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GS1 AIDC Fresh Foods Sold at Point-of-Sale Implementation Guide

serves as a guide to implement GTIN, GS1 Application Identifiers, and GS1 DataBar for Fresh Food trade items sold at POS

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1 Executive Summary

Every year, 25% of the world’s food supply wasted!* How can we work to reduce this cost?

The growing sophistication of technology and management systems has led to demands for additional information to be carried by GS1 BarCode symbols and captured at the retail Point-of-Sale. GS1 DataBar provides the path for the fresh food (and other) industry to respond to these new requirements.

While EAN/UPC BarCodes will remain useful for product identification, GS1 DataBar enables expanded bar code implementation by meeting the objective of identifying small items and carrying more information than the standards and technology of current EAN/UPC BarCodes used on fresh food trade items today. Today, variable measure products are labeled with an EAN/UPC BarCode encoding a Restricted Circulation Number (RCN). Migrating from RCNs to GTIN will enable retailers and suppliers to expand their business functionalities of the center store to the perimeter and enable new financial opportunities within fresh food departments.

GS1 DataBar encodes brand identification and additional data on fresh food products. This means Consumer and Food Safety programs can be instituted at the register and on the consumer receipt. Additional benefits from implementing GS1 DataBar; Automatic Markdowns at Point-of-Sale (POS), Expiration Date Management, Traceability to the POS, and Category Management.

Fresh Food departments (meat, poultry, seafood, deli, dairy, bakery and produce) represent many opportunities for GS1 DataBar BarCodes to enhance current practices and solve tactical identification problems.

The decision to use EAN/UPC or GS1 DataBar on variable measure products will be left to the brand owner or bi-lateral use between trading partners from 2010. In 2014 GS1

DataBar becomes an open symbology and all scanning environments must be able to read these symbols.

This Implementation Guide is specifically focused on process changes for fresh food Point-of-Sale applications for variable measure, fixed measure, as well as, loose produce trade items. It will provide retailers, suppliers and solution providers the necessary information to implement GTIN, GS1 Application Identifiers and GS1 DataBar Symbols at Point-of-Sale. It will point to Fresh Foods Standards in the GS1 General Specifications.

*Source: 2010 IBM commercial – Tracking Food through the Supply Chain

1.1 Benefits of Implementation

- Provides migration from RCN to GTIN (e.g. GTIN removes need for supplier and customer agreements for product identification)
- Brand identification via GTIN to support improved Category Management (e.g. improved inventory management / reduced shrinkage)
- Enables Traceability at Point-of-Sale
- Expiration Date Management at POS
- Automatic Markdown at POS**
- Improved Quality Control at shelf (e.g. best-before-date / sell-by-date encoded and checked at Point-of-Sale)
- Improved Product Replenishment and Reduced out of stocks
- Improved Pricing Accuracy at Point-of-Sale (e.g. organic vs non-organic)
- Enables standard manufactured issued coupon use for Fresh Foods at POS

** Subject to local regulations

2 Introduction

2.1 Purpose and Scope of this Document

2.1.1 Purpose

This document describes the Business Process Changes needed to encode and decode GTIN and/or additional data using GS1 DataBar BarCodes for Variable Measure, Fixed Measure and loose produce fresh food trade items scanned at retail Point-of-Sale.

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

2.1.2 Scope

This document outlines what retailers and suppliers need to do in order to identify fresh food items at Retail POS and apply the corresponding GS1 BarCodes. Specifically it will cover what is required to;

- Move from the use of traditional Restricted Circulation Numbers (RCNs) such as Prefix 02, 20-29, to Global Trade Item Number (GTIN) and attribute information using GS1 Application Identifiers (AIs) for Variable Measure Trade Items.
- Apply GS1 Application Identifiers (AIs) to existing Fresh Food Fixed Measure Trade Items.



Note: If the supplier chooses to provide extra information about a fixed measure product sold at POS, such as its expiry date or batch number, GS1 DataBar Expanded or GS1

DataBar Expanded Stacked symbols will be used. This process will require some form of on-demand or in-line printing.

- Identify and bar code loose produce items

In order to migrate to GTIN identification, or to apply additional information to products at retail POS, implementation of GS1 DataBar will be required.

2.2 Who can use this Document?

This is a practical guide for retailers, suppliers and solution providers to understand business opportunities, process changes and requirements needed to implement GTIN, GS1 Application Identifiers, GS1 DataBar and EAN/UPC symbols at Point-of-Sale on their fresh food trade items.

2.3 How do I use the Document?

New Users:

If GS1 DataBar or GS1 standards are new to your company, please contact your local GS1 Member Organisation (www.gs1.org/contact).

Suppliers:

Read Section 3 for Business Process changes required to implement GTIN, GS1 Application Identifiers and GS1 DataBar at Point-of-Sale.

Retailers:

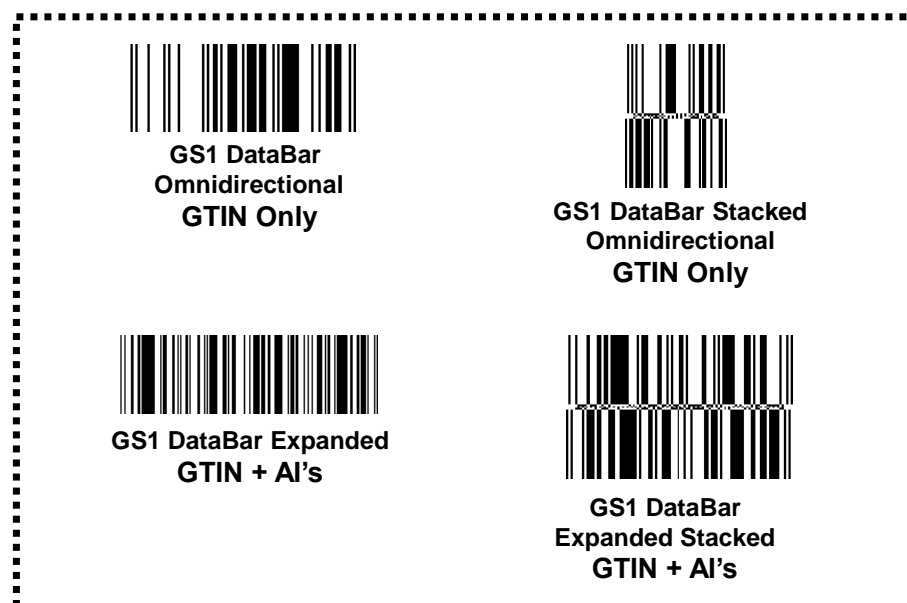
Read Section 4 for Business Process changes required to implement GTIN, GS1 Application Identifiers and GS1 DataBar at Point-of-Sale.

