TRACEABILITY SYSTEM FOR TOBACCO PRODUCTS

Technical guide

Real Casa de la Moneda
Fábrica Nacional
de Moneda y Timbre

CONTENT

1. OBJECT

The object of this document is to offer a detailed technical description of the mechanism of interaction regarding the FNMT as unique identifiers ID issuer from the point of view of all the involved operators in the identifiers requesting system.

2. INTRODUCTION

Having regard to Directive 2014/40/EU of the European Parliament and of the Council on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco and related products and repealing Directive 2001/37/EC was published on 3 April 2014.

In particular, Article 15 of the Directive includes the need for all packaging units of tobacco products to be marked with a unique identifier to guarantee the traceability of these products. These identifiers will be formed by data that will allow determining information related to the manufacturing process.

Likewise, unique identifiers must be assigned to the economic operators involved in the process of products distribution, which must record all the movements carried out with any packaging unit. These two tasks correspond to the two basic function that the ID issuer must provide.

3. DESCRIPTION OF THE SERVICE SCOPE

3.1. OPERATORS

3.1.1. ID ISSUER

Each Member State shall appoint an entity (the 'ID Issuer') responsible for generating and issuing unique identifiers, in accordance with Articles 8, 9, 11 and 13, within a maximum period of one year from the date of entry into force of this Implementing Regulation.

3.1.2. ECONOMIC OPERATOR

'Economic operator' means any natural or legal person who is involved in the trade of tobacco products, including exportation, from the manufacturer to the last economic operator before the first retail outlet. The economic operators that must request the registration to the FNMT ID issuer are those that operate within Spanish territory and that have at least one installation on this territory.

Manufacturers and importants

Manufacturers and importers are the operators responsible for introducing tobacco products into the distribution process within the European Union.

Distributors and wholesalers

These operators are responsible for distributing and selling tobacco wholesale. Aggregations and disaggregations of tobacco products can be produced in their facilities.

First retail outlet

The first retail outlet is one in which tobacco is offered to the consumer. Among the establishments that are considered as first retail outlet economic operators are the dispensing and establishments (bars, restaurants, etc.) that sell tobacco manually and/or with automatic vending machines in their name, the duty free stores that sell tobacco and, in the Canarian market, all those establishments that sell tobacco products.

3.1.3. FACILITIES

Factories

These factories are the locations that the manufacturers own, in which the tobacco is manufactured.

Wholesalers Facilities

The wholesalers facilities are the locations owned by the distributors, in which the tobacco is distributed. These facilities can be distribution facilities and means of transport in which tobacco is taken for distribution.

First reatil outlet

The first retail outlet is the facility in which tobacco products are offered for sale for the first time. This group of operators includes both tobacconists and vending machines. The market of the Canary Islands is more peculiar and it includes a large number of shops that are considered as first retail outlets and that in any other place in Spain would not be considered as such. Other first retail outlet that must be registered as facilities are the duty free stores.

3.1.4. MACHINES

Machine means the equipment used for the manufacture of tobacco products which is integral to the manufacturing process.

3.2. FUNCTIONALITIES

The high-level technical specification of the tobacco traceability system is included in the COMMISSION Implementing Regulation (EU) 2018/574 of December 15, 2017. The following are the functionalities offered by the FNMT Issuer ID.

3.2.1. REGISTER

Operation

Within the traceability infrastructure of the tobacco product, one of the key points is the identification of all the operators involved. The operators that must be identified are manufacturers, importers, distributors, first retail outlets, facilities and machines.

The registration tasks must include both the identification and inclusion in the system of operators, facilities and machines, as well as the modification of the data and the deactivation of any of the operators, facilities and machines. The deactivation of manufacturers and importers will cause the subsequent deactivation of their associated facilities and machines.

- ## Registration process

All users of the system must complete the registration process. This must be a simple process in which an assignment of credentials and a proof of possession of an access data is carried out.

