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International Article Numbering GTIN (EAN, UPC)

Benummerung

Globale Artikelidentnummer GTIN (EAN)

Universal Product Code (UPC)

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Numbering

Global Trade Item Number GTIN (EAN)

Universal Product Code (UPC)

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The organizational unit listed first on the cover sheet is referred to below as the Functional Department.

Changes

The following changes have been made in respect of the 2008-12 edition:

- SN 01090-1 and SN 01090-2 streamlined and combined
- Structure in accordance with DIN 820-2
- Publisher and References to Standards updated
- Tables of number ranges for GTIN, GLN and UPC have been removed from the standard and are available on the CCS page.
- Expanded to include GTIN 14

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1 Scope

1.1. GTIN Global Trade Item Number (formerly EAN)

GTIN is an internationally unique numeric product identifier for trade items. The number consists of 13 digits, the first 7 of which are managed centrally by the GS1 Group and allocated on request to manufacturers as a GLN (Global Location Number) (license fee).

GTIN is a purely numeric numbering system approved in accordance with SN 01000-2 and can be maintained in parallel with Siemens product numbers.

This numbering system can be used to number both products (GTIN=article numbering) as well as local corporate entities (GLN=Global Location Number).

The numbering system is used solely for identification purposes and does not contain any classifying elements.

1.2. UPC Universal Product Code

The 12-digit UPC (Universal Product Code) article numbering system is the equivalent of the GTIN for markets in the USA and Canada.

UPC is a purely numeric numbering system approved in accordance with SN 01000-2 and can be maintained in parallel with Siemens product numbers.

The numbering system is used solely for identification purposes and does not contain any classifying elements.

Currently, in the USA and Canada the UPC remains the coding system that is accepted by the market as a whole. UPC-12 numbers were still needed up until January 01, 2005 for the coding of articles for export to the USA or Canada. They can be requested from GS1 Germany via the Functional Department.

By placing a leading zero in front of the UPC, the number string can be used as a valid GTIN (EAN).

GTIN includes the following forms:

GTIN 8	formerly	EAN 8
GTIN 13	formerly	EAN 13
GTIN 14	formerly	EAN 14
GTIN 12	formerly	UPC 12
GLN	formerly	ILN

By adding leading zeros, a GTIN 12 (UPC) can be made into a 13 or 14 digit GTIN.

2 References to standards

SN 01000-2 Numbering; Products and Technical Documents; Special Number Systems

3 Terms

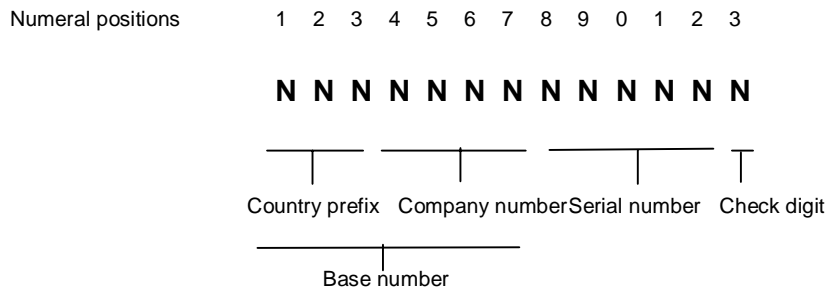
Base number	Country prefix + company number (base number is issued by GS1)
Barcode	Barcode that can be identified by readers (scanners)
Functional department	The organizational unit listed first on the cover sheet
BBN	German standard company number → Forerunner of the ILN
EAN	European Article Number → International Article Number → Forerunner of the GTIN
GLN	Global Location Number
GTIN	Global Trade Item Number
GS1	Private-sector, antitrust compliant organization based in Cologne, is part of the Global Standards One (GS1) international network and the second largest of more than 100 GS1 national organizations. Responsible for issuing company numbers in Germany (license fees)
IAC	Issuing Agency, based in Brussels
ILN	International Location Number → Forerunner of GLN
UPC	Universal Product Code (equivalent to GTIN for USA and Canada)
UCC	Uniform Code Council → Forerunner of GS1
SSCC	Serial Shipping Container Code
MTV	Reusable Transport Packaging, for example pallet, crate, cask, etc.

