

# UCC/EAN-128 Guidelines

Version 2

A guide to the implementation of  
the EAN 128 bar code on  
pallet and outer case labels  
in the grocery trade in Ireland



GS1

EAN ®  
I R E L A N D

ECR *Ireland*  
Efficient Consumer Response

# table of contents

Introduction . . . . .	3
Acknowledgements . . . . .	3
Sample Logistics Label . . . . .	4
Industry Agreed Application Identifiers (AIs) . . . . .	4
UCC/EAN 128 Technical Specifications . . . . .	5
Logistic Unit Labelling & Label Design . . . . .	9
AI Specifications . . . . .	11
Appendix . . . . .	15
Further Information . . . . .	16



---

**As of January 2005 EAN International, EAN Ireland the other member organisations are known as GS1.**

---

## *Disclaimer*

*The objective of this document is to provide GS1 and ECR Members with a simple set of guidelines on the best practice implementation of the EAN 128 bar code symbology on pallet and outer case labels. This document is not exhaustive and does not replace the General EAN.UCC Specifications.*

*Whilst every effort has been made to ensure that the contents of this document are correct, GS1 Ireland and ECR Ireland and any other party involved in the creation of the document hereby state that the document is provided without warranty, either expressed or implied, of accuracy or fitness for purpose, and hereby disclaim any liability, direct or indirect, for damages or loss relating to the use of the document. The document may be modified from time to time, subject to developments in technology, changes to the standards, or new legal requirements.*

*Please Note: The bar code symbols used in this guide are for illustrative purposes only and should not be scanned.*

*Copyright © GS1 Ireland September 2004*

---

# introduction

It is with great pleasure that we bring you "A guide to the implementation of the EAN 128 bar code on pallet and outer case labels in the grocery trade in Ireland". In September 2003, the ECR Ireland Board and the Council of EAN Ireland approved our participation in a joint EAN/ECR project group set up to examine issues around the implementation of EAN 128 for the FMCG industry in Ireland. The first phase in this process entailed the preparation of these industry-agreed guidelines.

The second phase commenced in February 2004 and involved assisting companies on a practical level with the introduction of EAN 128 as part of their business processes.

The following benefits of implementation have been identified:

- Cost Reduction
- Greater Speed & Response
- Greater Accuracy
- Improved Data Flow and Reporting
- Compliance - EU Food Traceability Regulation 178/2002 - effective 01/01/05  
- US Bioterrorism Act - effective 12/12/03

Once again, we would like to thank the companies who have taken part in this project to date and we hope that you will encourage the adoption of EAN 128 at pallet and outer case level.

We believe that this guideline will be a useful tool for companies operating in the FMCG marketplace in Ireland.

Tony Keohane, Retail Co-Chair & Jim McNeill, Supplier Co-Chair, ECR Ireland

David Fitzgerald Chairman & Jim Bracken Director, GS1 Ireland

September 2004

# acknowledgements

**GS1 Ireland and ECR Ireland would like to thank the following organisations for their input to this document and their support for its implementation:**

ADM Londis	C&C Group	Fyffes
Barry's of Malow	BWG Foods	Cadbury Schweppes
Glanbia	Dunnes Stores	Carton Group
Horgans	Mangans	Coca Cola Bottlers
Kerry Foods	Musgrave SuperValu-Centra	Dairygold
Moypark	Superquinn	Diageo
SHS Sales & Marketing	Tesco Ireland	

# Sample Logistics Label

A typical pallet or outer case label could contain the following information:

1. The name of the company
2. The name of the product and its description (size, flavour ...)
3. The GTIN (bar code number) for that product
4. The expiry or best before date
5. The batch or lot number
6. The SSCC for the logistics unit i.e. a serialised reference number unique to this case or pallet.

**THE DEMO COMPANY**  
No.1 MAIN STREET, ANYTOWN, Co. ANYWAY

---

**Product:**  
Fizzy Orange Soda 500ml x 24

**SSCC:**  
353912345678910118

**GTIN:**  
05391234567892

**Best Before Date:** 31/12/2005      **Batch Number:** APO1536Z



(01)05391234567892(15)051231(10)APO1536Z



(00)353912345678910118

## Industry Agreed Application Identifiers (AIs)

This section contains the shortlist of EAN.UCC Application Identifiers that have been agreed by the participating retail & wholesale companies for use on bar coded outer case or pallet labels. Please confirm with your customer the actual AIs from this list that they require at this moment in time.