- ## Economic operators, facilities and machines national registration process

The registration in the national operator system involves the assignment of a unique identifier. In addition, it supposes the registration in the ID issuer system to carry out any necessary administrative process.
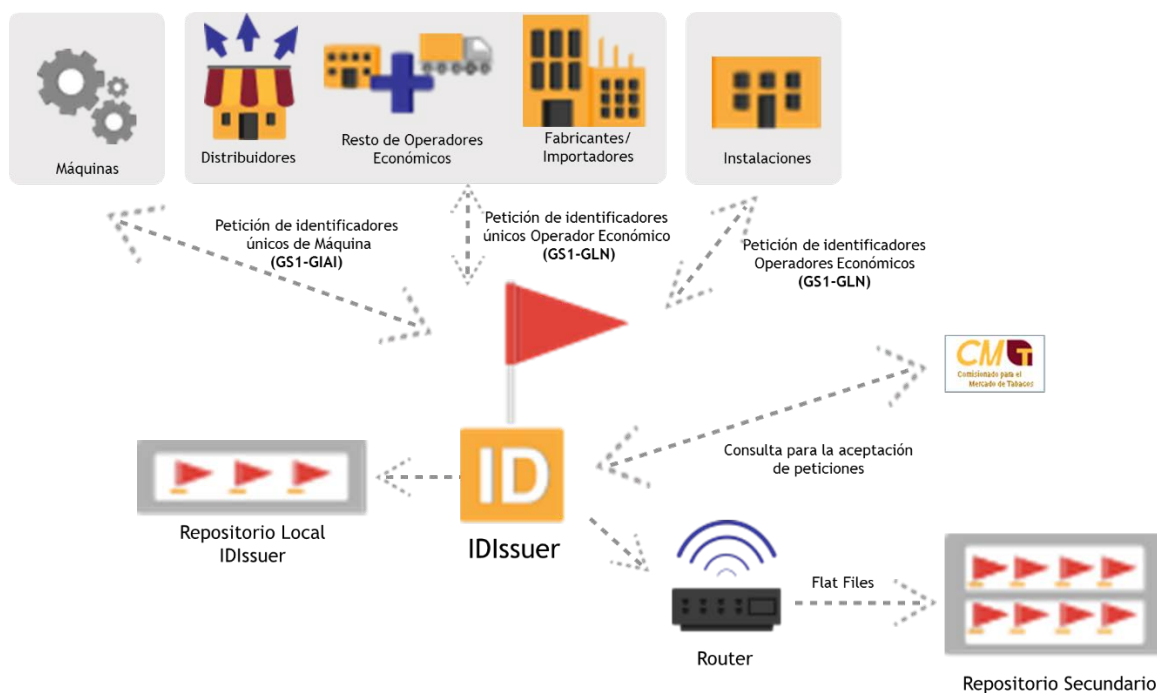
Once the ID issuer receives an identifier request for an economic operator, a facility or a machine, it will have to consult with the regulatory body to verify the applicant's capacity to provide service in the tobacco market and thus have access to said identifier. This verification will be carried out according to established procedures.

- ## Customer system registration

Manufacturers and importers, whose products are going to be sold in the Spanish market, must carry out the registration process in the customers system in order to be allowed to request unique identifiers at the unit package or aggregation packing level. This process will only generate an administrative register in the system, with the purpose of being able to carry out

the invoices associated with the requests made, except for the case in which manufacturing facilities are located in the Spanish territory.
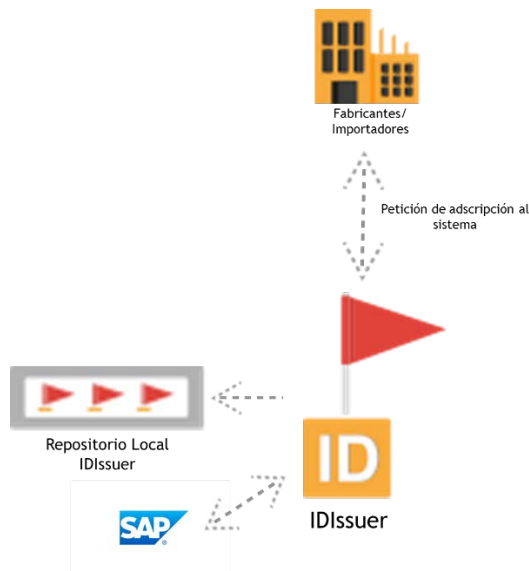
- Modification of the information refered to economic operators, facilities or machines