4 Format and system

GLN and GTIN 13 number format

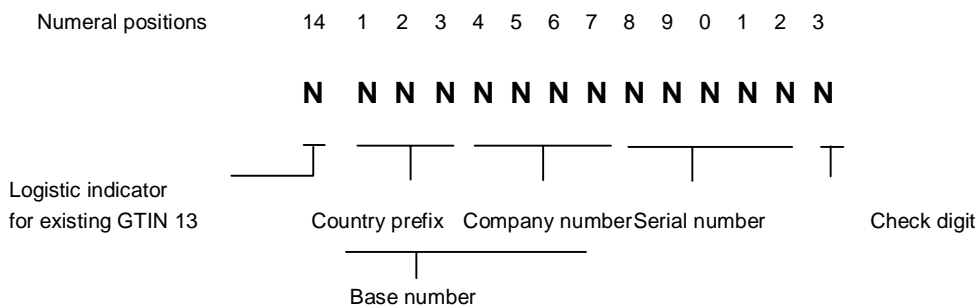
The first three digits contain the country prefix of the GS1 member organization, e.g. Germany 400-440. This is followed by the 4-digit company number, which together with the country number forms the 7-digit base number for the company. Digits 8 through 12 are serial numbers issued within the company. Digit 13 is the check digit.

The country prefix and company number make up the base number which is allocated by GS1.



GTIN 14 number format

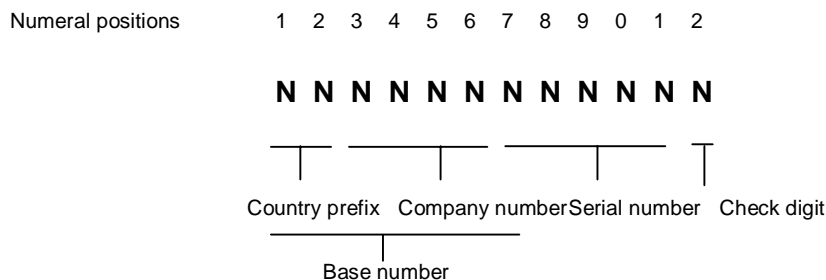
GTIN 13 + one additional digit (0 through 8) placed in front of GTIN 13 and used solely for logistical purposes.



UPC 12 number format

The first two digits are the GS1 country prefix; this is followed by a four-digit company number, a five-digit serial number issued internally in the company and the calculated check digit (12th digit).

The country prefix and company number make up the supplier number which is allocated by GS1.



4.1 Numbering systems

4.1.1 Global Location Number GLN (ILN)

The Global Location Number (GLN) identifies globally the full organization or company designation and the company address. GLNs are issued by the GS1 organizations on payment of license fees; in the case of Germany they are issued by GS1 Germany.

Prior to 2009, the GLN was called the International Location Number (ILN).

The GLN does not appear on a company's articles, but an article's 13-digit GTIN always starts with a GS1 base number for the company consisting of country prefix + company number, see 4.

The GLN (International Location Number ILN) is a unique identification number for a specific location and does not contain any "descriptive" features. It can be represented in the GTIN 128 barcode and can therefore be read automatically.

The GLN is broken down into two product categories:

4.1.1.1 GLN Type 1

GLN type 1 is used solely as a unique identifier in communications with other business partners and cannot be used for the identification of products etc.

The GLN identifies locations. It specifies, for example, where a pallet should be sent. It is not used to identify pallets or other shipping containers. The Serial Shipping Container Code (SSCC) should be used to do this.

This GLN is provided by GS1 as a complete code, i.e. including the check digit.

The number is used solely for identification of a company and must not be changed.

The valid primary GLN for Siemens AG is: 401600100000 6.

There are also other GLNs for Siemens; these identify locations and specify, for example, where a pallet should be sent.

4.1.1.2 GLN Type 2

As well as uniquely identifying company units by specifying the location, the GLN type 2 can also be used to identify articles, shipping containers, etc.

