



Business Standards Supporting Traceability

Stephen Arens
GS1 US





“The term standard... includes all of the following”

- *Common and repeated use* of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices.
- The *definition* of terms; *classification* of components; *delineation* of procedures; *specification* of dimensions, materials, performance, designs, or operations; *measurement* of quality and quantity in describing materials, processes, products, systems, services, or practices; *test* methods and sampling procedures; or *descriptions* of fit and measurements of size or strength.

Source: www.standards.gov and OMB Circular A-119



Examples of Industry Standards

- Cell Phones / telecommunications
- Computer Hardware
- Computer Software
- Electrical Outlets and light bulbs
- USB devices / connections
- DVD / CD's
- Automotive / Truck Tires
- Nuts & Bolts
- Train tracks
- Weights & Measures
- Paper Sizes i.e. letter, legal, etc.
- And many many more



What Are the GS1 Standards?

- Industry developed and accepted voluntary standards for
 - Company (Trading Party) Identification
 - Product identification
 - Electronic Data Interchange (EDI) / Electronic messaging
 - Bar Codes
 - Radio Frequency Identification (RFID)
 - Asset identification
 - ... And more





Who is GS1 US?



- Established 1973 to manage development and adoption of the U.P.C.
- Not-for-profit, neutral, member driven
- Promotes implementation and voluntary use of GS1 Standards in the U.S.
- Works with industry to develop, understand, and adopt GS1 industry standards to improve supply chain efficiency and integrity
- Provides industry-driven solutions and services that help enhance the customers' satisfaction and consumer safety





Industries Using GS1 Standards

- **Agriculture**
- Alcohol Beverages
- Apparel
- Audio / Video
- Automotive
- Chemicals
- Computer Hardware and Software
- Cosmetics and Fragrances
- Electrical Supplies and Equipment
- Electronics
- **Food and Beverage**
- **Foodservice**
- **Fresh Meats, Poultry, Seafood ,Deli**
- Furniture
- General Merchandise
- Healthcare / Med Surg
- Healthcare / Rx

- Healthcare / OTC
- Hobbies and Crafts
- Home Accessories
- Home Furnishings
- Home Improvement / DIY
- Jewelry
- Lawn and Garden
- Maintenance Repair and Operations
- Pet Foods and Supplies
- **Produce**
- Public Sector / Government
- Publishing
- Raw Materials
- Shoes
- Sporting Goods
- Telecommunications
- Toys and Games
- And others





Who Are Using GS1 Standards in the Food Industry?

- Manufacturers
 - Grocery Products
 - Dairy Products
 - Beverage Products
 - Frozen Foods
 - Produce
 - Fresh meat, poultry, pork and seafood
 - Organic and Conventional Products
 - Branded and Private Label Products
 - Foodservice
 - Ingredients and raw materials
 - Equipment and supplies
- Retailers, Wholesalers, Distributors, Restaurant Operators




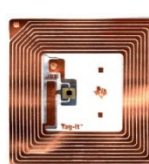



From the **VERY LARGE** to the very small





GS1 US Solutions Building Blocks

Automatic Identification, Data Capture, and Data Exchange

Automatic Identification:					
Company	Product	Inner Pack, Case, Pallet	Location	Assets	Services
<ul style="list-style-type: none"> •GS1 Company Prefix •EPC Manager Number •GLN 	<ul style="list-style-type: none"> •GTIN® - Global Trade Item Number® •EPC - Electronic Product Code™ 	<ul style="list-style-type: none"> ▪ GTIN - Global Trade Item Number ▪SSCC – Serial Shipping Container Code ▪EPC 	<ul style="list-style-type: none"> •GLN – Global Location Number •EPC 	<ul style="list-style-type: none"> ▪ GIAI - Global Individual Asset Identifier ▪ GRAI - Global Returnable Asset Identifier ▪EPC 	<ul style="list-style-type: none"> •GSRN -Global Service Relation Number •EPC
Data Capture:					
Barcodes				Radio Frequency Identification - RFID	
Product:	EAN/UPC  6 14141 00527 7	GS1 DataBar™ 	Data Matrix  (8004) 0123456712345678501		
Case & Pallet:	GS1-128  (01) 1 0614141 99999 3	ITF-14  1 06 14141 00041 5			
Data Exchange:					
Electronic Commerce (Transactional Data)		Data Synchronization (Master Data)		Physical Visibility	
<ul style="list-style-type: none"> ▪ Electronic Data Interchange (EDI) ▪ GS1 Business Message Standards using Extensible Markup Language (XML) 		<ul style="list-style-type: none"> ▪ Item data ▪ Price and promotion data 		EPC Information Services – EPCIS	



GS1: Vision

Our vision

A world where things and related information move efficiently and securely for the benefit of businesses and improvement of people's lives — everyday, everywhere.