AIDC Equipment and Software Companies:

Read Section 5 for requirements to implement GTIN, GS1 Application Identifiers and GS1 DataBar at Point-of-Sale.

2.4 Omnidirectional Scanning of Fresh Foods

Figure 2-1 **GS1 DataBar Symbols for Fresh Foods**



Note: Symbols shown do not have required Human Readable Interpretation (HRI) which is normally shown.

2.5 Key Definitions

- **Fixed measure trade item** - An item always produced in the same pre-defined version (e.g., type, size, weight, contents, design) that may be sold at any point in the supply chain.
- **Loose produce trade items** - Are fruits and vegetables which are delivered to the store loose, in boxes or cases.
- **Variable measure trade item** - A trade item which may be traded without a pre-defined measure, such as its weight or length.

3 Implementation Guideline for Suppliers

3.1 Business Process Change for Variable Measure Products

How you identify, and label your products today at Point-of-Sale is changing.

The industry is migrating from current Restricted Circulation Numbers (RCNs) to GTIN (Global Trade Item Number) plus additional data. (This data can include for example; pack weight, price, best-before-date, or batch number). The use of GTINs and additional data to replace RCNs requires the use of GS1 DataBar Symbols which are being introduced as an open standard on January 1, 2014.

GTIN identifies each brand owner uniquely rather than generically. In order to create a GTIN, a GS1 Company Prefix is required. Contact your local GS1 Member Organisation at www.gs1.org/contact for further information.

When additional data is used, it becomes possible to prevent out-of date products being sold at the Point-of-Sale automatically. The use of GTINs also makes possible the providing of master data about these product lines using the GS1 Global Data Synchronisation standards and the GDS Network. This change means that suppliers will change the numbers they use to identify their trade items sold at retail.

Suppliers need to be ready to change from current RCNs to GTIN, additional data and GS1 DataBar for their trading partners. This is different than the current Prefix 02 / 20-29 RCN data today. You will need to have your scale labeling and product management ready. These new processes will enable validation of product information throughout the supply chain up to the Point-of-Sale (POS), for example, the expiry date has passed.

Figure 3-1

Current Label with Prefix 02 /20-29

Best - Mart



Braeburn Apples

20-05-10		
£/kg	kg	£
1.59	0.160	0.25




2 001010 000255 >

To Be Label with GS1 DataBar

Best - Mart




Braeburn Apples

20-05-10		
£/kg	kg	£
1.59	0.160	0.25



(01)02345678925872(3103)000160(3922)000025(15)100520

-  **Note:** The samples above are not actual size and are for example only. Reference Section 5 - Table 1 in the GS1 General Specifications for symbol specifications

3.2 Supplier Readiness Checklist

Product Information

1. GTIN Management
 - Can your system handle GTIN for consumer items?
 - Do you have your GS1 Company Prefix to create GTINs?
2. Do you have data elements for all Application Identifiers you may have to encode / produce?

Order Processing

1. Can your order processing system manage any additional data required for customer required AIs?
2. Can your order processing system handle the transition from Prefix 02 (Code Set 2) in North America or Prefix 20-29 to GTIN plus additional data using GS1 Application Identifiers?

Scheduling

3. Historically most suppliers scheduled production runs by order to account to variability of Prefix 02, 20-29 content (Item Reference, Price Check and Price, Tare) and label content (frequent shopper programs, local requirements and specific customer requirements). Have you evaluated the efficient method of scheduling for GS1 DataBar Expanded Symbol labeling equipment?
4. Have you determined a transition plan and can your scheduling method handle this plan?
5. Do you anticipate and have plans in place to manage dual labeling based on different customer adoption timelines?

Scale System Items

6. Can your scale systems produce GS1 DataBar Expanded Symbols?
7. Assign GTINs to all your consumer level trade items for retail POS sale
8. Determine AI requirements for all customers
 - a. Can all your customer needs be satisfied with a common set of AIs?
 - b. If a common set of AI's is not possible is there a subset of AIs for all levels?
9. Determine the size of the GS1 DataBar Symbol with required HRI.
10. Evaluate the new label layout and real estate requirements with the GS1 DataBar in mind.
11. Determine if label stock or packaging changes will be required
 - a. If stock change is required arrange for new stock?
 - b. If new stock is required determine transition strategy?
12. Determine software ability of scale to handle any new data requirements for an Item
 - a. Can the scale manage GTINs?
 - b. Can the scale manage the data for the AIs required for an item?
13. Determine data elements that must be managed for a customer
 - a. Can the scale manage the data for the AIs required for a customer?

- b. Are customer requirements consistent across all items?
14. Can your scanning systems, being employed for bar code validation handle the GS1 DataBar Symbols?
15. Have you determined a transition plan and can your scale software handle this plan?

Logistics Issues and Upstream Processes: Transition from RCN to GTIN plus additional data using GS1 Application Identifiers

16. When moving from RCN's to GTIN consideration should be given to how this may impact your current system applications and processes.


There may be a requirement to alter existing applications to support the inclusion and processing of different customer requirements at the consumer level within a GS1DataBar Expanded and GS1 DataBar Expanded Stacked that is different to the way it has been processed using a RCN.

Moving from a customer specified product identification to GTIN will require internal system application changes to manage trade units produced according to customer requirements for accurate order fulfilment and shipping.


17. Have you determined a transition plan and can your storage and logistics systems handle this plan?

3.3 Scale Label Readiness


When evaluating your Scale Labeling readiness, be sure you have all GS1 Application Identifiers you need or applicable in your software.


-  **Note:** For a list of Suggested Application Identifiers for variable measure fresh food products – see Appendix Section 6.3

Local government regulations may require specific data. You should also ensure additional data interface between ERP system and scale are ready and updated. Your systems should be able to print both EAN/UPC and GS1 DataBar Expanded Symbols per GS1 General Specifications.

-  **Note:** For Symbol Specifications for GS1 DataBar Expanded and Expanded Stacked Symbols reference GS1 General Specifications, Section 5, Table 1

You also need to determine if your current label stock (size and coating) or packaging requires changes for GS1 DataBar Expanded and Expanded Stacked Symbols.

-  **Note:** For Required Attribute data for Variable Measure Fresh Food Trade Items scanned at Point-of-Sale - reference GS1 General Specifications Section 2.

-  **Note:** For Human Readable Interpretation label information – reference GS1 General Specifications, Section 4.

3.4 Scanner Readiness

Scanners must be compliant and enabled for GS1 DataBar Expanded and GS1 DataBar Expanded Stacked, GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional Symbols.