The economic operators must have the possibility of making modifications on the information referring to them provided in the registration process. This functionality must be possible for operators that have obtained their ID from the FNMT ID issuer. In addition, in the case of manufacturers and importers, they may request the modification of data relating to their facilities and machines.
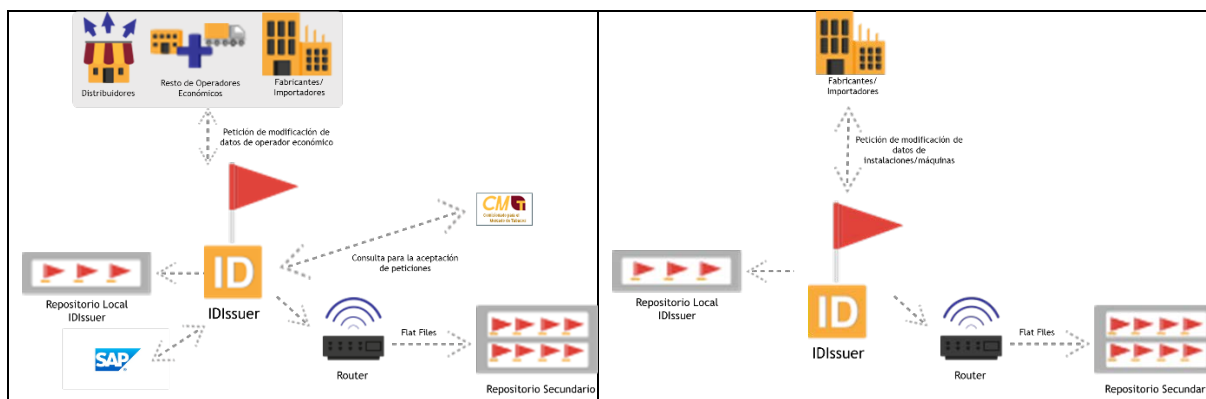
The request for modification of data associated to economic operators is initiated by the economic operator. For obvious security reasons, the requester must be authenticated. Once the modification request is received, it will be necessary to follow the existing validation procedures. The request for modification of data relating to facilities or machines will be made by their owner, either a manufacturer or an importer. As in the previous case, the requester must be authenticated before the modification is carried out. Once the modification request is received, it will be necessary to follow the existing validation procedures.

- Deactivation of economic operators, facilities and machines.

The deactivation of economic operators, facilities and machines may be requested by the economic operator itself or by the regulatory authority.
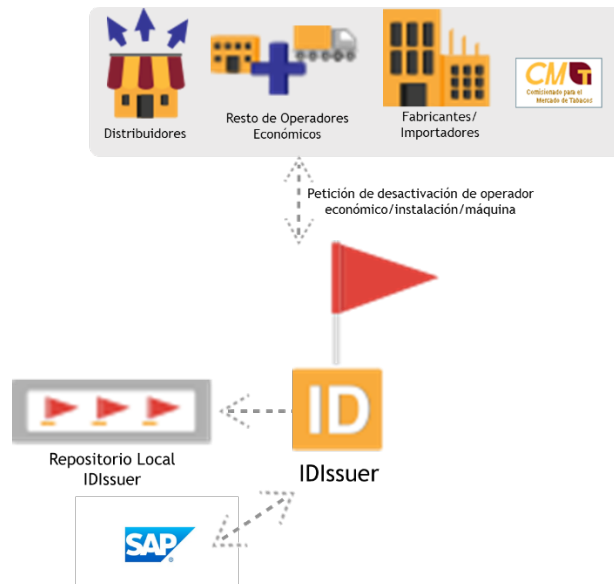
The deactivation of an economic operator, installation or machine will be carried out previous authentication of the origin, regardless of who makes the request. Once the modification request is received, it will be necessary to follow the existing validation procedures. The ID issuer will confirm the deactivation to the applicant.

3.2.2. ISSUANCE OF UNIQUE IDENTIFIERS AND AGGREGATED PACKAGING IDENTIFIERS

Procedure

The ID Issuer is the operator in charge of the generation of unique identifiers and aggregated packaging identifiers. The request for these identifiers will be made only for those products destined to the market in which the ID Issuer operates.

- Unique packet identifiers issuing.

