}

The data transmitted from the barcode reader means that the element string denoting the ISO country code and number of processor has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **PROCESSOR # s**

3.8.17 National Healthcare Reimbursement Number (NHRN): AIs (710), (711), (712), (713), and (714)

The GS1 Application Identifiers (710), (711), (712), (713), and (714) indicate that the GS1 Application Identifier data field contains a National Healthcare Reimbursement Number, from the NHRN GS1 Application Identifier series, associated to the Global Trade Item Number (GTIN) of the trade item. The GS1 Application Identifiers (710), (711), (712), (713), and (714) indicate a specific NHRN from within the assigned series.

Use of the NHRN GS1 Application Identifier, associated to the GTIN of the trade item, is needed for compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the need.

GTIN is the GS1 identifier for pharmaceutical and medical device trade items. The GS1 Application Identifier for National Healthcare Reimbursement Number is provided to meet regulatory or industry requirements until they are amended to accept the GTIN as a compliant identifier.

Within this application are the rules and recommendations for the association of NHRNs to the Global Trade Item Number (GTIN) where regulatory requirements require an NHRN for product identification, registration or reimbursement purposes.

There are a number of known NHRNs but at this time not all are required to be encoded within the data carrier found on the trade item. Flexibility for additional assigned NHRN AIs has been provided if required.

The National Healthcare Reimbursement Number GS1 Application Identifier is an initial step in a migration path to the most efficient method to identify trade items. GS1 recommends that Healthcare stakeholders faced with national numbers:

a) Use GTIN for all supply chain and reimbursement purposes (GTIN used in the data carrier and as the NHRN) as this is the most efficient and effective way for all stakeholders to identify trade items.

b) Use GTIN, cross-referenced to an NHRN in an existing database, in the case of an existing system of NHRNs (i.e. GTIN used in the data carrier with the NHRN found via cross-reference).

c) Use GTIN with an associated NHRN (GTIN and NHRN both used in the data carrier via the NHRN AI) as an intermediate solution for those who cannot use "a" or "b". GS1 only recommends this as a migration path to noted options "a" or "b".

Note: There is a mandatory association of the National Healthcare Reimbursement Number Application Identifier with the GTIN.

Note: The NHRN is usually assigned by a national authority to healthcare brand owners for specific trade items and SHALL only be used for compliance to regulatory requirements where the GTIN alone will not meet the requirements.

Note: Additional individual NHRN AIs can only be assigned by GS1 and only in response to a work request being submitted ~~into the~~through GSMP ~~system~~.

Commented [CJ128]: ERv18-031

Note: The GTIN and all associated NHRNs SHOULD be concatenated into a single data carrier (i.e. single GS1-128, GS1 DataMatrix).

Note: Use of NHRN on the item is controlled by and subject to the rules and regulations of national/regional agencies. Those rules and/or regulations may supersede these recommendations.

Note: More than one NHRN may need to be associated with a given GTIN.

The general format of an NHRN GS1 Application Identifier is:

Figure 3.8.17-1. Format of the element string

GS1 Application Identifier	National Healthcare Reimbursement Number
n n n	X_1———variable length———›X_{20}

Note: When an NHRN AI is approved, the overall variable length (i.e. allowable number of characters) is specified by the national authority, with a twenty (20) character maximum as noted in the general format above if applicable.

The GS1 Application Identifiers used with this element string, their specific format and associated regulatory body or assigning organisation, are shown in the figure below:

Figure 3.8.17-2. Overview of NHRN Application Identifiers

GS1 Application Identifier	National Healthcare Reimbursement Number			Organisation
710	X_1	variable length	X_{20}	Germany IFA
711	X_1	variable length	X_{20}	France CIP
712	X_1	variable length	X_{20}	Spain National Code
713	X_1	variable length	X_{20}	Brazil ANVISA
714	X_1	variable length	X_{20}	Portugal INFARMED
nnn (*)	X_1	variable length	X_{20}	Country "A" NHRN Authority
(*) An example to illustrate future additional NHRNs. If additional NHRN AIs are required, a request for a new NHRN AI SHALL be made through ~~the GS1~~ GSMP.				

Commented [CJ129]: ERv18-032

Note: Companies wishing to apply one of the listed NHRN AIs will need to associate that NHRN AI to the trade item's GTIN according to the NHRN AI rules and should contact their GS1 Member Organisation for further considerations of use.

The data transmitted from the barcode reader means that the element string denoting a National Healthcare Reimbursement Number has been captured. This element string is an attribute of a trade item and must be processed together with the GTIN of the trade item to which it relates (see section

4.14.2). When indicating this element string in the non-HRI text section of a barcode label, the data title listed in figure *3.2-1* SHOULD be used.

3.8.18 Certification reference: AI (723s)

Commented [CJ130]: WR18-157 new section

The GS1 Application Identifier (723s) indicates that the GS1 Application Identifier data field contains a reference to a product certification. The certification reference is an attribute of a trade item or an individual asset.

As multiple certificates may be present, each with an individual certification reference, the fourth digit of the AI (s in the figure below) indicates the sequence of the certification references.

The general structure of AI (723s) is:

- Certification scheme (2 characters) defined by GS1. The following code values are currently allowed:
  - "EM" (European Marine Equipment Directive). See *http://eur-lex.europa.eu/legal-content/EN/AUTO/?uri=CELEX:32018R0608* for more information.
- Certification reference (28 characters)

Figure 3.8.18-1. Format of the element string

GS1 Application Identifier	Certification scheme	Certification reference
7 2 3 s	X_1 X_2	X_3 ——variable length——› X_{30}

The data transmitted from the barcode reader means that the element string denoting the certification reference has been captured. As this element string is an attribute of a trade item or an asset, it must be processed together with the GTIN of the trade item or the GIAI of the asset to which it relates (see section *4.14.2*).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **CERT # s**

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3.9 GS1 Application Identifiers starting with digit 8

3.9.1 Roll products - width, length, core diameter, direction, splices: AI (8001)

The GS1 Application Identifier (8001) indicates that the GS1 Application Identifier data fields contain the variable attributes of a roll product. Depending on the method of production, some roll products cannot be numbered according to standard criteria that have been determined in advance. They are, therefore, classified as variable items. For those products where the standard trade measures are not sufficient, the following guidelines should be used.

