



**BAR CODE
GRAPHICS**

Why Pre-Deployment Testing is Critical for GS1 Digital Link QR Code Success





Executive Summary

The retail industry faces a transformational shift. As part of the Sunrise 2027 initiative, GS1 requires that 2D barcodes—specifically QR codes using the GS1 Digital Link standard—be accepted at point-of-sale globally. This represents a fundamental change from the linear 1D UPC and EAN barcodes that have dominated product identification for decades.

GS1 Digital Link enables a single 2D barcode to serve both supply chain and consumer engagement purposes, connecting a product's Global Trade Item Number (GTIN) to a structured web URL that powers traceability, safety, and omnichannel experiences. The opportunity for brands and retailers is immense—but so are the risks.

Many companies believe they're prepared simply because their packaging includes QR codes. However, most existing QR codes are not GS1 Digital Link compliant. These codes may function for marketing purposes but lack the formatting, data syntax, and resolver logic required for retail point-of-sale systems.

Without proper testing and certification, brands face significant risks:



Failed or
duplicate scans
at POS



Retailer
rejections and
chargebacks



Broken digital
experiences for
consumers



Costly relabeling
or repackaging
post-launch

This white paper outlines why **pre-deployment testing is essential** and highlights common compliance issues that proper certification can prevent.

"The 2D barcode is going to be multipurpose—not just for the consumer, but for POS, for regulators, and for the supply chain and that requires collaboration, standardization, and testing."

Steve Keedie GS1 Global Office

Understanding GS1 Digital Link and Critical Implementation Requirements



GS1 Digital Link transforms the Global Trade Item Number (GTIN) into a structured, scannable web URL. Unlike legacy UPCs that simply identify products at checkout, GS1 Digital Link embeds the GTIN into a web address that can include additional data attributes like batch numbers, expiration dates, or serial numbers.

Steven Keedie of GS1 Global Office emphasized the complexity of this transition at GS1 Connect 2025: "With the UPC, we had 30 years to get it straight. Now we're living in a dual-barcode world. The 2D barcode is going to be multi-purpose—not just for the consumer, but for POS, for regulators, and for the supply chain. And that requires collaboration, standardization, and testing."

The Critical 50mm Rule

During the transitional period, packages must display both traditional UPC/EAN barcodes and GS1 Digital Link QR codes. These symbols must be positioned within 50mm to prevent double-scanning errors that disrupt checkout processes.



During the GS1 Connect 2025 conference, Chuck Lasley from Dillard's warned: "If you have too much separation between the 1D and 2D barcodes, you may capture them as two separate items and essentially double ring that item." Wegmans' Paul Wawrzyniak reinforced this at another session: "It's less than milliseconds that a scanner picks up the code. If they're far apart, your cashiers won't catch the 2D. Be sensitive to the 50 millimeter rule."



The Myth of "We Already Have a QR Code"

Major CPG manufacturers may incorrectly believe they are already ahead of the curve—simply because their packaging includes a QR code. The reality is that most existing QR codes on packaging are not GS1 Digital Link compliant. They typically contain only a marketing URL (e.g., <https://brand.com/product>) and do not encode the product's GTIN in a structured, standards-based format. They may scan successfully with a smartphone, but they lack the formatting, data syntax, and resolver logic required to work with retail point-of-sale (POS) systems. Product design with a marketing QR code must be revised to reduce confusion at point-of-sale and prevent scanning issues.

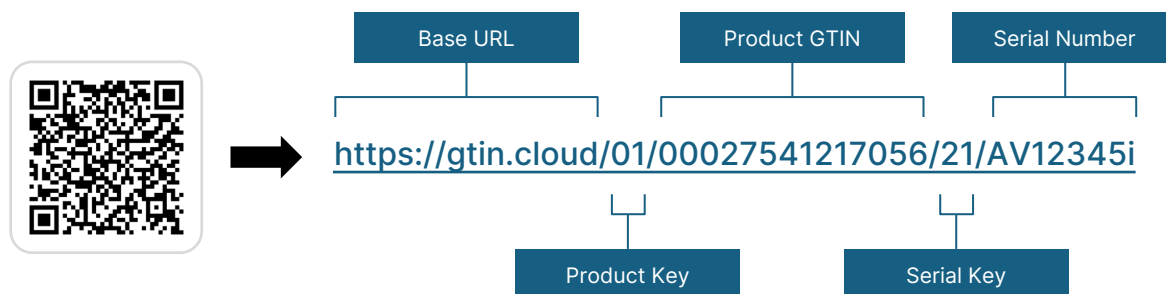
The SmartLabel initiative, widely adopted by CPG manufacturers, represents a perfect example of this opportunity. For years, SmartLabel QR codes have successfully directed consumers to expanded product information templates. Now these existing QR codes can be restructured to comply with GS1 Digital Link standards, enabling them to serve both consumer engagement and retail POS functionality when properly implemented.





There Is More to a GS1 Digital Link QR Code Than Meets the Eye

GS1 Digital Link is not just a way to point to a webpage—it is a global standard for embedding critical product data within a scannable, machine-readable URL. This structured approach includes the GTIN in a defined URL path using Application Identifiers, optional attributes like batch/lot numbers, expiration dates, or serial numbers, and a resolver-based URL structure that enables future flexibility and multi-domain redirection.



