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in Europe

Identification of coupons

Technical specifications GS1 DataBar and Global Coupon Number

Version 1.0, November, 2014

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Contents

1. Target Audience

This document is destined for solution providers, coupon issuers, marketing agencies, distributors and other parties who are designing, issuing and distributing coupons and who have to program the GS1 DataBar and the GS1 Global Coupon Number (GCN).

2. Scope of the document

The scope of this document is to describe how to implement the global GS1 standards for coupon identification and symbol marking in order to automate and speed up coupon handling procedures for all involved parties in a coupon management process.

3. Business Application

A coupon is a paper or electronic presentation that can be exchanged for a financial discount, for loyalty points or for a free item when making a purchase.

This standard meets the needs of a growing number of applications enabling consumers to receive and redeem coupons both in paper and electronic formats(digital coupons), making that process quicker and safer. These coupons applications represent potential huge savings for coupon issuers and retailers. It is a major milestone in GS1's objective to bring benefits to all value chain parties, including the end consumer.

The Coupons specification will co-exist in the foreseeable future with coupon specifications described in the GS1 General Specifications which are restricted to national or common currency regional applications specified by the respective GS1 Member Organisations. There are some clear benefits of moving to a Global identification scheme for coupons:

- The structure of the GCN and its assignment rules are administered by GS1, a not-for-profit standards organization that is supported by implementation guidance, business examples, and maintenance.
- GCN is a simple coding system used to facilitate coupon numbering and identification with almost limitless capacity.

- The GCN uses the same GS1 Standards that are used in many other business applications. If you are already using GS1 Standards to identify products or locations, it is easy to extend your use to identify coupons as well.
- GCNs are unique worldwide. A GCN can be used throughout the world with no need for trading partner(s) to assign proprietary numbers to ensure uniqueness.
- The GCN can identify a coupon uniquely if required.
- The GCN enables companies to scan a coupon in order to retrieve or track the key data.
- The GCN allows the issuer, rather than a third party, to allocate GCNs.
- The GCN guards against misidentification and fraud.
- The GCN is an easily defined data structure with integrity checking that facilitates processing and transmission of data.

GS1 DataBar is the solution for marking paper coupons when scanned at POS. Applicable variants are GS1 DataBar Expanded or GS1 DataBar Expanded Stacked. The only mandatory data element for identifying coupons is the GCN. All related coupon data should be accessed via a database. However in some applications it may be helpful to additionally encode the coupon value and expiry date in the GS1 DataBar using GS1 Application Identifiers (AI).

4. Content of a GS1 DataBar on a coupon

GS1 Global Coupon Number: AI (255)

The GS1 Identification Key used to identify a coupon. The key is comprised of a GS1 Company Prefix followed by a Coupon Reference Number, Check Digit and an optional Serial Component.

The function of a GCN, electronic or printed, is to provide an identification point which can be used to retrieve information held in a database associated with the coupon.

The structure and content of the coupon reference is at the discretion of the owner of the GS1 Company Prefix to uniquely identify each type of coupon.

The optional serial component is assigned to an individual instance of a coupon. The combination of GS1 Company Prefix, Coupon Reference and Serial Component uniquely identifies an individual coupon. The Serial Component field is numeric and may contain up to 12 digits. The issuer of the Global Coupon Number determines the serial component.

Format of the Element String				
Application Identifier	Global Coupon Number (GCN)			
	GS1 Company Prefix $\longrightarrow$ Coupon Reference $\longleftarrow$		Check Digit	Serial Component (Optional)
2 5 5	N_1 N_2 N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}		N_{13}	N_1 — variable $\rightarrow$ N_{12}

GS1 Company Prefix: A globally unique number assigned to a GS1 member company

Coupon Reference number: The number assigned by a member company to the coupon

Check Digit: A modulo-10 number calculated across the preceding digits to ensure data integrity

Serial Component (optional): Optional serial numeric component that can be added to an individual instance of a coupon

When indicating this Element String in the Non-HRI text section of a bar code label, the following Data Title should be used: GCN

Coupon Value - Single Monetary Area: AI (390X)

Format of the Element String	
Application Identifier	Coupon Value
3 9 0 **n**	N_1 $\longrightarrow$ variable length $\longrightarrow$ N_{15}

Application Identifier (390n) indicates that the data field following this AI, contains the value of the coupon. "n" indicates the implied decimal point position, where 0 means that there is no decimal point, and 1 means that the decimal point is before the last position of the coupon value.