The identification of a roll product consists of the Global Trade Item Number (GTIN) and the variable attributes. The basic product (e.g., a certain type of paper) is included as data in the GTIN-14 ID number (see section *2.1.12~~2.1.12~~2.1.13*), and the variables contain information about the special features of the particular item that has been produced. The variable values of a roll product, N1 to N14, consist of the following data:

- N1 to N4: slit width in millimetres (width of the roll).
- N5 to N9: actual length in metres.
- N10 to N12: internal core diameter in millimetres.
- N13: winding direction (face out 0, face in 1, undefined 9).
- N14: number of splices (0 to 8 = actual number, 9 = number unknown).

Figure 3.9.1-1. Format of the element string

GS1 Application Identifier	Variable values of a roll product													
8 0 0 1	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}

The data transmitted from the barcode reader means that the element string denoting the variable attributes of the identification of a roll product trade item have been captured. This element string must be processed together with the GTIN of the trade item to which it relates (see section 4.14.2)~~(see section 3.3.2)~~. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **DIMENSIONS**

3.9.2 Cellular mobile telephone identifier: AI (8002)

The GS1 Application Identifier (8002) indicates that the GS1 Application Identifier data field contains the serial number of a cellular mobile telephone.

The serial number field is alphanumeric and may contain all characters contained in figure 7.11-1. A national or pluri-national authority usually assigns the number. It uniquely identifies each mobile telephone within a given authority for special control purposes. It is not considered as an attribute of the identification of the telephone as a trade item.

Figure 3.9.2-1. Format of the element string

GS1 Application Identifier	Serial number
8 0 0 2	X_1 ——variable length ——› X_{20}

The data transmitted from the barcode reader means that the element string denoting an electronic serial identifier of a cellular mobile telephone has been captured. This element string is normally processed as stand-alone information.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used (see also section 3.2): **CMT NO.**

3.9.3 Global Returnable Asset Identifier (GRAI): AI (8003)

The GS1 Application Identifier (8003) indicates that the GS1 Application Identifier data field contains the GRAI (Global Returnable Asset Identifier). The GRAI is used to identify returnable assets.

The GS1 Company Prefix (see section 1.4.4) is allocated by GS1 Member Organisations to the company that allocates the GRAI – the asset owner or manager of the returnable asset. It makes the number unique worldwide.

A zero in the leftmost position is added to generate an even number of 14 digits which enables efficient encoding.

The structure and content of the asset type is at the discretion of the asset owner or manager.

The check digit is explained in section 7.9. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

The optional serial component is assigned by the asset owner or manager. It identifies an individual asset within a given asset type. The field is alphanumeric and may contain all characters listed in figure 7.11-1.

Figure 3.9.3-1. Format of the element string

GS1 Application Identifier	Global Returnable Asset Identifier (GRAI)															
	GS1 Company Prefix ——›							‹—— Asset type					Check digit	Serial component (optional)		
8 0 0 3	0	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	X_1	variable	X_{16}

The data transmitted from the barcode reader means that the element string denoting the GRAI has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **GRAI**

3.9.4 Global Individual Asset Identifier (GIAI): AI (8004)

The GS1 Application Identifier (8004) indicates that the GS1 Application Identifier data field contains a GIAI (Global Individual Asset Identifier). The GIAI is used for the unique identification of individual assets.

Note: Note: This element string must never be used to identify the entity as a trade item or logistic unit. If an asset is transferred between parties, the GIAI cannot be used for ordering the asset. However, asset identification may be exchanged between parties for the purpose of traceability.

The GS1 Company Prefix (see section 1.4.4) is allocated by GS1 Member Organisations to the company that allocates the GIAI – here the asset owner or manager. It makes the number unique worldwide.

The structure and content of the individual asset reference is at the discretion of the asset owner or manager. It may contain all characters listed in figure 7.11-1.

Figure 3.9.4-1. Format of the element string

GS1 Application Identifier	Global Individual Asset Identifier (GIAI)				
	GS1 Company Prefix →		Individual asset reference →		
8 0 0 4	N_1 ...	N_i	X_{i+1} ...	variable length	$X_{j\ (j<=30)}$

The data transmitted from the barcode reader means that the element string denoting a GIAI has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **GIAI**

3.9.5 Price per unit of measure: AI (8005)

The GS1 Application Identifier (8005) indicates that the GS1 Application Identifier data field contains a price per unit of measure. This element string is used to indicate the price per unit of measure of price marked goods on a variable measure trade item to discriminate price variants of the same item. It is considered as an attribute of the respective trade item and not as part of its identification.

Content and structure of the price per unit of measure field are left to the discretion of the trading partners.

Figure 3.9.5-1. Format of the element string

GS1 Application Identifier	Price per unit of measure					
8 0 0 5	N_1	N_2	N_3	N_4	N_5	N_6

The data transmitted from the barcode reader means that the element string denoting the price per unit of measure has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section 4.14.2)~~(see section 3.3.2)~~. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **PRICE PER UNIT**

3.9.6 Identification of an individual trade item piece: AI (8006)

The GS1 Application Identifier (8006) indicates that the GS1 Application Identifier data field contains the identification of an individual piece of a trade item. The piece is not traded independently and therefore cannot be assigned its own GTIN.

The GTIN that is included in this element string is the GTIN for the complete trade item.

The piece number identifies an individual piece of the trade item. The total count provides the total number of individual pieces of the trade item.

Figure 3.9.6-1. Format of the element string

GS1 Application Identifier	Global Trade Item Number (GTIN)	Piece number	Total count
8 0 0 6	N_1 N_2 N_3 ..... N_{12} N_{13} N_{14}	N_{15} N_{16}	N_{17} N_{18}

The data transmitted from the barcode reader means that the element string denoting the identification of an individual piece of a trade item has been captured. ~~This element string is normally processed as stand-alone information~~. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **ITIP or GCTIN**

Note: ITIP is the preferred data title for AI (8006) and GCTIN will have a sunset date of January 2020.

3.9.7 International Bank Account Number (IBAN): AI (8007)

The GS1 Application Identifier (8007) indicates that the GS1 Application Identifier data field contains the international bank account identifier.

The International Bank Account Number (IBAN), AI (8007), defined as *ISO 13616*, indicates to which account the amount of the respective payment slip is to be transferred (see section *2.6.6*). The invoicing party determines the applicable bank account number. The data field is alphanumeric and may contain all characters contained in figure *7.11-1*.

