GS1 identification keys – the global language of business

Every organisation does things differently which makes them stand out from their competitors. But when it comes to communicating with their trading partners, wouldn't it be great if all can speak the same language?

The language barrier that exists between businesses around the world can be overcome by unambiguously identifying items, parties, logistics units, services, documents etc involved in businesses in a common single manner which is also unique and universal.

This is where GS1 identification keys come in….

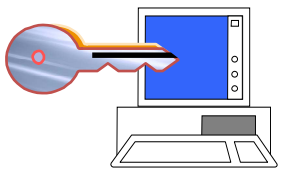
No matter where in the world a business is based or what language it uses, trading partners can always understand one another using GS1 identification numbers/GS1 ID Keys as these are already established as the standard in over 150 countries to help businesses by-

- Providing a common language for information sharing among supply chain partners
- Facilitating automatic identification and data capture like barcode scanning in an accurate way
- Driving electronic communications systems like EDI across trading partners
- Addressing the identification requirements of data synchronisation

GS1, a not-for-profit organization, has been dedicated for more than 35 years to the development and implementation of open, interoperable and user driven standards in Supply Chain Management. These widely implemented standards make it easy to do business globally using a unique set of identification numbers for products, companies, locations, services, assets, logistics units or customers. This in turn enable data capture and seamless sharing of supply chain information between trading partners including manufacturers/suppliers, retailers, logistics providers and also consumers.

Key features of GS1 ID keys

- ***Unique***: providing unambiguous and unduplicated identification by all in a single, common manner.
- **Universal**: recognised across all countries and all Industry sectors
- **Secure**: fixed length, numeric and include a standard check digit



How do GS1 ID keys work?

GS1 ID keys facilitate access to detailed information about them which may be contained in a centralized database. Such keys could be used to identify a product, entity, location, asset or document.

Often, such keys are encoded in automated data capture carriers like barcodes or RFID tags or used in a database or transmitted in EDI messages. A guide to which GS1 identification number/key to use and for what is provided in the table below:

What to identify	*Description*	*Applicable GS1 key*
Products	Any item e.g. toothpaste, jam, CD, apparel etc.	GTIN (Global Trade Item Number)
Parties, locations and legal entities	Companies, warehouses, factories, Stores	GLN (Global Location Number)
Logistics units	Pallets, containers, cartons	SSCC (Serial Shipping Container Code)
Returnable assets for transporting goods	Pallet bases, crates, totes	GRAI (Global Returnable Asset Identifier)
Fixed Assets	Medical equipment, manufacturing equipment, components	GIAI (Global Individual Asset Identifier)
People with their service relationships	Members of a customer loyalty scheme, patients, employees	GSRN (Global Service Relation Number)
Documents	Papers including tax demands, shipment forms, insurance policies, driving licences	GDTI (Global Document Type Identifier)
Freight Consignment	Logistics units that comprise a single consignment	GINC (Global Identification Number for Consignment)
A grouping of logistics units that travel under one despatch advice	Customs Authorities for identifying import and export shipments.	GSIN (Global Shipment Identification Number)

Composition of GS1 ID keys

GS1 ID keys are composed of the following parts -

- GS1 Company Prefix (GCP) which is a unique number assigned by the local GS1 organization to each subscriber company. The GS1 Company Prefix assigned to a user company allows the company to create any of the GS1 Identification Keys.
- Entity reference number, which is a unique number assigned by the subscriber company to each individual entity like its products, locations, shipments etc.
- GS1 check digit which is a number calculated using the check digit calculator provided. to ensure integrity of the GS1 ID key.

Global Trade Item Number (GTIN)

GTIN is used globally to identify trade items - products/stock keeping units (SKUs) and services that are priced, ordered or invoiced at any point in the supply chain - at the Retail checkout counter, in a warehouse or in an electronic catalogue.

It is generally represented through a 13 digit code (GTIN-13), which is also commonly known as the EAN code worldwide. In the U.S and Canada, it is represented through a 12 digit (GTIN-12), which is also commonly known as the UPC code.Items like lipsticks, eye-liners or similar items with limited space on packaging for printing of barcode may use 8 digit code (GTIN-8) allocated directly by the local GS1 organisation in the country.

GTIN-13, GTIN-12, GTIN-8 are assigned to items meant for sale at the Retail Point of Sale (PoS). GTIN is represented through a 14 digit code (GTIN-14) for use on items that will **not** be sold at the PoS, e.g., a carton of individual items.

GTIN-14

GTIN-13

GTIN-8

Key features

- Each trade item that is different from another is allocated a separate, unique GTIN.
- GTIN enables items to be uniquely identified worldwide without ambiguity/ duplication.