GS1 Traceability Vision

- All traceable items are identified with the appropriate GS1 identifier at point of production
- Identification remains with/on the item until it is used
- All physical locations are identified with the appropriate GS1 identifier across the entire supply chain





GS1 Traceability Vision

- Agreed master data is captured and shared (e.g. via GDSN) on demand among trading partners
- Agreed event and transactional data is captured and shared on demand amongst traceability stakeholders
- Trading partners or industry sectors determine the relevant level of accuracy and depth of their traceability system
- Trading partners or industry sectors choose the relevant enabling technologies to implement traceability in their environment



Two Key GS1 Standards

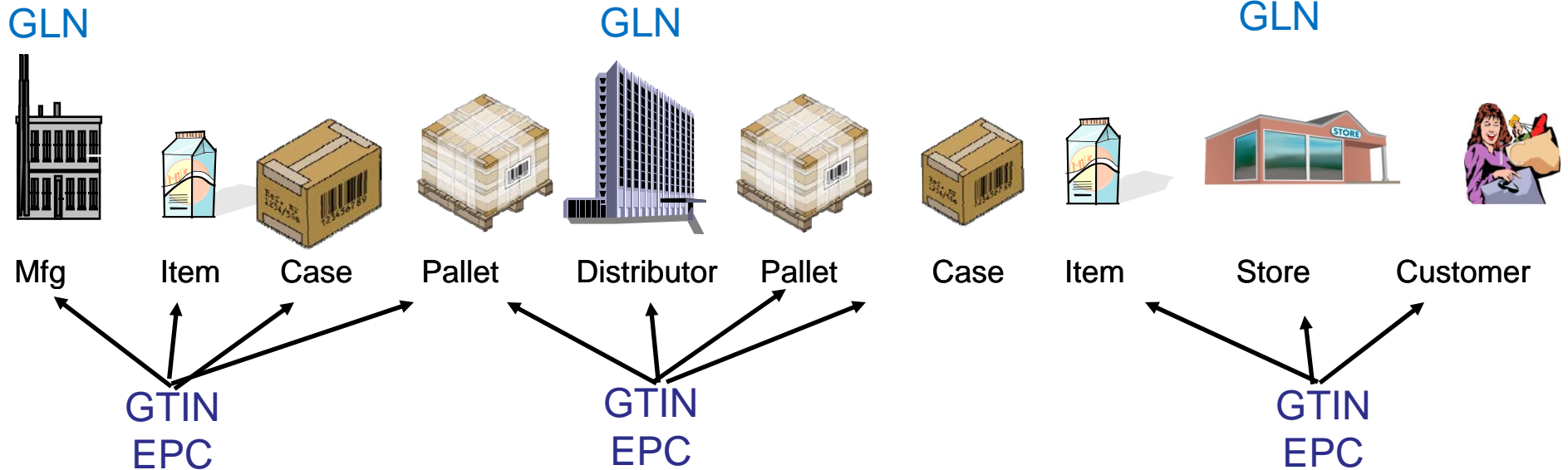
- **Global Trade Item Number (GTIN)**
 - The GTIN uniquely identifies any one product offered in commercial trade. Assignment of GTINs is standardized world wide. GTINs can be 8, 12, 13 or 14 digits in length and its three components are a GS1 company prefix, an item reference, and a check digit.

- **Global Location Number (GLN)**
 - The GLN is a 13-digit number used to uniquely identify a physical location, functional entity, or legal entity. Its three components are a GS1 company prefix, a location reference number, and a check digit.





GS1 Standards in the Supply Chain



Automatic Identification

Barcodes **GS1 System Data Carriers** **EPC/RFID**

This section shows various data capture methods: standard 1D barcodes, GS1 System Data Carriers (including QR codes and 2D barcodes), and EPC/RFID tags (a square tag and a square antenna).

