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GS1 DataBar:
The Future of Retail Product Identification

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Datalogic Mobile

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What We'll Cover

✦ Current product identification standards
  - ✦ UPC/EAN bar codes
  - ✦ Global Trade Item Numbers
  - ✦ Sunrise 2005—global normalization
✦ Limitations that are driving system enhancements
✦ A new barcode, GS1 DataBar, is the solution
  - ✦ Description
  - ✦ Sunrise 2010
✦ GS1 DataBar applications
  - ✦ Packaged goods
  - ✦ Fresh produce
  - ✦ Variable-measure fresh foods
  - ✦ Coupons
✦ Impacts and benefits of change

Supply Chain Standards

✦ Developed by GS1 and GS1 US

   ✦ Formerly named EAN and UCC (Uniform Code Council)

   ✦ GS1 has over 100 Member Organizations, including GS1 US

✦ GS1 Products and Solutions

   ✦ Bar Codes and Identification

   ✦ EPCglobal (RFID)

   ✦ eCom (Electronic Commerce)

   ✦ GDSN (Global Data Synchronization Network)

✦ Each solution relies on universal use of "GTIN"

Supply Chain Bar Code Applications

✦ Item level
- ✦ UPC-A & UPC-E, holds 12 digits
- ✦ EAN-13, holds 13 digits
- ✦ EAN-8, holds 8 digits

UPC-A

✦ Case level
- ✦ ITF-14, holds 14 digits
- ✦ GS1-128, holds up to 48 characters

ITF-14

✦ Pallet level
- ✦ GS1-128, holds up to 48 characters

(GS1-128 was formerly named UCC/EAN-128)

GS1-128

Global Trade Item Numbers

✦ What's a GTIN?

  ✦ World-wide unique identifier of a product

  ✦ The fundamental building block of the GS1 system

  ✦ Encoded in almost every GS1 bar code

"A trade item is any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain."

"Each trade item that is different from another in design and/or content is allocated a unique identification number, which remains the same as long as it is traded."

GTIN Data Structures

✦ Data Structure: A value with defined logical meaning
✦ Data Carrier: A physical encoder of data, e.g. a bar code

Data Structures	Size	Data Carriers	Size
GTIN-12	12	UPC-A	12
		UPC-E	8
GTIN-13	13	EAN-13	13
GTIN-8	8	EAN-8	8
GTIN-14	14	ITF-14	14
		GS1-128	14+
		GS1 DataBar	14
		GS1 DataBar Limited	14-
		GS1 DataBar Expanded	14+

A GS1 DataBar can encode any of the four GTIN data structures

GTIN Representations

- Three Components in Every GTIN
    - Company Prefix (P)—*assigned by GS1 Member Organization*
    - Item Reference Number (I)—*assigned by the company*
    - Check Digit (C)

Position #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
GTIN-8	0	0	0	0	0	0	P	P	P	I	I	I	I	C
GTIN-12	0	0	P	P	P	P	P	P	I	I	I	I	I	C
GTIN-13	0	P	P	P	P	P	P	P	I	I	I	I	I	C
GTIN-14	*P*	P	P	P	P	P	P	P	I	I	I	I	I	C

Application Identifiers

✦ The GS1 system defines over 100 data structures, known as Application Identifiers

  ✦ (01) GTIN: Product identification, encoded on most GS1 bar codes

  ✦ (10) Batch or Lot Number

  ✦ (17) Expiration Date

  ✦ (3202) Net Weight, Pounds

  ✦ (3902) Amount Payable (Price)

✦ The GTIN identifies the product, the others describe attributes of the product

Changes to the System: 2005 Sunrise

- Brings North America into compliance with global GS1 standards
- Allows packages marked with EAN bar codes (for the rest of the world) to be sold in North America

1. Required
   - ✦ Add capability to read and process EAN-13 and EAN-8 labels
2. Required
   - ✦ Accept variable-length Company Prefixes
     (enables continued expansion of the GS1 system)
3. Recommended
   - ✦ Upgrade systems to read and process 14 digit GTIN data *(GS1 DataBar is coming!)*

Variable-Length Company Prefixes

- UPC-A before 1/1/2005:

1	2	3	4	5	6	7	8	9	10	11	12
P	P	P	P	P	P	I	I	I	I	I	C

- UPC-A after 1/1/2005:

1	2	3	4	5	6	7	8	9	10	11	12
P	P	P	P	P	P	P/I	P/I	P/I	P/I	I	C

Store software can no longer assume a fixed-length Company Prefix

Key: P=Company Prefix

I=Item Reference

C=Check Digit

Shortcomings of Current System (1)

