

Whitepaper GS1 2D-Codes in Retail Industries, Digital-Link

written by Michael Czerny, 02.11.2023

Introduction

In order to better control and manage the flow of goods in the retail sector throughout the entire life cycle, more data is to be packed into a code. This future solution means that the currently common EAN/UPC barcode can be replaced by a more potent GS1 2D code. The GS1 Digital Link Standard additionally enables GS1 identification numbers, such as GTINs, to be linked to the Web. A single link can now provide different information about a physical unit (2D code) that is accessible to consumers and all supply chain and retail partners. The linked information can be customized, even individualized, at any time. This opens up many new possibilities to extend or even personalize the static information on the physical unit online.



Quelle: <https://www.gs1-germany.de/gs1-standards/datenaustausch/gs1-digital-link/>

Existing GS1 identification numbers retain their validity and are embedded in a standard-compliant URL. A migration to GS1 Digital Link can basically be carried out without any far-reaching changes to existing data systems and processes, although the application of the 2D codes partly requires adjustments to the coding systems and their integration.

This whitepaper shows how QualiVision supports manufacturers and machine builders in their transformation.

QualiVision - Expert in printing and inspection processes

QualiVision is a leading provider of printing and inspection technology, with a focus on the packaging and product labelling sector. The QualiReader PI solutions installed worldwide are characterized by simple and flexible machine integration and full print inspection. A widely used Level3 interface is available for vertical networking (Level3/ MES, ERP, Label Management System, ...). The quality control camera is usually taught automatically from digital print reference. Production reliability is thus raised to a new level, saving time and money.



A Baumer Company

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QualiVision sees itself as a solution and software specialist in data and image processing and not as a labelling system manufacturer. We cooperate with various partners such as producers, printer manufacturers, labellers and machine builders. Based on decades of experience with well over several thousand installations, we have gained deep insight and expertise with our partners in diverse processes and industries such as pharma, medtech and food.



2D-Codes – new requirements for the marking system!

Continuous inkjet printers (CIJ) are often used on today's production lines. They allow marking of various materials and products with uneven surfaces or unstable products (changing distance between print head and product). Further, there are a variety of certified non-toxic inks. The 2D code poses challenges to this printing process, because the 2D codes (GS1 data matrix, GS1 QR or stacked codes) must be printed in sufficient quality. This means that with the changeover to 2D codes, the marking system and thus also the integration and re-qualification of the process often have to be reconsidered. In inline printing, laser, TTO, TIJ or similar high-resolution marking systems are then often preferred.

New marking system - new challenges!

The changeover of the marking system is accompanied by any new requirements, e.g.:

- Transport: At the very least, adequate, "jerk-free" transport must be ensured along the printing route. Otherwise, the quality of the code is reduced to the point of illegibility (keyword: decodability).
- Lines/machine integration: integration level (offline vs. inline), speed (without serious reduction in print resolution) and hygiene requirements (contamination) are key issues with regard to selection.
- Product guidance: The distance between the product and marking system must be more stable. Additional structural measures may be necessary to ensure the required distance between the printing surface and the marking system.
- Print data supply: Depending on the application, there is more data to integrate in the code, so vertical integration makes sense. Networking allows accurate logging of the process. Furthermore, the use of a label management system (LMS) allows print layouts to be managed centrally. The single source of truth approach (see [QualiReader PI mit Nicelabel](#)) reduces the risks of mislabelling and reduces the data maintenance effort.



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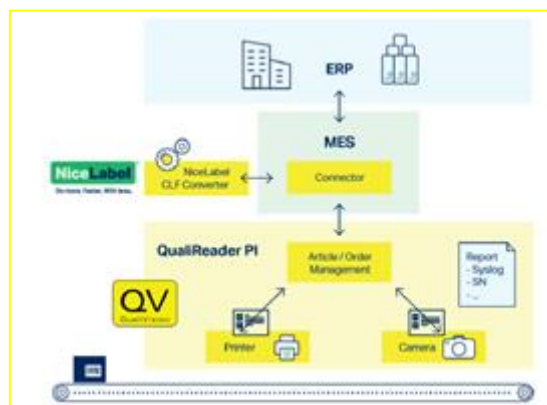
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- **Controls:** New printing systems make it possible to print additional information (ingredients, dosage, etc.) in plain text in addition to the code. This data, some of which is critical, can be checked using a camera system.
- **Environmental conditions:** Environmental conditions such as humidity, temperature, surface tension, material as well as its composition have an influence on the selection of the marking system and thus on the physical stability of the code.
- **Ink:** The ink and its formulation may in itself or in combination with the packaging level (primary, secondary; tertiary packaging) and the aggregate state of the product to be packaged lead to limitations or exclusion of the printing system.

What next - what can QualiVision do?

QualiVision is one of the leading providers in the field of automation of printing and inspection solutions as well as vertical integration. With our independence from marking systems, we have developed into an innovative, agile, highly qualified partner in the field of automated manufacturing over the decades with challenging projects and a wide variety of customer requirements. We support you in the following areas:

- Assistance with the evaluation of printing and inspection technology
- Clarification and definition of data flow and process optimization (e.g. simplifications of in-process controls)
- Integration clarification of the QualiReader-PI or I solution in machine/conveyor technology
- Customer adaptation of the standard QualiReader PI or I solution.
- General quality assurance with camera
- Complete printing and inspection solution for machine builders and end customers: Typically, we control the printers, supply the inspection system including process integration.
- Services for installations and integration as well as training and service
- Vertical IT integration incl. special software development
Label Management Solutions with the Single-Source-Of-Truth Approach





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As an SME, we live and strive for partnerships! We feel at home in the cooperation with producers as well as specialists in mechanical engineering, printing as well as labelling solutions. Please contact us!



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