Field Code Changed

Figure 3.9.7-1. Format of the element string

GS1 Application Identifier	International Bank Account Number
8 0 0 7	X←————variable length————→X_{34}

The data string transmitted by the barcode reader means that the element string denoting an IBAN has been captured. Restrictions apply to the use of AI (8007) in combination with other AIs, see section *4.14 Data relationships*.~~This element string must be processed together with the payment slip reference number, AI (8020), and the GLN of the invoicing party, AI (415).~~ When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **IBAN**

3.9.8 Date and time of production: AI (8008)

The GS1 Application Identifier (8008) indicates that the GS1 Application Identifier data fields contain a date and time of production (or assembly). The date and time of production is determined by the manufacturer. The date and time may refer to the trade item itself or to the items contained. The structure is:

- Year: the tens and units of the year (e.g., 2000 = 00), which is mandatory.
- Month: the number of the month (e.g., January = 01), which is mandatory.
- Day: the number of the day of the relevant month (e.g., second day = 02), which is mandatory.
- Hour: the number of the hour based on local time (e.g., 2 p.m. = 14), which is mandatory.
- Minutes: may be dropped if not required.
- Seconds: may be dropped if not required.

Note: This element string can only specify dates ranging from 49 years in the past to 50 years in the future. Determination of the correct century is explained in section *7.12*.

Figure 3.9.8-1. Format of the element string

GS1 Application Identifier	Date and time of production					
	YY	MM	DD	HH	MM	SS
8 0 0 8	N_1 N_2	N_3 N_4	N_5 N_6	N_7 N_8	N_9 N_{10}	N_{11} N_{12}

The data transmitted from the barcode reader means that the element string denoting a date and time of production has been captured. As this element string is an attribute of a trade item, it must be processed together with the GTIN of the trade item to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used (see also section *3.2*): **PROD TIME**

3.9.9 Optically readable sensor indicator: AI (8009)

Commented [CJ131]: WR18-101

The GS1 Application Identifier (8009) indicates that the GS1 Application Identifier data field contains the optically readable sensor instruction parameters defined by AIM (Association for Automatic Identification and Mobility). The parameter field is alphanumeric and may contain all characters contained in figure 7.11-1. Refer to AIM, Inc. *www.aimglobal.org* for the sensor instruction parameters to be encoded.

Figure 3.9.9-1. Format of the element string

GS1 Application Identifier	AIM defined sensor instruction parameters
8 0 0 9	X←————variable length————→X_{50}

Note: This data element is intended to be carrier agnostic, however the user is cautioned regarding payload limitations of GS1 data carriers e.g. GS1-128 (48 total characters)

The data transmitted by the barcode reader means that the element string denoting the parameters of a sensor/monitor has been captured. As this element string is an attribute of a trade item or a logistic unit, it must be processed together with the GTIN of the trade item or the SSCC of the logistic unit to which it relates (see section *4.14.2*).

Note: This element string may appear in a separate barcode from that used to encode the GTIN or SSCC.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **OPTSEN**

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~~3.9.9~~3.9.10 Component/Part Identifier (CPID): AI (8010)

The GS1 Application Identifier (8010) indicates that the GS1 Application Identifier data field contains the C/P Identifier.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the C/P Identifier, making the number unique worldwide.

The structure and content of the C/P reference is at the discretion of the company that has been assigned the GS1 Company Prefix to uniquely identify each C/P.

The C/P reference format is variable length. The Component & Part reference SHALL only consist of numeric, alphabetic upper-case or special characters "#", "-", or "/", see figure *7.11-2*.

Figure 3.9.10-1. Format of the element string

GS1 Application Identifier	Component/Part Identifier			
	GS1 Company Prefix ⟶		C/P reference number ⟶	
8 0 1 0	N_1 ...	N_j	X_{j+1} ...variable length	$X_{k\ (k<=30)}$

The data transmitted from the barcode reader means that the element string denoting a C/P Identifier has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **CPID**

~~3.9.10~~3.9.11 Component/Part Identifier serial number: AI (8011)

The GS1 Application Identifier (8011) indicates that the GS1 Application Identifier data field contains a C/P serial number. A C/P serial number is assigned to an entity for its lifetime. When combined with a C/P Identifier, a serial number uniquely identifies an individual item. The C/P serial number field is numeric only. The C/P Identifier issuer (e.g., C/P buyer or OEM) determines the C/P serial number.

The C/P serial number SHALL NOT begin with a "0" digit, unless the entire serial number consists of the single digit "0".

Figure 3.9.11-1. Format of the element string

GS1 Application Identifier	Component/Part Identifier serial number
8 0 1 1	N_1 ——variable length——⟶ N_{12}

The data transmitted from the barcode reader means that the element string denoting a C/P serial number has been captured. As this element string is an attribute of a ~~C/P Identifier~~component/part, it must be processed together with the C/P Identifier of the ~~C/P~~component/part to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **CPID SERIAL**

~~3.9.11~~3.9.12 Software version: AI (8012)

The GS1 Application Identifier (8012) indicates that the GS1 Application Identifier data field contains a software version number. Software versioning is the process of assigning unique version numbers to unique states of computer software.

Examples include:

- Software versions for regulated healthcare device software.
- Commercially available office productivity software (Microsoft® Word 2013 version 15.0.4701.1001, Adobe® Reader® XI version 11.0.10).

This AI may be combined with AI 10 (lot/batch) when the manufacturer decides that both lot and version control are required to meet regulatory or commercial requirements.

The data is alphanumeric and may include all characters contained in figure *7.11-1*.

Figure 3.9.12-1. Format of the element string

GS1 Application Identifier	Software version
8 0 1 2	X_1 ——variable length——⟶ X_{20}

The data transmitted by the barcode reader means that the element string denoting a software version has been captured. As this element string is an attribute of a software trade item, it must be processed with the GTIN of the software to which it is related (see section *4.14.2*). When indicating this element string in the non-HRI text section of a label, the following data title SHOULD be used ~~(see also section 3.2)~~: **VERSION**

~~3.9.12~~3.9.13 Global Model Number (GMN): AI (8013)

The GS1 Application Identifier (8013) indicates that the GS1 Application Identifier data field contains a GMN (Global Model Number). The GMN is used for the unique identification of product models.