The request for unique packet identifiers will be made by manufacturers and importers for those products destined for the market in which the issuer ID operates. This request will always be carried out electronically.
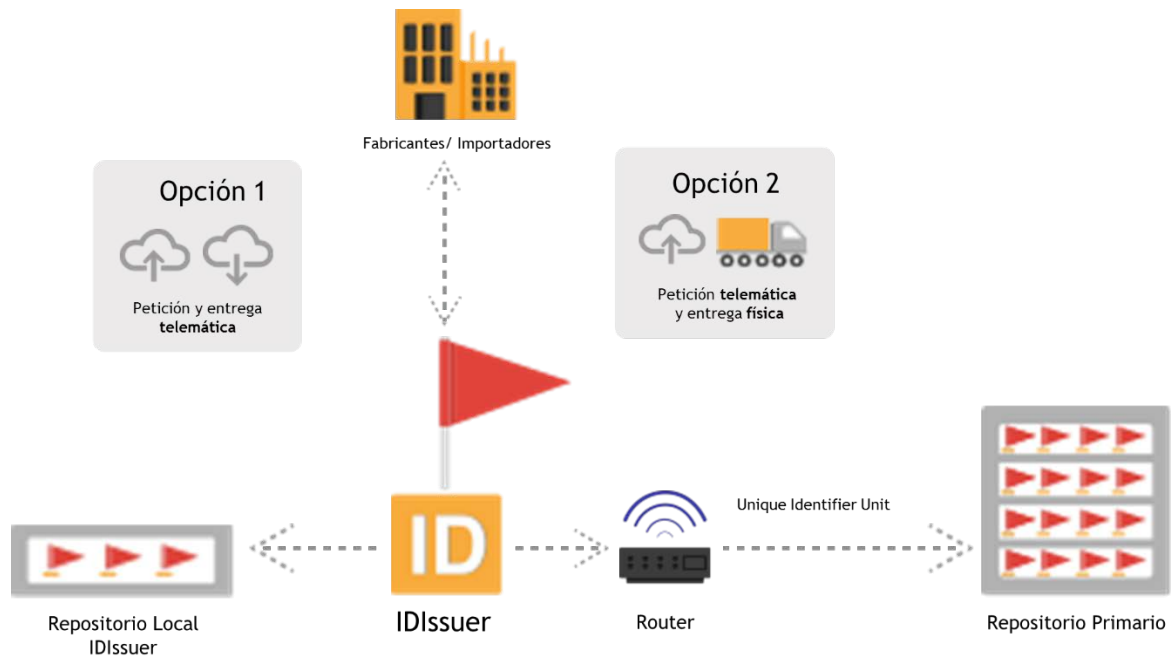
To make the request, the manufacturer or importer must be authenticated by the ID issuer. After this, it will send a message with the information related to the product and its data and manufacturing characteristics:

- Place of manufacturing
- Manufacturing facility
- Machine
- Product description
- Intended market
- Intended route
- Importer(if applicable)

The ID issuer will validate the content of the request syntactically and semantically. Subsequently, it will generate a unique code, which will consist of all the information provided by the applicant, and to which the identification code of the ID issuer and a random number will be added.

The final recipient of the codes must concatenate the date and hour to obtain the final unique identifier.

- Unique aggregated level identifiers

The request for unique aggregated level identifiers is optional. This request can be made by manufacturers and importers as well as by wholesalers and distributors.
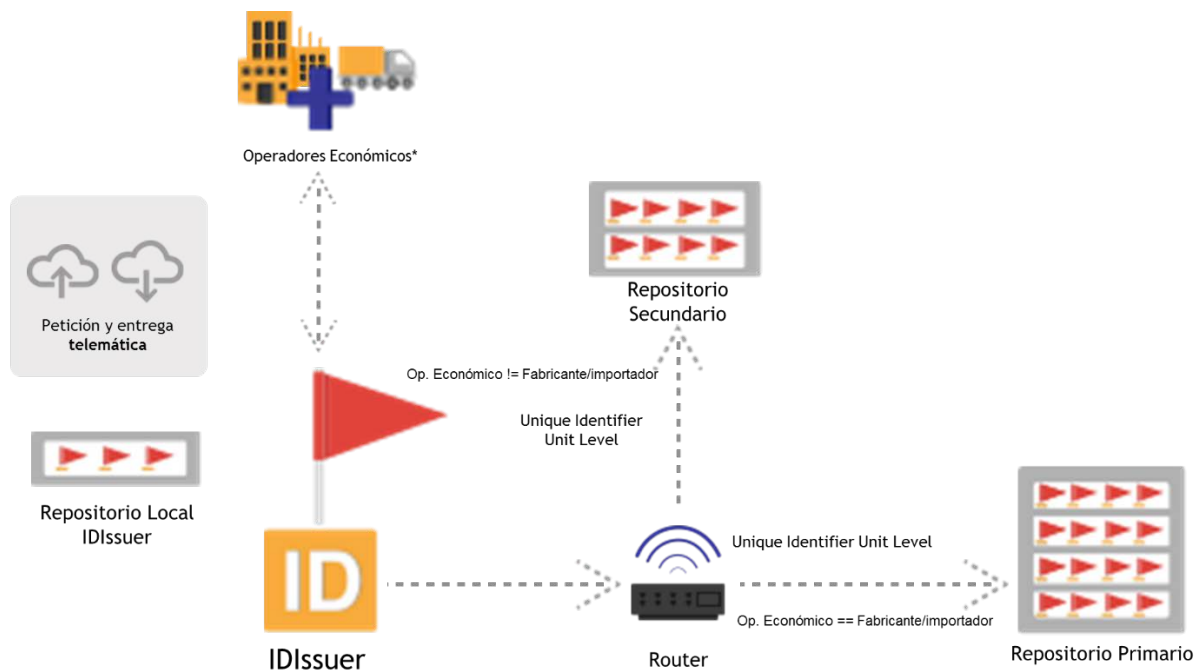
These identifiers are formed by the identifier of the issuer ID, a random serial number, and the identifier of the manufacturing facility. The final recipient of the codes must concatenate the date and the hour to obtain the final unique identifier.

