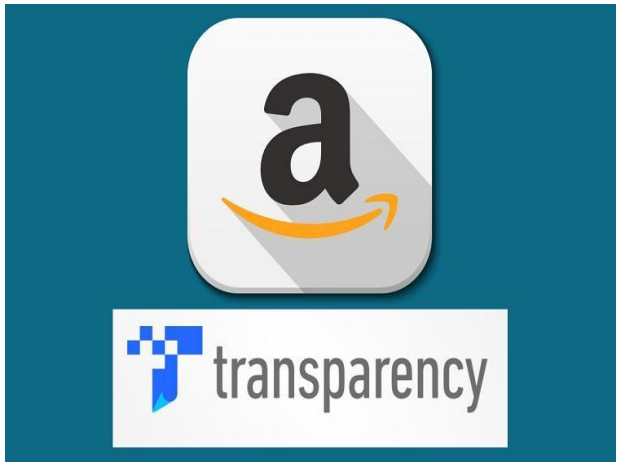
Intelligent Packaging Industry Compliance

Company Confidential

September 12, 2025

Intelligent Packaging Standards and Processes



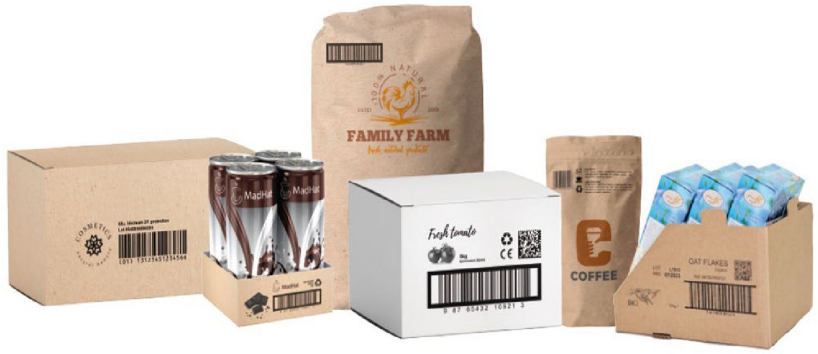
Target Applications and Workflows

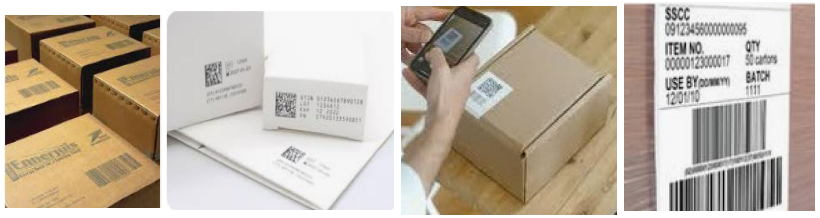
Intelligent Packaging

printing

Secondary Packaging

1D/2D barcodes, graphics, and human readable content





Late-Stage Packaging

Direct label printing and custom image

Array Technologies Intelligent Solutions For the Packaging Industry

- When it comes to printing labels, bar codes, human readable characters, variable or static images or custom applications, Array Technologies provides the engineering, products, and solutions to meet the needs of the **“Intelligent”** packaging industry.