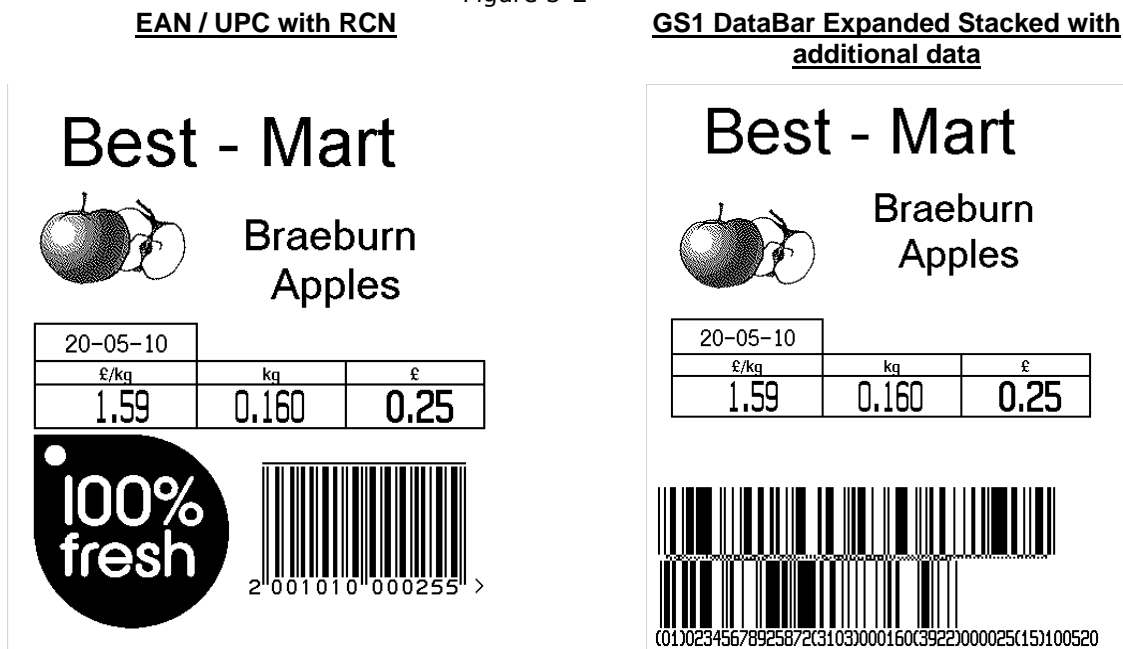
3.5 Variable Measure Products



3.5.1 Which Bar Code Do I Use?

Today, the EAN/UPC Symbol is used to encode a Restricted Circulation Number (RCN) for variable measure products. GS1 DataBar Expanded or GS1 DataBar Expanded Stacked Symbols are used to encode the product's GTIN plus additional data for variable and fixed measure products.

Figure 3-2



✓ Note: The samples above are not actual size and are for example only. Reference Section 5 - Table 1 in the GS1 General Specifications for symbol specifications

With the Business Process Change of migrating from RCNs to GTIN, suppliers will be required to create GTINs for each product sold at POS. When assigning GTIN for these products, suppliers must follow the GTIN Allocation Rules, such as:

- When a different configuration of a fresh food trade item requires separate identification for POS a new GTIN will be assigned.

✓ Note: For the full GTIN Allocation Rules for Fresh Food Trade Items Scanned at Point-of-Sale information – See Appendix Section 6.1

How Global Trade Item Numbers (GTIN) work in GS1 DataBar in a 14-digit format

GTIN-13

1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	GCP	GCP	GCP	GCP	GCP	GCP	GCP/IR	GCP/IR	GCP/IR	GCP/IR	GCP/IR	IR	CD

GTIN-12

1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	0	GCP	GCP	GCP	GCP	GCP	GCP	GCP/IR	GCP/IR	GCP/IR	IR	IR	CD

GCP = GS1 Company Prefix number (assigned by GS1 Member Organisation)

IR = Item Reference number (assigned by your company)

CD = Check Digit (calculated by GS1 check digit calculator on www.gs1.org)

3.5.2 How to manage Non-POS product that may go to POS

A brand owner is the responsible party for identification of their trade items using GS1 standards. They must identify and segment inventories with different GTINs according to GTIN Allocation Rules and commercial agreements. This does not mean that a trade item intended by the brand owner for use at POS or not at POS will never be used by a downstream trading partner in a manner not intended. This exception cannot be managed by GS1 standards compliance, but only by bilateral commercial agreements.

3.6 Fixed Measure Products

3.6.1 Which Bar Code Do I Use?


If the supplier chooses to provide additional information about a fixed measure product sold at POS, such as its expiry date or batch number, GS1 DataBar Expanded or GS1 DataBar Expanded Stacked Symbols are used. This process will require some form of on-demand or in-line printing.

EAN/UPC Bar Codes will remain an option when no extra data is required and there is sufficient space. If insufficient space is available, GS1 DataBar Omnidirectional or GS1 DataBar Stacked Omnidirectional can be used to encode GTIN only.

3.6.2 How to Allocate and When to Change the GTIN


The brand owner assigns a GTIN and follows the GTIN Allocation Rules for Trade Items and/or GTIN Allocation Rules for Fresh Food Trade Items scanned at Point-of-Sale.


- When a different configuration of a fresh food trade item requires separate identification for POS a new GTIN will be assigned.

 **Note:** For GTIN Allocation Rules for Fresh Food Trade Items Scanned at Point-of-Sale information - See Section 6.1 in the Appendix

3.6.3 Loose Produce Trade Items

Loose Produce trade items are trade items which are identified with a GTIN. At the retailer’s discretion, these fresh foods items can be processed as fixed or variable measure products.

 **Note:** Products identified as fixed measure - reference Loose Produce Trade Items Scanned at Point-of-Sale of the GS1 General Specifications, Section 2.

- 
Note: Products identified as variable measure, reference Variable Measure Fresh Food Trade Items Scanned at Point-of-Sale Using GTIN of the GS1 General Specifications, Section 2.

For loose produce you can use GS1 DataBar Stacked Omnidirectional to encode GTIN only.



4 Implementation Guide for Retailers



4.1 Business Process Changes

How you identify, label, sell and capture data of fresh food trade items scanned at Point-of-Sale is changing.

The industry is migrating from current Restricted Circulation Numbers (RCNs) to GTIN (Global Trade Item Number) plus additional data. (This data can include for example; pack weight, price, best-before-date, or batch number). The use of GTINs and additional data to replace RCNs requires the use of GS1 DataBar Symbols which are being introduced as an open standard on January 1, 2014.

