



The Global Language of Business

Request for Finding

GS1 identification keys allocation by third parties

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1. Introduction

1.1 Audience

This document is intended primarily as a reference for GS1 Member Organisations. Because the recommendations in this document may affect MO operations, GS1 governance groups are also part of the target audience.

1.2 Assumptions

Readers should be familiar with the GS1 system of standards and services. References to GS1 prefix, GS1 company prefix, GS1 identification key, etc. are used throughout this document without any expansion and with limited, if any, explanation of their use cases.

1.3 Scope of work

The scope for this document is to answer the request for finding submitted to the GS1 architecture group, see Annex 1.

The purpose is to document the impact on the GS1 system architecture of allocating GS1 identification keys to End Users through third parties, to highlight the related business issues and to recommend the adoption of adequate policies. The intent is to provide some certainty and guidance when opportunities for allocating blocks of keys to third parties arise. This document does not address the unauthorised use of GS1 identification keys.

This analysis is based on past and current practices.

Annex 2 gives some examples of blocks of GS1 identification keys allocated to third parties.

2. Concepts

2.1 Classes of GS1 identification keys

In the GS1 System Architecture, Class 2 Keys are keys whose framework is controlled by GS1 and for which a portion of the identification capacity is allocated for an identification scheme administered by an external agency. An extract of the GS1 System Architecture is available in Annex 3 for easy reference.

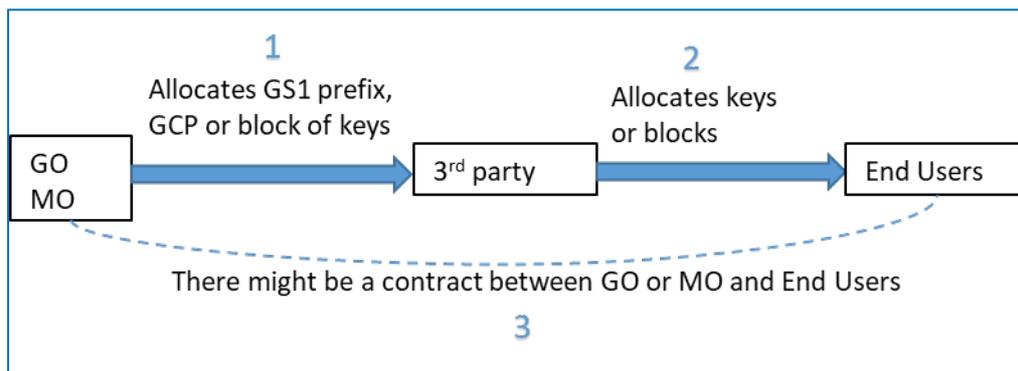
The GS1 System Architecture section related to Class 2 keys suggests that different structures prevail depending on the way the third party manages the identifier and on the contractual agreement with GS1.

2.2 Third party

The usual identification management process in GS1 is that an MO licenses a GS1 Company Prefix to a company that makes use of this capacity to identify entities using the appropriate standard GS1 identification keys. A company that has subsidiaries established in the same country or in other countries may choose to manage the assignment of GS1 keys centrally using the GCP licensed to the headquarter or to one of its subsidiaries. The GS1 Company Prefix may not be sold, leased, or given, in whole or in part, for use by any other company.

In the context of this document, a third party refers to an organisation that is accredited by GO or an MO to allocate GS1 identification keys to End Users. The main difference between the usual and the third party assignment context is that third parties make use of the GS1 prefix or GCP to assign keys to external parties that are not under their legal and/or financial control.

The figure below illustrates the scenario of GS1 keys allocation through a third party:



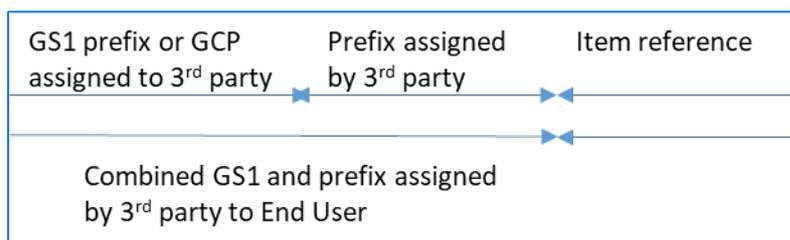
In this figure:

- 1) GS1 GO or MO allocates a GS1 prefix, a GCP or a block of keys to a third party through a contractual agreement
- 2) The third party allocates individual keys or blocks of keys to End Users
- 3) It may happen that the End User has a direct relation with GS1 GO or an MO. However, the End User may still be allocated a key by the third party because this key is designed for a specific purpose or mandated by regulation.

