



The Global Language of Business

Apparel & General Merchandise

Encoding Your RFID Tags or Labels

RFID Journal Live!

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Agenda



- About GS1 US
- The Electronic Product Code (EPC)
- EPC Components and Encoding
- Serialization Strategies
- Resources

Our Purpose



At GS1, we believe in the power of standards to transform the way we work and live.

We create a common foundation for business by uniquely identifying, accurately capturing, and automatically sharing vital information about products, locations, and assets.

We enable visibility through the exchange of authentic data.

We empower business to grow and to improve efficiency, safety, security, and sustainability.



Who We Are



GS1 is...

- Neutral and not-for-profit
- User-driven and governed
- Global and local
- Inclusive and collaborative

**We bring
communities
together.**

What We Do



**We are in
the business
of progress.**

**GS1 brings industry leaders
together to revolutionize
the way they do business:**

- Envision the future
- Solve an industry problem
- Engage their communities
- Exemplify best practices

Why We Do It



GS1 helps companies of all kinds do business better:

- Access GS1 Standards
- Use services and tools
- Get education and training
- Connect with trading partners and peers

**Our role is to
advance our
system of
standards for
everyone.**

Global Reach



110+

Member Organizations
Serving Business
Around the World

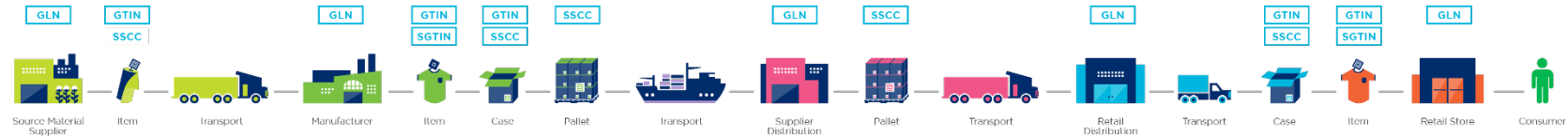


GS1 Standards



Identify: GS1 Identification Numbers

GLN Global Location Number **GTIN**[®] Global Trade Item Number[®] **SSCC** Serial Shipping Container Code **EPC**[®]/**SGTIN** Serialized Global Trade Item Number



Capture: GS1 Data Carriers

Barcodes



EPC-Enabled RFID Tags



Share: GS1 Data Exchange

Master Data Global Data Synchronization Network™ (GDSN[®])

Transactional Data Electronic Data Interchange (EDI)

Physical Event Data EPC Information Services (EPCIS)



The Global Language of Business

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The Electronic Product Code (EPC)

Constructing an Electronic Product Code (EPC)



- Option 1: Service Bureau
 - They will provide fully encoded labels for your products.
- Option 2: Do it yourself
 - Buy your own RFID labels and use an RFID printer to encode your own serialized data.



GS1 Identification Keys

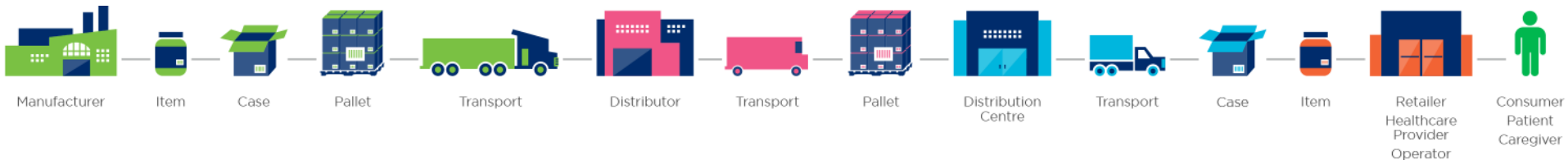


A core requirement for nearly every use case is knowing exactly what is being referred to.

GS1 Identification Keys provide globally unique, persistent identification to represent products, locations, logistic units, documents, assets and more.

