

# Move from national number to GTIN for variable measure items at POS – Brochure for suppliers

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At retail Point-of-Sale the most commonly used barcode is still the linear EAN-13 barcode, which contains 13 digits. Most consumer units scanned at POS are therefore identified with a 13-digit GTIN (= Global Trade Item Number) assigned by the brand owner. This is the global standard for the identification and barcoding of retail consumer items, also applied in Belgium & Luxembourg.

However, the situation is different for **consumer items of variable measure**. To automate the scanning process at retail POS, it is crucial that the weight or price of the variable measure item is encoded in the barcode as well. Since a GTIN cannot contain the price or weight, an exception to this global standard needed to be made in order to guarantee the continuity of EAN-13 barcode scanning.



Suppliers selling variable measure products at retail POS in Belgium & Luxembourg needed to identify their products with a **national number**, which they need to request from GS1 Belgium & Luxembourg. This number starts with 295, 296 or 28. Upon weighing/labelling, this “national article number” will be completed by the supplier’s system with either the price or the weight. In total this national number will be 13-digits long and can therefore be encoded in an **EAN-13 barcode**.

This is a national solution that hinders 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**. A GTIN is a Global Trade Item Number and contains the GS1 Global Company Prefix of the brand owner. A GTIN can be used worldwide and is uniquely linked to the product. In order to obtain a GS1 Global Company Prefix, one needs to become member of a GS1 organisation. The ultimate goal is to use **1 GTIN for one product for all retailers for all countries**.

GS1 Belgilux is therefore 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.

This is now possible since the POS scanning landscape has changed over the past few years and has welcomed new types of barcodes that can contain more than a GTIN, by following the [GS1 Application Identifier standard](#). This makes it possible to move from the EAN-barcode (with national number) to another POS barcode that can contain the GTIN and net weight instead. Encoding **additional data** beyond GTIN can unlock opportunities to improve traceability, food safety and waste management. The data needs to respect the standardized formats as follows:

<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

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This information is to be encoded in either the GS1 DataMatrix or the GS1 DataBar Expanded (Stacked). These are two types of barcodes following the GS1 Application Identifier standard. However, there are major differences:

- **GS1 DataMatrix** (by preference): this is a 2D barcode, which means it needs to be scanned with a 2D image based scanner. This barcode is very small, can contain a lot of data and can be easily read. 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.

These are the dimensions and structure to be followed for GS1 DataMatrix:

- 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
- L-shaped finder pattern
- Up to 2335 alphanumeric or 3116 numeric characters
- On all four sides: white spaces of one time the X-dimension

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)).

- **GS1 DataBar Expanded (Stacked)** (as alternative): this is a linear 1D barcode. This barcode is larger but is already implemented in Belgium & Luxembourg for coupons.

These are the dimensions and structure to be followed for GS1 DataBar Expanded (Stacked):

- Minimal X-dimension of 0,264 mm
- Nominal X-dimension of 0,330 mm
- Maximal X-dimension of 0,660 mm
- Starting with FNC1 sign
- Separating data fields of variable length with group separators
- Up to 74 numeric or 41 alphabetic characters
- No left or right white spaces needed

Examples of the GS1 DataMatrix versus the GS1 DataBar Expanded (Stacked):

#### Example of GS1 DataMatrix

#### What is encoded



(01) 05412345000013

(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

#### Example of GS1 DataBar

#### What is encoded



(01) 05412345000013 (3103)000189

(01)05412345000013(3103)000189

- Global Trade Item Number 5412345000013
- Net weight 0,189 kg

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As the examples illustrate, we recommend to use the GS1 DataMatrix (because of its smaller size, larger data capacity and higher readability) but only if its use is agreed upon with the Belgilux retailer.

When printing the barcodes, a good printing quality of the barcode is of great importance. The barcode must be printed with black modules/bars on a white surface, in order to guarantee a sufficient colour contrast. Please check the printing process on a regular basis. When printing a GS1 DataMatrix, 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 of encoded/decoded data in the GS1 DataMatrix



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

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
- For a GS1 DataBar, it is mandatory to mention all encoded information underneath the barcode in human readable interpretation. For the GS1 DataMatrix, it is only mandatory to put the GTIN in the human readable text underneath the barcode. This human readable text enables manual processing of the GTIN at POS when the barcode is not readable. The reason for the difference between human readable text between GS1 DataMatrix and GS1 DataBar Expanded (Stacked) lies in the higher readability rate (due to the error correction algorithm) of the GS1 DataMatrix.
- 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.

**Please find an example of a correct label on page 5.**

More and more Belgilux retailers are implementing/planning to implement 2D at their POS. 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.

Please contact the Belgilux retailer you are working with to check their readiness for 2D scanning prior to applying the GS1 DataMatrix on the label.

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

### 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. In case of a GS1 DataBar Expanded, all other encoded information will need to be put underneath the barcode in human readable text.

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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Please contact GS1 Belgium & Luxembourg for technical support or consult the GS1 General Specifications ([https://www.gs1.org/docs/barcodes/GS1\\_General\\_Specifications.pdf](https://www.gs1.org/docs/barcodes/GS1_General_Specifications.pdf)).

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