

# Section 2.2:

## Numbering and Symbol Marking of Logistic Units

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## 2.2.1 Introduction

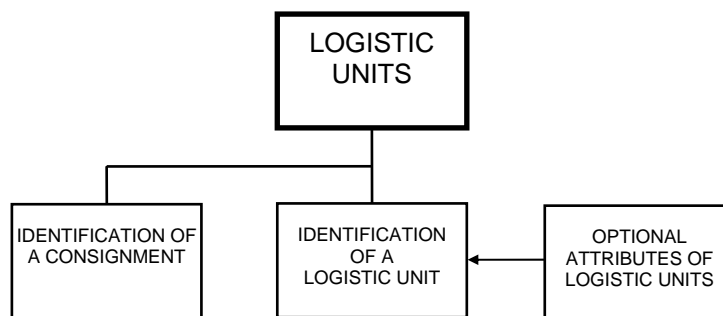
A logistic unit is an item of any composition established for transport and/or storage that needs to be managed through the supply chain.

Tracking and tracing logistic units in the supply chain is a major application of the 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.

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

Figure 2.2.1 – 1



## 2.2.2 Definition and Identification of Logistic Units

A logistic unit is an item of any composition established for transport and/or storage which needs to be managed through the supply chain. The identification and symbol marking of logistic units enables a large number of user applications. In particular, 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).

The SSCC Element String AI (00) is used for the identification of logistic units (see [Section 3.6.1](#)). 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 organization 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.

### **2.2.2.1 Element Strings Used on Logistic Units**

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.

#### **2.2.2.1.1 Identification of Trade Items Contained in a Logistic Unit: AIs (02) and (37)**

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. The Element String AI (02), which has a mandatory association with AI (37), may be used only on a unit that is not itself a trade item and only if all trade items that are contained within the unit have the same GTIN.

#### **2.2.2.1.2 Logistic Measures: AI (33nn), (34nn), (35nn), (36nn)**

The EAN.UCC System provides standard Element Strings for representing 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.

#### **2.2.2.1.3 Consignment Number: AI (401)**

The Consignment Number, AI (401), 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, AI (401), must be allocated by a freight forwarder, carriers acting as a freight forwarder, or a consignor, but only if the prior agreement of the freight forwarder is given. Typically AI (401) encodes a House Way Bill Number (HWB).

#### **2.2.2.1.4 Shipment Identification Number: AI (402)**

The Shipment Identification Number (Bill of Lading) is assigned by a consignor. 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.

#### **2.2.2.1.5 Routing Code: AI (403)**

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. The routing code, AI (403), must not be used to encode information that could be encoded in a separate AI (such as AI (420), ship to postal code).

#### **2.2.2.1.6 Ship to - Deliver to EAN.UCC Global Location Number: AI (410)**

This Element String has been designed to allow the automatic sortation of logistic units using the EAN.UCC Global Location Number (GLN).

#### **2.2.2.1.7 Ship for - Deliver for - Forward to EAN.UCC Global Location Number: AI (413)**

This Element String has been designed to allow the cross docking of logistic units using the EAN.UCC 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.

### **2.2.2.1.8 Ship to - Deliver to Postal Code Within a Single Postal Authority: AI (420)**

This Element String has been designed to allow the automatic sortation of logistic units using the postal code in a single postal area.

### **2.2.2.1.9 Ship to - Deliver to Postal Code with Three-Digit ISO Country Code: AI (421)**

This Element String 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.

## **2.2.3 Special Considerations**

By their nature, units that need to be tracked and traced individually in a supply chain require unique identification numbers. The SSCC provides this identification number.

Because each logistic unit must be assigned its own unique SSCC, it is not practical to preprint the bar code symbol containing the SSCC on the logistic unit packaging. A more logical approach is to create a label that can be affixed to the logistic unit when the unit is constructed.

Further, a logistic unit may also be a trade item and hence be subject to the EAN.UCC System specifications for trade items (See Section 2.1). If this is the case, it is logical to generate a single label containing all of the information required.

EAN International and the Uniform Code Council (UCC™), along with representatives from manufacturers, retailers, transporters, and EAN Member Organisations, have developed a voluntary standard for bar code symbol label applications: the EAN.UCC Logistics Label. The SSCC and its application on logistic units are the central focus of the EAN.UCC Logistics Label.

## **2.2.4 EAN.UCC Logistics Label Design**

These specifications constitute the basis for all EAN.UCC Logistics Labels. Other sections, most notably [Section 3.0, Definitions of the Element Strings](#), and [Section 5.3, UCC/EAN-128 Symbology Specifications](#), should be read in conjunction with the following sub-sections.