4. DATA DICTIONARY

The identifiers provided by the issuer ID are based on the GS1 standards. GS1 identifiers can be used to identify individual units, product aggregations, transport units, economic operators, facilities and machines in all Member States of the European Union since:

- Are legislation compliant (eg.ISO / IEC 15459)
- Provide unique, global identification and interoperability among Member States
- They allow to speed up the deployment among companies, since they are solutions based on "Open Standards"
- Reduce disruption in the supply chain by ensuring compatibility with solutions that are currently used

All identification codes issued by the Id Issuer must be unique within the traceability system for tobacco products infrastructure.

4.1. ID ISSUER IDENTIFIER (UIC – UNIQUE IDENTIFIER CODE)

Article 3 of the Implementing Acts of the Directive establishes that the ID Issuer must be identified, univocally, by a code (UIC) issued by an Issuing Agency in accordance with ISO 15459-2: 2015.

In the case of the FNMT, the UIC has been provided by GS1 and its value is 1E.

4.2. ECONOMIC OPERATOR IDENTIFIER (EOID)

According to the Directive, all economic operators that participate in the market must obtain an identification code from the ID Issuer of the market in which they operate. These identifiers

will be part of the requests made to obtain installation, machine, unique product and aggregated packaging identifiers.

The base of the economic operator identifiers is the Global Location Number (GLN) of GS1.

The economic operator identifiers issued by the ID Issuer are formed by the concatenation of the identifier of the ID issuer, together with an extension of this identifier, with the GLN.

Those economic operators that have GLN must include it in the request so that it is included in their identifier. To the rest of the operators, that is, to those who do not have GLN, the ID Issuer will assign them one, based on a root that GS1 has provided for this purpose.

	Economic operator identifier structure			
	ID Issuer Identifier 1E	UIC extension 9_	GLN xxxxxxxxxxxxx	Total
Length	2	2	13	17

The GLN value depends on the Economic operator.

4.3. FACILITY IDENTIFIER (FID)

As established in the Directive, all the facilities belonging to an economic operator of the tobacco market must be identified. These identifiers will be part of the request for machine, unique product and aggregated packaging identifiers.

As in the case of economic operator identifiers, facility identifiers are based on the GLN code of GS1.

The structure of the facility identifier is the same as that of the economic operators, with the difference of the GLN used for the identifier.

Facility identifiers issued by the ID issuer are formed by the concatenation of the identifier of the ID issuer, together with an extension of this identifier, with the GLN.

Those facilities that have GLN must include it in the request so that it is included in their identifier. To the rest of the operators, that is, to those who do not have GLN, the issuer ID will assign them one, based on a root that GS1 has provided for this purpose.

	Facility identifier structure			
	ID Issuer Identifier 1E	UIC extension 9*	GLN Yyyyyyyyyyyyy	Total
Lenght	2	2	13	17

In the UIC extension field, the symbol "*" will be dependent on whether the installation of the economic operator is of an importer of tobacco products within the countries affected by the Directive or not.

The GLN field is a value dependent on the facility.

4.4. MACHINE IDENTIFIER (MID)

The Directive establishes that all machines in which tobacco products are manufactured must obtain an identification code. These identifiers will be part of the requests for unique product identifiers.

The machine identifiers are based on the Global Individual Asset Identifier (GIAI) standard of GS1.

The identifiers of machine issued by the ID Issuer are formed by the concatenation of the ID issuer identifier, together with an extension of this identifier, with the GIAI.

All the machines of all the facilities of manufacturers will have, prior to the request of the identifier, a GIAI assigned by GS1.

Machine identifier structure			
ID Issuer Identifier 1E	UIC extension 9*	GIAI Zzzzzzzzzz…zzz	Total
Lenght	2	2	Variable (max. 41)	Max 45

In the UIC extension field, the "*" symbol will be dependent on whether the machine of the economic operator facility is of an importer of tobacco products within the countries affected by the Directive or not.

The GIAI field is a value dependent on the machine.

4.5. UNIT PACKET IDENTIFIER

4.5.1. CODE FORMAT

According to the Directive, tobacco package unit products are to be identified with a unique code.