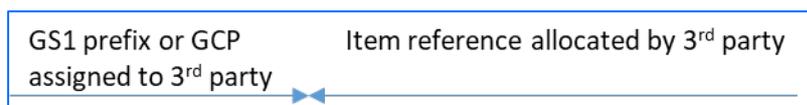
In some cases, MOs keep track of End Users that have been allocated a key by a third party. The figure makes a distinction between End Users that have been allocated a third party key and End Users in good standing that have a direct contract with the MO.

2.3 Structure of the key allocated by the third party

The key allocated by third parties may or may not include a prefix unique to the End User. Some GS1 standards (e.g. EPCIS) and services (e.g. GEPIR) rely on the structured identifier comprising a prefix and an item reference. If a prefix assigned by the third party to an End User is part of the key structure, it is, in theory, possible to consider the combination of GS1 prefix and third party prefix as an equivalent to the GCP and to provide the same functionalities as those provided with a regular GS1 key comprising a GCP. This case is illustrated in the figure below:



In other cases, the GS1 prefix or GCP is allocated to a third party who makes use of it to assign GS1 keys to End Users:



In the case of ISBN for example, the combination of GS1 prefix, ISBN registrant group and ISBN registrant is functionally equivalent to a GCP. In the case of ISSN, there is no GCP equivalent since the ISSN international agency allocates blocks of number to its local ISSN chapters who allocate individual numbers to End Users.

2.4 Function of the key allocated by the third party

An organisation that manages an identification scheme for a specific purpose may reach an agreement with GS1 to embed this existing identification scheme in a GS1 key structure for various reasons, e.g. ensure global uniqueness, use of GS1 data carriers, use of GS1 data sharing standards.

⇒ Example: national identifier for pharmaceutical products preceded by a GCP to form a GTIN, see Annex 2, #4.

An organisation may wish to use a GS1 identification scheme to identify external entities when there is no expectation that some subset of identifiable entities will subscribe to GS1 in the usual way.

⇒ Example: Governmental agency uses GLN as the national enterprise identifier, see Annex 2, #1 and #2.

The GS1 key allocated through a third party is usually restricted in one or more of the following ways:

- to a category of items, for example books or pharmaceutical products
- to an area of GS1 system application (e.g. trade item, parties)
- to a geographical area
- restricted to certain purposes defined by the third party (e.g. GLNs allocated by Austrian Federal Office of Statistics can only identify legal entities and public authorities)
- to certain GS1 technical standard components, for example ISBN can only be used with the EAN/UPC barcode

3. Analysis

3.1 Architecture impact

When contemplating an agreement with a third party, it is useful to look at the technical implications and consider these before drafting the contract between GO/MO and the third party.

3.1.1 Affected GS1 architecture principles

In the GS1 Global Standard Management Process (GSMP), formal business requirements and draft deliverables are reviewed against the GS1 architecture principles. If issues are identified, a dialogue about the specific divergences takes place between the Architecture Group and the work group responsible for the deliverables. If divergences remain after this dialogue, the deliverables may still be put to the Board Committee for Standards for ratification. Deviation from one or more of the architecture principles does not disqualify a development of the system because other factors, commercial or geopolitical for example, may be more important.

The GS1 architecture principles were designed mainly to support the development of the GS1 system. When agreements are made with a third party that will issue GS1 identification keys, the agreements do generally incorporate restrictions and rules governing the allocation of such keys. These restrictions and rules are not GS1 standards per se but in practice the implementation of the GS1 identification keys allocated in this way are subject to compliance with them.