These keys play a critical role in a wide variety of business scenarios.

The identification of everything makes anything possible.



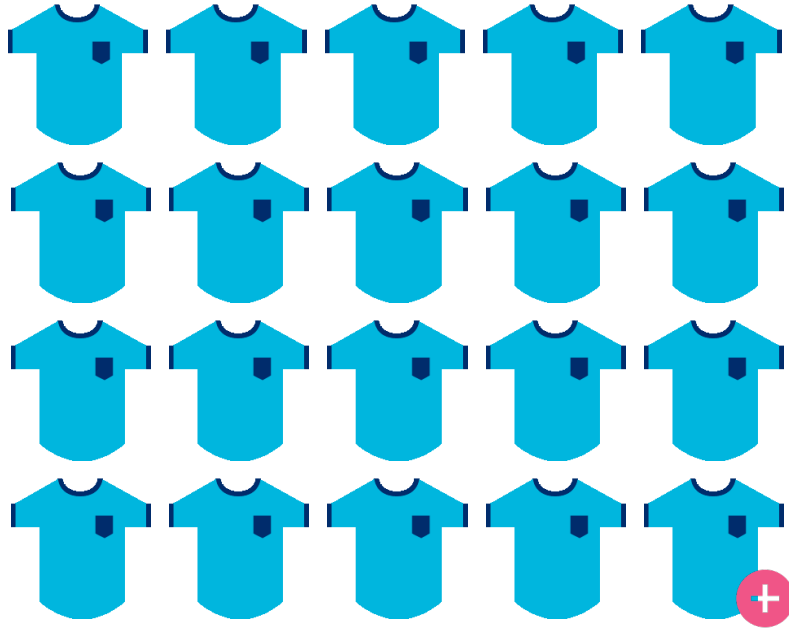
What is a GTIN?



- **A Global Trade Item Number** is the GS1 Identification Key used to identify products.
 - U.P.C. is also known as a *GTIN-12*
 - Created from a GS1 Company Prefix or individually licensed
- **Serialized GTIN (SGTIN)**: identifies a specific product instance



The Power of Individual Identity



Sample GS1 Company Prefix Certificate



**GS1
Company
Prefix**



The Global Language of Business

GS1 Company Prefix Certificate

Issued and Registered to:
GS1 US, INC.
"Company"

GS1 Company Prefix: 0614141 Original Issue Date: 6/25/1996

For use in creating GS1 Identification Numbers

Global Trade Item Number® (GTIN®)	Global Document Type Identifier (GDTI)	Global Returnable Asset Identifier (GRAI)
Serial Shipping Container Code (SSCC)	Global Service Relation Number (GSRN)	Global Identification Number for Consignment (GINC)
Global Location Number (GLN)	Global Individual Asset Identifier (GIAI)	Global Shipment Identification Number (GSIN)

U.P.C. Company Prefix: 614141

For use when creating U.P.C. barcodes

Legal Entity Global Location Number (GLN): 0614141000005

Account Number: 01157888


Bob Carpenter
President and CEO, GS1 US

The GS1 Company Prefix and the corresponding U.P.C. Company Prefix ("the Prefixes") are licensed for the sole and exclusive use of the licensee and are restricted to the number to whom they are licensed. Only one company may use the Prefixes. Any other use of the Prefixes is prohibited, including but not limited to renting, leasing or subdividing all or portion of the Prefixes. Upon the sale of a company, division, or product line, Licensee shall forward a letter signed by both parties to the transaction or a copy of the legal agreement to evidence that the Prefixes were part of such sale before GS1 US may, in its sole discretion, change its official registration for any Prefixes involved in the sale.