AI	Title	Data Type	Field Length	Number of Data Characters in the Field
00	SSCC (Serial Shipping Container Code)	Numeric	Fixed	18
01	Global Trade Item Number™	Numeric	Fixed	14
02	GTIN of Trade Items Contained in a Logistic Unit*	Numeric	Fixed	14
10	Batch or Lot Number	Alphanumeric	Variable	Up to 20
15	Best Before Date (YYMMDD)	Numeric	Fixed	6
17	Expiration Date (YYMMDD)	Numeric	Fixed	6
310N	Net Weight in KG	Numeric	Fixed	6
37	Count of Trade Items Contained in a Logistic Unit*	Numeric	Variable	Up to 8
400	Customer's purchase order number	Alphanumeric	Variable	Up to 30
410	Ship to Global Location Number	Numeric	Fixed	13
413	Forward to Global Location Number	Numeric	Fixed	13
91-99	Company Internal Information	Alphanumeric	Variable	Up to 30

\* There is a mandatory association between 02 and 37

# UCC/EAN-128 Technical Specifications

## An introduction to EAN 128, Application Identifiers, Serial Shipping Container Codes and the EAN Logistics Label.

This section will explain what EAN 128 is and how the symbol is constructed. It will introduce the concept of Application Identifiers (AIs) and explain those most commonly used in retail/grocery. Finally we will outline the EAN Logistics Label and detail the structure of the Serial Shipping Container Code (SSCC).

## What is EAN 128?

UCC/EAN 128 is a special bar code symbol that enables trading partners to send not only product identification information (i.e. the product's bar code number), but also additional information about the product. This additional information could include, among others, a sell by date or expiry date, a batch number or a measurement or weight.

## Where did EAN 128 come from?

The formal name for EAN 128 is UCC/EAN-128 and its use is exclusively licensed to GS1 International. The UCC/EAN-128 symbology is a pure sub-set of another bar code called Code-128. Code 128 is a symbol which can encode all 128 ASCII alpha-numeric and special characters. Code 128 is not suitable for use in open trade as it does not follow a defined structure and therefore is only suitable for in-house or closed system applications.

### Code 128

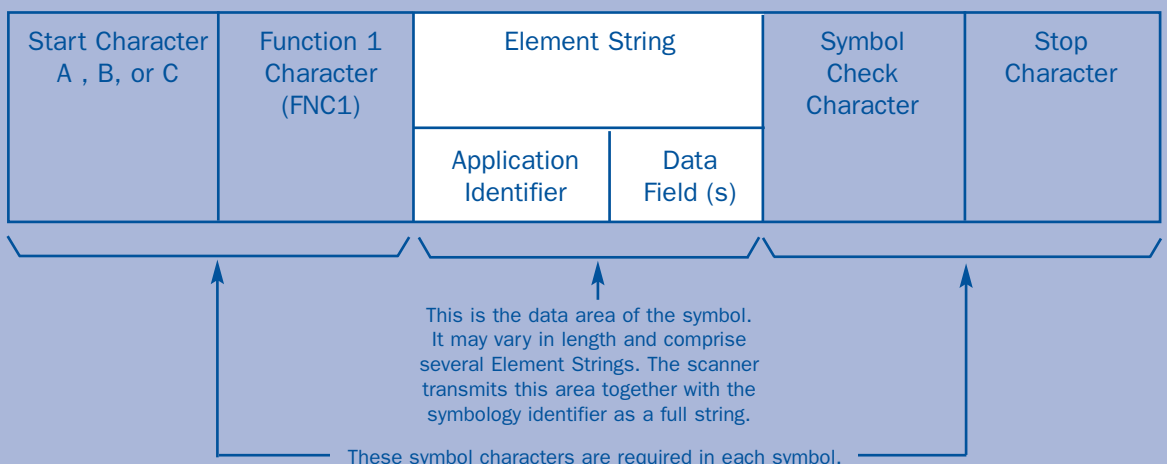
No data structure  
No security



EAN 128 on the other hand, has a defined structure which has been agreed by GS1 International and the Automatic Identification Manufacturers Inc. (AIM), making it ideal for open distribution. **A unique character called the Function One (FNC 1) character, found at the start of the bar code symbol, is what distinguishes EAN 128 from Code 128.**

**It is important to remember that EAN 128 and Code 128 are not the same.**

## EAN 128 symbol components



## Where can EAN 128 be used?

EAN 128 is generally used for traded unit (outer cases) and transport unit (pallets) coding. It is not intended to be scanned at checkouts as most retail point of sale systems are currently not capable of reading this bar code symbol.