This will take place with the introduction of GS1 DataBar Symbols.

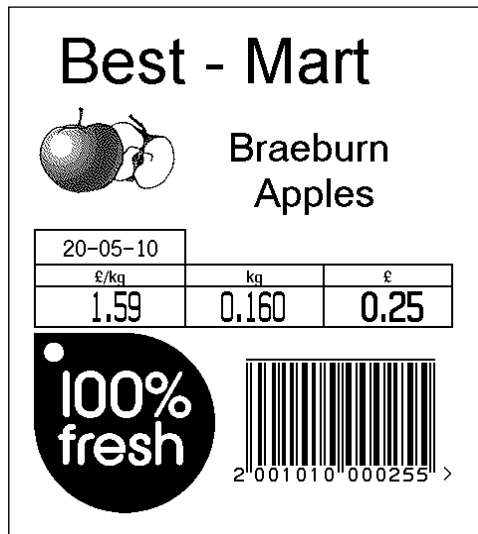
Retailers need to be ready to process GTINs and additional data at POS. This is a major change from the present use of RCNs. Retailers will need to ensure their front-end systems can handle the additional data and process their desired data at POS appropriately. For example, you will be able to use this extra data, such as best-before- date or expiry date, automatically to prevent out-of-date products being sold to your customers. It is recommended to have the scanner pass all data encoded in the GS1 DataBar to your POS Application software. When processing the encoded AIs, remember they may come in any order.

- 
Note: Reference Section 7 of the GS1 General Specifications for more details
- 
Note: For Identification of a Variable Measure Trade Item (GTIN): AI (01) - reference GS1 General Specifications, Section 3

How to make these process changes are highlighted in the upcoming sections.

To illustrate what the new bar codes will look like, here are examples of the labels used now, and the labels to be used with GS1 DataBar symbols. The labels now for variable measure products simply encode an RCN, while the new label encodes the GTIN for the product, and any additional data.

Figure 4-1 **Current label using an EAN/UPC symbol with a Prefix 02 / 20-29**



Note: The sample above is not actual size and is for example only. Reference Section 5 - Table 1 in the *GS1 General Specifications* for symbol specifications.

Figure 4-2 **To-Be label using a GS1 DataBar Expanded Stacked encoding GTIN plus additional data**



Note: The sample above is not actual size and is for example only. Reference Section 5 - Table 1 in the *GS1 General Specifications* for symbol specifications

4.2 Retailer Readiness Checklist

18. Is your **Scanner Hardware** capable, configured, and activated to process GS1 DataBar formats and all AIs? (**Scanners include** POS lanes, self-checkout, self-scan, hand-held units in POS lane or on the sales floor and backroom)
19. Is your **POS Software** capable of processing the GS1 DataBar data contents including any desired business rules using GS1 Application Identifiers (e.g. best-before-date, batch number, lot number, weight)? (**POS Software includes** cashier lanes, unattended lanes (self-checkout, self-scan and home shopping applications) Your POS systems should have the ability to accept multiple AIs and process only those relevant to your POS processes.

- For Analysis of the Data Carrier and Plausibility Test for Element Strings - reference GS1 General Specifications, Section 7
- 20. Is your **POS Transaction Log** capable of downstream processing and utilization of the POS transaction data containing the additional GS1 Application Identifiers present such as the net weight, batch/lot, serial number, etc?
- 21. Is your **Host Systems Software/Master Data** capable of supporting all forms of GTIN and one or more GTINs assigned to a stock keeping unit reference?
- 22. Is your **Scale/Labeling Software** capable of handling all forms of GTIN and required AIs?
- 23. Are all relevant GTINs listed in your POS System?
- 24. Is your hardware equipment and software application for **price verification, product receiving, inventory recording / checking** capable of reading and processing GTIN and additional GS1 AIs in GS1 DataBar required?
- 25. POS applications need to accommodate the key entry of required AIs in Human Readable Interpretation (HRI) to meet retailer requirements. When bar codes fail to scan, any prompting of key entry or other processes needs to be considered for both checkout staff and self-scanning customers.
 - For Human Readable Interpretation label information – reference GS1 General Specifications, Section 4
- 26. Determine POS process for loose produce in a bag which has a bar code on each individual item and is sold as variable measure. For example, one approach might be to force key entry of a quantity for items sold by piece, and another might be to delay scaled weight slightly when an item is scanned and weighed (versus keyed PLU and weighed which may be instant).
- 27. List the different fresh food product types potentially involved in your GS1 DataBar project – and identify how they are sourced and sold:
 - Pre-packed consumer ready for shelf products, labeled and priced, from your supplier
 - Pre-labeled consumer ready for shelf products, labeled and priced, from your supplier
 - Pre-packed products, labeled and not-priced, from your supplier
 - Pre-packed products, not labeled and not-priced, from your supplier
 - In-store 'weight-wrap labeled' packs (via in-store pre-packing)
 - In-store counter-served packs (via counter scales)
 - Loose Produce
- 28. Define the objectives that you would ideally like to achieve – for each type of product identified above. (This defines the data which is required to be encoded on the GS1 DataBar BarCode).
 - Loose Produce encodes the GTIN to ensure correct identification at POS
 - Identify quantity or weight of items sold at full price, plus any sold at a reduced (mark-down) price: (may require both the pack weight and the price to be encoded on consumer pack)
 - At the checkout, stop sales of any packs past their sell-by dates: (requires additional data other than GTIN for example best-before-date to be encoded)
 - For product safety recall / stop (requires additional data other than GTIN for example, batch or lot number to be encoded on the consumer pack)
- 29. Map out the end-to-end process for each product type:
 - Ensure that there is clarity on where all of the data comes from, how it moves through the complete supply chain and how it is used in the store or head office systems.
 - Use this to confirm the requirements with both the supply chain and any solution providers
 - This – along with quantifying the business benefits, can also help in any business case justification

4.3 POS software Readiness

POS software needs to be capable of processing and storing the GS1 Application Identifiers (e.g. weight, best-before-date). The POS Software must be able to both successfully process your specifically required additional data and effectively ignore all remaining additional information that you do not require. (See Section 5.3.1 for more information). This is a major change from the present use of RCNs. You will need to ensure your front-end systems can handle the additional data and process your desired data at POS appropriately. For example, you will be able to use this extra data, such as best-before- date or expiry date, automatically to prevent out-of-date products being sold to your customers. When processing the encoded AIs, remember they may come in any order.