Data Capture

Item data, price and promotion data, ship notice, invoice

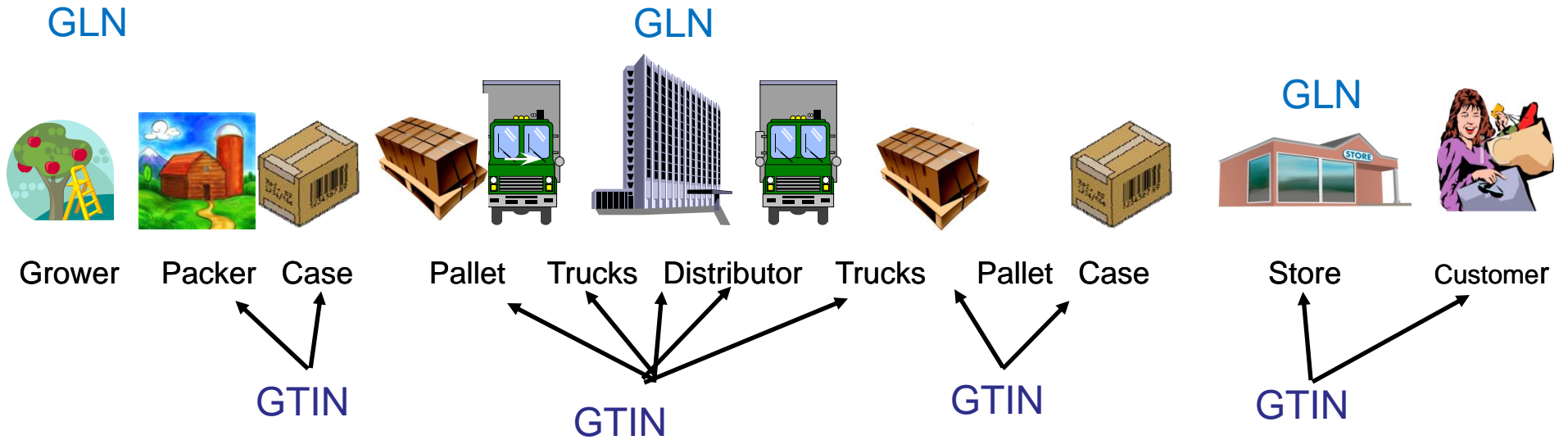
request for quotation, planning schedule, PO

Data Exchange

This section illustrates data exchange between supply chain partners, with a large blue arrow pointing from left to right.



GS1 Standards in the Fresh Foods Supply Chain

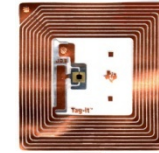


GTIN: Global Trade Item Number
 GLN: Global Location Number





U.P.C. Bar Code and Information



Data Carrier
Bar Code

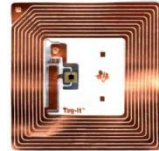
Data Structure
“GS1-12” Global
Trade Item Number
(GTIN)



The GS1 assigned Company Prefix forms the basis for all GS1 identifiers for products, locations, assets, documents, etc.

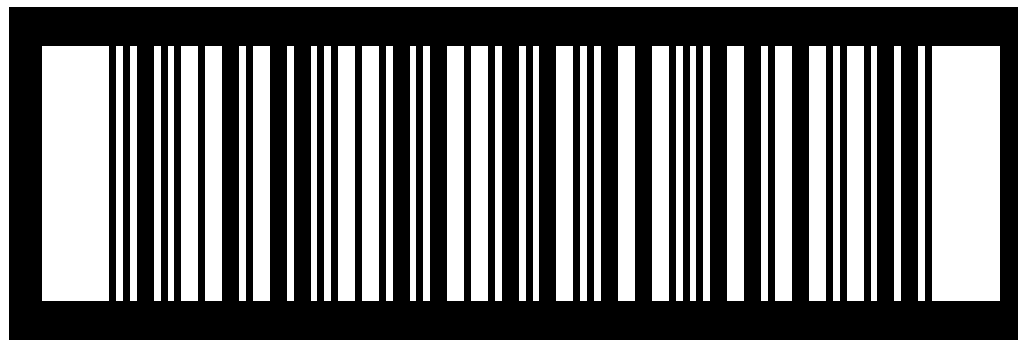


Barcode Symbols Used on Cases



ITF-14 Symbol

- Used to encode only Global Trade Item Number (GTIN) to identify products
- Can be printed directly on cardboard or adhesive label