# What is an Application Identifier (AI)?

As mentioned above, EAN 128 has a defined structure i.e. sets of rules which define the nature, format and structure of each piece of data. An Application Identifier or AI is a prefix or tag which precedes a piece of data and indicates the nature, format and content of that data string which follows it.

Application Identifiers may be 2 – 4 digits in length and will determine if the subsequent piece of data takes numeric or alphanumeric data and is fixed or variable in length. The AIs are represented in the human readable characters surrounded by brackets. For example the Application Identifier (01) means "GTIN" or Article Number. Application Identifiers are set globally by GS1 International and are the keys to the successful interpretation of an EAN 128 symbol.

## What AIs are available?

There is a whole range of AIs to cover many different business requirements. These include among others:

- Item Identification
- Traceability Numbers
- Dates
- Trade Quantities and Measures
- References & Locations.

Some of the most commonly used Application Identifiers are:

<b>00</b>	for the SSCC	<b>240</b>	Additional Manufacturer's ID
<b>01</b>	for the GTIN	<b>3102</b>	Net Weight KG (two decimal places)
<b>02</b>	for the GTIN of the item contained	<b>37</b>	is the quantity of the 02 GTIN
<b>10</b>	for batch or lot number	<b>400</b>	Customers P.O. No.
<b>11</b>	Production Date	<b>410</b>	Ship To GLN
<b>15</b>	Best Before/Sell by Date	<b>413</b>	Forward to GLN
<b>17</b>	Use By/Expiry Date	<b>91-98</b>	Internal Applications
<b>21</b>	Serial Number		

A detailed look at the AIs agreed for use under this project are outlined on pages 12 -15. A full list of all Application Identifiers, together with their specification, may be downloaded from the GS1 Ireland website: [www.gs1ie.org](http://www.gs1ie.org) if required.

## Symbol Characteristics

UCC/EAN-128 is an extremely flexible symbology. It allows the representation of data of variable length and makes it possible to *encode several pieces of information in one bar code symbol*. This is called **Concatenation**.

Like all bar codes, the symbol has a number of set characteristics and elements. These are principally:

- Leading Quiet Zone
- The Double Character Start Pattern:
  - The Character Set Start
  - The Function 1 Character
- The AIs required
- The data string relating to each AI selected
- Separator Characters if required (the Function 1 Character)
- A Check Character
- A Stop Character
- Trailing Quiet Zone

ST

F1

AI + DATA

F1

AI + DATA

CK

SP

## How to create an EAN 128 symbol:

A symbol is created by completing the following steps:

1. Selection of the Character Set Required (A, B or C)
2. Insertion of the Function One Character: ]C1
3. Insertion of the first AI required and its data string
4. Insertion of the Function 1 Separator Character if required (i.e. if the AI indicates that the data string is of variable length and all character spaces are not used or if the AI is not included on the list of predefined length AIs which do not require the separator. These AIs which do not require a Separator Character may be found in Table 1 in the Appendix at the end of this document.
5. Remaining AIs and Data Strings required
6. Check Character
7. Stop Character.

## Explanation of the above components:

### • Code Sets

Code Set A includes all of the standard upper case alphanumeric characters and punctuation characters together with the symbology elements (e.g., characters with ASCII values from 00 to 95) and seven special characters.

Code Set B includes all of the standard upper case alphanumeric characters and punctuation characters together with the lowercase alphabetic characters (e.g., ASCII characters 32 to 127 inclusive) and seven special characters.

Code Set C includes the set of 100 digit pairs from 00 to 99 inclusive, as well as three special characters. This allows numeric data to be encoded as two data digits per symbol character.

### • Code Set and Shift Characters

Code set and shift characters are used to change from one code set to another within a symbol. Code set characters A, B, or C change the symbol code from that set previously to the new one. This change applies to all characters following the code set character until either the end of the symbol, another code set character, or the shift character is encountered. The shift character changes the code set from A to B or B to A for the *single character following the shift character*. Characters following the affected character shall revert to the code set A or B defined prior to the shift character.