- ✔ **Note:** Reference Section 7 of the GS1 General Specifications for more details
- ✔ **Note:** For Identification of a Variable Measure Trade Item (GTIN): AI (01) - reference GS1 General Specifications, Section 3
- ✔ **Note:** More detailed information on POS software Readiness can be found in Section 5.3 of this Guide

Back-end software solutions such as those that process and consume POS transaction log data also need to be able to process the GTIN and additional GS1 AIs based on your specific requirements as well as effectively ignore all remaining additional data that are not required.

POS software must also be capable of handling key entry of the data in the GS1 DataBar, in the event the bar code does not scan. You should also consider your procedure for handling the key entry of additional data beyond GTIN. Furthermore, it is important to ensure that your front-end cashiers are trained on how to key enter the label's Human Readable Interpretation, both the GTIN and additional data, in this situation.

- ✔ **Note:** For Human Readable Interpretation label information - reference GS1 General Specifications, Section 4

With respect to the maintenance of your master data relationships with the presence of GTIN in the GS1 DataBar, your product management solutions will need to support one or more item references (GTINs, RCNs, etc.) when a stock-keeping unit is used to represent a commoditized consumer product. For example a stock-keeping unit for loose bananas should contain the GTINs for each of your chosen suppliers and any RCNs that may be utilized in the supply chain.

As you may receive product from your variable measure trading partner, you will want to be familiar with minimum required data (GTIN + Variable Count / Trade Measure) encoded in the GS1 DataBar Expanded Symbols, as well as the Human Readable Interpretation label information.

- ✔ **Note:** For Required Attribute data for Variable Measure Fresh Food Trade Items scanned at Point-of-Sale - reference GS1 General Specifications, Section 2

For further information please contact your local GS1 Member Organisation at www.gs1.org/contact

4.4 Scanner Readiness

Omni-directional and hand-held scanners must be capable and activated for GS1 DataBar Expanded and GS1 DataBar Expand Stacked, GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional Symbols. Since 2001, most scanners are GS1 DataBar capable, but they are generally installed at the retailer's location with this functionality not yet "turned on." Depending on your generation of scanner, you may need a firmware upgrade or a chip set exchange. Be sure to do an assessment of all of your scanning equipment to determine the status of each piece. You may need to contact your equipment vendor to enable this functionality.

GS1 DataBar Test Cards are available to test your scanners. See the Appendix for an example of the Test Card. It is recommended to contact your local GS1 Member Organisation for actual Test Cards.

4.5 Scale Label Readiness

When evaluating your Scale Labeling readiness, be sure you have all GS1 Application Identifiers you need or "applicable" in your software.

- ✔ **Note:** For a list of Suggested Application Identifiers for variable measure fresh food products – see the Appendix Section 6.3

Local government regulations may require specific data. You should also ensure additional data interface between ERP system and scales are ready and updated. Your systems should be able to print both EAN/UPC and GS1 DataBar Expanded Symbols per GS1 General Specifications.

- ✔ **Note:** For Symbol Specifications for GS1 DataBar Expanded and Expanded Stacked Symbols - reference GS1 General Specifications, Section 5 Table 1

You also need to determine if your current label stock (size and coating) or packaging requires changes are required for GS1 DataBar Expanded and Expanded Stacked Symbols.

For further information please contact your local GS1 Member Organisation.

- ✔ **Note:** For Required Attribute data for Variable Measure Fresh Food Trade Items scanned at Point-of-Sale - reference GS1 General Specifications, Section 2

- ✔ **Note:** For Human Readable Interpretation label information – reference GS1 General Specifications, Section 4

4.6 Variable Measure Products

4.6.1 In-store Labeled Products

4.6.1.1 Which Bar Code Do I Use?

Continue to use EAN/UPC BarCodes to encode RCNs. When you want to encode GTIN plus attribute / extra data you will need to be GS1 DataBar ready. This means having your fresh food department scale printers capable of printing both GS1 DataBar and EAN/UPC. Additionally, the scale printer software needs to have your desired GS1 Application Identifiers built in.

EAN / UPC with RCN

Figure 4-3

GS1 DataBar Expanded Stacked with attribute data

Best - Mart

Braeburn Apples

20-05-10		
£/kg	kg	£
1.59	0.160	0.25

100%
fresh

2 001010 000255 >

Best - Mart

Braeburn Apples

20-05-10		
£/kg	kg	£
1.59	0.160	0.25

(01)02345678925872(3103)000160(3922)000025(15)100520

Note: The samples above are not actual size and are for example only. Reference Section 5 - Table 1 in the GS1 General Specifications for symbol specifications

4.6.1.2 How to Allocate and When to Change the GTIN

The brand owner assigns a GTIN and follows the GTIN Allocation Rules for Trade Items and/or GTIN Allocation Rules for Fresh Food Trade Items Scanned at Point-of-Sale.

- When a different configuration of a fresh food trade item requires separate identification for POS, a new GTIN will be assigned.

Note: If the retailer is reconfiguring a trade item in-store, that already is assigned a GTIN and the reconfigured item requires separate identification from the original trade item GTIN, the retailer will be responsible for new GTIN assignment.

Note: For the full GTIN Allocation Rules for Fresh Food Trade Items Scanned at Point-of-Sale information – See Appendix Section 6.1

How Global Trade Item Numbers (GTIN) work in GS1 DataBar in a 14-digit format

GTIN-13

1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	GCP	GCP	GCP	GCP	GCP	GCP	GCP/IR	GCP/IR	GCP/IR	GCP/IR	GCP/IR	IR	CD

GTIN-12

1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	0	GCP	GCP	GCP	GCP	GCP	GCP	GCP/IR	GCP/IR	GCP/IR	IR	IR	CD

GCP = GS1 Company Prefix number (assigned by GS1 Member Organisation)

IR = Item Reference number (assigned by your company)

CD = Check Digit (calculated by GS1 check digit calculator on www.gs1.org)

4.6.1.3 How to manage Non-POS product that may go to POS

A brand owner is the responsible party for identification of their trade items in GS1 standards. They must identify and segment inventories with different GTINs according to GTIN Allocation Rules and commercial agreements. This does not mean that a trade item intended by the brand owner for use at POS or not at POS will never be used by a downstream trading partner in a manner not intended. This exception cannot be managed by GS1 standards compliance, but only by bilateral commercial agreements.

4.6.2 Pre-packed / Pre-labeled products

You will continue to use EAN/UPC BarCodes that encode the RCNs used now, but need to be ready to scan GS1 DataBar Symbols. GS1 DataBar Expanded Symbols for variable measure products will encode a GTIN plus additional data (AIs).

When you are GS1 DataBar ready (software and hardware) and want GTIN plus additional data you need to contact your suppliers to inform them of your readiness so they too can be ready on their end to support your needs. It is recommended to acquire sample labels from your suppliers prior to the product arriving in-store in order to verify scanability of Application Identifiers encoded.