### **2.2.4.1 Scope**

These specifications detail the structure and layout of EAN.UCC Logistics Labels. Emphasis is given to the basic requirements for practical application in an open trade environment. Primary topics include:

- The unambiguous identification of logistic units
- The efficient presentation of text and machine readable data
- The information requirements of the key partners in the supply chain: suppliers, customers, and carriers
- Technical parameters to ensure systematic and stable interpretation of labels

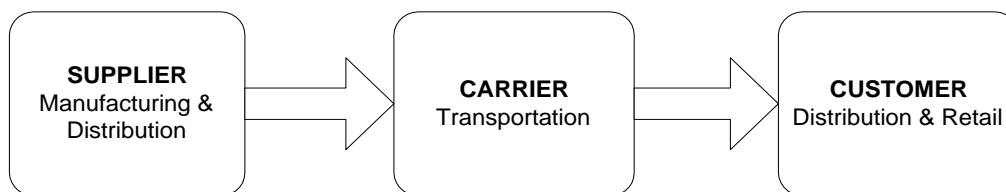
## 2.2.4.2 Concepts

### 2.2.4.2.1 Logistics Information Flow

As a logistic unit moves through the supply chain, a series of events occur that defines the information related to the unit. The whole supply chain process of manufacturing, finished goods distribution, transportation, and deployment into the marketplace adds layers of information related to the logistic unit.

For example, the physical content of the unit is typically defined at finished goods distribution. At that point in time the identification of the logistic unit as an entity is possible. Other elements of information, such as final destination or the composition of a multi-unit shipment, are not typically known until later in the supply chain process. In a trading relationship, different elements of information are generally known and applied by the supplier, carrier, and customer.

Figure 2.2.4.2.1 – 1



### 2.2.4.2.2 Representation of Information

The information included on an EAN.UCC Logistics Label comes in two basic forms. Human Readable Interpretation is used by people and is comprised of text and graphics. Machine readable information is designed for data capture by a machine. Bar code symbols are machine readable and are a secure and efficient method for conveying structured data, while Human Readable Interpretation allows people general access to basic information at any point in the supply chain. Both methods add value to EAN.UCC Logistics Labels, and often co-exist on the same label.

The EAN.UCC Logistics Label has three sections. The top section of the label contains free format information. The middle section contains text information and the Human Readable Interpretation of the bar code symbol(s). The lowest section contains the bar code symbol(s).

### 2.2.4.2.3 Specific Bar Code Symbol Structures

The UCC/EAN-128 Symbology is used for EAN.UCC Logistics Labels. This symbology, which is used exclusively for EAN.UCC System defined data structures, is a subset of Code 128, a highly refined, secure, and space efficient alphanumeric symbology. The data formats carried include the Element Strings and their Application Identifiers (AIs) (see [Section 3.0](#)). Each AI is a two-, three-, or four-digit prefix that defines the meaning of the data that follows. AIs allow data to be represented in bar code symbols in a form that is unambiguously and securely interpreted when scanned.

### 2.2.4.2.4 Identification of a Logistic Unit

The one mandatory field for all EAN.UCC Logistics Labels is the SSCC. The SSCC is an identification number that is unique to each logistic unit. The SSCC is represented by AI (00) and in principle is sufficient for all logistics applications.

In an environment where Electronic Data Interchange (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 information.

However, when EDI is not available at each point in the supply chain, or when replicated data is desired, certain additional elements of information are desirable in bar code form. Each of these is also represented through the use of AIs.

### **2.2.4.3 Label Design**

The layout of the EAN.UCC Logistics Label groups information into three logical sections for the supplier, customer, and carrier. Each label section may be applied at a different point in time as relevant information becomes known. Additionally, within each section, bar code symbols are segregated from text information to facilitate interpretation by both machines and people.

The labeller, the organisation responsible for printing and applying the label, determines the content, format, and dimensions of the label. The SSCC is the single mandatory element for all EAN.UCC Logistics Labels. Other information, when required, should comply with the specifications of this document and with the proper use of Application Identifiers.

#### **2.2.4.3.1 Supplier, Customer, Carrier Sections**

A section is a logical grouping of information that is generally known at a particular time. There are three label sections on an EAN.UCC Logistics Label, each representing a group of information. Generally, the order of the sections, from top to bottom, is: carrier, customer, and supplier. However, this order and top/down alignment may vary depending on the size of the logistic unit and the business process being served.

##### **2.2.4.3.1.1 Supplier Section**

The supplier section of the label contains information that is generally known at the time of packaging by the supplier. The SSCC is applied here as the unit identifier, along with the Global Trade Item Number<sup>™</sup> (GTIN<sup>™</sup>) if used.

Other information that may be of interest to the supplier but might also be useful for customers and carriers, can be applied. This includes product-related information such as product variant; dates such as production, packaging, expiration, and best-before dates; and lot, batch and serial numbers.

##### **2.2.4.3.1.2 Customer Section**

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

##### **2.2.4.3.1.3 Carrier Section**

The carrier section of the label contains information that is generally known at the time of shipment and is typically related to transport. Typical information includes ship to postal codes, AI (420), Consignment Numbers, AI (401), and carrier-specific routing and handling information.

### 2.2.4.3.2 Bar Code Symbol and Human Readable Interpretation Layout

Bar code symbols are represented in the lower part of each section, while Human Readable Interpretation is shown in the upper part of the section. This facilitates access to each component.