### • The Function 1 Separator Character

The Separator Character appears in the decoded data string as <GS> (ASCII character 29). All Element Strings not of pre-defined length must be followed by a Function 1 Character (FNC1) separator when followed by another Element String in a single bar code symbol. An FNC1 is not required at the end of the last Element String represented in an EAN-128 symbol.

## EAN 128 Symbol Specifications

Symbol(s) Specified	*X-Dimensions mm (inches)			** Minimum Symbol Height for Given X mm (inches)			Quiet Zone		Minimum Quality Specification
	Minimum	Target	Maximum	For Minimum X-dimension	For Target X-dimension	For Maximum X-dimension	Left	Right	
UCC/EAN-128	0.495 (0.0195")	0.495 (0.0195")	0.940 (0.037")	32.00 (1.25")	32.00 (1.25")	32.00 (1.25")	10X	10X	1.5/10/670

## Symbol Length

The UCC/EAN-128 is of variable length, depending on the number of data and separator characters encoded, the types of character encoded and the X-dimension used. As the symbol is designed to be read bi-directionally by fixed or portable scanners its overall physical length must **not be greater than 165mm**, including light margins. The **maximum number of encoded characters is 48**, including the Application Identifiers and any Function 1 Characters used as Separators, but excluding any auxiliary characters and the symbol check character. For a given length of data, the symbol size varies, between limits, to accommodate the ranges in quality achievable by the various printing processes. For this reason it is not possible to specify maximum and minimum sizes.

---

## The X - dimension

All bar code symbols are constructed around the principal of the "X-dimension" i.e. the narrowest width of a bar module. For Logistics Units in General Distribution the recommended X-dimension range is between 0.495 mm (0.0195 in.) and 0.94 mm (0.037 in.).

The reliability of scanning will always be enhanced by selecting an X-dimension at the higher end of the specified range. However, if the information required cannot be accommodated in the space available, a lower X-dimension may be used. Using smaller symbols reduces reading distance and makes the production of quality symbols more difficult to maintain.

---

## Bar Height

Taller symbols present a better target for readers. For EAN 128 symbols used in general distribution the minimum bar height is 32mm. Space constraints may not allow a bar code to be printed at the recommended height, but in no case shall a bar code symbol be less than 13 mm (0.5 in.) high.

---

## Magnification

In the past, the term symbol magnification was extensively used to specify the size of a bar code symbol. This technique relied upon setting a nominal size (100%) that was directly related to a given X-dimension. Since January 2000, the more precise X-dimension has been used to specify permissible symbol sizes. EAN-128 symbols can be printed at magnification factors from 25% to 100%. To ensure efficient reading in any environment, a minimum magnification factor of 50% should be used.

---

## Quiet Zones

Bar codes should be printed with leading and trailing Quiet Zones that are at least 10 modules wide.

---

## Orientation and Placement

Bar Codes on Logistics Units should be printed in "Picket Fence" style i.e the bars and spaces should be perpendicular to the base of the logistic unit. The bar code symbols should be printed in the bottom portion of any label, with the SSCC symbol being the last of all. For more information on label placement please see the next section.

---

## Human Readable Interpretation

As a safeguard for manual key entry of data in the event a bar code will not scan, the data contained in a bar code symbol is printed in human readable form below the symbol. The Human Readable Interpretation of each bar code includes the Application Identifiers and data content but not any special symbol characters such Start, Stop, Separator or Symbol Check Characters. To facilitate key entry, AIs should be set apart from the data by parentheses or brackets.

---

## Colour

Dark bars on a light background are necessary for a successful scan. As most EAN-128 symbols will be printed on labels, they will be printed using black ink on a white background.

---



## Verification and Symbol Quality

As the data contained within an EAN 128 symbol is often variable it is likely that the labels and symbols will be prepared on demand for a specific order or pallet and will not be pre-printed. For this reason it is vitally important that symbols are verified to ensure they are both properly constructed and printed to a sufficiently high quality level. A verifier is an invaluable piece of equipment to measure the accuracy of your symbols and thus ensure that your consignments are not rejected by your customer. Your local solution provider will be able to advise on the many verifiers available on the market or consult the Useful Contacts section of the GS1 Ireland website.

All bar code readers work by measuring both the thickness of the dark bars and the relative darkness of the bars to the spaces. Therefore EAN 128 symbols printed onto brown fibreboard or cardboard will never scan as well or receive as high a quality rating as those printed onto white labels.