It is thus worthwhile to assess the intended use of the third party issued identifiers in light of the GS1 architecture principles. Here are the main GS1 architecture principles that might be affected:

Consistency: The use of a key assigned by a third party may not be consistent with other implementations of the key. In particular, the third party may define allocation and lifecycle rules that could vary significantly from the GS1 standard rules. Let us take for example a country where an identification system exists to identify prescription drugs. The system might stipulate that the identifier is associated to the active molecule of the drug and does not vary with the packaging format or the brand. If an agreement is reached to embed this existing identifier in a GTIN format, there is a risk that a particular category of products is subject to specific allocation rules that are not compatible with the basic GS1 allocation rules.

Global Multi-Sector Standards: The key may be restricted for use with a specific category of items and a specific geography. For example, an MO allocates a number capacity to a

governmental agency for identifying businesses registered in the country using the GLN format. International companies that have a subsidiary operating in that country will have to use the government-assigned GLN to identify the subsidiary in trade transactions instead of the GLN assigned by the headquarter for that particular subsidiary.

Non-duplication: The introduction of the third party key may duplicate solutions available with “regular” keys. Specific rules and constraints associated with the keys assigned by the third party may lead to the assignment of several identifiers to the same entity with different purposes but overlapping functionalities.

Open Supply Chains: GS1 identification keys provide identification that is not dependent on any particular business relationship or process. The identification of trade items, services, locations, assets and other business objects can be communicated to anybody anywhere in the world without any limitation and without requiring qualification by one of the parties. The principle of Open Supply Chains could be challenged if the agreement with the third party includes restrictions regarding the use of the keys with some of the GS1 technical standards.

3.1.2 Further issues

Ambiguity in constructing EPC/EPC Class URIs: When using identification keys in EPCIS, they need to be expressed as URIs. For instance, the corresponding EPC URI for GLN 4012345123456 would look like this: urn:epc:id:sgln:4012345.12345.0. To construct EPC/EPC Class URIs in a correct manner, organisations need to know the GCP length. However, there is usually no information available on that matter for keys allocated by third parties. This in turn entails a potential interoperability issue as users may construct the resulting URIs in an incorrect and/or divergent manner. This does not only hold true for organisations that capture EPCIS events, but also for potential querying clients: If their query operations (e.g. for a specific product or receiving party) contain incorrect GCPs, they are returned empty query responses even when there are actually matching visibility events present in the queried EPCIS repository.

Lack of relevant information in GS1 services: GS1 services providing information on GS1 keys (particularly GEPIR, but also others such as the GCP length tool) typically do not contain sufficient data for keys issued by third parties. Thus, they are also of little help to address the previously mentioned issue. For instance, while data on a third party itself might be available via GEPIR, there is none pertaining to any of the third party’s licensees.

3.2 Business considerations

3.2.1 Opportunities

Expand GS1’s scope of application. GS1 should strive to make it easy for any company to join and have access to the required identification capacity. This is not always possible for various reasons. The allocation of GS1 keys through third parties may enable to reach organisations that would not have used the GS1 system otherwise. This practice is a good way to create awareness about GS1 and it opens the door for new applications.

Governmental and regulated applications. There are some cases where the third party entering into an agreement with GS1 to allocate GS1 keys are governmental bodies or regulatory agencies from highly regulated sectors such as Healthcare or Energy. The implicit governmental support for GS1 keys is useful to demonstrate the credibility and robustness of the GS1 system.

Additional services. The expansion of the use of GS1 standards can lead to requirements for new services and presents thus the opportunity for MOs to provide these services and to expand their activities.

3.2.2 Potential Risks

Losing control. If the contract between GS1 GO or MO and the third party does not make clear provision for the purpose of the key and the information feedback by the third party, there is a risk of misuse of the keys and thus conflicts with the legitimate use of the keys.

Neutrality. The third party managing the allocation of GS1 keys through an agreement with GS1 may impose the adoption of the key by organisations within its scope. This is especially true for governmental organisations. There could be a risk of neutrality lost for GS1 given that the GS1 system is based on voluntary adoption.

Financials. There are possible financial risks in entering into agreements with third parties if the business model planned in the agreement does not meet expectations or if the agreement leads to unforeseen extensive additional work for GS1. It should be noted that the financial aspects of agreements with third parties could also represent interesting opportunities.

Further sub-division: Barring contractual restrictions, a third Party might sub-divide the numbering range made available to them to fourth parties without any oversight or visibility to GS1 GO or MOs making the potential risks above even more pronounced.