In order to prevent the same value being encoded in a different way, following best practices are defined:

- This data field has a **variable length** (from 1 to 15 digits)
- Never introduce **unnecessary zeros** in the decimals after the value – for example. € 0,50 should be encoded as (3901)05.

- Never introduce **unnecessary zeros** before the first digit fo the integer part of the value – for example € 13,5 should be encoded as (3901)135

In the table below, you can find some examples to clarify the best practices.

Value (€)	AI	Data field	Human Readable
0,15	3902	015	(3902)015
0,5	3901	05	(3901)05
1	3900	1	(3900)1
1,5	3901	15	(3901)15
1,25	3902	125	(3902)125
12,7	3901	127	(3901)127
12,75	3902	1275	(3902)1275
12,754	3903	12754	(3903)12754
127,54	3902	12754	(3902)12754

The data string transmitted from the bar code reader means that the Element String denoting the coupon value has been captured. This Element String must be processed together with the Global Coupon Number, AI (255).

When indicating this Element String in the Non-HRI text section of a bar code label, the following Data Title should be used: AMOUNT

Expiry date: AI (17)

The Application Identifier (17) indicates that the GS1 Application Identifier data fields contain an expiration date.

The structure is:

- Year: the tens and units of the year (e.g., 2003 = 03), which is mandatory
- Month: the number of the month (e.g., January = 01), which is mandatory
- Day: the number of the day of the relevant month (e.g., second day = 02); if it is not necessary to specify the day, the field must be filled with two zeros

Format of the Element String			
Application Identifier	Expiration Date		
	Year	Month	Day
1 7	N_1 N_2	N_3 N_4	N_5 N_6

When it is not necessary to specify the day (the Day field is filled with two zeros), the resultant data string shall be interpreted as the last day of the noted month including any adjustment for leap years (e.g. "130200" is "2013 February 28", "160200" is "2016 February 29", etc.).

The data transmitted from the bar code reader means that the Element String denoting an expiration date has been captured. As this Element String is an attribute of a coupon, it must be processed together with the Global Coupon Number (GCN) to which it relates.

When indicating this Element String in the Non-HRI text section of a bar code label, the following Data Title should be used: EXPIRY

Concatenation rules

All GS1 bar code symbologies that use GS1 Application Identifiers allow several Element Strings to be encoded in one bar code, a process called concatenation

Pre-Defined Length Element Strings:

Concatenated Element Strings constructed from Application Identifiers with a pre-defined length do not require a Separator Character. Each Element String is immediately followed by either the next Application Identifier or the Symbol Check Character and Stop Character.

For example, concatenation of expriry date with the associated Global Coupon Number (GCN) does not require the use of a Separator Character.

Variable length Data Strings:

Concatenating Element Strings of variable length involves the use of a Separator Character. The Separator Character used is the Function 1 Symbol Character (FNC1). It is placed immediately after the last symbol character of a variable length data string and is followed by the Application Identifier of the next Element String. If the Element String is the last to be encoded, it is followed by the Symbol Check and Stop Characters and no FNC1 Separator Character is required.

For example, concatenation of monetary value requires the use of a Separator Character immediately after the price per unit of measure.

When concatenating a mixture of pre-defined and other Element Strings, the pre-defined Element Strings should appear before the variable length Element Strings.

For coupons application, the length types of the element strings are as follows:

- AI (255)   ➔ Variable length data string

- AI (390n)   ➔ Variabale length data string

- AI (17)   ➔ fixed length data string

Here below, the optimized concatenation for coupons:

AI(255)	Data	FNC1	AI(17)	Data	AI(3902)	Data

Note: Parentheses shall surround AIs in Human Readable Interpretation, but are not encoded in the GS1 symbol.

5. GS1 Databar Symbol Specifications

The GCN is a GS1 identification key and both GS1 DataBar Expanded and GS1 DataBar Expanded Stacked are specified by GS1 to encode the GCN.. The use of these GS1 DataBars further provides the opportunity to encode other information such as the coupon value; AI (390n) or the expiry date; AI (17).