## Symbol Grades

Symbol Grades are measured on one of two scales, the American ANSI scale or the European CEN scale. EAN 128 symbols must achieve CEN Grade 1.5 / ANSI Grade C or above.

## *Important Things to Remember:*

- The brackets seen around the AIs are **only** included in the human readable text below the bar code and **must not be encoded** in the symbol itself.
- Each EAN 128 symbol may contain no more than 48 characters excluding the auxiliary and symbol check characters.
- The physical length of the symbol including light margins must not exceed 165mm.
- To limit the number of Function 1 characters used it is recommended that all predefined, fixed length Data Strings are included at the start of the symbol and variable length fields are placed at the end of the symbol.
- The use of AIs is governed by certain rules. Some must always be used with others: for example AI (02) must be accompanied by AI (37). Some AIs must never be used together, for example AI (01) and AI (02).

## *Logistic Unit Labelling & Label Design*

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

This section will outline the structure and layout of the EAN.UCC Logistics Label, which is a voluntary standard developed by GS1 International. Consistency in the layout of labels and the location of information on them is vital for their speedy interpretation.

There are two basic forms of information on an EAN.UCC Logistics Label - Human Readable and Machine Readable. The typical EAN Label has three sections:

- A top section which contains free format information
- A middle section which contains information about the unit in human readable form and
- A bottom section which contains the bar code symbol(s) and their human readable interpretation.

**THE DEMO COMPANY**  
No.1 MAIN STREET, ANYTOWN, Co. ANYWAY

**Product:**  
Fizzy Orange Soda 500ml x 24

**SSCC:**  
353912345678910118

**GTIN:**  
05391234567892

**Best Before Date:** 31/12/2005      **Batch Number:** APO1536Z



(01)05391234567892(15)051231(10)APO1536Z



(00)353912345678910118

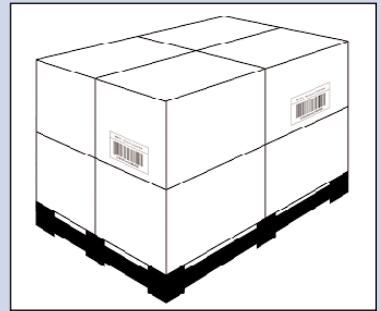
## Label Dimensions

The physical dimensions of the label are determined by the labeller. Factors influencing label dimensions include the amount of data required, the content and X-dimension of the bar code symbols used and the dimensions of the logistic unit to be labelled.

The standard A6 or A5 formats are sufficient for most requirements. As a guideline the width of the label is best held constant at 105 mm (4 in.), while the height of the label varies depending on data requirements.

## Label Location

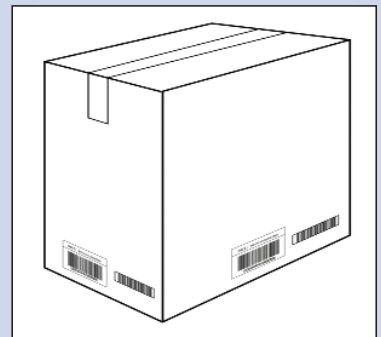
Each full unit, whether a trade item or a logistics unit, should have at least one bar code symbol. The symbol should be a minimum of 50 mm (2") from any vertical edge. Two labels (or printed bar code symbols) are strongly recommended and should be affixed to adjacent sides of the Logistics Unit: one on a short side and one on the long side to its right (in warehouse applications this enables consistent turning to ensure a label is visible).



## Units Less than 1 Meter in Height

For cartons and other units less than 1 m (39 in.) in height (pallets excluded) labels should be placed so that the lowest edge of the SSCC is 32 mm (1.25 in.) from the base of the unit. Including Quiet Zones, the symbol should be at least 19 mm (0.75 in.) from the vertical edge.

If the unit is already marked with an EAN-13, UPC-A, ITF-14, or UCC/EAN-128 Bar Code Symbol for trade item identification purposes, the label shall be placed so as not to obscure the pre-existing bar code symbol. In situations like this, the preferred location for the label is to the side of the pre-existing bar code, so that a consistent horizontal location is maintained.