The content of the identifier is specified in the Implementing Acts of the Directive. Thus, the sequence must be composed of the following data:

1.   The alphanumeric characters that constitute the identification code of the ID issuer.
2.   An alphanumeric sequence, whose probability to be guessed shall be negligible and in any case lower than one in ten thousand ('serial number').
3.   A code that allows the determination of the following:
    a. The place of manufacturing
    b. The manufacturing facility
    c. The machine used to manufacture
    d. The description of the product
    e. The intended market for sale
    f. The intended shipping route
    g. The importer, if applicable
4.   In the last position, the timestamp

The FNMT has based the content of these identifiers on the Global Trade Item Number (GTIN) standard of GS1 and a serialized extension of this code (TPX). In this way, the content of the same would be the following:

1.   In the first position, the unique identification code (UIC) of the ID issuer.
2.   Next, the extension of the UIC together with a random code (Serial Number) that includes all the manufacturing information of the coded product, with the exception of the product description.
3.   The following data corresponds to the description of the product and its content will be its GTIN.
4.   Finally, the manufacturer must add the time (TimeStamp) of manufacturing of the product.

Unique identifier Data issued by the FNMT as ID Issuer		Data according to Directive
TPX	UIC	ID Issuer Identifier
	UIC Ext + Serial Number	Unlikely to be guessed alfanumeric sequence
		Place of manufacturing
		Manufacturing facility
		Manufacturing machine
		Intended market for sale
		Intended shipping route
		Importer, if applicable
GTIN		Product description
TimeStamp		Timestamp

Following the request of a unique identifier by a manufacturer (EU product) or importer (non-EU product), the FNMT will transmit the code in short format (UpUI (s)) to these and to the primary repository:

Manufacturers (UE) UpUI(s)					
	UIC	UIC Ext	Serial Number	GTIN	Total
Example	1E	9E	IF%!<B;?oa%	08456789120002	
Lenght	2	2	11	14	29

Importers (no UE) UpUI(s)					
	UIC	UIC Ext	Serial Number	GTIN	Total
Example	1E	9E	OK%A>C0.?i34	08456789120019	
Lenght	2	2	12	14	30

UpUIs will be delivered in a JSON file, following the next format:

```
{
    "EO_ID":"string",
    "F_ID":"string",
    "M_ID":"string",
    "Process_Type":boolean,
    "M_ID":"string",
    "P_Type":integer,
    "P_Brand":"string",
    "P_Weight":number,
    "P_CN":"string",
    "TP_ID":"string",
    "TP_PN":"string",
    "Intended_Market":"string",
    "Intended_Route1":"string",
    "Intended_Route2":"string",
    "Import":boolean,
```

```
    "Req_Quantity":integer,
    "P_OtherID":"string",
    "P_Other_Type":"string",
    "Code":"string",
    "upUI":[
    "string"
    ]
}
```

M_ID, P_Other_Type, P_CN, Intended_Route2 are optional fields and will only be included if the requester provide them in the request.

The field upUI is an array of strings. Quotation marks (") are among the allowed characters for upUIs. Since these are special characters, they will always be escaped with the character '\' which is not part of the accepted characters set and that should be ignored when transmitted or printed.

Below is an example of a batch of 3 UpUIs with fictitious data:

```
{
    "EO_ID":"I05B2DQS8KN7823851457TPULHSIDZR2735861466DPINXHLRMJ",
    "F_ID":"K09991JJD5860808396KKJSJJJJJAA3342945630SYQLNERCAH",
    "Process_Type":true,
    "M_ID":"MNAJW2R1SV014368814A7OKKKKKWIG1472251275KPSEBIRZGF",
    "P_Type":1,
    "P_Brand":"AAAA",
    "P_Weight":23.0,
    "TP_ID":"45127-44-23514",
    "TP_PN":"BBBBBB",
    "Intended_Market":"ES",
    "Intended_Route1":"FR",
    "Import":false,
    "Req_Quantity":3,
    "P_OtherID":"00000084160089",
    "Code":"U0000000014",
    "upUI":[
    "1E94ABnSMLcS/AU00000084160089",
    "1E94f!(ny_+/UT300000084160089",
    "1E94J7m3P-ory8H00000084160089"
    ]
}
```

Once the transmission has occurred, the primary repository will remain waiting for manufacturers or importers to complete the code with the manufacturing TimeStamp, transforming it into an UpUI (L) and updating that value in the repository system. This code will be the unique identifier used throughout the Track & trace flow.