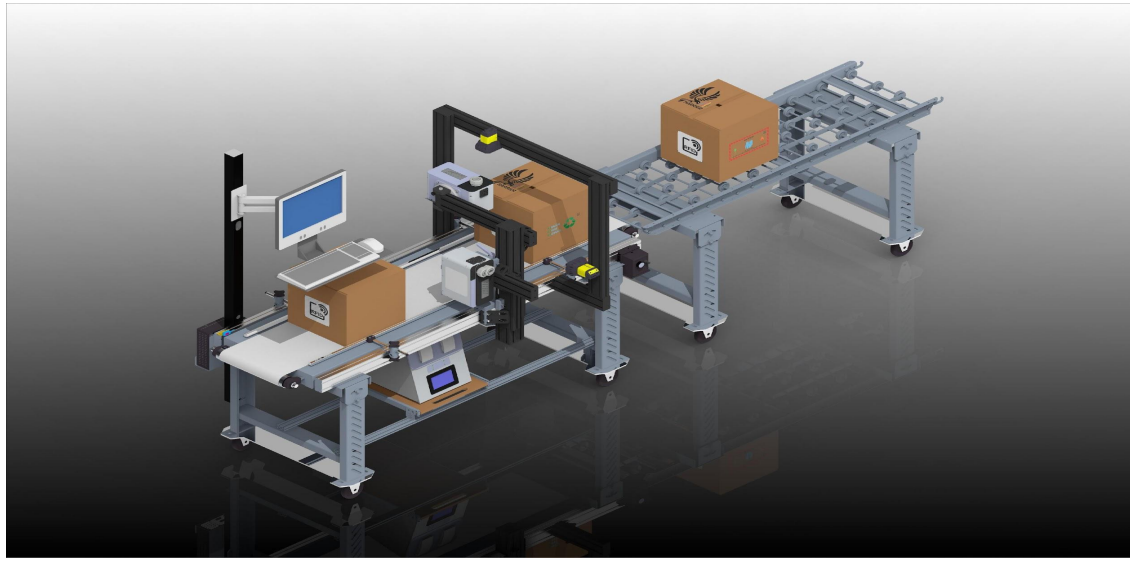
- Array Technologies can implement GS1 compliant solutions on existing systems deployed in the field or can partner with OEMs on new equipment designs and installations. **Examples of engagements include the Amazon Transparency program.**

- Whether your packaging needs are intelligent or simple, Array Technologies has a proven solution for your business.

Array Technologies Intelligent Solutions For the Packaging Industry

Array Technologies provides the intelligence and the solutions for the implementation of the GS1 data capture compliance industry standards. Array Technologies leverages Bar Code reading and RFID Tags as an integral part of the compliance process. Elements include:

- **Reading an intelligent bar code**
- **Reading and writing the applied intelligent RFID tag**
- **Tracking the package**
- **Providing a data file look-up capability**
- **Printing unique images and content**
- **Verification**
- **Logging and storing and transferring data**



***Solutions are also compatible with BLE and wiliot workflows**

GS1 Barcode (2027 Compliance)

What are the GS1 barcode standards:

They are used in both the physical and digital worlds, GS1 identification numbers uniquely distinguish products, logistic units, locations, assets, documents, and relationships across the supply chain (from the manufacturer to the consumer)

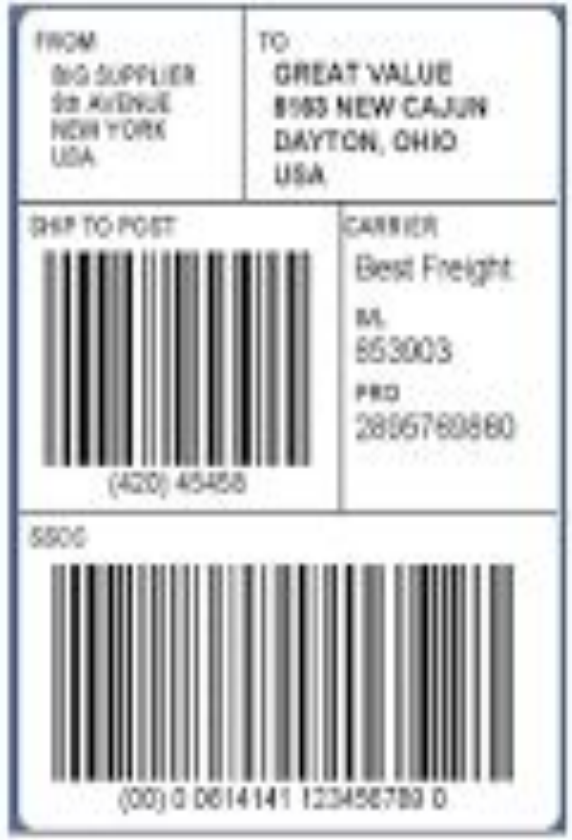
What is the GS1 general specification:

The GS1 General Specifications is the foundational GS1 standard which defines how identification keys, data attributes and barcodes must be used in business applications. Each year, the specifications are updated* to ensure they continue to meet evolving industry needs and changes to regulations.

