Identification of assets

Fact Sheet

Introduction

The GS1 System provides a method for the identification of assets. The object of asset identification is to identify a physical entity as an inventory item.

Each company holding a GS1 Company Prefix may assign asset identifiers to the assets or trade items supplied to their customers. The asset identifier may be a Global Returnable Asset Identifier (GRAI) or a Global Individual Asset Identifier (GIAI). If the asset is manufactured on behalf of a company best practice may dictate that the manufacturing company applies the GRAI or GIAI during the manufacturing process on behalf of this customer.

Where assets of the same type need to be ordered, a GTIN is required for the ordering process. There is no conflict when a GTIN and a GRAI (GS1 Company Prefix, Asset Type and Check Digit) have the same digits, because the data carrier (EDI qualifier, GS1 barcode with GS1 Application Identifier or EPC/RFID) will distinguish between the two GS1 Identification Keys.

GS1 System asset identifiers act as keys to access the characteristics of an asset stored in a computer file and/or to record movements of assets. Examples of the characteristics of an asset that might be stored include the full name and address of the party who owns the asset, the value of the asset, the location of the asset, and the life-cycle history of the asset.

Asset identifiers can be used for applications such as the location and usage of a given asset (e.g., a personal computer or returnable transport item) or the recording of the characteristics of a returnable asset (e.g., a reusable beer keg), its movements, its life-cycle history and any relevant data for accounting purposes.

Asset identifiers must not be used for any other purpose and must remain unique for a period well beyond the lifetime of the relevant records.

If a company assigns asset identifiers to trade items supplied to its customers, the company must ensure that the asset identifiers are never re-used.

Global Returnable Asset Identifier (GRAI) - AI (8003)

A returnable asset is a reusable package or transport equipment of a certain value, such as a beer keg, a gas cylinder, a plastic pallet, or a crate. The GS1 Identification Key for a returnable asset, the Global Returnable Asset Identifier (GRAI), enables tracking as well as recording of all relevant data.

A typical application using a GRAI is in tracking returnable beer kegs. The owner of the beer keg applies a barcode carrying a GRAI to the keg using a permanent marking technique. This barcode is scanned whenever the keg is supplied full to a customer and scanned again when it is returned. This scanning operation allows the beer keg owner to automatically capture the life-cycle history of a given keg and to operate a deposit system, if desired.

A GRAI identifies a physical entity as a returnable asset. When such a physical entity is used to transport or to contain a trade item, the element string AI (8003) must never be used to identify the transported or contained trade item.

Assigning a Global Returnable Asset Identifier (GRAI)

The structure of the data for a GRAI can include two parts: the mandatory identification of an asset type and an optional serial number to distinguish individual assets within the same asset type. Although consecutive numbering is recommended, the structure is left to the discretion of the assigning company. The owner of the asset assigns the optional serial number; it is alphanumeric and denotes an Individual Asset within a given asset type.

How you assign a GRAI depends on the length of your allocated GS1 Company Prefix. Currently GS1 Australia allocates seven, eight, nine and ten-digit GS1 Company Prefixes to its membership, however GS1 Company Prefixes of other lengths may be allocated in the future to further conserve numbers. Please note that other GS1 Member Organisations may allocate GS1 Company Prefixes of different lengths.

TABLE 1: Global Returnable Asset Identifier (GRAI) structure

GS1 Application Identifier	Lead zero	Global Returnable Asset Identifier (GRAI)														
		GS1 Company Prefix →							← Asset type					Check digit	Serial component (optional)	
8 0 0 3	0	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}	X_1	variable X_{16}

The GS1 Company Prefix is the one allocated to the owner of the asset.

The GS1 Company Prefix should have one filler zero added as shown in the table above. If you have obtained a prefix to assign twelve-digit GTINs, either directly from GS1 US, GS1 Canada or via GS1 Australia, you must add a second filler zero to the front of the prefix.

The Asset Type is a number assigned by the owner of the asset to uniquely identify each type of asset. The length of the asset type will depend on the length of the GS1 Company Prefix.

The Check Digit is mathematically calculated to ensure that the whole number is correct. Correct calculation is essential for successful scanning of the barcode:

- A Check Digit Calculator Program which will automatically calculate the Check Digit can be obtained from the GS1 Australia web site at www.gs1au.org
- For manual calculation of the Check Digit please refer to the *Manual Check Digit Calculation Fact Sheet*.
- For either method of calculating the Check Digit use the GTIN-13 option.
- The AI (8003) is not part of the Check Digit calculation.