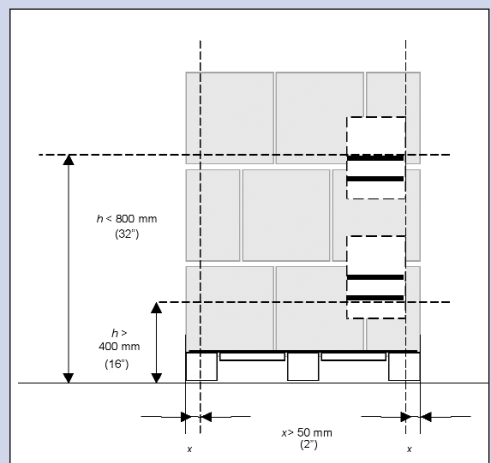


## For Pallets Less than 1 Meter in Height

For pallets less than 1 m (39 in.) in height, symbols should be placed as high as possible but not more than 800 mm (32 in.) from the base of the unit.

## Units Greater than 1 Meter in Height

For pallets and other units greater than 1 m in height, labels should be placed so that all bar code symbols are at a height between 400 mm (16 in.) and 800 mm (32 in.) from the base of the unit, and no closer than 50 mm (2 in.) from the vertical edge.



# AI Specifications

## AI 00

### Logistic Unit Identification – the Serial Shipping Container Code (SSCC)

By their nature, units that need to be tracked and traced individually in a supply chain require **unique identification numbers**. Tracking and tracing logistic units is a major application of the EAN.UCC 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 an EAN.UCC Identification number called the SSCC. The SSCC ensures that logistic units are identified with a number that is unique worldwide and is in essence a licence plate number for that pallet or case. The SSCC 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). In an environment where EDI is used to transmit detailed information about a logistic unit, or where that information is already resident in a database, the SSCC acts as a reference pointer to that information.

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.

SSCCs identify all Logistic Units, whether they are homogeneous or mixed. A company wishing to differentiate its production plants within the SSCC can do so by allocating blocks of SSCCs to each production plant. The SSCC is declared in the despatch advice or the delivery note and in all transportation messages.

The SSCC Element String AI is (00). The Element String takes numeric data only and is fixed at 18 digits in length. The Check digit is calculated according to the Modulo 10 algorithm.

Application Identifier	SSCC																	
	Extension digit	GS1 Global Company Prefix ← → Item Reference															Check Digit	
00	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>	N <sub>14</sub>	N <sub>15</sub>	N <sub>16</sub>	N <sub>17</sub>	N <sub>18</sub>

**Example:** (00) 3 5391234 123456789 5

The **Extension digit** (also known as the Packaging Indicator) is used to increase the capacity of a company's prefix. It is assigned by the company that allocates the SSCC and traditionally the digit 3 has been allocated in this position.

The **GS1 Global Company Prefix (GCP)** is assigned by a GS1 Member Organisation to a company wishing to allocate GTINs (bar code numbers). It makes the number unique world-wide but does not identify the origin of the unit.

The **Item Reference** is a serial number added by the issuing company. The length of the item reference is dependent upon the length of the global company prefix number issued to the company. The shorter the GCP, the longer the item reference and thus the greater the capacity to issue SSCCs. The GCP plus the Item Reference must be a total of 16 digits. The simplest way to allocate the Item Reference is sequentially, that is 000000000, 000000001, 000000002.

Additional information on the application of SSCCs is available from the GS1 Ireland Helpdesk upon request.

# AI 01

## Trade Unit Identification – the Global Trade Item Number (GTIN)\*

The GTIN Element String AI is (01). As EAN 128 is generally used on traded or logistic units, the article number is typically the GTIN of an Outer Case. The Element String takes numeric data only and is fixed at 14 digits in length. The Check digit is calculated according to the Modulo 10 algorithm. The GTIN usually starts with a 0 for fixed weight products and always a 9 for variable weight products.

Application Identifier	GTIN													
	GS1 Global Company Prefix ← → Item Reference												Check Digit	
01	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>	N <sub>14</sub>

**Example:** (01) 05391234567892

\* For more detailed information on GTINs (product bar code numbers) please refer to the First Steps Guide or to the GS1 General Specifications, both available from the Helpdesk on request or to download from our website.

# AI 02

## Identification of Trade Items (GTIN) contained within a Logistic Unit

The application identifier for the GTIN of items contained within a Logistic Unit is (02). The Element String takes numeric data only and is fixed at 14 digits in length. The Check digit is calculated according to the Modulo 10 algorithm. The GTIN usually starts with a 0 for fixed weight products and always a 9 for variable weight products. There is a mandatory association between AI 02 and AI 37 and both must be used in conjunction with the other.