GTIN Applications

GTINs are used in all areas of modern business. They provide a quick way to identify an item which then can be looked up in a database and their use recorded. The look-up may typically be to get a price, record a sale, confirm a delivery or to identify an order.

The following are typical uses of GTIN in business applications. They are just a few of the most common uses but show how GTIN when combined with GS1 standards has become an integral part of modern business applications:

At a Retail outlet

At checkout point GTIN on a retail item is scanned for –

- price look-up to ensure customer charged correctly
- recording of sold products required in inventory update for re-ordering

At a Warehouse

At a goods-in bay, GTIN on shipment is scanned to confirm

- orders received
- correct products picked up

At a Hospital

GTIN on consumable items are scanned at points of use to

- assign use of item to patient
- record stock usage
- update stock-management system for re-ordering

In an electronic business message

GTIN is mentioned in electronic business messages from-

- checkout scanner to back office for price look up
- back office in store or hospital to central ordering system
- central ordering system to supplier for orders , forecasting , pricing and delivery schedule
- supplier to customer,

At each stage the GTIN will identify the correct item for order confirmation, forecasting, delivery confirmation and payment

In a product catalogue

GTINs of different products are mentioned in product catalogue for -

- new product selection
- transmitting product or price changes
- managing re-merchandising systems

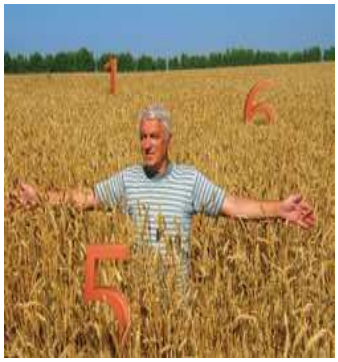
Global Location Number (GLN)

GLN

The Global Location Number (GLN) identifies locations and legal entities. Location indicates physical structures such as a building, warehouse, loading dock, or even a specific shelf within a store while a legal entity indicates a company or a customer.

Key features

- GLN allows complete flexibility for whatever level location identification is required .Organisations may choose to allocate one GLN for the whole business whilst others may allocate a GLN for every location that they need to identify. For example- this could be a warehouse goods-in door or a hospital bed location in a ward.
- As a GS1 Identification Key the GLN will always be unique which allows trading parties to exchange GLN data for location identification with no danger of number duplication.



GLN Applications

The GLN, as opposed to a proprietary internal numbering system, provides a standardized way to uniquely identify locations. Being able to identify locations with a unique number, it works as a key to many business processes. The GLN is used-

- in supply chains to identify trading partners/legal entities
- in electronic messaging between customers and suppliers, where location advice is important
- within companies to identify specific locations and functions both electronically in a database or physically where the GLN can be produced in a barcode or GS1 EPC tag

Serial Shipping Container Code (SSCC)

The Serial Shipping Container Code (SSCC) is used to identify individual logistic unit such as cartons, pallets, or air cargo containers. A logistic unit can be any combination of units put together in a case or on a pallet or truck where the specific unit load needs to be managed through the supply chain. The SSCC enables this unit to be tracked individually which brings benefits for order and delivery tracking and automated goods-receiving.

As the SSCC provides a unique number for the delivery it can be utilized as a look-up number to provide not only detailed information regarding the contents of the load but also as part of an Advanced Shipping Notice (ASN) or Despatch Advice process.

Typically this means that just one scan at a goods-in bay of the SSCC on a logistic unit can be linked to a pre-received electronic ASN/Despatch Advice of the contents of the logistic unit to facilitate speedy goods-in and put away processes. Alternatively when tracking a unit in transit the SSCC provides all the information required for accurate identification.

An SSCC is different to a traded unit in that it is used when an item or unit load need to be identified specifically when moving from one place to another. It is possible to have a single item identified with both an SSCC and a GTIN (e.g. a pallet of bottled water that needs to be tracked in the supply chain but is also bought and sold).

The SSCC can be captured when a specific logistic unit is dispatched, arrives at the destination or at any other intermediary point in the supply chain.

SSCC

Key features

The SSCC is fully compatible with ISO/IEC 15459 – Unique Identifiers for Transport Units. This is often referred to as the ISO Licence Plate and is a pre-requisite for tracking and tracing many international shipments.

Combined with GS1 standards for electronic messaging, this ‘license plate’ facilitates simple tracking of goods from carton to even trailer load level. In addition it allows reliable look up of complex load detail. In turn this saves having to encode long detailed consignment information on individual logistic unit labels.

