

**APPENDIX A**  
**BAR CODES AND THE EAN/UCC SYSTEM**



# Bar Codes and the EAN/UCC System<sup>1</sup>

## Introduction

Through the use of the EAN/UCC Numbering System, products, shipments, locations, production lines, boats, trucks, and most other physical assets can be individually identified by giving each one a unique number. In addition to uniquely identifying a product, the EAN/UCC System also provides the ability to record important information regarding the product (e.g. date of harvest; net weight). Currently, not all of the product attribute information important for the traceability of BC seafood (e.g. method of production; country of origin) can be recorded numerically by the EAN/UCC System – information that cannot be numerically recorded must be recorded in a ‘human readable’ form (see section on Application Identifiers).

To facilitate the collection, sharing, and storage of the identification numbers and numerical attribute information, the EAN/UCC System converts the numbers into a *bar code*. A bar code is simply a precise arrangement of parallel lines (bars) and spaces that vary in width to represent the numerical data. In other words, the fundamental key to the EAN/UCC System is its use of numbers – bar codes simply enables the automation of the traceability process through the use of scanners and electronic databases.

*Example: Scanning this bar code yields the sequence of numbers shown beneath it. This sequence of numbers contains product information including a unique identification number, net weight and harvest date.*



## Company Prefix

A key element in uniquely identifying – as well as linking - a company’s products, shipments and locations is the EAN Company Prefix. A Company Prefix uniquely identifies a company any where in the world through a unique numerical sequence of 6-10 digits. In Canada, the Electronic Commerce Council of Canada (ECCC) is responsible for assigning and maintaining a registry of all Company Prefixes licensed to Canadian organizations.



The Company Prefix is essential to linking a specific company with the location of its physical assets as well as with its products.

---

<sup>1</sup> This information and associated figures are taken primarily from CanTrace’s draft Traceability of Seafood Guidelines and the EAN Traceability of Fish Guidelines

## Global Location Numbers (GLN's) & Locations

Traceability generally requires the identification of physical entities involved in the supply chain. Using the EAN/UCC System, every location is uniquely identified by a Global Location Number (GLN). The 13-digit GLN can be used to identify locations (a processing plant, grow-out site, holding pond, customer warehouse, receiving door, etc.), physical assets (a fishing vessel, forklift truck, trailer), legal entities (subsidiary company, division, supplier, customer), and functional entities (production line, freezer, unloading equipment).

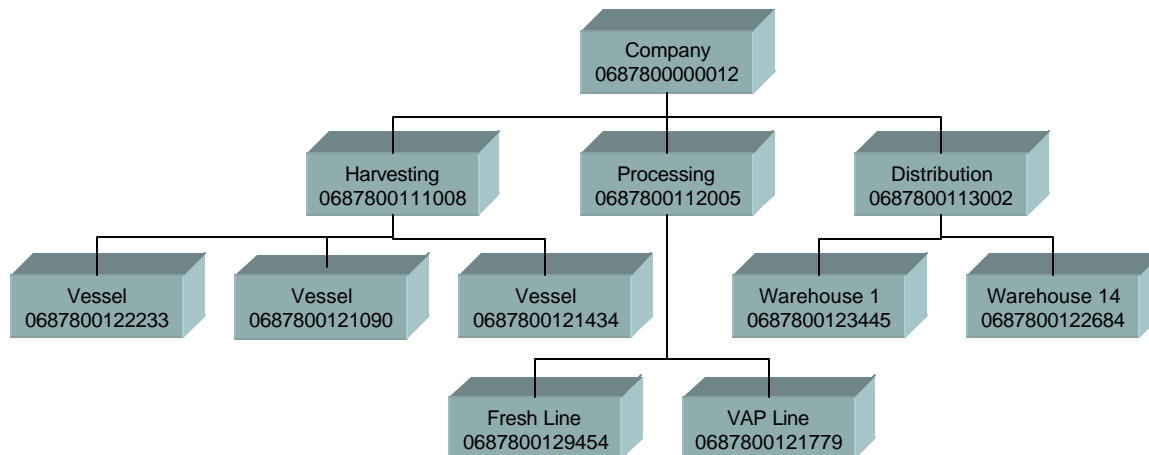
The GLN generally consists of three elements:

- Company Prefix + Location Reference Number + Check Digit.