Manufacturers (UE) UpUI(s)					
	UIC	UIC Ext	Serial Number	GTIN	TimeStamp	Total
Example	1E	9E	IF%!<B;?oa%	08456789120002	19052011	
Lenght	2	2	11	14	8	37

Importers (no UE) UpUI(L)					
	UIC	UIC Ext	Serial Number	GTIN	TimeStamp	Total
Example	1E	9E	OK%A>C0.?i34	08456789120019	19052011	
Lenght	2	2	12	14	8	38

4.5.2. ENCODING RULES

The manufacturer or importer must print the 2D barcode, being able to choose whether or not to include the TimeStamp in this 2D barcode. UpUI printing in a 2D barcode implies the addition of the different application identifiers (AIs) that allow the identification of each of the fields that are part of this UpUI. The following encoding rules must be followed:

1. Parse UpUI(s) to determine GTIN and TPX
   a. The last 14 digits of UpUI(s) correspond to the GTIN
   b. The other characters correspond to the TPX
2. Coding of UpUI in the barcode
   a. Include before the TPX the GS1 qualifier with value 235 (AI)
   b. Add separator character <FNC1> (ASCII 29) after the TPX field
   c. Include the GS1 qualifier with value 01 (AI) before the GTIN. The GTIN format must be 14 digits
3. If the manufacturer or importer includes the TimeStamp
   a. Include before the TimeStamp the GS1 qualifier with value 8008 (AI)
   b. Include the TimeStamp. The TimeStamp format must always be YYMMDDhh
   c. If the manufacturer does not add the TimeStamp to the barcode, he must never add the GS1 8008 qualifier to the data encoded in the barcode

In the general case of products manufactured within the countries affected by the Directive (EU products), the codes included in 2D barcodes, if the TimeStamp is incorporated, will be 31 characters long. For importers (non-EU products), the length, including TimeStamp, will be 32 characters. If the TimeStamp is not included, the lengths will be 25 characters in the first case and 26 in the second.

UpUI(s) bar code (UE)							
	AI	UIC	UIC Ext	Serial Number	FNC1	AI	GTIN	
	235	1E	9E	xxxxxxxxxxx		01	N14	Total
Plain text length	3	2	2	11	1	2	14	35
2D bar code length	1.5	1.5	2	11	1	1	7	25

UpUI(s) bar code (no UE)							
	AI	UIC	UIC Ext	Serial Number	FNC1	AI	GTIN	
	235	1E	9E	yyyyyyyyyyyy		01	N14	Total
Plain text length	3	2	2	12	1	2	14	36
2D bar code length	1.5	1.5	2	12	1	1	7	26

UpUI(L) bar code (UE)									
AI	UIC	UIC Ext	Serial Number	FNC1	AI	GTIN	AI	TimeStamp	
235 3	1E 2	9E 2	xxxxxxxxxxx		01 2	N14 14	8008 4	yymmddhh 8	Total
Plain text length			11	1					47
2D bar code length 1.5	1.5	2	11	1	1	7	2	4	31

UpUI(L) bar code (no UE)									
AI	UIC	UIC Ext	Serial Number	FNC1	AI	GTIN	AI	TimeStamp	
235 3	1E 2	9E 2	yyyyyyyyyyyy		01 2	N14 14	8008 4	yymmddhh 8	Total
Plain text length			12	1					48
2D bar code length 1.5	1.5	2	12	1	1	7	2	4	32

4.5.3. *HUMAN READABLE* CODE PRINTING.

The *human readable* code printing must be based on the UpUI(s).

HRC Manufacturers (UE)			
UIC 1E	UIC Ext 9E	Serial Number IF%!<B;?oa%	GTIN 08456789120002
Example			
Length 2	2	11	14

Total 15 + 14

HRC Importers (no UE)			
UIC 1E	UIC Ext 9E	Serial Number OK%A>C0.?i34	GTIN 08456789120019
Example			
Length 2	2	12	14

Total 16 + 14

4.6. AGREGATED LEVEL IDENTIFIERS

4.6.1. CODE FORMAT

Article 13(3) of the Implementing Regulation obliges the competent ID issuer to deliver aUIs within two working days from the receipt of the relevant request. There is no optionality, it is an obligation therefore GS1 must provide an ISO/IEC conformant solution. This means GS1 must provide (for ID Issuers with a GS1 UIC) a specification that meets Secondary Repository data capture specifications (e.g., exclusive communication of UI within the Repository System, use of symbology identifiers, data qualifiers, control characters for use within data capture applications).

As an ISO/IEC Issuing Agency, GS1 already has an existing specifications for these identifiers per ISO/IEC 15459-1 (SSCC) and ISO/IEC 15459-4 (SGTIN). These existing GS1 identifiers, which are assigned by economic operators, are covered in Section 2.2.2 of Dentsu data capture specifications. In order to ensure the identifier based upon specifications of Art 11(1) do not conflict with GS1 open, identification standards, their use is restricted to the EU 2018/574 application). In support of this restricted use, the following specifications and rules have been established by GS1.