For pre-packed / pre-labeled product from your suppliers, they are responsible for ensuring that they allocate different GTINs to the different product lines they supply you.



Note: For the full GTIN Allocation Rules for Fresh Food Trade Items Scanned at Point-of-Sale information – See Appendix Section 6.1



Note: For Application Standards for Fresh Food Trade Items Scanned at Point-of-Sale – reference GS1 General Specifications, Section 2

4.7 Fixed Measure Products

4.7.1 Which Bar Code Do I Use?

If suppliers choose to provide additional information, such as expiry date or batch number, for use at POS, GS1 DataBar Expanded or GS1 DataBar Expanded Stacked will be used to encode GTIN plus attribute data.

EAN/UPC BarCodes will remain an option when no additional data is required and there is sufficient space. If insufficient space is available, GS1 DataBar Omnidirectional or GS1 DataBar Stacked Omnidirectional can be used to encode the GTIN.

4.7.2 How to Allocate and When to Change the GTIN?

The brand owner assigns a GTIN and follows the GTIN Allocation Rules for Trade Items and/or GTIN Allocation Rules for Fresh Food Trade Items scanned at Point-of-Sale.

- When a different configuration of a fresh food trade item requires separate identification for POS a new GTIN will be assigned.



Note: For GTIN Allocation Rules for Fresh Food Trade Items Scanned at Point-of-Sale information - See Section 6.1 in the Appendix

4.7.3 Loose Produce Trade Items

Loose Produce trade items are trade items which are identified with a GTIN. At the retailer's discretion, loose produce can be sold as fixed or variable measure products.

If this product is to be identified as variable measure, see variable measure Section 4.6.

- When a loose produce item is further processed in-store and repackaged, it may be sold by the retailer as a fixed measure trade item, then it is treated as a Fixed Measure Trade Item and follows

- Loose Produce Trade Items Scanned at Point-of-Sale of the GS1 General Specifications Section 2.

- However, if loose produce is sold as a variable measure trade item, then it is treated as Variable Measure Trade Item and follows - Variable Measure Fresh Food Trade Items Scanned at Point-of-Sale Using GTIN of the GS1 General Specifications Section 2.

For loose produce you can use GS1 DataBar Stacked Omnidirectional to encode GTIN only.



5 Implementation Guide for AIDC Equipment and Software Companies

5.1 Scanners

Scanners must be compliant and enabled for GS1 DataBar Expanded and GS1 DataBar Expanded Stacked, GS1 DataBar Omnidirectional, GS1 DataBar Stacked Omnidirectional Symbols and able to auto discriminate these GS1 DataBar Symbologies and EAN/UPC Symbologies.

5.2 Label Printer Equipment (includes printers with or without scales)

Any label printer equipment used for this application should be capable of producing GS1 DataBar Symbols using all GS1 Application Identifiers. At minimum, they should include the list of suggested AIs for Fresh Foods.

- ✓ **Note:** For a list of Suggested Application Identifiers for variable measure fresh food products – see Appendix Section 6.2

Some GS1 Application Identifiers identify fixed length data fields, while others support variable length data fields. To obtain more information about the entire list of recognized GS1 Application Identifiers with their corresponding GS1 Application Identifier data fields and length rules, please refer to the GS1 General Specifications Section 3.

- ✓ **Note:** For Required Attribute data for Variable Measure Fresh Food Trade Items scanned at Point-of-Sale – reference General Specifications, Section 2
- ✓ **Note:** For Human Readable Interpretation label information – reference GS1 General Specifications, Section 4

- ✔ **Note:** For maximum and minimum barcode dimensions - reference GS1 General Specifications, Section 5

5.3 Retailers and Software Companies at POS

5.3.1 Processing GS1 Application Identifiers (AIs)

If you want to process some or all GS1 Application Identifiers encoded in a GS1 DataBar Expanded or GS1 DataBar Expanded Stacked Symbol:

- It is recommended to have the scanner pass all Application Identifiers to your POS Application software. At this point, the retailer will specify which GS1 Application Identifiers they want processed from the POS Application software.

For example, the POS may only be interested in GTIN and Expiry Date. One supplier may have the expiry date as the 4th Application Identifier in their bar code. Another may have Expiry Date as the 5th Application Identifier. The retailers' POS processing will need to accurately pass the "uninteresting" AIs and data between GTIN and Expiry Date. This approach implies that the POS software understands at least the data length implied by, and associated with, each AI. This applies to AIs that are not currently being processed. Because the standard generally allows AI's beyond the GTIN to be in any order within the bar code.

- It is recommended the POS application understands the symbology identifier along with the AIs and bar code data. This further allows the POS to be certain which bar code it is processing.

Notes:

- Application Identifiers are of different lengths.
- Data fields may be fixed or variable in length.
- Software solutions should be based on the latest table of GS1 Application Identifiers
- Solution Providers should make a provision for updating GS1 AIs with each software maintenance cycle.

- ✔ **Note:** For a complete list of all GS1 Application Identifiers, their length and data titles – reference GS1 General Specifications, Section 3 GS1 Application Identifiers in Numerical Order.

5.3.2 Processing Key Entry of Data on Labels

In the event that the GS1 DataBar BarCode does not scan, POS Software must be capable of handing the key entry of the bar code information. This includes the key entry of the GTIN information, as well as additional information that may appear with GS1 DataBar Expanded BarCodes.

Some considerations with key entry of GS1 DataBar BarCodes and additional information:

- Determine how the cashier should be instructed to enter the pertinent information for the GTIN and additional information. For instance, a cashier might be prompted for particular pieces of additional information, such as expiration or best-before date. Alternatively, the cashier might be prompted for all of the additional information available and the POS Software could parse out the required additional information.
- Consider how to prompt cashiers to locate additional information on the bar code, either through using the HRI (Human Readable Interpretation) or additional non-human readable text available on the bar code.
- Local regulations may determine what is key-entered.

Note: For Human Readable Interpretation label information – reference GS1 General Specifications, Section 4

5.3.3 Handling Master Data Relationships

With respect to the maintenance of your master data relationships with the presence of GTIN in the GS1 DataBar, your product management solutions will need to support one or more item references (GTINs, RCNs, etc.) when a stock-keeping unit (SKU) is used to represent a commoditized consumer product.

For example an SKU for loose bananas should contain the GTINs for each of your chosen suppliers and any RCNs that may present in the supply chain.

