

# GS1 DataMatrix for variable measure items at POS

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Suppliers selling variable measure products at retail POS in Belgium & Luxembourg often identify their products as follows:

- Products labelled/packed by **supplier**: GS1 Belgium & Luxembourg assigns a 'national article number' (starting with 295, 296 or 28) that is then, together with the price or net weight, encoded in the POS barcode EAN-13.
- Products labelled/packed by **retailer**: the retailer uses an internal number starting with a 02 or between 20-27, which is also encoded in an EAN-13.



These are national or internal numbers that hinder traceability, product safety, and efficient international data exchange (e.g. via the GDSN data pool or GS1 Registry Platform), as well as e-commerce. Suppliers need to request different numbers in each country they supply. This creates an administrative burden resulting in inefficiency in the supply chain.

As GS1 we aim to improve efficiency for our members, and we would therefore like to step away from internal or national identification systems, and migrate to a global identification system using a GTIN (Global Trade Item Number). The ultimate goal is to use **1 GTIN for one product for all retailers for all countries**.

GS1 Belgilux is actively standardizing this identification of variable measure items at POS. **As from January 1st 2023, GS1 Belgilux will no longer assign new national article numbers to suppliers selling to the Belgium & Luxembourg market.** The supplier will instead need to create a GTIN that includes his GS1 Company Prefix. This GTIN will need to be encoded along with the net weight (and other possible dynamic information like lot number or best before date) in a different type of barcode that can contain all this data and can be scanned at POS. The options are: **GS1 DataBar Expanded (Stacked)** or **GS1 DataMatrix**.

Belgilux retailers have already expressed their preference for the GS1 DataMatrix and their plans and ambitions to implement it at POS. This barcode can contain a lot of data, is highly readable and remains small in size. Example:



(01)05412345000013(3103)000189(3923)2070(10)ABC123

- Global Trade Item Number 5412345000013
- Net weight 0,189 kg
- Price to be paid €2,07
- Lot number ABC123

Encoding additional data can unlock opportunities to improve traceability, food safety and waste management. The data needs to be encoded following the **Application Identifier standard**.

<b>Mandatory</b>	GTIN-13 + leading 0	AI (01)	14 numeric characters
	Net weight	AI (310X)	6 numeric characters with X as number of decimal
<b>Optional</b>	Price to be paid	AI (3923)	Up to 15 numeric characters with X as number of decimal
	Lot number	AI (10)	Up to 20 alphanumeric characters
	Price/unit of measure	AI (395X)	6 numeric characters with X as number of decimal
	Best Before Date	AI (15)	6 numeric characters in YYMMDD format
	...		

The GS1 DataMatrix is scanned with a 2D image scanner. In order to be readable at POS, the barcode needs to follow these dimensions and structure:

- Minimal X-dimension (= size of 1 module) of 0,375 mm
- Nominal X-dimension of 0,625 mm
- Maximal X-dimension of 0,990 mm
- Starting with FNC1 sign
- Separating data fields of variable length with group separators
- Data encoded multiple times with an error correction algorithm

More technical information can be found in the **GS1 DataMatrix guideline** ([https://www.gs1.org/docs/barcodes/GS1\\_DataMatrix\\_Guideline.pdf](https://www.gs1.org/docs/barcodes/GS1_DataMatrix_Guideline.pdf)).

A good printing quality of the barcode is of great importance. The barcode must be printed with black modules on a white surface, in order to guarantee a sufficient colour contrast. Please check the printing process on a regular basis. Avoid L-shaped patterns in the lines elsewhere on the label, as the 2D image scanner will look for L-shapes in order to detect the GS1 DataMatrix.

## Examples



GTIN + net weight

- **Human readable interpretation** (01)05412345000013(3103)000189
- **Encoded in barcode** FNC101054123450000133103000189
- **Decoded in system** ]d201054123450000133103000189



GTIN + net weight + price to be paid + lot number

- **Human readable interpretation** (01)05412345000013(3103)000189(3923)2070(10)ABC123
- **Encoded in barcode** FNC10105412345000013310300018939232070FNC110ABC123
- **Decoded in system** ]d20105412345000013310300018939232070<GS>10ABC123

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When creating the barcode, take the following **tips and tricks** into account.

- A GS1 DataMatrix is not the same barcode as a DataMatrix, which is not a GS1 symbology.
  - Correct: GS1 DataMatrix
  - Incorrect: Datamatrix
- A GTIN (= Global Trade Item Number) is not a number starting with a 2 or 02. A GTIN contains the GS1 company prefix of the brand owner.
  - Correct: 5412345000013 with 5412345 as GS1 company prefix
  - Incorrect: 2862501010005
- AI (01) must be followed by 14 digits. A GTIN-13 must therefore be preceded by a meaningless zero.
  - Correct: (01)05412345000013
  - Incorrect: (01)5412345000013
- A GTIN starting with indicator 9 can only be used for outer packages that are not scanned at POS. The GTIN-13 must be preceded by a meaningless 0.
  - Correct: 05412345000013
  - Incorrect: 95412345000016
- AI (01) must be followed by a GTIN, not by an internal/national number.
  - Correct: (01)05412345000013
  - Incorrect: (01)02862501010005
- It is mandatory to mention the GTIN underneath the barcode in the human readable interpretation. This enables manual processing of the GTIN at POS when the barcode is not readable. Other encoded information should be mentioned as well, although this is optional if the info is already mentioned on the label in human readable text (e.g. in Belgilux, it is legally required to have price and weight on the label of a variable measure item).
- Do not encode the brackets around the Application Identifiers in the GS1 DataMatrix. The Application Identifiers should only be between brackets in the human readable text underneath the barcode.

More and more Belgilux retailers are implementing/planning to implement 2D at their POS. Since this is still ongoing, the use of GS1 DataMatrix at POS is first to be agreed upon bilaterally between retailer and supplier, to make sure the retailer can scan the product.

The role of GS1 Belgilux is to coordinate the implementation, to verify the labels and to provide technical trainings where necessary. For this project, GS1 Belgilux is strongly supported by GS1 Global Office and other GS1 Member Organisations (e.g. GS1 Sweden, GS1 Netherlands and GS1 Germany), as the interest in 2D barcodes is rising on a global level.

**For more information**, please contact Karen Arkesteyn at [karkesteyn@gs1belu.org](mailto:karkesteyn@gs1belu.org).

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### Example of label

This is an example of how the GS1 DataMatrix should be used on the label. The GTIN is the only mandatory information string that needs to be put as human readable text underneath the barcode. It suffices to mention the other encoded information on the label next to the barcode.

Please note that the mentioning of e.g. ingredients is out of scope, as they obviously need to be mentioned on the label as well. It is legally mandatory in Belgium to mention the 'Price per kg' on the label. If the barcode is not scannable at POS, the 'Price to be paid' can be calculated by multiplying the net weight and the 'Price per kg'.

In the following example it would be  $0,189 \text{ kg} * \text{€}11,49 = \text{€}2,17161$  as 'Price to be paid'. Because the X = 3 as decimal for the 'Price to be paid', it rounds up to €2,172 in the barcode (encoded as (3923)2172) and €2,17 on the label.



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