Figure 2.2.4.3.2 – 1



### 2.2.4.3.3 Label Dimensions

The physical dimensions of the label are determined by the labeller, but the size of the label should be consistent with the data requirements for all sections of the label. 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 size of the label is determined by the amount of bar coded data required. The standard A6 (105 mm x 148 mm) or 4 x 6 inch formats are ideal when only the SSCC is coded. Other dimensions are typically variations driven by data requirements or logistic unit size. As a guideline to users, 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.

## 2.2.4.4 Technical Specifications

### 2.2.4.4.1 Bar Code Symbols

UCC/EAN-128 Bar Code Symbols shall be used on the EAN.UCC Logistics Label.

#### 2.2.4.4.1.1 Concatenation

Concatenation is an effective means for presenting multiple Element Strings in a single bar code symbol and should be used to conserve label space and optimise scanning operations. However, concatenation shall not be used with the UCC/EAN-128 bar code symbol containing the SSCC on cartons or outer-cases due to the scanning environment. SSCC concatenation is not recommended on standard A6 (105 mm x 148 mm) or 4 x 6 inch formats when SSCC concatenation is used on pallets. This helps to maintain the required symbol height and X-dimension of the bar code containing the SSCC, which is the identifier for the logistics unit and the most fundamental element on the label.

#### 2.2.4.4.1.2 X-Dimension (Symbol 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 (see [Section 5.4](#)).

The recommended X-dimension range is between 0.495 mm (0.0195 in.) and 0.94 mm (0.037 in.) The target X-dimension recommended for the UCC/EAN-128 Bar Code Symbol encoding the SSCC is 0.495 mm (0.0195 in.).

The reliability of scanning will always be enhanced by selecting the same X-dimension for all the bar codes on the label. However, if the information required cannot be accommodated in the space available, a lower X-dimension may be used. In any case, the minimum X-dimension is 0.250 mm (0.00984 in.) Using smaller symbols reduces reading distance and makes the production of quality symbols more difficult to maintain.

#### 2.2.4.4.1.3 Bar Code Symbol Height

Taller symbols present a better target for readers. The recommended bar code symbol height of at least 32 mm (1.25 in.) applies to all of the bar codes on the label, especially the UCC/EAN-128 Bar Code encoding the SSCC (see [Section 5.4](#)). January 1, 2004 is the end of the migration from the previous minimum height of 27 mm (1.1 in.). 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.

#### 2.2.4.4.1.4 Quiet Zones

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

#### 2.2.4.4.1.5 Orientation and Placement

Picket Fence Orientation Bar Code Symbols should be used on logistic units. In other words, the bars and spaces shall be perpendicular to the base on which the logistic unit stands. In all cases, the UCC/EAN-128 Bar Code Symbol encoding the SSCC shall be placed in the lowest portion of the label.

**2.2.4.4.1.6 Human Readable Interpretation**

As a back up key entry and diagnostic aid, a Human Readable Interpretation of each bar code symbol shall be provided above or below the symbol. It includes Application Identifiers, data content, and a Check Digit, but no representation of special symbol characters or the Symbol Check Character.

To facilitate key entry, AIs should be set apart from the data by parentheses.

This Human Readable Interpretation characters shall be no less than 3 mm high and clearly legible and preferably below the symbol.

**2.2.4.4.2 Text****2.2.4.4.2.1 Plain Text**

Text that has no bar code symbol equivalent is often required on a label. The name and address of the sender and receiver are typical examples. In many instances companies may also wish to add specific text to a label (e.g., company logos). All text shall be clearly legible and no less than 3 mm high.

**2.2.4.4.2.2 Human Readable Interpretation**

Human Readable Interpretation is text designed to support manual operations and to facilitate key entry in menu driven systems. It is the equivalent of data elements represented in bar code symbols and is comprised of data titles and data content. The data content should be at least 7 mm in height. If there is no language agreed between trading partners, data titles must be printed in English. As an option left at the discretion of the labeller, a second language can be added. Application Identifiers are not included in Human Readable Interpretation.

**2.2.4.4.2.3 Data Titles**

Data titles are the standard abbreviated descriptions of data fields used to denote the Human Readable Interpretation of encoded data. They are prefixes of the Human Readable Interpretation to support manual interpretation of data fields. They can also be used adjacent to other text or bar code symbols to clarify content, such as the word "from" adjacent to a sender's address.

All data titles are shown in [Section 3.A.4](#).

**2.2.4.4.3 Label Location**

Label placement specifications are maintained in Section 6.7.

**2.2.4.5 Label Examples**

Figure 2.2.4.5 – 1

The Basic Label: An SSCC



Figure 2.2.4.5 – 2

Label with Supplier and Carrier Sections



Figure 2.2.4.5 – 3

Label with Supplier Section with Concatenated Data

GRAND SUPPLIER COFFEE

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**SSCC**

0 0614141 1234567890

<b>CONTENT</b>	<b>COUNT</b>
00614141000418	20
<b>BEST BEFORE (ddmmyy)</b>	<b>BATCH</b>
14.02.00	4512XA

---



(02)00614141000418(15)000214(10)4512XA(37)20



( 0 0 ) 0 0 6 1 4 1 4 1 1 2 3 4 5 6 7 8 9 0