**U.P.C.
Company
Prefix**

Looking Up Company Information



- GS1 provided utility, Global Electronic Party Information Registry (GEPIR), to look up company information given a GTIN
- This includes the GS1 Company Prefix (7-digit length in this example)

Search by GTIN

Global Trade Item Number

00614141999996

Request Trade Item

Ownership

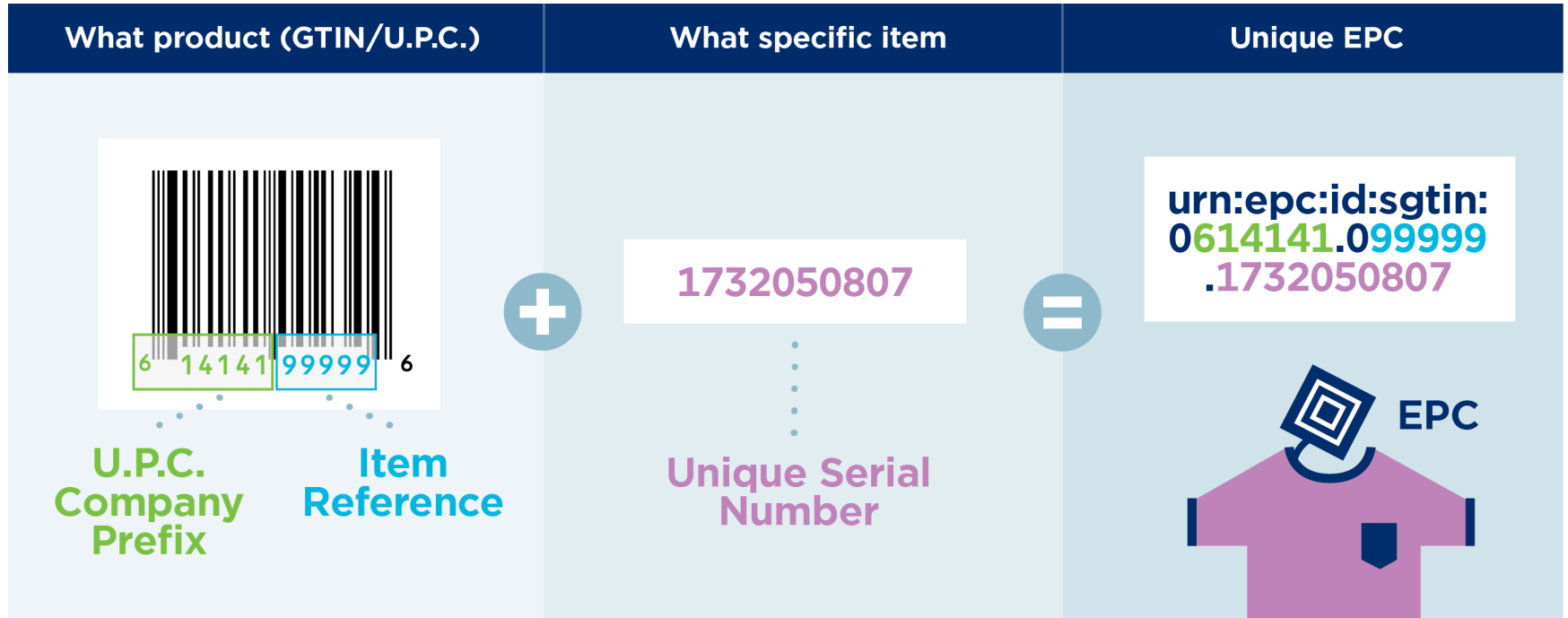
Search

Key Licensee GLN	Co. Name	City	State	Province
0614141000005	GS1 US, INC.	DAYTON	OH	--
GS1 Company Prefix	0614141			
Last Change Date	Oct. 18, 2014			
Return Code	Query Successful [RC-0]			
Requested Key				
Code	GTIN			
Value	00614141999996			
GS1 Company Prefix Licensee				
Party Name	GS1 US, INC.			
GLN	0614141000005			
GS1 Key Licensee				
Party Name	GS1 US, INC.			