The Location Reference Number is a 1-5 digit number assigned by the licensed user of the Company Prefix to each location, physical asset, or functional entity

The Check Digit refers to the single digit number at the end of each GLN. A formula is used to calculate this number – and it is re-calculated each time the GLN is used to ensure that it has been read, transmitted, or stored correctly.

*Example: The following figure demonstrates how a company can use GLN's to identify the various entities in its business structure. In this example, the company has been assigned an EAN/UCC Company Prefix of 68780 (Note: the first 0 is a left filler digit). The company has then assigned a location reference number to each entity to create a unique GLN.*



The ECCC has considered the creation of a national GLN Directory that would serve as a centralized data bank linking GLN's with vital company information. For example, in the figure shown above, the GLN 0687800122233 has been assigned to a harvest vessel. Through a GLN Directory, this GLN could be linked to information such as the Name of the Vessel Owner, Contact Person, Address, Telephone number, Fax number, Cell number, E-mail address, Vessel Name, Name of the Vessel's Captain, Captain's address, Telephone number, Fax number, Cell number, E-mail address, and Vessel License Number. In other words, the existence of a GLN

Directory would allow seafood supply chain partners to retrieve complete, up-to-date information on whatever is identified by the specific GLN.

Recently, an ECCC representative indicated that the Directory initiative was not proceeding due to a lack of industry interest/funding. However, the ECCC is a service provider - and the ECCC representative indicated that they would create such a directory if financial support were forthcoming.

Regardless of whether a national GLN Directory is created, any group of supply chain partners could create a mini-directory to meet their specific requirements. For example, a supply chain participant could provide a list of relevant GLN's (linked to associated vital information) to all of its upstream and downstream business partners – thereby creating a one-up/one-down GLN directory.

A GLN can also include Global Positioning System (GPS) co-ordinates to precisely identify where a Location, physical asset, or functional entity is physically situated. The technology also allows the GLN to be used to track a moving target (e.g. a trailer) by linking the GLN to a Global Positioning Mapping System.

### **Global Trade Item Numbers (GTIN's) & Trade Units**

Traceability requires the identification of every product. Using the EAN/UCC System, each trade unit is uniquely identified by a Global Trade Item Number (GTIN).

The GTIN consists of three elements:

- Company Prefix + Item Reference Number + Check digit

The Item Reference Number is a unique number assigned by the holder of the Company Prefix to uniquely identify a product, by-product, or item of waste.

The Check Digit refers to the single digit number at the end of each GTIN. A formula is used to calculate this number – and it is re-calculated each time the GTIN is used to ensure that it has been read, transmitted, or stored correctly.

*Example: The following figure demonstrates how the GTIN links a product to the company that produces it: the sequence '012345' uniquely identifies the company while the '67890' is the Item Reference Number that uniquely identifies the product (Note: the final '5' is the check digit)*



## **Application Identifiers (AI's)**

In addition to bearing a unique identification (the GTIN), a seafood product must also carry important product-related information (e.g. net weight, harvest date etc.) as it passes along the supply chain. Some of this information can be carried via the EAN/UCC System using Application Identifiers.

Application Identifiers (AI's) are numerical descriptors in the EAN/UCC System that provide context and meaning for a number in a bar code. For example, the number 040501 is simply a number without context or meaning. However, if that number is preceded by an AI, a bar code scanner is instructed to read the number as a specific piece of product information

### *Example:*

*If 040501 is preceded by AI 15 in the bar code, then the bar code scanner will read (15)040501 as a date in the format Year, Month, Day. In other words, a bar code carrying the numbering structure of (15)040501 would be read as May 1, 2004.*

### *Example:*

*The same number 040501 with the AI (3202) would mean that the net weight of product is expressed in lbs. to two decimal places. In other words, (3202)040501 would mean the net weight of product in the container is 405.01 lbs. An AI of (3102) would mean the net weight of product in the container is 405.01 kg.*

The EAN/UCC System defines more than 90 Application Identifiers to identify batch and lot numbers, serial numbers, production and packing dates, best before dates, ship to, ship from, etc. Those AI's applicable to the seafood supply chain are shown in the following figure.