Note: This element string must never be used to identify the entity as a trade item.

The GS1 Company Prefix (see section *1.4.4*) is allocated by GS1 Member Organisations to the brand owner that allocates the GMN. It makes the number unique worldwide.

The structure and content of the model reference is at the discretion of the brand owner. It may contain all characters listed in figure *7.11-1*.

Figure 3.9.13-1. Format of the element string

GS1 Application Identifier	Global Model Number (GMN)				
	GS1 Company Prefix →		Model reference →		
8 0 1 3	N_1 ...	N_i	X_{i+1} ...	variable length	$X_{j\ (j<=30)}$

The data transmitted from the barcode reader means that the element string denoting a GMN has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: GMN

Note: For medical devices, the GMN SHALL NOT be used in any labelling, physical marking, or GS1 AIDC data carrier on associated trade items. When indicating this element string in the non-HRI text on documents or certificates, the following data title SHOULD be used ~~(see also section *3.2*)~~: BUDI-DI

~~3.9.13~~3.9.14 Global Service Relation Number (GSRN): AIs (8017, 8018)

The GS1 Application Identifiers (8017, 8018) indicate that the GS1 Application Identifier data field contains a GSRN (Global Service Relation Number). The GSRN is used to identify either the recipient or individual provider of services in the context of a service relationship. In order to provide identification for both roles in a service relationship, recipient and provider, two GSRN AIs are available. The resultant element string provides a means for the service provider to store data relevant to services provided to the recipient and by the individual provider.

The GS1 Company Prefix is allocated by GS1 Member Organisations to the company that allocates the GSRN – here the organisation offering the service (see section *1.4.4*). It makes the number unique worldwide.

The structure and content of the service reference is at the discretion of the organisation offering the service in order to uniquely identify each service relation.

The check digit is explained in section *7.9*. Its verification, which must be carried out in the application software, ensures that the number is correctly composed.

The Global Service Relation Number – Provider (see figure below) identifies the relationship between an organisation offering services and the provider of services.

Figure 3.9.14-1. Format of the element string

GS1 Application Identifier	Global Service Relation Number (GSRN) - PROVIDER																	
	GS1 Company Prefix →								← Service reference									Check digit
8 0 1 7	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}	N_{15}	N_{16}	N_{17}	N_{18}

The data transmitted from the barcode reader means that the element string denoting the Global Service Relation Number for the Provider has been captured.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **GSRN – PROVIDER**

The Global Service Relation Number – Recipient identifies the relationship between an organisation offering services and the recipient of services.

Figure 3.9.14-2. Format of the element string

GS1 Application Identifier	Global Service Relation Number (GSRN) - RECIPIENT		
	GS1 Company Prefix ⟶	⟵ Service reference	Check digit
8 0 1 8	N_1 N_2 N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12} N_{13} N_{14} N_{15} N_{16} N_{17}		N_{18}

The data transmitted from the barcode reader means that the element string denoting Global Service Relation Number for the Recipient has been captured. When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **GSRN - RECIPIENT**

Note: AI (8017) and AI (8018) must not be used in combination, see section *4.14 Data relationships*.

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~~3.9.14~~3.9.15 Service Relation Instance Number (SRIN): AI (8019)

The GS1 Application Identifier (8019) indicates that the GS1 Application Identifier data field contains a Service Relation Instance Number (SRIN). The SRIN is used when the identification of a "Subject of Care" Global Service Relation Number for the Service Recipient (GSRN - RECIPIENT) needs to be further qualified with a sequence indicator during the episode of care. The SRIN is further used when an identification (e.g., a badge) of a "Provider of Care" with Global Service Relation Number for the Service Provider (GSRN - PROVIDER) needs to be decommissioned and a replacement issued. The resultant element string provides a means for the organisation issuing badges to distinguish between badges with identical GSRNs.

The structure and content of the Service Relation Instance Number is at the discretion of the organisation offering the service, in order to uniquely identify each service relation instance.

Figure 3.9.15-1. Format of the element string

GS1 Application Identifier	Service Relation Instance Number
8 0 1 9	N_1 ——variable length——› N_{10}

The data transmitted from the barcode reader means that the element string denoting a Service Relation Instance Number has been captured. Since the SRIN is an attribute of a service relation, it must be processed with the GSRN of the service relation to which it relates (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, one of the following data title SHOULD be used as appropriate ~~(see also section 3.2)~~: **SRIN**

~~3.9.15~~3.9.16 Payment slip reference number: AI (8020)

The GS1 Application Identifier (8020) indicates that the GS1 Application Identifier data field contains a payment slip reference number.

The payment slip reference number, assigned by the invoicing party, identifies a payment slip within a given Global Location Number (GLN) of an invoicing party (see section *2.6.6*). Together with the GLN of the invoicing party, the payment slip reference number uniquely identifies a payment slip. The data field is alphanumeric and may contain all characters contained in figure *7.11-1*.

Figure 3.9.16-1. Format of the element string

GS1 Application Identifier	Payment slip reference number
8 0 2 0	X_1———variable length———› X_{25}

The data string transmitted from the barcode reader means that the element string denoting a payment slip reference number has been captured. Restrictions apply to the use of AI (8020) in

combination with other AIs, see section *4.14 Data relationships.* ~~This element string must be processed together with the GLN of the invoicing party, AI (415).~~

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section *3.2*)~~: **REF NO.**

3.9.17 Identification of pieces of a trade item contained in a logistic unit: AI (8026)

Commented [CJ132]: WR18-115 new section

The GS1 Application Identifier (8026) indicates that the GS1 Application Identifier data field includes the ITIP of the contained piece of a trade item. The ITIP is used to identify a piece of a trade items.

The GTIN that is included in this element string is the GTIN for the complete trade item.

The piece number identifies an piece of the trade item. The total count provides the total number of pieces of the trade item.

Figure 3.9.17-1. Format of the element string

GS1 Application Identifier	Global Trade Item Number (GTIN)	Piece number	Total count
8 0 2 6	N_1 N_2 N_3 ..... N_{12} N_{13} N_{14}	N_{15} N_{16}	N_{17} N_{18}

Note: This element string SHALL be used only on a logistic unit if:

- the logistic unit is not itself a trade item; and
- all the pieces of the trade item that are contained have the same ITIP.