Application Identifier	GTIN													
	GS1 Global Company Prefix ← → Item Reference												Check Digit	
02	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>	N <sub>14</sub>

**Example:** (02) 05391234567892

# AI 10

## Batch or Lot Number Identification

The Application Identifier for a batch or lot number is (10). A Batch number distinguishes one group or set of identical items from another. Production line numbers, shift number, time of production and so on, used singularly or in combination to form what is in effect, a batch number, may be encoded in this standard.

The batch number can be alphabetic characters and/or numeric characters and may have any length up to a maximum of twenty characters. There is no check digit calculated for a batch number. If the full twenty character spaces are not utilised the Function 1 Separator Character must be used to terminate the field if the data string is not immediately followed by the Symbol Check and Stop Characters.

Application Identifier	Batch or Lot Number													
	GS1 Global Company Prefix ← → Item Reference												Check Digit	
10	AN <sub>1</sub>	AN <sub>2</sub>	AN <sub>3</sub>	AN <sub>4</sub>	.....	AN <sub>17</sub>	AN <sub>18</sub>	AN <sub>19</sub>	AN <sub>20</sub>					N/A

**Example:** (10) XYZ 0104 6a7b

# AI 15

## Best Before Date

A Best Before Date means that the product can be used until at least this date i.e. the date of ideal prior consumption. It is a statement about quality. It is also referred to as a sell by date or a Minimum Durability Date and is encoded into an EAN 128 symbol with the AI 15. This AI has a fixed six digit numeric format and the date is expressed in the format YYMMDD, i.e., 2 digits for the year, 2 digits for the month and two digits for the day. If it is not necessary to specify the day, the field must be filled with two zeros. For example, a Minimum Durability Date of 11th February 2004 is expressed as 040211. A Best Before End February 2004 would be encoded as 040200. There is no check digit calculated for a Best Before Date.

Application Identifier	Best Before Date						Check Digit
	Year – Month – Day ( YY MM DD)						Check Digit
15	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N/A

**Example:** (15) 040211

# AI 17

## Expiration Date

The expiration date is the date that determines the limit of consumption or use of a product. It is often referred to as "use by date" or "maximum durability date" and is encoded into an EAN 128 symbol with the AI 17. This AI has a fixed six digit numeric format and the date is expressed in the format YYMMDD, i.e., 2 digits for the year, 2 digits for the month and two digits for the day. If it is not necessary to specify the day, the field must be filled with two zeros. For example, an Expiry Date of 11th February 2004 is expressed as 040211. There is no check digit calculated for an Expiry Date.

Application Identifier	Expiry Date						Check Digit
	Year – Month – Day ( YY MM DD)						Check Digit
17	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N/A

**Example:** (17) 040211

# AI 310N

## (3100) to (3109) Net Weight in Kilograms

Net weight is the weight of the traded product without packaging and distribution materials. It is the weight that is invoiced. Use of Net Weight is restricted to variable measure products where the weight is needed to complete the product identification. The fourth digit of the AI is the decimal point indicator (inverse exponent). It indicates explicitly the decimals that must be applied to the value encoded.

For example:

35kg	=	(3100)000035
3.5kg	=	(3101)000035
0.35kg	=	(3102)000035
0.035kg	=	(3103)000035
0.0035kg	=	(3104)000035
0.00035kg	=	(3105)000035
0.000035kg	=	(3106)000035
0.0000035kg	=	(3107)000035
0.00000035kg	=	(3108)000035
0.000000035kg	=	(3109)000035

This AI has a fixed six digit numeric format and there is no check digit calculated for Net Weight.

**IMPORTANT NOTE:** The GTIN for a variable weight traded unit is prefixed by a 9. The 9 denotes variable weight. The check digit is calculated using the standard modulo 10 algorithm. The 9 is included in the calculation.

Application Identifier	Net Weight							
	KG							Check Digit
310N	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N/A	

**Example 25.65KG:** (3102) 002565

## AI 37

### Count of Trade Items Contained in a Logistic Unit

The Element String with Application Identifier (37) indicates that the field contains the number of trade items contained in a respective logistic unit. It must be processed with the identification number (GTIN) represented in AI (02) appearing on the same logistic unit. The field is variable in length and takes numeric data only. If the full eight character spaces are not utilised the Function 1 Separator Character must be used to terminate the field if the data string is not immediately followed by the Symbol Check and Stop Characters.