GS1 DataBar Expanded & Expanded Stacked

The GS1 DataBar family consists of 7 different varieties of the GS1 DataBar. Only two of them are applicable for the GCN; the GS1 DataBar Expanded and the GS1 DataBar Expanded Stacked.

GS1 DataBar Expanded

(255)5452374500016(3902)075

- Max 74 Numeric/41 Alphanumeric characters
- All GS1 keys and Application Identifiers (e.g. GCN)
- Omnidirectional

GS1 DataBar Expanded Stacked

(255)5452374500016(3901)015

- Max 74 Numeric/41 Alphanumeric characters
- All GS1 keys and Application Identifiers (e.g. GCN)
- Can be stacked from 2 up to 11 rows.
- Omnidirectional

Data transmitted by the scanner

The GS1 Databar family symbols are designed and intended to be used with symbology identifiers and also specified in the ISO standard. GS1 DataBar family symbols are normally transmitted using symbology identifier prefix "]e0". For example, a GS1 DataBar Symbol encoding AI (01) Element String 10012345678902 produces the transmitted data string "]e00110012345678902."

GS1 Databar Expanded Symbols encode the application identifiers. All Element Strings of variable length and those of fixed length not stated in the predefined table shown in Gen Specs page 357 must be delimited when followed by another Element String in a single Bar Code. The delimiter is a Function 1 Symbol Character (FNC1). This is transmitted as a <GS> (ASCII 29)..

Examples:

- **Non-serialised** coupon:]e02555410013150015**<GS>**3901025
- **Serialised** coupon:]e025554100131500150000001**<GS>**390102517140508

Printing considerations

For the print quality, you must take into consideration the following parameters :

a) the minimum X-dimension to comply with (between 0.264 mm and 0.660 mm)

b) the space available for the printing of the barcode (size of the coupon and the space available for the barcode on the coupon)

c) The printing method

6. Implementation notes

The following points are very important when considering the implementation of GS1 Databar for coupons:

1. Decide wether you want a **non-serialised or serialised coupon** in order to create your GCN.
    - Non-serialised coupon: You only need GS1 Company Prefix+Coupon refence.
    - Serialised coupon: GS1 Company Prefix+Coupon refence+Serial number

2. Decide on the **value of the coupon**. Take the rules defined in this document into consideration to translate this value in the GS1 DataBar.

3. Check the **space** dedicated to the barcode on the coupon. This will enable you to select either GS1 DataBar Expanded or GS1 DataBar Expanded Stacked.
    - If less space (probably in case of serialized GCN), choose for a GS1 DataBar Expanded Stacked.
    - If enough space (probably in case of non-serialized GCN), choose for a GS1 DataBar Expanded

    Note: As the use of coupon is often restricted to a market, it would be possible to consider other data carriers in order to comply with local business requirements.

4. Choose the **X-dimension**. This should be between 0.264 mm and 0.660 mm.

5. Check the way the coupon is **issued**:
    - Paper coupon (classical way): you have to look to the printing method and printing quality. Your local GS1 Member Organisation offers bar code verification for original coupon test samples .

- eCoupon : you have no control on the printing quality as the coupon is printed at home by the consumer. However, it is advised you send a test sample by email to your local GS1 Member Organitzation.
- Digital coupon: no printing quality to control.

6. Make a **test** and send it to your GS1 MO to ensure the correctness of the implementation

7. Examples

Example 1

A **non serialized coupon** (*GS1 Company Prefix+Coupon refence, Expiry Date, Value*), encoded using **GS1 DataBar Expanded Stacked** and **GS1 DataBar Expanded**. A 3 digits value has been used in AI390X.

*The given height and lenght take into account the **maximal quantity** of characters into the GS1 DataBar Expanded: (GCN part 1 and value)*

Non serialized coupon (*GS1 Company Prefix+Coupon reference*)			
X-Dimension(in mm)	**Barcode**	**Length(in mm)**	**Height(in mm)**
0.28	GS1 DataBar Expanded	68.1	8.6
	GS1 DataBar Expanded Stacked	44.5	17.9
0.32	GS1 DataBar Expanded	77.9	11.5
	GS1 DataBar Expanded Stacked	50.8	23.9
0.40	GS1 DataBar Expanded	97.4	11.5
	GS1 DataBar Expanded Stacked	63.5	24.1

Example 2

A **serialized coupon** (*GS1 Company Prefix+Coupon reference+Serial Number, Expiry Date, Value*), encoded using **GS1 DataBar Expanded Stacked**. A 3 digits value has been used in AI390X.