The data transmitted from the barcode reader means that the element string denoting the ITIP of the trade item piece contained in a logistic unit has been captured. This element string must be processed together with the count of items ~~AI (37)~~, which must appear on the same unit ~~(see section *3.6.5*)~~ (see section *4.14.2*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used (see also section *3.2*): **ITIP CONTENT**

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~~3.9.16~~3.9.18 Coupon code identification for use in North America (AI 8110)

See GS1 US for the *North American Coupon Application Guideline using GS1 DataBar Expanded Symbols* for detailed information on GS1 US coupon code data content.

The coupon barcode is constructed by starting with a coupon GS1 Application Identifier (8110), followed by the required and optional data elements, until all desired data is encoded (or the limit of 70 digits is reached).

Figure 3.9.18-1. Format of the element string

GS1 Application Identifier	Formatted according to rules of North American Coupon Application Guideline using GS1 DataBar Expanded Symbols
8 1 1 0	X_1 ———variable length————›X_{70}

The data string transmitted from the barcode reader means that the element string denoting a Coupon code for use in North America has been captured.

~~3.9.17~~3.9.19 Loyalty points of a coupon: AI (8111)

The GS1 Application Identifier (8111) indicates that the GS1 Application Identifier data field contains the loyalty points of a coupon.

Figure 3.9.19-1. Format of the element string

GS1 Application Identifier	Loyalty points of a coupon
8 1 1 1	N_1 N_2 N_3 N_4

The data string transmitted from the barcode reader means that the element string denoting the loyalty points of a coupon has been captured. This element string must be processed together with the Global Coupon Number, AI (255) of the coupon to which it relates (see section 4.14.2).

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **POINTS**

~~3.9.18~~3.9.20 Paperless coupon code identification for use in North America (AI 8112)

See GS1 US for the *North American Coupon Application Guideline using GS1 DataBar Expanded Symbols* for detailed information on GS1 US coupon code data content.

The paperless coupon data string is constructed by starting with a coupon GS1 Application Identifier (8112), followed by the required and optional data elements, until all desired data is encoded (or the limit of 70 digits is reached).

Figure 3.9.20-1. Format of the element string

GS1 Application Identifier	Formatted according to rules of North American Coupon Application Guideline using GS1 DataBar Expanded Symbols
8 1 1 2	X_1 ———variable length————›X_{70}

The data string transmitted means that the element string denoting a paperless coupon code for use in North America has been captured.

~~3.9.19~~3.9.21 Extended packaging URL: AI (8200)

The GS1 Application Identifier (8200) indicates that the GS1 Application Identifier data fields contain the identification of a brand owner authorised URL to be used in mandatory association with GTIN AI (01) encoded in one symbol.

Figure 3.9.21-1. Format of the element string

GS1 Application Identifier	Brand owner authorized URL
8 2 0 0	X_1————variable length————›X_{70}

The data transmitted from the barcode reader means that the element string denoting the Extended Packaging URL for a trade item has been captured. This element string SHALL be processed as specified in section 2.1.14~~2.1.14~~~~2.1.15~~ to obtain one URL address associated with the trade item identified by the GTIN.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **PRODUCT URL**

3.10 GS1 Application Identifiers starting with digit 9

3.10.1 Information mutually agreed between trading partners: AI (90)

The GS1 Application Identifier (90) indicates that the GS1 Application Identifier data field contains any information mutually agreed between trading partners.

The data field shows the information agreed between the two trading partners. The field is alphanumeric and may contain all characters contained in figure 7.11-1. It may also be used to incorporate data preceded by ASC MH10 Data Identifiers.

Figure 3.10.1-1. Format of the element string

GS1 Application Identifier	Data field
9 0	X_1———variable length———›X_{30}

The data transmitted from the barcode reader means that the element string denoting mutually agreed information has been captured. As this element string may contain any information, processing is subject to prior agreement between trading partners.

Important: The barcode carrying this element string SHOULD be removed from any item that leaves the jurisdiction of the trading partners.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **INTERNAL**

~~**Note**: The actual data title may be specified by the issuer of the data.~~

3.10.2 Company internal information: AIs (91 - 99)

The GS1 Application Identifier (A1 A2) assigned to company internal information is AI (91 to 99).

The GS1 Application Identifier data field may contain any company internal information. The field is alphanumeric and may show all characters contained in figure 7.11-1.

Figure 3.10.2-1. Format of the element string

GS1 Application Identifier	Data field
A_1 A_2	X_1 ———variable length———› X_{90}

Note: Use of this Application Identifier for field lengths greater than 41 data characters will require the appropriate data carrier selection, see section 2.6.10.

The data transmitted from the barcode reader means that the element string denoting company internal information has been captured. Processing of this element string is to be organised by the using company.

Important: This element string SHOULD be removed from any item that leaves the jurisdiction of the company.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used ~~(see also section 3.2)~~: **INTERNAL**

~~**Note**: The actual data title may be specified by the issuer of the data.~~

3.11 Compatibility of EPC Tag Data Standard and GS1 General Specifications

The GS1 Application Identifiers, defined in this section of the *GS1 General Specifications*, may be used in GS1 endorsed GS1 barcodes in line with the application standards outlined in section 2. GS1 Application Identifiers may also be used in GS1 endorsed RFID tags as defined in the latest version of the *EPC Tag Data Standard*.

(*) If a GTIN was withdrawn prior to 1 January 2019, the previously applicable rules must be adhered to (see section 4.17.1 Deprecated GTIN reuse rules).

4.3.6 Data alignment

When a new Global Trade Item Number (GTIN) is assigned to a trade item, it is essential that the brand owner provide the detailed information to trading partners about the item's characteristics. This information should be provided at as soon as possible before the trade item is actually traded. Expediting GTIN information to buyers reduces order exception handling and reduces the lead time in getting goods to the selling floor.

4.3.6.1 Data alignment best practice

A number of actions are vital to ensure that Global Trade Item Numbers (GTINs) are accurately communicated within the supply chain. These ensure that the data associated with any scanned barcode can be associated with accurate, up-to-date data. This is particularly essential for items scanned at the point-of-sale where the absence of accurate data may have legal implications.