For aggregated level UI generated on the basis of a request to the competent ID issuer, the structure of the aggregated level UI shall consist of a sequence of a maximum of 100 alphanumeric characters that is unique to a given aggregated package and shall be composed of the following data elements:

  a. in the first position, the alphanumeric characters that constitute the ID issuer identification code assigned under Article 3(4);
  b. an alphanumeric sequence, whose probability to be guessed shall be negligible and in any case lower than one in ten thousand ('serial number');
  c. the identifier code of the facility (as set out in Article 16) in which the aggregation process took place;
  d. in the last position, the time stamp in the form of a numeric sequence of eight characters, in the format YYMMDDhh, indicating the date and time of aggregation.

aUI				
UIC	UIC Ext	Serial Number	FID	TimeStamp
Example 1E	9E	AB*12Y7	456FGRD66	19043013
Length 2	2	Variable	Variable	8

4.6.2. ENCODING RULES

The following encoding rules must be followed:

1. GS1 data capture specifications for ID Issuer generated aggregate Unique Identifiers are restricted for use within the EU 2018/574 Repository System, SHALL NOT be used or communicated within GS1 open, data sharing standards (e.g., GS1 EPCIS, EPC Core Business Vocabulary, GS1 EDI, GS1 Master Data including aUI Request Messages), and SHALL NOT appear in the GS1 General Specifications or GS1 EPC Tag Data Standards.
2. The symbology identifiers, group separator(s), and qualifiers AI (7040), (98) or (99), and (8008) (required during data capture applications) SHALL NOT be communicated to or used within the EU 2018/574 Repository System in relation to aggregate level UIs.
3. The qualifier AI (7040) provides no distinction between standard trade item groupings and transport (logistic) units, therefore AI (98) SHALL be used for standard trade item groupings and AI (99) for transport units.
4. AI (98) and AI (99) SHALL be used with AI (7040) and (8008) solely for the purpose of ID Issuer generated aggregate level Unique Identifiers and SHALL NOT be processed independently by the scanner system processor when the message string begins with AI (7040) as AI (98) and AI (99), used independently, are reserved for internal applications.
5. To permit adequate scanning, barcodes containing more than 48 characters should be encoded in GS1 DataMatrix or GS1 QR Code rather than GS1-128. Where use of GS1-128 and/or additional data beyond the aUI is required in the barcode, self-generation by the economic operator is recommended.
6. UIs must only provide for unique identification of the traceable item and as such, any additional information added to the aggregated level UI, as provided for in Article 11(4) of Implementing Regulation 2018/574, must not be transmitted by economic operators as part of their recording activity to the repositories system.
7. If information beyond the aUI is required by the economic operator, this information SHALL be encoded after the Time Stamp using element strings (Application Identifier and data elements).
8. AI (7040) with either (98) or (99) plus (8008) SHALL NOT appear on any physical item that is marked with AI (00) SSCC or AIs (01)(21) GTIN.

The following table shows an example of a GS1-128 encoding ID Issuer generated, aggregate level UI (with additional information permitted, but not required).

	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9)
Unique Identifier (UI)	Symbology Identifier	Data Qualifier (GS1 Application Identifier)	UIC + UIC Extension 1 + Importer Index NOTE : Importer Index SHALL be '_' 'underscore character'	Data Qualifier	Serial number (variable length up to 20 characters)	FID (variable length up to 50 characters)	Data Qualifier	Time stamp (fixed length) YYMMDDhh	EXAMPLE Data Qualifier for optional attribute added by the manufacturer	EXAMPLE Logistic unit weight in kilograms
Position within the unique identifier	**Fixed**	**Fixed**	**Fixed**	**Fixed**	**Fixed**	**Fixed**	**Fixed**	**Fixed**	**Fixed**	**Fixed**
Regulated by	Art. 21(5)	Art.11(1-3) and Annex II, Chap. 1, Sect. 1					Art. 11(3)		Art. 11(4)	
Applicable international standards:	ISO/IEC 16022:2006, 18004:2015, or 15417:2007	ISO 15459-2:2015 and ISO 15459-3:2014								
Values	]C1	7040	1E9_	99	AB*12Y7	456FGRD66	8008	19043013	3301	101234
Process	← Applied by EO →		Generated by ID Issuer							
Transmission to repositories systems	No	No	Yes	No	Yes	Yes	No	Yes	No	No
aUI			1E9_		AB*12Y7	456FGRD66		19043013		