*The given height and lenght take into account the **maximal quantity** of characters into the GS1 DataBar Expanded Stacked: (GS1 Company Prefix+Coupon refence+Serial Number, Expiry Date, Value)*

Serialized coupon (*GS1 Company Prefix+Coupon reference+Serial Number*)			
X-Dimension (in mm)	**Barcode**	**Length(in mm)**	**Height(in mm)**
0.28	GS1 DataBar Expanded Stacked	44.8	23.7
0.32	GS1 DataBar Expanded Stacked	51.1	23.9
0.40	GS1 DataBar Expanded Stacked	63.9	24.1

According to experience gained in North America, for GS1 DataBar Expanded Stacked in 2 row and 3 row configurations the X-dimension may be as low as 0.203 mm as long as a minimum overall bar height of 25.91 mm is maintained. X-dimensions less than 254 mm might not always be feasible for all GS1 DataBar Coupon bar codes due to variables, such as printing process, symbol orientation, and material. Due to the time sensitive nature of the coupon printing process, these variables should be considered during the design and bar code origination processes. Bar code verification should always be done from printing press proofs.

8. GS1 Glossary of Terms and Definitions

| Term	Definition
Concatenation	The representation of several Element Strings in one bar code.
Coupon	A voucher that can be redeemed at the Point-of-Sale for a cash value or free item.
Coupon Instance ID	The identification of a unique instance of a digital coupon.
Coupon Issuer	Party issuing the coupons, bearing the commercial and financial responsibility for the coupons.
Digital Coupon	A digital coupon is an electronic presentation, that is distributed and presented without manifesting as "paper" or in other hard-copy form, and that can be exchanged for a financial discount or for loyalty points when making a purchase.
Function 1 Symbol Character (FNC1)	A symbology character used in some GS1 data carriers for specific purposes.
Global Coupon Number	A GS1 Identification Key that provides a globally unique identification for

(GCN)	a coupon, with an optional serial number
GS1 Application Identifier	The field of two or more digits at the beginning of an Element String that uniquely defines its format and meaning.
GS1 Application Identifier data field	The data used in a business application defined by one application identifier.
GS1 DataBar	A family of bar codes, including GS1 DataBar Omnidirectional; GS1 DataBar Stacked Omnidirectional; GS1 DataBar Expanded; GS1 DataBar Expanded Stacked GS1 DataBar Truncated, GS1 DataBar Limited, and GS1 DataBar Stacked symbols.
GS1 DataBar Expanded Bar Code	A bar code that encodes any GS1 Identification Key plus Attribute data, such as weight and "best before" date, in a linear symbol that can be scanned omnidirectionally by suitably programmed Point-of-Sale scanners
GS1 DataBar Expanded Stacked Bar Code	A bar code that is a variation of the GS1 DataBar Expanded Bar Code that is stacked in multiple rows and is used when the normal symbol would be too wide for the application.
GS1 Prefix	A number with two or more digits, administered by GS1 that is allocated to GS1 Member Organisations or for Restricted Circulation Numbers.