- This might affect such areas as:
- Inventory Processing Software
- Product Look Up operations

6 Appendix

6.1 Fresh Foods GTIN Allocation Rules









For the latest GTIN Allocation Rules - reference the GTIN Allocation Rules Home at <http://www.gs1.org/1/gtinrules/index.php/p=home>

Note: The following GTIN Allocation Rules are intended for global use. Exceptions may occur only when local regulatory or legal requirements mandate otherwise.



30. When a different configuration of a fresh food trade item requires separate identification for POS, a new GTIN will be assigned. Specific examples of Rules include:

Note: If the retailer is reconfiguring a trade item in-store, that already is assigned a GTIN and the reconfigured item requires separate identification from the original trade item GTIN, the retailer will be responsible for new GTIN assignment.

	Rule	NEW GTIN Required	Example	Diagram
1.1	Where a fresh food pre-packed package item differs in weight, is sold by weight but ordered by specific separate pack size a new / unique GTIN will be assigned to each type of pack size.	Yes	Pre-packaged chicken drumsticks, each package differs in weight, sold by weight but ordered by specific pack size (GTIN A = 10pk and GTIN B = 14pk)	


	Rule	NEW GTIN Required	Example	Diagram
1.2	Where a loose produce item is sold as an each (product 1), then cut and packaged to be sold by weight (product 2), product 1 and 2 require separate unique GTINs.	Yes	A whole watermelon is sold for \$4.00 each. The retailer decides to cut the watermelon into halves and sell the quarters for \$1.99 per kilo/pound	 Product 1 with GTIN C  Product 2 with GTIN D
1.3	Where a loose produce item is sold as an each or weight (product 3), is then packaged in-store and sold as a fixed measure (product 4), product 3 and 4 require separate unique GTINs	Yes	An apple sold by each or weight for 1.29 per kilo/pound. It is then packed in-store as a fixed measure container and sold as 3.00 for a 4 pack of apples.	 Product 3 with GTIN E <hr/>  Product 4 with GTIN F
1.4	Where a bulk fresh food item of fixed or variable measure, not intended for Point-of-Sale, (product 5), is cut and packaged in-store and sold by weight (product 6), product 5 and 6 will require separate GTINs based on the requirement to use Indicator digit 9 in a GTIN-14 on product 5 and the requirement to use GTIN-12 or GTIN-13 on product 6 because it will be scanned at Point-of-Sale.	Yes Yes	<p>A wheel of cheese (not intended for Point-of-Sale) is ordered by a GTIN-14 inclusive of Indicator digit 9, is cut and packaged in variable weight packages in the deli department and sold by weight, will require a new GTIN, either GTIN-12 or GTIN-13 at Point-of-Sale.</p> <p>Bulk chicken breast (not intended for POS) is ordered by a GTIN-14 inclusive of Indicator digit 9, then packaged into individual variable weight packages and sold by weight, will require a new GTIN, either GTIN-12 or GTIN-13 at Point-of-Sale.</p>	 Product 5 with GTIN G  Product 6 with GTIN H <hr/>  Product 7 with GTIN I  Product 8 with GTIN J

31. When different configurations of fresh food items do not require separate identification at POS use the same GTIN. Specific examples of Rules include:

	Rule	NEW GTIN Required	Example	Diagram
2.1	Where a loose produce item (product 9) is placed in a bag (product 10) by the consumer, product 9 and 10 have the same GTIN.	No	Loose Produce items presented for sale at the POS, either individually or in a bag (placed by the consumer) will be identified with the same GTIN. Placing the loose produce items in a bag by the consumer does not change the GTIN.	 <p>Product 9 with GTIN</p> <p>K</p>  <p>Product 10 with GTIN K</p>

GTIN Allocation and Responsibility for Branded Items and Unbranded Items can be found in Section 4 of the GS1 General Specifications.

6.2 Suggested Application Identifiers for Variable Measure Fresh Food Products

-  **Note:** GS1 DataBar Expanded Symbols can encode all GS1 Application Identifiers approved for Point-of-Sale and not limited to the suggested list below

AI	Data Content	Format*	FNC1 Required	Data Title
01	Global Trade Item Number (GTIN)	N2+N14		GTIN
10	Batch or Lot Number	N2+X..20	(FNC1)	BATCH/LOT
11 (**)	Production Date (YYMMDD)	N2+N6		PROD DATE
13 (**)	Packaging Date (YYMMDD)	N2+N6		PACK DATE
15 (**)	Best Before Date (YYMMDD)	N2+N6		BEST BEFORE or SELL BY
17 (**)	Expiration Date (YYMMDD)	N2+N6		USE BY OR EXPIRY
21	Serial Number	N2+X..20	(FNC1)	SERIAL
30	Count of Items (Variable Measure Trade Item)	N2+N..8	(FNC1)	VAR. COUNT
310 (***)	Net weight, kilograms (Variable Measure Trade Item)	N4+N6		NET WEIGHT (kg)
320 (***)	Net weight, pounds (Variable Measure Trade Item)	N4+N6		NET WEIGHT (lb)
392 (***)	Applicable Amount Payable, single monetary area (Variable Measure Trade Item)	N4+N..15	(FNC1)	PRICE
393 (***)	Applicable Amount Payable with ISO Currency Code (Variable Measure Trade Item)	N4+N3+N..15	(FNC1)	PRICE
412	Purchased from Global Location Number	N3+N13		PURCHASE FROM

AI	Data Content	Format*	FNC1 Required	Data Title
414	<i>Identification of a Physical Location - Global Location Number</i>	N3+N13		LOC No
422	<i>Country of Origin of a Trade Item</i>	N3+N3	(FNC1)	ORIGIN
8008	<i>Date and Time of Production</i>	N4+N8+N..4	(FNC1)	PROD TIME

** : If only year and month are available, DD must be filled with two zeroes.

***: The fourth digit of this GS1 Application Identifier indicates the implied decimal point position.

Example:

- 3102 Net weight in kg with two decimal points

6.3 GS1 DataBar Homepage URL

www.gs1.org/barcodes/databar

6.4 How GS1 DataBar can be used - Business Case Examples

The following examples can enable Consumer and Food Safety Programs at the Point-of-Sale for your fixed and variable measure fresh products.

Examples using GS1 DataBar Expanded and Expanded Stacked (GTIN + AIs)

6.4.1 Expiration Date Management – Stopping a Transaction at POS

GTIN + Expiration Date enables the POS to determine if the product is out dated, hence stopping the sale or allowing the exchange of a fresher one. A pop up message could appear on the register screen. See examples below:



(01)08801114111116
(17)101220

- **(01) GTIN**
- **(17)**



6.4.2 Automatic Markdown

GTIN + Expiration Date enables the POS to determine if the product is close to the expiration date, enabling the POS software to provide an Automatic Markdown at the POS (*Subject to local regulations). A pop up message could appear on the register screen. See examples below:



(01)08801114111116
(17)101220

- **(01) GTIN**
- **(17)**

“This product has 3 days left until expiration. We give a 40% discount.”