4. Recommendations

The allocation of GS1 keys through third parties has been done by GO and MOs for many years. There is however no GS1 policy dealing with that topic. This creates uncertainty and missed opportunities. The establishment of a GS1 policy is not in the scope of this response to the request for finding. The development of such a policy should be done by a team including MOs who have experience in such agreements with third parties. The following contribution is provided for the content of a future policy:

4.1 Principles

1. Preference should always be given to the issuance of GS1 identification capacity following the normal rules.
2. Issuance of GS1 identification capacity to third parties may be justified but is always treated as an exception to the normal process.
3. The issuance of GS1 identification capacity to third parties may be considered only for specific applications making use of one GS1 identification key.
4. Issuing a block of GS1 company prefixes to a third party for unlimited usage shall not be considered.
5. Co-operation with third parties must have the aim of extending the usefulness and value of the GS1 system and must not be allowed to compromise the interests of the MOs' members overall nor generally undermine the benefits they derive from the GS1 standards.

4.2 Future policy criteria

1. The third party is a recognized not-for-profit organization that has a proven record of being responsible for the management of identification systems.
2. The agreement includes a recommendation that end-users join the GS1 Member Organisation in order to benefit from the use of the GS1 system, its products and services.
3. The incorporation of the identification scheme brings benefits to GS1 member companies, for example through broadening the GS1 scope of application.
4. The agreement makes due reference to GS1 branding (trademarks, logos)
5. The identification scheme subject of the agreement is interoperable with the GS1 system both in the MO territory and internationally.
6. The agreement does not impact foreign companies doing business in the territory subject to the agreement.
7. There must be a formal contract between the third party and GS1 or a GS1 MO. This contract must specify, at minimum, the following:
 - Scope and purpose of the GS1 key subject to the agreement
 - GS1 System components that can be used with the key
 - Any restrictions that may apply
 - Financial considerations
 - Requirements of third party to register entities identified with GS1
 - Compatibility with class 1 key function and syntax for example:
 - a. Allocation and lifecycle rules
 - b. AIDC and GDSN validation rules
 - Provisions for terminating the agreement



4.3 Other considerations

Financial considerations. The allocation of GS1 keys by a third party to end users should not in itself be subject to fees. However a third party might charge fees to end users for services related to the allocation of GS1 keys to end users.

Competing third parties. There may be situations where several third parties have a similar role, for example two trade associations in the same industry sector. An agreement with GS1 could create a competitive advantage for the selected third party. GS1 should thus consider to offer the same agreement to the other parties. If this is not possible, there should be a rationale for making an exclusive agreement with one third party.

Impact on GS1 services. The impact on GS1 services of an agreement with a third party should be analysed and understood upfront. For example, have provisions been made in the agreement for maintaining the GS1 Cloud services?

Duration of the agreement. The duration of the contract between GS1 and the third party should be duly considered and legal advice should be sought. It is often, but not always, prudent to set a maximum duration (e.g. 3 years) with a systematic review before renewal.

Annex 1: Original request for finding

Request for Finding – Brief Summary (one phrase or sentence)

What is the impact on the GS1 system architecture of allocating blocks of GS1 identification keys to third parties who allocate them to End Users for specific purposes?

| | |
|--|------------------------------|
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Statement of Question or Concern (please be specific as to what you want answered)

Over the years, GS1 GO and several GS1 MOs made agreements with governmental organisations, trade associations and other bodies through which a portion of the GS1 identification capacity is issued for an identification scheme administered by an external agency.

The GS1 identification keys assigned by the external agency are unique with respect to “regular” GS1 keys. Their allocation and lifecycle rules, however, are typically defined by the external organisation and may sometimes vary significantly from the GS1 standard rules.

- If a block of numbers is allocated to a third party that issues numbers to organisations for specific purposes, is that still the same GS1 key?
- In case the object may have an identifier assigned by a third party in addition to the regular GS1 key, can the distinction be managed through a different AI and/or EPC header?
- There is no GS1 policy guiding these practices. A policy should be developed but this is outside the AG’s scope.

Relevant GS1 Standards or other GS1 System Components (omit if unsure)

All GS1 standards and system components are affected since they all make use of GS1 keys.