Application Identifier	Count of Trade Items Contained in a Logistic Unit								
	← Variable Length up to 8 characters →								Check Digit
37	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N/A

**Example:** (37) 4

## AI 400

### Customer's Purchase Order Number

The Application Identifier (400) indicates that the data field contains the customer's purchase order number i.e. the purchase order number assigned by the company that issued the order. The field is variable in length and takes alphanumeric data. If the full thirty character spaces are not utilised the Function 1 Separator Character must be used to terminate the field if the data string is not immediately followed by the Symbol Check and Stop Characters.

Application Identifier	Customer's Purchase Order Number										
	← Variable Length up to 30 alphanumeric characters →										Check Digit
400	AN <sub>1</sub>	AN <sub>2</sub>	AN <sub>3</sub>	AN <sub>4</sub>	.....	AN <sub>27</sub>	AN <sub>28</sub>	AN <sub>29</sub>	AN <sub>30</sub>	N/A	

**Example:** (400) 04 GS1 12

# AI 410

## Ship To – Deliver to EAN.UCC Global Location Number

The Application Identifier (410) indicates that the data field contains the EAN.UCC Global Location Number (GLN) that the order must be delivered to. The field is fixed in length and takes numeric data only i.e. the thirteen digit GLN allocated to a given location.

Application Identifier	Ship to GLN												
	GLN: Company Prefix + Location Reference											Check Digit	
410	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>

**Example:** (410) 5398888123450

# AI 413

## Ship to – Deliver to – Forward to EAN.UCC Global Location Number

The Application Identifier (413) indicates that the data field contains the EAN.UCC Global Location Number (GLN) of the destination that the logistic unit must be forwarded on to in a cross docking situation. AI 410 must be used with AI 413 to indicate the cross docking station and final delivery destination.

Application Identifier	Ship to GLN												
	GLN: Company Prefix + Location Reference											Check Digit	
413	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>	N <sub>6</sub>	N <sub>7</sub>	N <sub>8</sub>	N <sub>9</sub>	N <sub>10</sub>	N <sub>11</sub>	N <sub>12</sub>	N <sub>13</sub>

**Example:** (413) 5398888000010

# AI 91 - 99

## Company Internal Information

These data fields may contain any company internal information. The fields are alphanumeric and variable in length. If the full thirty character spaces are not utilised the Function 1 Separator Character must be used to terminate the field if the data string is not immediately followed by the Symbol Check and Stop Characters.

Application Identifier	Company Internal Information										
	← Variable Length up to 30 alphanumeric characters →										Check Digit
A <sub>1</sub> A <sub>2</sub>	AN <sub>1</sub>	AN <sub>2</sub>	AN <sub>3</sub>	AN <sub>4</sub>	.....	AN <sub>27</sub>	AN <sub>28</sub>	AN <sub>29</sub>	AN <sub>30</sub>		N/A

**Example:** (91) GS1 Ireland

### Table 1: Pre-Defined Length Application Identifiers

This table contains all Application Identifiers that have a predefined length and therefore do not require a Function 1 Character (FNC1) separator.

Element Strings with Pre-Defined Length Application Identifiers			
First Two Digits of the Application Identifier	Number of Characters (Application Identifier and Data Field)	First Two Digits of the Application Identifier	Number of Characters (Application Identifier and Data Field)
00	20	17	8
01	16	(18)	8
02	16	(19)	8
(03)	16	20	4
(04)	18	31	10
11	8	32	10
12	8	33	10
13	8	34	10
(14)	8	35	10
15	8	36	10
(16)	8	41	16

Those numbers in parentheses are not yet assigned.



## *Further Information*

### **GS1 Ireland**

Confederation House  
84-86 Lower Baggot Street  
Dublin 2

Tel: +353 1 605 1539  
Fax: +353 1 662 5863  
Email: [info@gs1ie.org](mailto:info@gs1ie.org)  
Web: [www.gs1ie.org](http://www.gs1ie.org)

### **Efficient Consumer Response (ECR) Ireland**

Confederation House  
84-86 Lower Baggot Street  
Dublin 2

Tel: +353 1 605 1570  
Fax: +353 1 638 1570  
Email: [andrea.wood@ibec.ie](mailto:andrea.wood@ibec.ie)  
Web: [www.fdie.ie/ecrireland](http://www.fdie.ie/ecrireland)