The GTIN provides a supply chain solution for the identification of any item that is traded (priced, invoiced, or ordered). Overall supply chain costs are minimised by all partners in the supply chain adhering to identical GTIN Management Standards (see section *4.3*).

The following best practices are proposed for all items. It has been developed by manufacturers, distributors, and retailers to help eliminate any confusion between product identification and product listing in the retailer's database in the supply chain.

1. GTIN Management and the barcoding of the GTIN are technical processes with rules detailed in these GS1 General Specifications. Product listing is the act of adopting a new product in an assortment by a commercial organisation. Product listing is the result of commercial negotiations between purchaser and seller. For example, GTIN Management should be independent from product listing.
2. For management reasons, or to ensure that correct information is communicated to the final consumer, changes to an item may require a new GTIN. A new GTIN does not automatically imply a new listing. For example, if a change requiring a new GTIN is made to a listed product, this should not automatically imply a new product listing is needed.

GTIN Management and database listing are to be considered as two entirely autonomous decisions: GTIN Management is not an object of negotiation.

The brand owner makes available to its client all information regarding the listed items, ideally with an EDI message or in an e-product catalogue, no later than at the time of item listing. In case of time limited promotions or a product evolution, this information will be communicated largely beforehand, thus allowing the retailer to validate this information and to circulate it internally.

4.3.7 GTIN-8 guidelines and pack size constraints

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~~, the following guidelines should be observed.~~ Before deciding to use a GTIN-8 as opposed to a GTIN-13 or GTIN-12, companies, working jointly with their printer, should consider options such as:

- Whether the barcode can be reduced in size; e.g., printed at a lower X-dimension, taking into account the minimum barcode print quality requirements (see section *5.9*).
- Whether the label or artwork can reasonably be changed to enable the inclusion of an EAN-13 or a UPC-A barcode or a symbol from the GS1 DataBar Retail POS family.
- For example, redesigning the label and increasing the label size may be an option, especially when the existing label is small in comparison with the pack area.
- Whether a truncated barcode can be used.

Note: A truncated barcode (normal length, but reduced in height) may only be used if there is absolutely no possibility of printing a full size barcode. Truncation removes the omnidirectional scanning capability. A barcode with excessive truncation will not be of any

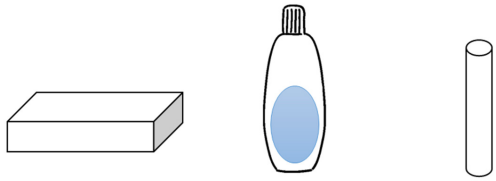
practical use. Users considering this option should consult their customers to see if an acceptable compromise can be reached.

Pack size constraints

The use of a GTIN-8 is authorised when:

- The total printable area of the product packaging is less than 80 cm², or
- The area of the largest label for the item is less than 40 cm², or
- The product is cylindrical with a diameter less than 30 mm.

Figure 4.3.7-~~1~~2. GTIN-8 pack size constraints



1. Total printable area less than 80 cm2
2. Largest label less than 40 cm2
3. Product diameter less than 30 mm

Field Code Changed

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5.9.4 Barcode production

The following subsections will:

- Provide background on major barcode printing methods and materials
- Provide general printing and packaging background for major application groups
- Provide technical considerations for direct part marking (DPM)

The various definitions and specialist terms used throughout this section are found in *ISO/IEC 15419, Information Technology, Automatic Identification and Data Capture Techniques, Bar Code Digital Imaging and Printing Performance Testing*, *ISO/IEC 15416*, *Information technology, Automatic Identification and Data Capture Technologies, Bar Code Print Quality Test Specification – Linear Symbols* and *ISO/IEC 15415, Information technology, Automatic Identification and Data capture Techniques, Bar Code Print Quality Test Specification, Two-dimensional Symbols*.

5.9.4.1 Digital imaging

5.9.4.1.1 General requirements

General requirements consisting of the following topics are found in section 4 of *ISO/IEC 15419*.

- Data input.
- Quiet Zones.
- Classification of imaging device categories, from informative reference Annex E of *ISO/IEC 15419.*
- Programmer's examples, from informative reference Annex F of *ISO/IEC 15419.*
- Programmer's example for general-purpose printers.
- Programmer's example for indirect barcode imaging devices.
- Programmer's example for symbols distorted for plate roll circumference.
- Direct barcode imaging devices.
- Dedicated barcode printers.
- Adjustment of target element dimensions.
- Record of design elements.
- General purpose printers.
- Adjusted bar width compensation (BWC) (including the General Purpose Printer Dot/Pixel Comparison figure).
- Record of design attributes.
- Indirect barcode imaging devices.
- Adjustments for planned distortion (disproportioning).
- Adjustments for special EAN/UPC symbol characters.
- Test requirements:
  - System configuration.
  - Test procedure.
- Conformance.
- Test report, including sample test layout, from normative reference Annex A of *ISO/IEC 15419*
- Certification.
- Software specification, including classification of software categories, from informative reference Annex D of *ISO/IEC 15419* and functions of barcode production software from informative reference Annex G of *ISO/IEC 15419.*

- Maintenance and supplies, from informative reference Annex C of *ISO/IEC 15419.*

5.9.4.1.2 Dedicated barcode printers

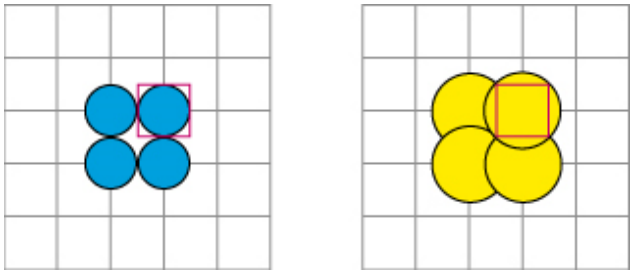
Section 5 of *ISO/IEC 15419* contains information on dedicated barcode printers and includes the following topics:

- Data input requirements.
- Test requirements.
- Selection of equipment for testing.
- Test conditions; environment, equipment configuration.
- Test procedure.
- Conformance.
- Test report.
- Certification and labelling.
- Equipment specification.