GLN type 2 extends potential applications beyond the standardized identification of a company, GLN can be the basis for

- issuing further location numbers for the identification of additional company units.
- participation in the GTIN international article numbering system and the Serial Shipping Container Code (SSCC) system.

4.1.2 Global Article Numbering GTIN

For participants in the system, the rule is:

no GTIN article numbering without provision of a GLN type 2 by GS1 Germany.

4.1.2.1 GTIN 13

GTIN - consisting of base number, individual article number and check digit – ensures that numbers are unique and internationally distinct.

Base number:

The 7-digit base number, derived from the GLN, type 2.

Individual article number:

Depending on the length of the base number, any 5-digit number combination between "00000" and "99999" can be created. A maximum of 100,000 different GTINs can therefore be generated using a 7-digit base number.

Check digit:

The check digit is the last digit in the GTIN and is calculated using modulo 10 with weighting 3, for example of calculation, see 4.3.

Calculation of check digit: [GS1 Check digit calculator](#)

Siemens, with the exception of Healthcare, uses GTIN 13.

4.1.2.2 GTIN 14

The additional digit is placed in front of the 13-digit GTIN, see 4.1.2.1 and contains purely logistical information. If zero is entered as this first digit, the check digit remains unchanged; any other entry (0 through 8 are possible) will require the check digit to be recalculated.

The first digit in the 14-digit GTIN has the following meaning:

Digit 0 Filler digit for GTIN 13

Digits 1 through 8 Identifies transport and distribution units (*logistic units*), that are *not* intended for retail point-of-sale. The entry for the first logistic digit is defined by the manufacturer, according to individual needs, e.g. entry:

1 for carton containing 6 individual products;

2 for carton containing 12 products, etc.

This is followed by the GTIN 13 article number for the products in the carton *without* check digit.

When a digit > 0 is entered as the first digit, the check digit must be recalculated using [Modulo](#) 10 with weighting 3.

Calculation of check digit for all 13 digits: [GS1 Check digit calculator](#)

4.1.3 Universal Product Code (UPC)

The first six digits of the UPC (also known as GTIN 12) enable products to be uniquely assigned to a manufacturer or retailer. Digits 7 to 11 are used to number products.

The 12th digit is the check digit which is calculated using [Modulo](#) 10 with weighting 3.

UPC number ranges are obtained from [GS1](#) (formerly Uniform Code Council) centrally by the Functional Department on payment of a fee.

4.2 Country prefix

The country prefix is a three-digit number used by GS1 to identify the local GS1 organizations. They are the first element in the GTIN, GLN or UPC and ensure there is no duplication of numbering systems worldwide:

[Country prefix](#)

4.3 Check digit calculation

The check digit is the last digit in the GLN, GTIN or UPC and is calculated by the same method in each case.
[GS1 Check digit calculator](#)

To calculate the check digit, take the first 7, 11, 12 or 13 digits and, starting from the right, multiply the odd positions by 3 and the even positions by 1 and then add all the products.

The sum is then subtracted from the next highest multiple of 10 to give the check digit.

If the sum is divisible by 10, the check digit is 0.

Example:

GLN	4	0	1	2	3	4	5	1	2	3	4	5	6
	x	x	x	x	x	x	x	x	x	X	x	x	↑
Weighting	1	3	1	3	1	3	1	3	1	3	1	3	
Products	4	0	1	6	3	12	5	3	2	9	4	15	
Product sum	64												
Modulo	10												
Quotient	6												
Remainder ¹⁾	4												
10 – remainder = check digit	6												

5 International, global administration

GS1 (Global Standards One) is a worldwide organization that designs and implements global standards. GS1 guarantees there is no duplication of GLN and UPC base numbers issued worldwide.

In each participating country there is a national GS1 organization responsible for issuing company numbers in that country; for Germany this is GS1 Germany.

The guidelines for article number and reading systems of the member states were defined within this organization.

A charge is made for the allocation of number ranges by the relevant national organization (see license fees).

6 Procedures for the Siemens Group

6.1 Central purchase

Participation in the GTIN system is coordinated and documented for Siemens AG and its affiliated companies by the Functional Department.