The serial reference component of the SSCC provides virtually unlimited number capacity simplifying number allocation and guaranteeing unique identification. A new SSCC is required in the case of creating a new logistics unit either by repacking or by breaking down the original one.

Benefits of using an SSCC

The SSCC is the key for building a business to business tracking system. It facilitates shipping notice processes from raw materials supplier to end user. Key Benefits include

- Unique identification and tracking of logistics units at any stage of the supply chain
- Provision for virtually unlimited numbering capacity
- Suitable for integration with all GS1 supply chain processes
- Enables fast look up of transactional data
- Facilitates simple electronic messaging between companies by linking bar coded or EPC tag information to electronic communications
- Suitable for identifying dispatch, a journey or an arrival either within or between companies

SSCC Applications

An SSCC is used in many industries when items and loads require tracking. It provides an efficient way to facilitate automated dispatch, delivery and good-in processes. For example in advanced Business-to-Business systems it is used to identify the Logistic Unit in electronic message delivery notes.

SSCC in typical B2B process

A load for shipment is assembled and assigned an SSCC

- The SSCC is printed onto a label and attached to the load
- The SSCC can now be scanned at any point to identify its progress through to delivery
- Detail of load sent electronically to recipient with SSCC as identifier in Advanced Shipping Notice (ASN) or Despatch Advice
- The SSCC provides a link to the full inventory of the load in the message
- Recipient scans SSCC upon arrival and matches consignment with electronic delivery note
- At any time during the transit the SSCC may be scanned to identify the load
- Every time that the SSCC is scanned traceability is available

Global Returnable Asset Identifier (GRAI)

Global Returnable Asset Identifier (GRAI) is one of the two GS1 keys for asset identification. GRAI is used to identify returnable assets. It is for re-usable packages or transport equipment, this could be a tray, pallet or a crate. The GRAI enables returnable assets to be identified by type or individually for tracking or sortation purposes. As GRAI allows enterprises to scan assets in and out of their businesses, it can either be used for asset identification or can be part of a hiring or rental system where two or more companies collaborate.

GRAI

Key features

- The key is comprised of a GS1 Company Prefix, Asset Type, Check Digit and optional serial number.
- The GRAI identify each individual asset type. Each asset type is allocated an Asset Type number to ensure that it can be identified correctly.
- There is an option to also include a serial number which will allow unique identification of each asset.

GRAI Applications

GRAI can be used in many areas of business where returnable asset tracking and identification is important. The GRAI is the enabler for returnable asset tracking and reconciliation. Businesses that handle returnable assets from many companies will find it a vital tool in controlling returnable asset movements. The following are some typical uses of GRAI in business applications. The list is not exhaustive but shows the most common use and how GRAI when combined with GS1 standards has become an integral part of modern business applications:

Within a company in a GS1 BarCode or RFID tag (using EPC standards)

- On all returnable assets to enable tracking within a warehouse or from a warehouse to a store
- To identify handling parameters for specific returnable asset types
- To identify cleaning regimes for specific returnable asset types
- As part of a manual or automated sortation system
- GRAI is scanned to record a returnable asset loaded for dispatch at all Goods-out locations

GRAI is scanned at all Goods-in locations

- GRAI may be scanned at Hubs for re-use or re-routing
- Combined with asset tracking software complete control of movement of assets can easily be achieved

At a customer's warehouse in a GS1 BarCode or EPC tag

- GRAI can be scanned at all points to record movement of returnable assets
- The data can be shared with the originating company to provide tracking visibility
- GRAI may be used to facilitate rental or trip charges as part of a business application
- GRAI will also help identify returnable assets that are lost or in the wrong location

Global Individual Asset Identifier (GIAI)

GIAI identifies fixed assets such as office equipment, computers, vehicles etc.

Global Individual Asset Identifier (GIAI) is one of the two GS1 keys for asset identification. GIAI is used to identify fixed assets. It enables assets to be individually and uniquely recorded.

GIAI

Key features

The key is comprised of a GS1 Company Prefix and Individual Asset Reference or serial number and check digit.

GIAI Applications

GIAI can be used in many areas of business where asset tracking and identification is important. They provide a quick way to identify an asset which then can be looked up in a database for asset stock reconciliation, to update a service record or to assign an asset to a user or location.