Annex 2: Examples of GS1 ID keys allocated to third parties

| # | MO/GO | Third party | GS1 key | Restriction |
|---|--|--|---------|---|
| 1 | GS1 Austria | Federal Chancellery and ministry of Finance of Austria | GLN | Restricted to legal entities and public authorities in Austria |
| | <p>In June 2012 the Federal Chancellery of the Republic of Austria and the Federal Ministry of Finance, in the name of the Republic of Austria signed a contract with GS1 Austria, were they licensed 30 million GLNs (with the option of 50 million). Following points stated in the contract (not complete):</p> <ul style="list-style-type: none"> • Only one issuing office (Federal Office of Statistics Austria) is allowed to allocate GLNs • The GLNs can only be allocated to legal entities and public authorities. It is not allowed to allocate a GLN to locations, stores, departments, or build hierarchies • The data of those entities must be stored in registers/databases of the Republic Austria • It is not allowed to give number ranges to other authorities / entities • The GLN allocated is a One-Off Key • The GLN is a public key <p>For further information contact GS1 Austria</p> | | | |
| 2 | GS1 New Zealand | New Zealand ministry of business, innovation & employment | GLN | Restricted to companies, public sector, sole trader, partnership or trust in New Zealand |
| | <p>The New Zealand government announced on 30 August 2013 the rollout of a New Zealand Business Number (NZBN) that will eventually be used to identify all legal entities in the country and used to communicate between themselves and with various governmental bodies. The NZBN is based on a numbering capacity of 10 million GLNs allocated by GS1 NZ to the government. See https://www.nzbn.govt.nz/ For further information contact GS1 New Zealand</p> | | | |
| 3 | GS1 Germany | GLOBALG.A.P. (Global Standard for Good Agricultural Practices) | GLN | Restricted to the identification of producers and individual members of a producer group. |
| | <p>GlobalG.A.P. is allowed to allocate a GLN (termed 'GlobalG.A.P. Number', 'GGN') to GlobalG.A.P. certified producers and suppliers if the respective enterprises do not already have a GLN allocated by either GS1 GO or a GS1 MO. The usage of a 'GGN' is restricted to support GlobalG.A.P.'s certification system only. It is not permissible to use a 'GGN' for any other purpose, e.g. for identifying the organisation in EDI. Further, if the GlobalG.A.P. partner is allocated a GLN by GS1 at a later point of time, this GLN has to replace the 'GGN'. For further information contact GS1 Germany</p> | | | |
| 4 | GS1 Spain | Farmaindustria (National Trade Association of the Spanish based pharmaceutical industry) | GTIN | Restricted to the identification of prescription pharmaceutical products |
| | <p>GS1 Spain allocated the GS1 company prefix 847000 to Farmaindustria. The GCP is followed by the national 6-digit code assigned by the ministry of Health for drugs sold under prescription. For further information contact GS1 Spain</p> | | | |
| 5 | GS1 US | Produce Marketing Association (PMA) | GTIN | Loose produce |
| | <p>The PMA licensed a GCP from GS1 US (003383) and it is being used by small farmers and packers of produce. As an Item Reference they are using the generic PLU (Price Look-up) number. See https://www.pma.com/Content/Articles/2014/05/Universal-Product-Codes</p> | | | |
| 6 | GO | International ISBN agency | GTIN | Restricted to books |
| | <p>A contract was agreed in 1980 between GS1 and the international ISBN agency. GS1 prefixes 978 and 979 have been assigned to ISBN for the identification and marking of books. See https://www.isbn-international.org/content/isbn-bar-coding</p> | | | |

Annex 3: Extracts of GS1 System Architecture

For ease of reference, this annex is an extract of the GS1 System Architecture document available at <https://www.gs1.org/gs1-architecture>.

Classes of GS1 identification keys

The GS1 identification keys are the foundation of the GS1 system. However, some GS1 standards make provision for the use of other systems of identification for which some organisation other than GS1 is the issuing authority. For this reason a classification of keys, drawn from a GS1 perspective, is helpful in understanding the relationship between a key and the rest of the GS1 system.