5.9.4.1.3 EAN/UPC on-demand printed symbols at minimum size

It is more difficult for the user to create high quality barcodes with general-purpose printers than it is with direct thermal transfer label printers. There are two reasons for this difficulty. First, the printed dot size for general-purpose printers is appreciably larger than the pixel dimension, as shown in the figure below. This causes the bars (dark bars) to be printed wider and the spaces (light bars) to be narrower than nominal, unless the software driving the printer corrects for this distortion. Second, the software that constructs the barcode may itself introduce dimensional errors.

Figure 5.9.4.1.3-1. Example of digital printing



Pixel-sized dot **Typical general-purpose printer dot**

The most common printing densities used by on-demand, barcode printers are 200 and 300 dpi. However, due to the constraints of the dot pitch, these printers cannot print a minimum X-dimension of 0.264 mm (0.0104 inch) or 80 percent magnification symbol correctly. The closest to 80 percent that these printers can print is 75.7 percent or 76.9 percent depending on the exact dot geometry (see figure 5.9.4.1.3-2).

Even though a minimum X-dimension of 0.264 mm (0.0104) inch or 80 percent magnification) is the minimum value specified, users of on-demand printers have used magnifications between 75 percent and 80 percent in point-of-sale (POS) scanning environments for years. They have done so with no significant reduction in scan rate, as compared to symbols printed precisely at 80 percent. Because larger in-specification symbols are always easier to scan, 80 percent symbols and larger are preferred. However, when an on-demand printer is required, the 75 to 80 percent symbols are an acceptable alternative given the following qualifications for printing:

- The allowance for symbols from the EAN/UPC symbology family of magnifications from 75 to 80 percent is only applicable to on-demand (e.g., thermal, laser) print processes. For all other printing processes, 80 percent is attainable and is the minimum allowable size.

- When printing a minimum symbol with any method of printing, the area provided for printing the symbol, including the required Quiet Zones, SHOULD never be less than the area required for an 80 percent symbol. This area is derived from the total width of an 80 percent symbol times its height.
- When printing a minimum symbol with any method of printing, the symbol height SHALL never be truncated below minimum bar height as stated in the symbol specification tables.

Figure 5.9.4.1.3-2. Achievable X-dimensions for thermal printed EAN/UPC symbols

Reference DPI	Actual DPI	Dots per millimetre	Actual dot width (centre point to centre point)		Dots per module width	Module width (X-dimension)		(*) Corrected magnification
			inch	mm		inch	mm	
200	203.2	8	0.004921	0.12500	2	0.0098	0.250	(**) 75.76%
200	203.2	8	0.004921	0.12500	3	0.0148	0.375	113.64%
200	203.2	8	0.004921	0.12500	4	0.0197	0.500	151.52%
200	203.2	8	0.004921	0.12500	5	0.2461	0.625	189.39%
300	304.8	12	0.003281	0.08333	3	0.0098	0.250	(**) 75.76%
300	304.8	12	0.003281	0.08333	4	0.0131	0.333	100.01%
300	304.8	12	0.003281	0.08333	5	0.0164	0.417	126.26%
300	304.8	12	0.003281	0.08333	6	0.0197	0.500	151.52%
300	304.8	12	0.003281	0.08333	7	0.0230	0.583	176.77%
400	406.4	16	0.002461	0.06250	4	0.0098	0.250	(**) 75.76%
400	406.4	16	0.002461	0.06250	5	0.0123	0.312	94.70%
400	406.4	16	0.002461	0.06250	6	0.0148	0.375	113.64%
400	406.4	16	0.002461	0.06250	7	0.0172	0.437	132.58%
400	406.4	16	0.002461	0.06250	8	0.0197	0.500	151.52%
400	406.4	16	0.002461	0.06250	9	0.0221	0.563	170.45%
400	406.4	16	0.002461	0.06250	10	0.0246	0.625	189.39%
600	609.6	24	0.001640	0.04167	6	0.0098	0.250	(**) 75.76%
600	609.6	24	0.001640	0.04167	7	0.0115	0.292	88.38%
600	609.6	24	0.001640	0.04167	8	0.0131	0.333	101.01%
600	609.6	24	0.001640	0.04167	9	0.0148	0.375	113.64%
600	609.6	24	0.001640	0.04167	10	0.0164	0.417	126.26%
600	609.6	24	0.001640	0.04167	11	0.0180	0.458	138.89%
600	609.6	24	0.001640	0.04167	12	0.0197	0.500	151.52%
600	609.6	24	0.001640	0.04167	13	0.0213	0.542	164.14%
600	609.6	24	0.001640	0.04167	14	0.0230	0.583	176.77%
600	609.6	24	0.001640	0.04167	15	0.0246	0.625	189.39%

(*) The nominal EAN/UPC symbol is based on a module width (X-dimension) of either 0.0130 inch or 0.330 millimetre. In North America, long-standing GS1 US specifications set the nominal module size (X-dimension) at 0.0130 inch or 0.330 millimetres. The ISO/IEC specification for EAN/UPC symbols set the nominal module size (X-dimension) at 0.330 millimetre. The international metric nominal is 0.0606 percent smaller than the original inch-based nominal. The data in the right-most column labelled "Corrected Magnification" are based on a nominal module width (X-dimension) of 0.330 millimetre.

(**) See figure *5.9.3.1-1* for when a magnification of less than 80% is acceptable

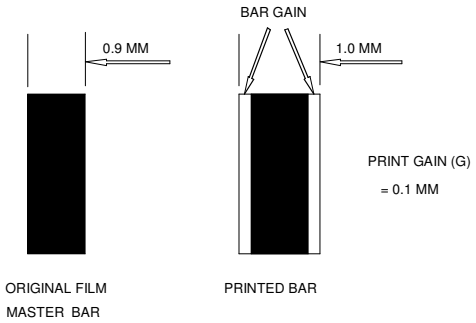
5.9.4.2 Barcode master image production

5.9.4.2.1 Introduction

For symbols in the EAN/UPC symbology family, the biggest usage of verification has always been in conjunction with printing and production of packaging and labels by means of the conventional or "wet ink" printing processes, such as offset lithography, flexography, and photogravure. A barcode master image is required as part of the production of printing plates for these processes.

The first point at which one might use verification is a printability test before actual production of the symbols, where a printing run including a test symbol is carried out under normal conditions. The test barcode is then verified to characterise the printing process for a particular press and printing substrate. It is necessary to assess how much bar gain (or loss) has occurred and over what range of variation, to decide how much bar width adjustment (BWA) is required. Bar gain will mean that the printed bars are wider than those of the master image, so the master image will need to be adjusted to compensate for this. BWA can be in the form of bar width reduction (BWR), where there is bar gain, or the less common bar width increase (BWI). The required BWA is associated with the X-dimension used. These details are required in order to specify the master image correctly for the barcode origination software.