The following are some typical uses of GIAI in business applications. The list is not exhaustive but shows the most common use and how GIAI when combined with GS1 standards has become an integral part of modern business applications:

At a Business in a GS1 BarCode or EPC tag

- On all fixed assets at a Head Office. Computers, printers, tables, chairs etc.
- GIAI is scanned whenever you need to identify an asset
- Enables quick look-up in Database
- GIAI can also be scanned to record change of user or component upgrade such as latest software or service.
- GIAI may be scanned to record new locations and assigned users of assets after an office re-organisation

At a Warehouse in a GS1 BarCode or EPC tag

- On pallets trucks and loading equipment
- GIAI scanned to identify specific asset
- Any other fixed assets such as computers and furniture

Global Service Relation Number (GSRN)

GSRN identifies service relationships between a business and its client, such as club memberships, loyalty programs, hospital admissions etc. GSRN is normally assigned by the service provider. It does not identify a business or individual specifically for purposes other than the service being provided and therefore does not raise privacy concerns.

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GSRN

Key features

The GSRN will identify each service relationship individually thus ensuring that it is always identified correctly anywhere within a business or the world. An individual may have many GSRN's from different service providers. As it is the service provider that allocates the GSRN there is no danger of the individuals other service relationships being linked. The GSRN itself has no meaning and this allows the service to be looked-up in a secure database and its associated information retrieved only by the service provider. As it is based on the GS1 system using a GS1 Company Prefix and a serial number, allocation of numbers is simple and uniqueness guaranteed.

If you are a business that has service relationships with individuals and you want to be able to identify your customers accurately, GSRN is a simple tool to enable this.

GSRN Applications

GSRN can be used in business where identification of recurring services is required. This can occur in many different ways but typically is where the detail of a service sold or offered to a specific customer needs to be recorded in a database.

The following are some typical uses of GSRN in business applications. The list is not exhaustive but shows the most common use and how GIAI when combined with GS1 standards has become an integral part of modern business applications:

Between an organisation and a customer encoded in a GS1 BarCode or EPC tag

- On a Library ticket to identify the customer and update take-outs and returns
- On a Loyalty card to identify the customer and update purchase history
- On a Hospital patient card
    - To identify treatment prescribed
    - To ensure drugs given to correct patient
    - To allocate charges to correct patient

By a company carrying out a service agreement

GSRN could be used to identify the scope of the maintenance/service contract with a particular Client

Global Document Type Identifier (GDTI)

GDTI identifies documents such as insurance policy, proof of shipment form, internal invoice, phone bill, graduate certificate etc. A company issues a GDTI when it needs to maintain a record of a document. GDTI provides a link to the database that holds the 'master' copy of the document.

The term "document" is applied broadly to cover any official or private papers that infer a right (e.g. a proof of ownership) or obligation (e.g., notification or call for military service) upon the bearer. The issuer of the document is normally responsible for all the information contained upon the document, both bar coded and Human Readable Interpretation. Such documents typically require storage of the appropriate information contained on the document.

GDTI

Key features

- GDTI is composed of an Application Identifier (253), a GS1 Company Prefix, a Document Type Number, a Check Digit and optionally a serial number.
- GDTI is a 13 digit number. The length of the Document Type number will depend on the length of the Company Prefix used.
- The GDTI will identify the class or type of document. In many cases individual document identification will also be required and for this an optional serial number can be used to uniquely identify each document.

GDTI Applications

GDTI can be used in business where identification of documents is important. The GDTI is the key to look up the document in a database and the key that can be bar coded on the document for identification or information purposes.

The GDTI can facilitate privilege levels allowed for the holder. e.g. on a driving licence, it could show classes of vehicle the holder was entitled to drive.

Any documents that are important and give entitlement or specify an obligation can be identified and applications built to capture the information using GDTI as the key.

Example of document types identified using GDTI

- Land registration papers identifying the property
- Tax demands identifying the claim
- Insurance policies identifying the holder and cover
- Exam papers for schools
- On a passport
- Identification of television commercials

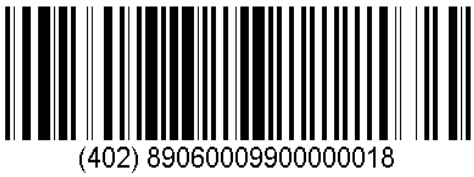
Global Shipment Identification Number (GSIN)

GSIN identifies a shipment - grouping of logistics units meant for trade, referencing a dispatch advice and/or Bill of Lading (BOL). Assignment of GSIN must comply with the regulations of the World Customs Organization (WCO). The GS1 Identification Key is comprised of a GS1 Company Prefix, Shipper Reference and Check Digit using the Application Identifier (402).

Global Identification Number for Consignment (GINC)

GINC identifies a consignment - grouping of logistics units that are assembled to be transported together under one transport document. The GINC comprises a GS1 Global Company Prefix and the Freight Forwarder's or Carrier's transport reference using the Application Identifier (401).

GINC



GSIN