The following classification of keys is used:

- **Class 1:** Keys administered by GS1 and fully under its control
- **Class 2:** Keys whose framework is controlled by GS1 and for which a portion of the identification capacity is allocated for an identification scheme administered by an external agency
- **Class 3:** Keys fully administered and controlled outside GS1 but which are supported in some part or parts of the GS1 system
- **Class 4:** Keys that are entirely outside the GS1 system i.e. all identifiers that meet the technical definition of "key", but are not in the first three classes.

Class 2 keys

A class 2 key starts with either a GS1 Prefix or a GS1 Company Prefix, incorporates a key administered by an external organisation, and includes a check digit if required by its corresponding class 1 key format. Class 2 keys are unique with respect to class 1 keys of the same type and their values are a subset of all possible values of the corresponding GS1 key. Their allocation and lifecycle rules, however, are defined by an organisation external to GS1. The degree to which these rules are compatible with those of the corresponding class 1 keys is specific to each class 2 key. In some cases they can easily be used alongside class 1 keys, but sometimes legal restrictions or dominant business practices lead to acceptance of class 2 keys whose rules vary significantly from their class 1 equivalents.

It is important to understand that technical compatibility is not the same in practice as interoperability. Technical compatibility is achieved by having uniqueness of values within the namespace and a similar basic structure for the identifier (e.g., GS1 Company Prefix, object reference, and check digit). It is still possible for business or legal restrictions to be imposed requiring use of a certain format or range of values, even if such restrictions are not technically justified. It might be argued that class 2 keys are more susceptible to these geopolitical constraints than keys in class 1.

Interoperability is the ability to use the key within the context of business processes supported by GS1 standards. However, the degree of interoperability with GS1 system depends on the extent to which a class 2 key conforms to class 1 key functionality and rules.

Class 2 keys are always based on a GS1 Prefix issued by the GS1 Global Office and might be based on a GS1 Company Prefix issued by a GS1 Member Organisation or the GS1 Global Office.

Examples include:

- The International Standard Serial Number (ISSN) may be used with GS1 Prefix 977 to form a key compatible with GTIN-13.
- The International Standard Book Number (ISBN) is issued using GS1 Prefixes 978 and 979 to form a key compatible with GTIN-13.
 - A subset of ISBNs starting with 9790 are reserved for the International Standard Music Number (ISMN).
- GS1 Prefix 34 is used with Club Inter Pharmaceutique (CIP) codes for pharmaceuticals in France to accommodate national numbers inside the GTIN number range

- The Produce Electronic Identification Board uses the GS1 Company Prefix 033383 issued by GS1 US combined with a commodity code issued by the Produce Manufacturers Association to create "PEIB UPCs" inside the GTIN number range.

Whether a class 2 key contains a GS1 Company Prefix or a GS1 Prefix alone is determined by the GS1 party to the contractual agreement with the external organisation. A class 2 key that contains a GS1 Prefix alone may also have a structure that is similar to the GS1 Company Prefix, that is, where the GS1 Prefix and some number of following digits are assigned by the external organisation to other organisations who assign the remaining digits. This depends on the type of key, on the nature of the agreement between the GS1 party and the external organisation, and on the structure of the external organisation's key. Such use is not the same as containing a true GS1 Company Prefix because it is not assigned by GS1.

Every GS1 party that supports class 2 identification keys is required to document whether it issues identifiers using a structure similar to the GS1 Company Prefix, and if so, what portion of their identifier is "equivalent" to the GS1 Company Prefix. Examples include:

- no equivalent for ISSN;
- GS1 Prefix, registrant group, and registrant for ISBN;
 - GS1 Prefix, registrant group, and publisher for ISMN;

There must be a contractual agreement between the GS1 Global Office or a GS1 Member Organisation and the agency that administers the embedded key. This agreement specifies at minimum the following:

- GS1 system components that can be used with the key (e.g. ISBN can only be used with the EAN/UPC data carrier)
- Restrictions that may apply, e.g. ISBN can only be used for books
- Financial considerations
- GS1 keys allocation and lifecycle rules
- Validation rules
- Compatibility with class 1 key function and syntax for example:
 - Will this class 2 key work with physical data carriers and GDSN validation rules
 - Will this class 2 key support ONS
 - Etc...
- Restrictions on reciprocity (e.g. national or currency zones)