QR codes that do not follow this precise structure may appear to function when scanned by consumers but fail to register at checkout, encode GTINs incorrectly (missing leading zeros, wrong length, or embedded as query parameters), or lead to static URLs that cannot support Digital Product Passports, traceability, or dynamic mobile experiences. This disconnect creates a false sense of compliance—products may seem ready for the 2D barcode future when they actually risk retailer rejection or point-of-sale failures.



The Case for Certification and Pre-Deployment Testing

With solution providers racing to address Sunrise 2027, there's widespread use of "GS1 Digital Link certified" claims. However, no GS1 office currently provides certification accreditation—only solution-partner membership. Proper syntax in a digital link URL builder represents just one component of true compliance.

Comprehensive Validation Process

Proper GS1 Digital Link certification validates:

01

Standards Compliance

GTIN formatting with proper Application Identifier usage, URL structure following GS1 syntax rules, and resolver functionality for dynamic redirection

02

Retail Compatibility

POS scanner readability across different retail environments and backend system integration

03

Product Identification Serialization

Different retailers may require detailed traceability through serialization while others may only require valid GTIN encodation. This requirement can vary among retailers and product categories.

04

Quality Assurance

Print contrast, quiet zone specifications, x-dimension requirements, and ISO/IEC symbol grading to minimum GS1 guidelines

05

User Experience

Mobile-optimized landing pages that match the GTIN/product and load reliably. In addition, retailers may want to be assured of limited "Buy Now" functionality on directed product web pages.

Certification provides peace of mind for suppliers ensuring retail performance, retailers reducing operational risk, packaging teams confident in complex standard implementation, and IT teams with documented proof of validated data structure.

Bar Code Graphics' Proven Expertise for GS1 Digital Link Compliance

Companies preparing for the complex transition to GS1 Digital Link and Sunrise 2027 are discovering they lack internal tools and expertise to fully validate suppliers' 2D barcodes. With over 40 years of leadership in barcode creation, compliance, and print quality testing, Bar Code Graphics offers the most comprehensive GS1 Digital Link Barcode Certification and Testing Service, serving both suppliers and retailers.

Unbiased 3rd Party Barcode Print Testing Laboratory

Identification Labs is the testing division of Bar Code Graphics and provides standardized print quality evaluations based on the applicable ISO and GS1 standards. Our company only utilizes GS1 certified verification equipment and does not have a conflict of interest in providing equipment or software sales.

Unmatched Experience in Barcode Certification Administration

Our first retailer program was launched in 1997 with Sears, and over the past few decades we have worked with over 20 retailer brands as their testing resource. Other industries, outside of retail, have relied on our services for 2D compliance across all trading partners.

Comprehensive Testing Service

Our structured certification process provides end-to-end validation including technical compliance verification, dual symbol positioning analysis, retail compatibility testing, print quality assessment, and mobile experience review. We specifically test for proper placement of both linear UPC/EAN and QR codes to prevent double-scanning issues that can disrupt checkout processes.

Retailer-Ready Certification Through Personalized Testing Portals

We provide comprehensive compliance reports and certification letters that suppliers can present to retail partners as proof that 2D barcodes meet GS1 Digital Link standards, helping avoid downstream scanning issues and launch delays. Customized retailer portals are created to address company-specific elements of compliance. Retailer supplier compliance and onboarding teams can have unique views and reports to foster better trading partner relationships with suppliers.

Why Choose Bar Code Graphics

01

Over 40 years of barcode standards expertise

02

Largest North American testing organization for POS and logistics barcodes

03

Leading resource for GS1-compliant barcode implementation in the U.S.

04

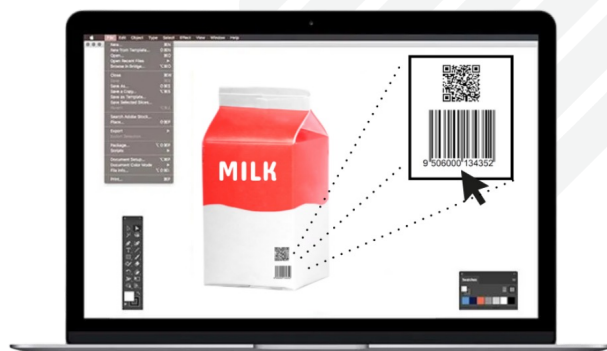
Independent and unbiased standards-focused verification



Conclusion

The transition to GS1 Digital Link represents a generational change in product identification, scanning, and consumer experience across retail ecosystems. It offers enormous potential for seamless checkout, traceability, dynamic digital engagement, and regulatory transparency. But this potential can only be realized through correct implementation—starting with comprehensive testing.

Pre-deployment testing and certification are essential investments that protect against costly failures and ensure smooth retail integration. Bar Code Graphics provides the industry's most robust GS1 Digital Link testing service, helping suppliers ensure accuracy, protecting retailers from disruptions, and preparing both for a confident transition to the 2D barcode future.





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Please direct all inquiries to sales@barcode.graphics to discuss how pre-deployment certification strategies can apply to your specific implementation needs and explore tailored solutions for your organization.