The Serial Number (optional) is assigned by the owner of the asset. It identifies an individual asset within a given asset type. The field is alphanumeric and variable in length up to 16 characters.

When it is not possible to assign an asset type (e.g. a museum exhibit), or when the type of asset is not required by the application (e.g. when the item is only used for a single type of asset), then AI (8004) - Global Individual Asset Identifier (GIAI), should be used.

Identical Assets Identification

A single Global Returnable Asset Identifier (GRAI) should be assigned to a series of identical assets.

Asset Type	GRAI
50 litre aluminium beer keg	9312345678907
10 litre aluminium beer keg	9312345678914
10 litre wooden beer keg	9312345678921

Serial Number (Optional)

The owner of the asset assigns the optional serial number. It denotes an individual asset within a given Asset Type. The field is alphanumeric and is used to distinguish individual assets with the same Asset Types.

Asset Type	GRAI (incl. the Serial Number)
50 litre aluminium beer keg	93123456789071234AX01
50 litre aluminium beer keg	93123456789071234AX02
50 litre aluminium beer keg	93123456789071234AX03

Note: The leading zero required before the GRAI when used with AI(8003) is not required when displayed as non-HRI text

Barcode

The GS1 data carriers that can be used to represent the GRAI are: GS1-128, GS1 DataMatrix, GS1 QR Code and EPC/RFID. For medical devices, when direct part marked, only GS1 DataMatrix can be used to represent the GRAI.

Global Individual Asset Identifier (GIAI) - AI (8004)

In the GS1 System, an individual asset is considered a physical entity made up of any characteristics.

The Global Individual Asset Identifier (GIAI) is the GS1 Identification Key used to identify a particular physical entity as an asset. It must not be used for other purposes and must be unique for a period well beyond the lifetime of the relevant asset records. Whether or not the assigned GIAI may remain with the physical item when the item changes hands, depends on the particular business application. If the GIAI remains with the physical item, then it must never be re-used.

This identification key might, for example, be used to record the life-cycle history of aircraft parts. By symbol marking the GIAI, using AI (8004), on a given part, aircraft operators are able to automatically update their inventory database and track assets from acquisition until retirement.

Assigning a Global Individual Asset Identifier (GIAI)

How you assign a GIAI depends on the length of your assigned GS1 Company Prefix. Currently GS1 Australia allocates seven- eight- and ten-digit GS1 Company Prefixes to its membership, however GS1 Company Prefixes of other lengths may be allocated in the future to further conserve numbers. Please note that other GS1 Member Organisations may allocate GS1 Company Prefixes of different lengths.

TABLE 2: Global Individual Asset Identifier (GIAI) Structure

GS1 Application Identifier	Global Individual Asset Identifier (GIAI)				
	GS1 Company Prefix →		Individual asset reference →		
8 0 0 4	N_1 …	N_i	X_{i+1} …	variable length	$X_{j\ (j<=30)}$

The GS1 Company Prefix is the one allocated to the company assigning the Individual Asset Reference.

If you have obtained a prefix to assign twelve-digit GTINs either directly from GS1 US, GS1 Canada or via GS1 Australia, you must add a filler zero to the front of the prefix after the Application Identifier.

The Individual Asset Reference is assigned and structured at the discretion of the holder of the GS1 Company Prefix. The data can be alphanumeric, and is of variable length, ensuring that the entire GIAI is not longer than 30 characters.

The exact method used to allocate the GIAI is left to the discretion of the issuing organisation. However, each GIAI must be unique for each individual asset being

identified and, for ease of administration, the GS1 System recommends that GIAIs be assigned sequentially and not contain classifying elements.

Barcode

The GS1 data carriers that can be used to represent the GIAI are: GS1-128, GS1 DataMatrix, GS1 QR Code and EPC/RFID. For medical devices, when direct part marked, only GS1 DataMatrix can be used to represent the GIAI.

Change of Asset Ownership

GS1 Asset Identification Numbers are used in a diverse range of business applications ranging from tracking the movements of re-usable packaging trays to recording the life-cycle history of aircraft parts. If a company sells an asset to another company, then the asset identifier should ideally be replaced by another GIAI or GRAI within one year or be removed from the item. It is permissible for the asset identifier to remain on the item when the ownership changes if the new owner takes responsibility for the GS1 Company Prefix associated with the asset identifier.