<b>AI</b>	<b>Full Title</b>	<b>Data Title</b>
00	Identification number of a logistic unit	SSCC
01	Global Trade Item Number	GTIN
02	Global Trade Item Number	GTIN
10	Batch/Lot number	BATCH/LOT
11	Production date of a trade item (Catch date)	PROD DATE
13	Packaging date of a trade item	PACK DATE
15	Best before/minimum durability date of a trade item	BEST BEFORE or SELL By
30	Count of items contained in a variable measure trade item	VAR. COUNT
310(n)	Net weight	NET WEIGHT (kg)
330(n)	Gross weight	GROSS WEIGHT (kg)
37	Count of trade items contained in a logistic unit	COUNT
410	Delivery to Global Location Number	GLN
412	Global Location Number of supplier	GLN
414	Global Location Number physical location	GLN
7030 up to 7039	Approval no. of processor with ISO-code	PROCESSOR # s

*Example: Bar code containing identity information:*



- (01)97612345000285: *Global Trade Item Number*
- (10)4512XA: *Lot or Batch Number*

*Example: Bar code containing both identity and attribute information:*



- (01)90123456123451: *Global Trade Item Number*
- (3202)004410: *Net weight = 44.10 lbs.*
- (11)010170: *Date of Harvest = January 7, 2001*
- (21)00700001: *Unit Serial Number = 001700001*



## Information Transfer Between Partners in Supply Chain

As a trade unit moves along the supply chain, all of its essential information (e.g. GTIN, Supplier GLN, Receiver GLN, product attributes) accompanies it in the form of a label bearing bar code and human readable formats.

*Example of EAN/UCC label bearing bar code and human readable format.*

Vessel Name: H608(DK) GLN5790000123456 95712345111119
Specie: COD
Batch No: 1234abc
Net weight: 25.60 kg
Catch Area/Method: North Atlantic/hook
Physical State: Defrosted
Catch Date: 14-01-01
 (01)95712345111119(414)5790000123456
 (10)1234abc(11)010114(3102)002560


*The 2 bar codes in the above label include the following information:*

- (01)95712345111119: GTIN
- (414)5790000123456: GLN of vessel
- (10)1234abc: Lot or Batch Number
- (11)010114: Harvest Date = January 14, 2001
- (3102)002560: Net weight = 25.60 kg

## Standardized Shipping Container Codes (SSCC's) & Logistic Units

For shipping, trade units may be assembled into a larger logistic unit (e.g. a pallet). To facilitate traceability, the EAN/UCC System assigns a uniquely identified Standardized Shipping Container Code (SSCC) to each logistic unit. The Application Identifier for the SSCC is AI(00). Even a single box – if it is sent on its own – is labeled with an SSCC.

*Example of a logistic unit label with SSCC and human readable information:*

Batch No.: 011214
EAN No.: 95712345111119
Count: 14 pcs.
Net weight: 330.20 kg
Specie: COD
Catch Area/Method: North Atlantic/hook
Physical State: Defrosted

{02}95712345111119 {37}14 {3102}033020 {10}011214

{00}35712345000001012 {412}5790000123456

*Bar coded information includes:*

- (02)95712345111119: GTIN = 95712345111119
- (37)14: 14 trade units contained with the logistic unit
- (3102)0333020: Net weight = 330.20 kg
- (10)011214: Lot or Batch Number
- (00)35712345000001012: SSCC
- (412)5790000123456: GLN of Supplier

## **Use of EAN/UCC System to Record BC Seafood Data Requirements**

*When used together, the GTIN and Global Location Number (GLN) will tell you what is moving, where it came from, and where it is going.*

Matrix A (available as an Excel file in CD format) is intended to demonstrate how the EAN/UCC Numbering System could be used to record the data requirements necessary to facilitate traceability of BC seafood. As revealed in the matrix, some data elements may be expressed via Application Identifiers while other data elements may be expressed only in a human readable format.