6.4.3 Product Recall and Traceability at Point-of-Sale

Encoding GTIN + Lot Number or GTIN + Batch Number enables the POS to determine if the product is being recalled. A pop up message could appear on the register screen. See examples below:



With GTIN + Lot Number or GTIN + Batch Number encoded in the GS1 DataBar Expanded or Expanded Stacked BarCode, the POS software can process and store both pieces of data enabling traceability to the consumer (based on loyalty card usage). It is also possible to print the batch number and other additional information on the customer receipt. See example below:



FEILE FOODS
 Unit 5A, Clonminam Bus Pk
 Portlaoise
 Co. Laois
 Ireland
 Tel: 057 8681955
 Fax: 057 8681956
 Vat No: 6361564R

Date: Tue, 02-Feb-2010 Time: 10:18
 No.: 00153300

Description	Qty	Wt	Value
Breakfast Pack	1		9.99
Peppered Steak x 4	1	0.859	9.99
Batch: 50020201/0005			
Expiry Date: 12-02-2010			
Weekend Bundle	1		29.99
Total:			49.97
Cash:			49.97

Thank You For Shopping At
Feile Foods

6.4.4 Product Replenishment



GTIN + Expiry Date or GTIN + Sell-by-Date can enhance the knowledge of how much close coded product is left in the display / selling case of the store

Example using GS1 DataBar Stacked Omnidirectional on Fruit & Vegetables

The GS1 DataBar Stacked Omnidirectional encodes GTIN only. The GTIN provides brand identification.

Improved Front-end Productivity and Shrink Reduction



With the GS1 DataBar Stacked Omnidirectional, the cashier or customer (if self scanning available) can scan the bar code versus key entry of a code number, providing accurate data, just like any other consumer product good. Having accurate data will reduce shrinkage, improve inventory management, and enable Category Management in the fruit & vegetable department.

6.5 GS1 DataBar Test Card

This card is for example and should not be used to test your scanners due to quality. Please contact your local GS1 Member Organisation for the Test Cards



GS1 DataBar Test Card – V2
Copyright: GS1 2007
 For procedures and to log Readiness results:
http://www.gs1.org/databar_readiness/
Global Document Type Number (253)

	<p>Symbol 1 - EAN-13 Data Output: <u>9501101420014</u></p>	
	<p>Symbol 2 – GS1 DataBar Omnidirectional Data Output: <u>0109501101420021</u></p>	
	<p>Symbol 3 – GS1 DataBar Stacked Omnidirectional Data Output: <u>0109501101420038</u></p>	
	<p>Symbol 4 – (POS and General Distribution) GS1 DataBar Omnidirectional Data Output: <u>0109501101420045</u></p>	
	<p>Symbol 5 - GS1 DataBar Expanded Data Output: <u>0109501101420052</u><u>21</u><u>12345678</u></p>	
	<p>Symbol 6 - GS1 DataBar Expanded Stacked Data Output: <u>0109501101420068</u><u>902995</u><u>-GS-</u><u>320200010017</u><u>100101422123</u><u>-G S-</u><u>21</u><u>12345678</u> <small>Note: Data Contained GTIN + Price + Weight + Expiration Date + Country of Origin + Serial Number</small></p>	
<p>Symbols 7 through 9 are Intended for Hand Held and Presentation Scanning - Not Intended for Omnidirectional Checkout Scanning -</p>		
<p>Symbol 7 – GS1 DataBar Truncated</p>  <p>Data Output: <u>0109501101420076</u></p>	<p>Symbol 8 – GS1 DataBar Limited</p>  <p>Data Output: <u>0109501101420083</u></p>	<p>Symbol 9 – GS1 DataBar Stacked</p>  <p>Data Output: <u>0109501101420090</u></p>

7 Glossary

Term	Definition
EAN/UPC Symbology	A family of bar codes including EAN-8, EAN-13, UPC-A, and UPC-E Bar Codes. Although UPC-E Bar Codes do not have a separate symbology identifier, they act like a separate symbology through the scanning application software. See also EAN-8 Bar Code, EAN-13 Bar Code, UPC-A Bar Code, and UPC-E Bar Code.
Fresh Food Trade Items	Trade items in the following product categories: fruits, vegetables, meats, seafood, bakery and ready to serve food such as cheeses, cold cooked or cured meats, and salad, etc. Fresh Foods is defined as food that is not preserved by canning, dehydration, freezing or smoking.
Global Trade Item Number (GTIN)	The GS1 Identification Key used to identify trade items. The key comprises a GS1 Company Prefix, an Item Reference and Check Digit.
GS1 Application Identifier (AI)	The field of two or more digits at the beginning of an Element String that uniquely defines its format and meaning.
GS1 DataBar Omnidirectional Bar Code	A bar code that encodes a GTIN. It is designed to be read by omnidirectional scanners.
GS1 DataBar Stacked Omnidirectional Bar Code	A bar code that is a variation of the GS1 DataBar Symbology that is stacked in two rows and is used when the GS1 DataBar Omnidirectional Symbol would be too wide for the application. It is designed to be read by omnidirectional checkout scanners.
GS1 DataBar Expanded Bar Code	A bar code that encodes any GS1 Identification Key plus Attribute data, such as weight and "best before" date, in a linear symbol that can be scanned omnidirectionally by suitably programmed Point-of-Sale scanners.
GS1 DataBar Expanded Stacked Bar Code	A bar code that is a variation of the GS1 DataBar Expanded Bar Code that is stacked in multiple rows and is used when the normal symbol would be too wide for the application.
Human Readable Interpretation	Characters that can be read by persons, such as letters and numbers, as opposed to symbol characters within bar codes, which are read by machines.
Loose Produce Trade Items	Are fruits and vegetables which are delivered to the store loose, in boxes or cases, and then put into a bag or selected individually by the customer for purchase.
Point-of-Sale (POS)	Refers to the retail checkout where omnidirectional bar codes must be used to enable very rapid scanning or low volume checkout where linear or 2D matrix bar codes are used with image-based scanners.
Restricted Circulation Number	Signifies a GS1 identification number used for special applications in restricted environments, defined by the local GS1 Member Organisation (e.g., restricted within a country, company, industry). They are allocated by GS1 for either internal use by companies or to GS1 Member Organisations for assignment based on business needs in their country (e.g., variable measure product identification, couponing).
Variable Measure Trade Item	A trade item which may be traded without a pre-defined measure, such as its weight or length.