- ## Packaged goods (fixed weight)
  - Need a smaller bar code for small packages
  - Less truncation for faster reading
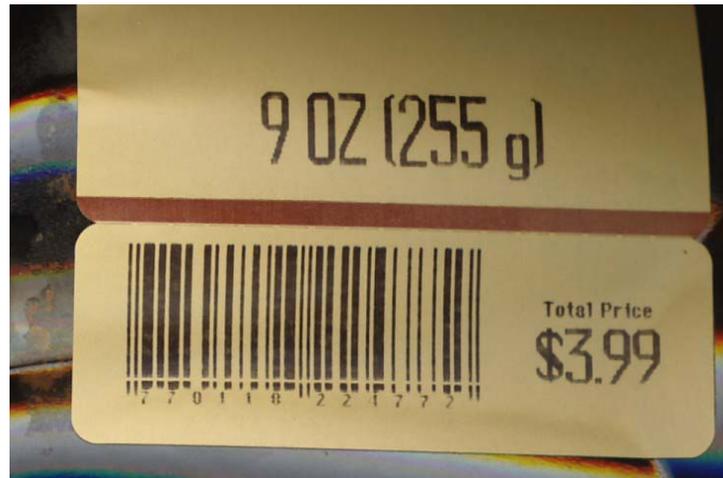 - Less space leaves room for product information

Shortcomings of Current System (2)

- ## Fresh produce
  - No bar code solution today
  - No identification of product source (limits traceability)
  - Limited number of PLU numbers
  - No e-commerce support without GTIN

Shortcomings of Current System (3)

- Variable-measure fresh foods (meat, fish, deli, dairy, etc.)
  - No identification of product source (limits traceability)
  - Limited number of PLU numbers
  - No e-commerce support without GTIN

Shortcomings of Current System (4)

- ## Coupons
  - Can't handle variable-length Company Prefixes
  - Limited number of offer options and value codes
  - No validation at the point of sale

Solution: GS1 DataBar

(This DataBar encodes a GTIN, as indicated by the AI of 01.)

✦ What is it?

- ✦ A new family of bar code symbologies
- ✦ Originally called Reduced Space Symbology (RSS)
- ✦ Seven variations of GS1 DataBar defined to cover all application requirements
    - ✦ Some to make smaller labels
    - ✦ Some to encode more data
- ✦ Supported in many scanners sold since 2001

Seven GS1 DataBar Variations

DataBar Omnidirectional

DataBar Stacked Omnidirectional

DataBar Expanded

Optimized for high-end multi-line POS scanners *(but easy to read on all types of scanners)*

DataBar Expanded Stacked

(The little dots are a separator pattern to help in scanning.)
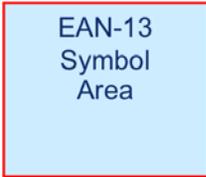
DataBar Truncated

DataBar Stacked

DataBar Limited

Optimized for 1D laser and 2D imager scanners

GS1 DataBar Size Advantage

✦ Same data in half the space of EAN/UPC, or

✦ More data in same space as EAN/UPC

Brief GS1 DataBar History

✦ **Mid 1990's**

   ✦ UCC (now GS1 US) looks for smaller bar codes and bar codes that carry more data

   ✦ AIM Technical Symbology Committee takes up challenge to design a suitable bar code

✦ **October 29, 1999**

   ✦ AIM TSC releases Reduced Space Symbology specification

✦ **2000-2001**

   ✦ Produce and meat committees release application specifications

GS1 DataBar History (continued)

✦ **2001**

  ✦ UCC conducts usability and cost/benefit analysis at Dorothy Lane markets, with positive result

✦ **2004**

  ✦ JICC/UCC coupon committee develops and releases expanded coupon specification

✦ **2006**

  ✦ GS1 DataBar pilots underway at major grocery chains
  ✦ GS1 announces Sunrise 2010 for GS1 DataBar

✦ **2007**

  ✦ GS1 changes symbology name from RSS to GS1 DataBar

Sunrise 2010 Announcement

BRUSSELS, Belgium – June 12, 2006

GS1, a not-for-profit standards organization, today announced a global sunrise date of Jan 1, 2010 for a new bar code called Reduced Space Symbology (RSS).

This marks the first time since the EAN/UPC bar code was adopted that GS1 has endorsed a bar code for global, open (unrestricted) trade item identification.

Today's announcement follows a compelling business case review by a global task force comprising retailers, fast moving consumer goods manufacturers, pharmaceutical companies, GS1 member organizations (MOs), and trade associations.

Sunrise 2010 Mandate

> *"RSS bar codes and GS1 Application Identifiers shall be available in all trade item scanning systems beginning Jan 1, 2010."*

- Beginning January 1, 2010 product manufacturers may ship products with GS1 DataBar codes in place of EAN/UPC codes
- All store and supply chain scanners must be able to read GS1 DataBar
  - Point of sale, inventory, receiving, mobile POS, line busting, self shopping, etc.
- Scanners must properly process Application Identifiers (AIs)
- No other data requirements for Sunrise 2010
  - AI and GTIN-14 storage and processing not required
  - But specific application standards are being adopted that require processing additional AI data