Figure 5.9.4.2.1-1. Example of bar width adjustment



If a proof of the print job is produced, the barcode should be verified as part of the approval process. Note, however, that since proofing presses are not the same as production printing presses, there may be a slight difference in the quality of the proof and the production job.

While the presses are being made ready, a check of bar widths on the first few printed sheets can help to ensure that the press is correctly set to produce near-ideal bar widths. Once the presses have started to roll, periodic sampling should be carried out, at intervals based on experience or dictated by the company's quality control procedures, to monitor both bar widths and other aspects of symbol quality (in particular symbol contrast), since these are the attributes most easily adjusted during the run.

Finally, a further sample should be verified following completion of the print job. The Scan Reflectance Profile (SRP) analysis SHALL be used as the basis for decision making, to ensure that the job has achieved at least the minimum quality grade specified by the customer or based on the application.

The following items are recommended to accompany a master image file:

- X-dimension (magnification factor).
- Selected bar width reduction.
- Product identification, including company name.
- Printing process for which the master image is intended.

- Identification of the master image supplier.
- Date of master image manufacture.

5.9.4.2.2 Master image requirements

The master image must be produced at an appropriate resolution for the hardware device which will produce the physical image of the barcode on paper, photographic film, printing plate or other substrate. The associated software which converts the input data (the master image) into digital instructions to drive the hardware device is equally important. The general principles and requirements that should be followed are explained in ISO/IEC 15419 *Information Technology, Automatic Identification and Data Capture Techniques, Bar Code Digital Imaging and Printing Performance*. This international standard sets out general principles governing the barcode image generation function in each component, supplemented by more specific details applicable to certain major categories of software and hardware.

The physical requirements for a film master are found in section 6 of *ISO/IEC 15421 Information technology -- Automatic identification and data capture techniques -- Bar code master test specifications*.

5.9.4.3 Technical considerations for direct part marking (DPM)

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Marking methods

It is important to analyse the selected method of marking in relation to several considerations:

- Finishes that cause an excess of shadowing or glare.
- Surfaces that do not provide sufficient contrast - less than 20 percent difference in surface reflectance.
- Safety critical parts that cannot be marked with intrusive methods.
- Marking method must comply with the users' requirements.
- Location of the symbol should not be:
  - In direct air/water (streams, etc.).
  - On sealing surfaces.
  - On surfaces subject to wear or exposure to heavy contact.

Intrusive (subtractive methods)

Intrusive marking refers to methods that remove or alter the material of the host.

- Abrasive blast.
- Dot peen.
- Electro-chemical marking, colouring, or etching.
- Engraving/milling.
- Fabric embroidery/weaving.
- Direct laser marking.
- Laser shot peening.
- Laser Inducted Surface Improvement (LISI).
- Gas Assisted Laser Etch (GALE).
- Laser Induced Vapour Deposition (LIVD).

Non-intrusive (additive methods)

Non-Intrusive marking does not affect the host material; it usually involves the addition of material.

- Cast, forge, mold.
- Inkjet

- Laser bonding.
- Liquid metal jet.
- Silk screen.
- Stencil

Host (substrate) surface

Direct part marking of GS1 DataMatrix or GS1 QR Code SHOULD be reserved for surfaces no rougher than 250 micro inches (millionths of an inch) and for surfaces that are no smoother than 8 micro inches. Surfaces that fall outside these parameters need to be re-surfaced or marked using an alternative method.

Consideration of the surface colour must be taken. A minimum 20 percent difference in contrast between the host and the symbol is required. Altering the cell size in relation to the surface roughness should provide adequate contrast on cast surfaces.

(Cell size = (0.00006 X roughness) + 0.0067); (see figure *2.1.10-15*)

Figure 5.9.4.3-115. Cell size in relation to surface roughness

Average roughness	Cell size minimum
0,508 micrometres (20 micro inches)	0.1905 mm (0.0075 in.)
1,524 micrometres (60 micro inches)	0.2286 mm (0.009 in.)
3,048 micrometres (120 micro inches)	0.381 mm (0.015 in.)
5,08 micrometres (200 micro inches)	0.508 mm (0.020 in.)
7,62 micrometres (300 micro inches)	0.635 mm (0.025 in.)
10,668 micrometres (420 micro inches)	0.762 mm (0.030 in.)

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Field Code Changed

Substrate surface thickness

A minimum host surface thickness is recommended as is a maximum marking depth. Both are outlined in the table below.

Figure 5.9.4.3-226. Marking depth and surface thickness by method

Method	Min. thickness	Max marking depth
Dot Peen	1.016 mm (0.04 in.)	0.102 mm (0.004 in.)
Laser Shot peening	0.508 mm (0.02 in.)	0.051 mm (0.002 in.)
Laser Bonding	0.025 mm (0.001 in.)	Surface Mark
Abrasive Blast	0.076 mm (0.003 in.)	0.008 mm (0.0003 in.)
Electro-Chemical Colouring	0.508 mm (0.02 in.)	0.051 mm (0.002 in.)
Laser Etch	0.762 mm (0.03 in.)	0.076 mm (0.003 in.)
LISI	1.016 mm (0.04 in.)	0.102 mm (0.004 in.)
Laser Engraving	1.27 mm (0.05 in.)	0.127 mm (0.005 in.)
Electro-Chemical Etch	2.54 mm (0.1 in.)	0.254 mm (0.01 in.)
Micro-Milling	31.75 mm (1.25 in.)	3.175 mm (0.125 in.)

Field Code Changed

Field Code Changed

5.9.5 Quality assessment

5.9.5.1 Verification

Verification is the technical process by which a barcode is measured to determine its conformance with the specification for that symbol. Verification is not intended to be used alone as a method for downstream rejection. For example, GS1's advice is to use the *ISO/IEC 15416* or *ISO/IEC 15415* methodologies as the basis to improve overall scanning performance. An ISO/IEC-based verifier is of enormous assistance in diagnosing the problem and providing a standard means of reporting among printing companies and their trading partners.