The Functional Department is responsible for the central purchase of number ranges from GS1; allocation of these number ranges within the Siemens group is free of charge.

The Functional Department is the central point of contact for both GS1 and for the [TIP Officers](#).

6.1.1 License fees

The annual license fees for the centrally managed GLN Global Location Numbers are remitted to GS1 by the Functional Department, for the Siemens group as a whole.

Other license costs for local use incurred with a national organization shall be paid by the regional unit.

6.1.2 Issuing of GTIN/ GLN and UPC number ranges

GTIN number ranges (EAN and UPC), as well as GLNs, can be requested informally from the Functional Department.

Number ranges already allocated can be seen here.

[EAN number ranges](#)

[UPC number ranges](#)

6.2 Use

If the same product is manufactured at different locations (or indeed in different regions), it is important to ensure that only one GTIN13, GTIN14 or UPC number is assigned to that product.

6.2.1 GTIN 14

GTIN 14 has only been introduced in Healthcare, but without coding of logistic content in the extra digit position. All other Divisions and Business Units use GTIN 13 exclusively.

Administration and use shall be coordinated with the relevant [TIP Officer](#).

6.2.2 GTIN 13

Administration of GTIN article numbering shall be defined within the Business Unit.

GTIN requirements shall be notified to the organizational unit listed first on the cover sheet. International location numbers (GLN) and/or number ranges for article numbering are then allocated, based on these requirements.

Appropriate documentation must be maintained to ensure that the assigned article numbers (i.e. the serial numbers issued by the manufacturing Group) are traceable and that a number is not assigned more than once.

The contact person in each case is the [TIP Officer](#).

For article numbering, the 13-digit GTIN (standard version) is approved in accordance with Siemens specifications. (for exception, see 6.2.1)

6.2.3 GTIN in the regional units

Regional units outside Germany can also participate in the GS1 GTIN system via the organizational unit listed first on the cover sheet.

The numbering of products manufactured under license must be coordinated with the product owner (licensor).

If the country concerned has a national organization for GTIN administration, an application for participation in the GTIN system can be submitted to this organization. The GLN defined there for the local company must then be reported to the Functional Department for the purposes of central registration.

6.2.4 UPC 12 in USA and Canada

Administration of UPC article numbering shall be defined internally within the Group.

The relevant TIP Officer (numbering coordinator) must notify UPC requirements in a timely manner to the Functional Department. Number ranges for article numbering are allocated based on these requirements. Appropriate documentation must be maintained to ensure that the assigned article numbers (i.e. the serial numbers issued by the manufacturing Group) are traceable and that a number is not assigned more than once.

Responsibility for proper use of the numbering system lies with the relevant contact person [TIP Officer](#)

Participation in the UPC system is coordinated and documented for Siemens and its affiliated majority shareholdings by the Functional Department.

The Functional Department is the central point of contact for both GS1 and for the TIP Officers.

6.2.5 Use in the regional units

Regional units can also participate in the GS1 UPC system via the Functional Department.

The numbering of products manufactured under license must be coordinated with the product owner (licensor).

If the country concerned has a national organization for UPC administration, an application for participation in the UPC system can be submitted to this organization. The UPC defined there for the local company must then be reported to the Functional Department.

7 Use in the industrial sector

7.1 GTIN numbering

Condition data is not possible in the GTIN system.
Changes in condition will require a new GTIN.

In addition to the 13-digit and 14-digit GTIN, an 8-digit GTIN is also available for particularly small products where there is insufficient space to reproduce the long barcode.

The 14-digit GTIN differs from the 13-digit GTIN in having an extra first digit which is a logistic indicator placed in front of the 13-digit GTIN and contains additional information about the package size.

If the first digit is a "zero", the check digit for the 13-digit GTIN is unchanged.

If this first digit is a number from 1 to 8, the check digit must be recalculated.

The EAN/GTIN is generally printed on the packaging as a machine-readable barcode and can be decoded by barcode scanners.

The best known application for GTIN barcoding is scanning in the retail environment (scanner point-of-sale systems).

7.2 UPC numbering

Condition data is not possible in the UPC system. Changes in condition will require a new UPC.