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GS1 Bar Codes Never Die

✦ Sunrise 2005 added EAN-13 and EAN-8

    ✦ UPC-A and UPC-E remain valid for use

✦ Sunrise 2010 is adding GS1 DataBar

    ✦ All the UPC/EAN bar codes remain valid for use

✦ Someday there will be an EPC/RFID Sunrise

    ✦ All the GS1 DataBar and UPC/EAN bar codes will remain in use

> **All of these data carriers encode a GTIN!**

GS1 DataBar Impacts and Benefits

✦ Adoption of GS1 DataBar will both impact and benefit four classes of products

    ✦ Packaged goods

    ✦ Fresh produce

    ✦ Variable-measure fresh foods

    ✦ Coupons

Packaged Goods

✦ **Current status:** Fixed-weight packaged goods is the simplest application for GS1 DataBar – in 2010 manufacturers are permitted to mark packages with GS1 DataBar codes encoding a GTIN-12 or GTIN-13.

✦ **Impact:** Only change is retailers must have scanners and POS systems capable of handling GS1 DataBar.

✦ **Benefits:**

  ✦ Manufacturers may now utilize a smaller bar code to mark smaller packages.

  ✦ Retailers will see fewer packages with truncated out-of-spec EAN/UPC labels, thus improving productivity at the point-of-sale.

Example: Cosmetics

Fresh Produce

✦ **Current status:** Multiple pilots are underway with produce stickers printed with a small GS1 DataBar Stacked Omnidirectional bar code.

✦ **Impact:**

　✦ Produce bar codes will not encode current PLU number but encode a GTIN.

　✦ Every grower/packer/supplier will have to obtain a GS1 Company Prefix.

　✦ Different suppliers that provide the same produce item will have different GTINs, even though the PLU number for the two produce items would be the same.

　✦ Using the GS1 DataBar produce labels will add to the number of distinct products in the retailer's system.

Example: Produce

Fresh Produce (continued)

✦ **Benefits:**

- ✦ Produce sales will be very accurately tracked.

- ✦ No shrinkage due to incorrectly identified produce, due to products that look similar, especially **organic** produce.

- ✦ Current inventory will be more accurately measured.

- ✦ Recalls limited to specific suppliers will be more practical.

- ✦ Self-checkout will be more productive and accurate by scanning bar codes, rather than looking up and entering PLU numbers.

Example: Produce Labels

Variable-Measure Fresh Foods

✦ **Current status:** GS1 and several industry associations are promoting use of GS1 DataBar across all categories of fresh foods – meat, poultry, fish, deli, bakery, dairy, etc. A few pilots are underway using GS1 DataBar Expanded labels typically encoding the supplier's GTIN, weight, price, lot number, and sell-by date.

✦ **Impacts:**

✦ Changes will be required to a store's application software to deal with a different format for item identification and price.

✦ POS software changes will be required to take advantage of new information encoded in the GS1 DataBar, such as sell-by date and lot number.

Example: Meat

Variable-Measure Fresh Foods (continued)

✦ **Benefits:**

  ✦ Migration to GTIN-based identification will allow an unlimited number of products to be uniquely identified.

  ✦ GTINs unambiguously identify the source of the product, greatly enhancing traceability.

  ✦ Automated checking of sell-by dates prevents sale of outdated products.

  ✦ Very accurate data will be available for category management and shrink control.

  ✦ Adoption of GTIN for fresh foods identification will enable fresh foods to be managed in electronic commerce and data synchronization systems.

Example: Meat

Coupons

✦ **Current status:** The first "interim" phase of new coupons started January 1, 2008. Interim coupons include both the current UPC-A bar code and a new GS1 DataBar Expanded code. The UPC-A bar code is scheduled to be dropped on January 1, 2010.

✦ **Impacts:**

  ✦ By 2010 retailers will have to upgrade their coupon processing software to handle a different and expanded format of the information that appears on today's coupons.

Examples: Old Coupon, Interim Coupon, Final Coupon

| *UPC-A & GS1-128*
up to 2008 | *UPC-A & GS1 DataBar Expanded*
2008 & 2009 | *GS1 DataBar Expanded Only*
2010 onwards |

Coupons (continued)

✦ **Benefits:**

 ✦ New coupons encode the entire Company Prefix (enabling reliable identification of the issuer).

 ✦ New coupons vastly expand the number of purchase requirements and cents off combinations from the current limitation of only 100.

 ✦ New coupons allow detailed specification of offer requirements involving up to three product purchases.

 ✦ New coupons facilitate complete validation of the coupon at the point-of-sale (rarely done today).

Example: Interim Coupon

Points to Remember

- Current retail product identification systems are outdated
- GS1 DataBar is a mature technology that can meet the new requirements
- The industry is lining up in support of GS1 DataBar
- Applications standards are being developed for
  - Packaged goods – starting in 2010
  - Fresh produce – in pilot test
  - Variable measure fresh foods – in pilot test
  - Coupons – interim phase today, final phase in 2010
- It's time to plan and budget for store system hardware and software upgrades

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For more information:

http://www.gs1.org/productssolutions/barcodes/databar

Thank You!

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