What are the requirements for GS1-128 barcodes:

The components of a GS1-128 barcode

- Left Quiet Zone.
- The double character start pattern: A start character (A, B, or C) The Function 1 Symbol Character (FNC1)
- Data (including the GS1 Application Identifier represented in character set A, B, or C).
- A symbol check character.
- The stop character.
- Right Quiet Zone.



GS1 Barcode (2027 Compliance)

Linear Barcodes:

- Linear barcodes, like the U.P.C. code commonly found on consumer goods, use a series of variable-width lines and spaces to encode data, including the GTIN for product identification.
  - UPC/EAN: Instantly recognizable 1D barcodes used in retail all over the world
  - GS1 DataBar: Can hold additional product attributes such as the weight of fresh foods
  - GS1-128 and ITF-14: Versatile barcodes often used in a distribution environment

Two-dimensional (2D) barcodes:

- 2D barcodes use patterns of squares, hexagons, dots and other shapes to encode data. Because the data is encoded in a two-dimensional pattern, 2D barcodes can hold more data than 1D barcodes while still appearing physically smaller.

GS1 Barcode (2027 Compliance)

- Barcodes are symbols that can be scanned electronically using laser or image-based technology.

- They are used to encode information such as key identifiers (product, shipment, location, etc.) and key attributes (serial numbers, batch/lot numbers, dates, etc.) via GS1 syntaxes (plain, GS1 element string and GS1 Digital Link URI).

- Barcodes play a key role in supply chains, enabling parties like retailers, manufacturers, transport providers and hospitals to automatically identify and track products as they move through the supply chain.

- GS1 utilizes several types of barcodes to satisfy different business requirements.

BLE (Bluetooth Low Energy) Process

The Bluetooth Low Energy **(BLE)** process involves a peripheral device broadcasting advertising packets, which a central device scans for to establish a connection.

Once connected, the devices can discover services and characteristics on the peripheral using a GATT server, and then exchange data through read, write, or notify operations to conserve power.

RFID (Radio Frequency Identification)

RFID (Radio Frequency Identification) is a wireless technology that uses radio waves to identify and track people or objects without requiring a direct line of sight. It consists of:

- Tags embedded with an antenna and transponder that store data
- Reader with an antenna and transceiver that activates the tag and reads the transmitted data.

Applications include:

- Inventory Management (tracking inventory)
- Asset Tracking (locating and monitoring assets)
- Supply Chain Management (visibility and accuracy in logistics and shipments

Wiliot Intelligence Platform

Wiliot connects physical items to the cloud using battery-free IoT sensors, simple network infrastructure, and AI-driven services. This transforms raw data into actionable insights for smarter, more efficient operations.

- **Inventory Intelligence**
- **Workflow Optimization**
- **Condition Monitoring**

Wiliot Intelligence Platform

IoT pixels (Bluetooth sensors)

Low-cost, battery-free Bluetooth sensors attach to items and harvest energy from ambient radio signals to transmit data

- **Location,**
- **Temperature**
- **Movement**

Network Infrastructure

Off-the-shelf bridges and gateways (hubs), which are quick to deploy, recognize IoT Pixels using radio signals, receive their data, and forward it securely to the Wiliot Cloud.

Wiliot Intelligence Platform

Wiliot Cloud

The Wiliot Cloud is where raw sensing data is transformed into smart decisions and where our agents and specialized AI models live. Providing:

- **Alerts**
- **Analytics**
- **Dashboards**

Amazon Transparency

Amazon Transparency is a product serialization service and anti-counterfeiting program that helps brands prevent the sale of counterfeit items by applying unique codes to individual product units.

- Brands enroll their products, then apply unique Transparency codes to each item's packaging, which customers can scan using the Amazon shopping app to verify authenticity and access additional product information.
- This process helps build customer trust, protects brand reputation, and provides brands with valuable insights into their supply chain.

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