Annex.- GS1 DataBar Technical Specifications

Symbol characteristics

Different (n,k) symbol characters are used for both GS1 DataBar Expanded versions, where each symbol character is n modules in width and is composed of k bars and k spaces. Each segment should have the same length.
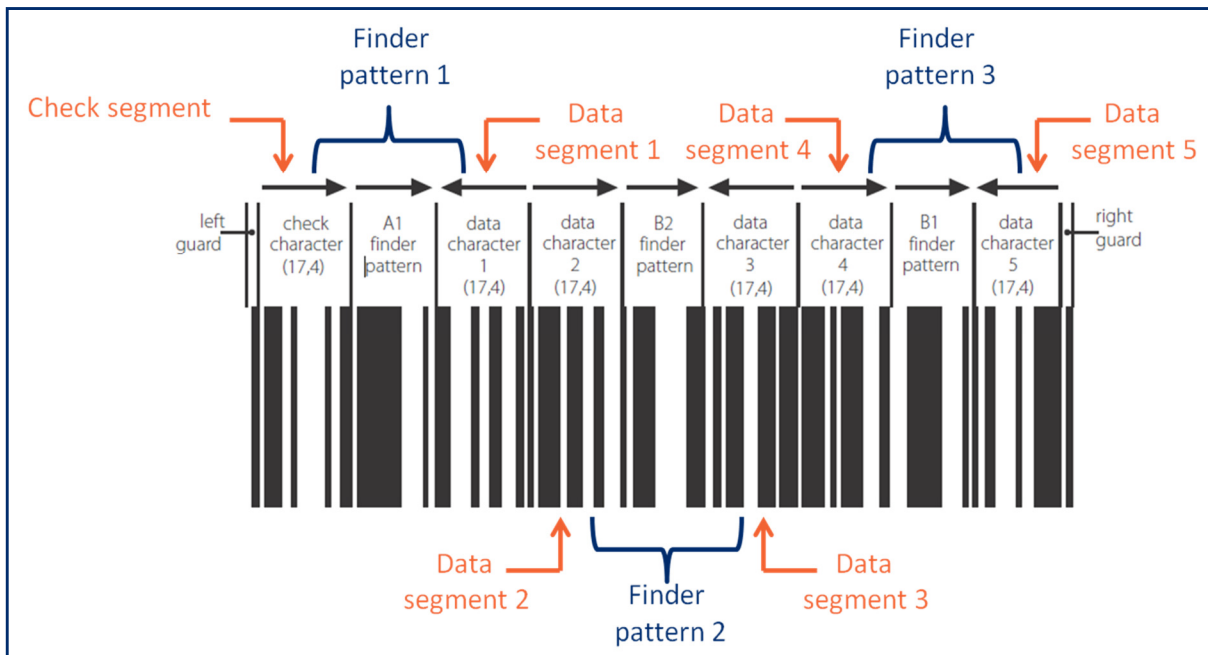
GS1 DataBar Expanded Symbols contains a Symbol Check Character, 3 to 21 data characters and 2 to 11 finder patterns, depending on the symbol length. The symbols are constructed as a sequence of triplets, each consisting of a finder pattern between two symbol characters. If there is an odd number of symbol characters a finder pattern follows the last symbol character. GS1 DataBar Expanded is capable of being scanned in separate segments, each segment consisting of a data character or Symbol Check Character and the adjacent finder pattern. The Symbol Check Character encodes a modulo 211 check value for data security.

The left and right Guard Bar Patterns consist of a narrow bar and narrow space. GS1 DataBar Expanded versions do not require a **Quiet Zone**. The **X-dimension** (= width of the narrowest bar) should be between 0.264 mm and 0.660 mm.

The **GS1 DataBar Expanded** Bar Code has a variable width (from 4 to 22 symbol characters, or a minimum of 102X wide and a maximum of 534X wide) and is 34X high. The symbol starts with a 1X space and ends with either a 1X bar or space.

The **GS1 DataBar Expanded Stacked** Bar Code is a multi-row stacked version of GS1 DataBar Expanded. It can be printed in widths of 2 to 20 segments and can have from 2 to 11 rows. Its structure includes a 3X high separator pattern between rows, each row is 34x high. It is designed to be read by an omnidirectional scanner such as a retail slot scanner. GS1 DataBar Expanded Stacked is used when the symbol area or print mechanism is not wide enough to accommodate the full single-row GS1 DataBar Expanded Symbol. It is designed for variable weight products, perishable products, traceable retail products, and coupons.

GS1 DataBar Size Specification for Coupons

Symbol(s) Specified	X-Dimension mm (inches)			Minimum Symbol Height for Given X mm (inches)			Quiet Zone		Minimum Quality Specification
	Minimum	Target	Maximum	For Minimum X-dimension	For Target X-dimension	For Maximum X-dimension	Left	Right	
GS1 DataBar Expanded	0.264	0.330	0.660	8.99	11.23	22.44	NA	NA	1.5/06/670
GS1 DataBar Expanded Stacked	0.264	0.330	0.660	18.75	23.44	46.86	NA	NA	1.5/06/670

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