GTIN-14

1 06 14141 00041 5

Packaging Level Indicator

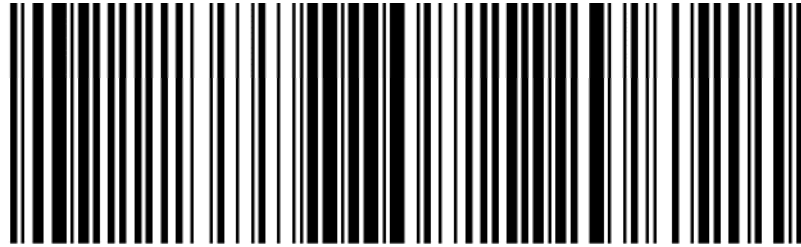
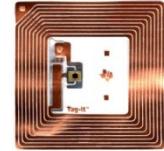
GS1 Company Prefix

Item Reference

Check Digit

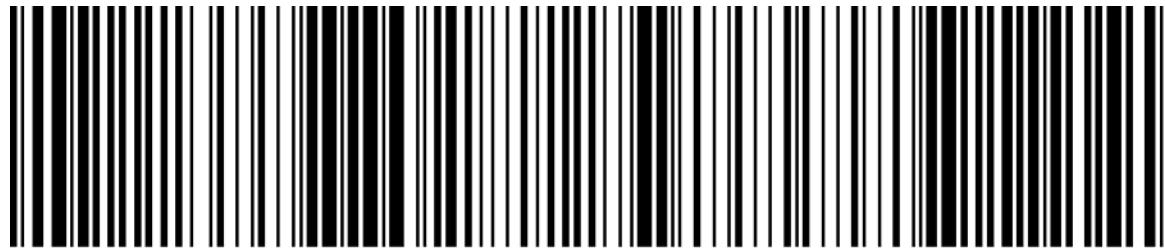


Barcode Symbols Used on Cases



(01) 00614141 99999 6 (10) 012345987650

This GS1-128 barcode encodes the GTIN (Global Trade Item Number), AI (01) and Batch or Lot Number, AI (10), where the Batch/Lot number is numeric digits.



(01) 00614141 99999 6 (13) 090801 (10) ABCDEF012345

This GS1-128 barcode encodes the GTIN (Global Trade Item Number), AI (01), Packaging Date, AI (13) in YYMMDD format, and Batch/Lot Number, AI (10), where the Batch or Lot Number encodes alphanumeric characters.

Printed on adhesive label and applied to case.



Leveraging the Global Trade Item Number



GTIN: 10614140000001



**Product
Master**



**Record and
Store**

- Product
- Location
- Day / Time

**Brand XYZ 12 Pack 32 oz
Canned Tomatoes
Height 18", Width 18",
Depth 24"**



GS1 Produce Industry Moving to GS1 DataBar

- Specific grower / packer / shipper identification
- Specific product identification
- Still carries PLU for those not scanning GS1 DataBar
- Retailers promoting use
 - Walmart*
 - Kroger
 - Winn-Dixie
 - Publix
 - More coming





Food Industry Traceability Initiatives Leveraging GS1 Standards

- Produce Traceability Initiative (PTI)
 - Launched in late 2008 and focusing on case level identification
 - Global Trade Item Number (GTIN)
 - Lot / Batch Number
 - Target completion date of 2012
- Grocery Industry
- Dairy Industry
- Meat, Poultry, Pork Industries
- Foodservice





In Closing ...

- GS1 Standards for product and location identification can provide the building blocks for business processes and information to support traceability
- Manufacturers, Retailers and Solution Providers can leverage these open standards to build systems and solutions to meet individual industry, customer and supply chain needs
- GS1 US and the other GS1 organizations around the world are working to ensure the proper standards are in place to support industry's traceability needs



Questions?





Contact Information:

Stephen Arens
Senior Director
Industry Development
Lawrenceville, NJ
609.620.4511
sarens@gs1us.org