GTIN Lookup (GEPIR): www.gs1us.org/tools/gs1-company-database-gepir



Translating a U.P.C. to an EPC



Constructing an Electronic Product Code (EPC)



To construct an EPC you'll need:

- AI (01) GTIN: U.P.C. converted to 14-digit format (padded leading zeros)
- AI (21) Serial number
- GS1 Company Prefix length

Show an Example Clear

GS1 Key or other identifier — as used in bar codes
GTIN + serial (AI 01 + AI 21) (01) 00614141999996 (21) 1732050807

GS1 Company Prefix Length 7 digits

EPC Pure Identity URI (urn:epc:id:...) — as used in EPCIS
urn:epc:id:sgtin:0614141.099999.1732050807

RFID Control Information
Tag Size 96 bits Filter Value 1 - POS item

EPC Tag URI (urn:epc:tag:...) — as used in RFID middleware
urn:epc:tag:sgtin-96:1.0614141.099999.1732050807

RFID Tag EPC Memory Bank Contents (hexadecimal) — starting at bit 20h
3034257BF461A7C0673CFF77

EPC Encoder/Decoder: <https://www.gs1.org/services/epc-encoderdecoder>

SGTIN-96 Binary Example



Binary
0011 0000 0011 0100 0010 0101 0111 1011 1111 0100 0110 0001 1010 0111 1100 0000 0110 0111 0011 1100 1111 1111 0111 0111

Hexadecimal
3 0 3 4 2 5 7 B F 4 6 1 A 7 C 0 6 7 3 C F F 7 7

Serialization



- The value of serialization
- Item-level serialization requirement
- The holder of the GS1 Company Prefix is responsible for encoding
- Various approaches
 - Centralized serial management
 - Distributed serial management
 - Chip-based serialization
 - Service bureau
- Private label / Private Brand Requirements
- Orientation document: <http://www.gs1us.org/serialization-plan>

Tag Marking



- RFID tags should have the EPC symbol printed on them.
- The EPC symbol should ONLY be placed on an item that has an RFID tag.
- The EPC symbol should be visible when viewing the U.P.C.



EPC Logo and guidelines for consumer products: <https://www.gs1.org/standards/rfid/guidelines>

3 Steps to RFID Success



You've Been Asked to Tag Your Products with EPC-Enabled RFID Tags - Now What?

Resources to help you get started!

- FAQs
- Checklists
- Guidelines
- Case Studies
- Video Series

How Do I Get
Started With
RFID Tagging?



<https://site.gs1us.org/RFID-success.html>

Resources



Orientation Resources:

- RFID Business Overview <https://site.gs1us.org/rfid>
- Supplier tagging orientation (video series) <https://site.gs1us.org/RFID-success.html>
- Serialization overview <http://www.gs1us.org/serialization-plan>
- Look up company information using a GTIN www.gs1us.org/tools/gtin-company-database-gepir
- GS1 US EPC Tag Placement Guideline www.gs1us.org/documents?Command=Core_Download&EntryId=429
- Consumer FAQ <https://www.gs1us.org/upcs-barcodes-prefixes/additional-ways-to-identify-products/epc-rfid/consumer-faq>

Technical Resources:

- Create SGTINs with the EPC Decoder / Encoder Tool www.gs1us.org/tools/epc-encoder-decoder
- Technical worksheet to translate a U.P.C. to a GTIN to an SGTIN to an EPC www.gs1us.org/documents?Command=Core_Download&EntryId=389
- GS1 Tag Data Standard <https://www.gs1.org/standards/epcrfid-epcis-id-keys/epc-rfid-tds/1-13>
- GS1 General Specifications https://www.gs1.org/docs/barcodes/GS1_General_Specifications.pdf

Common Encoding Errors



- Invalid GTIN
- Incorrect GS1 Company Prefix length
- Duplicate Serial Numbers
- ...

Thank you!

Contact Information



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