

ID ISSUER ACC. TO 2014/40/EU

EXTERNAL INTERFACES AND MAJOR DATA TYPES

Version 1.4

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Table of Content

| | | |
|-------|---|----|
| 1. | System Purpose and Basis | 6 |
| 2. | Interaction with the ID Issuer – Basic Concepts | 7 |
| 2.1 | Methods of interaction | 7 |
| 2.2 | Secured communication..... | 7 |
| 2.3 | Two factor authentication..... | 7 |
| 2.4 | GS1 product identifier..... | 8 |
| 3. | Process Descriptions..... | 9 |
| 3.1 | Onboarding of economic operators | 9 |
| 3.2 | Sign-on of Accredited Producers/Importers | 9 |
| 3.3 | Obtain API Credentials..... | 10 |
| 3.4 | Registration of facilities or machines | 10 |
| 3.5 | Correction of registry item information..... | 11 |
| 3.6 | Deactivation of a registration | 12 |
| 3.7 | Deactivation of a registration by a Member State..... | 12 |
| 3.8 | Acting on behalf of a retail operator | 13 |
| 3.9 | Ordering and recall of unit pack level IDs (upUI)..... | 13 |
| 3.10 | Ordering and recall of aggregated pack level IDs (aUI)..... | 15 |
| 4. | Interfaces..... | 17 |
| 4.1 | Onboarding GUI | 17 |
| 4.2 | Self-Management Portal..... | 19 |
| 4.3 | Programmable Interface – API..... | 20 |
| 4.4 | Environments | 22 |
| 4.4.1 | Productive environment..... | 22 |
| 4.4.2 | QA environment..... | 22 |
| 5. | Major Data Types..... | 23 |
| 5.1 | Basic concepts | 23 |
| 5.1.1 | Fixed Information Item Positions | 23 |
| 5.1.2 | Enhanced 64 Symbol Alphabet | 23 |
| 5.1.3 | ID Issuer Identifier | 23 |
| 5.1.4 | Country Code and Code Type Indicator (CCCTI) | 23 |
| 5.1.5 | Code Version | 24 |
| 5.1.6 | Short codes and Lookup Tables | 24 |
| 5.2 | Economic Operator ID (EO-ID)..... | 25 |
| 5.2.1 | Code Version 1 | 25 |
| 5.3 | Facility ID (F-ID)..... | 26 |

| | | |
|-------|---|----|
| 5.3.1 | Code Version 1 | 26 |
| 5.4 | Machine ID (M-ID) | 27 |
| 5.4.1 | Code Version 1 | 27 |
| 5.5 | Unit pack level Unique Identifier (upUI) | 28 |
| 5.5.1 | Code Version 1 | 29 |
| 5.6 | Aggregated Packaging Level Unique Identifiers (aUI) | 31 |
| 5.6.1 | Code Version 1 | 31 |
| 5.7 | UI Lists for electronic delivery of UIs | 32 |
| 5.8 | Order ID | 32 |
| 6. | Other Data Types | 33 |
| 6.1 | Mapping of TPD-Impl-Act – Annex II – types to internal type | 33 |
| 6.2 | Additional types | 34 |
| 7. | Constrains and Boundaries | 35 |
| 8. | Data Carrier Rules | 36 |
| 8.1 | General Encoding Rules | 36 |
| 8.1.1 | Unit pack level Unique Identifiers (upIU) | 36 |
| 8.1.2 | Aggregated level Unique Identifiers (aIU) | 36 |
| 8.2 | General Decoding Rules | 36 |
| 8.2.1 | Unit pack level Unique Identifiers (upIU) | 37 |
| 8.2.2 | Aggregated level Unique Identifiers (aIU) | 37 |
| 9. | Disclaimer | 38 |
| 10. | References | 39 |

Revision History

| Issue | Remark |
|-----------------------------|---|
| Version 1.4 January 2025 | <ul style="list-style-type: none"> - Extended GTIN support - Reflect TPD amendment - Description of ID Issuer environments |
| Version 1.3 April 2019 | <ul style="list-style-type: none"> - Data carrier definition changed acc. to clarification of DG SANTE, 2019/04/15, chapter 8 - Minor typo fixing - Correct aUI example in chapter 5.6.1 - Add process description for sign-on of accredited EOs, chapter 3.2 - Add screen shots of onboarding process in chapter 4 |
| Version 1.2 March 2019 | <ul style="list-style-type: none"> - Data carrier definition changed, chapter 8 - Added description on API token request, chapter 2.3 - Alignment of data type with definition of Secondary Repository, chapter 6 |
| Version 1.1 Jan. 2019 | <ul style="list-style-type: none"> - Corrections on GS1 identifiers (GTIN-14, no support for GLN) - Added chapter on data carrier coding rules - Added data type for UI downloads - Added process description on how to obtain API credentials - Updated structure of data types EO-ID, F-ID, M-ID, upUI, aUI - other minor editorial changes |
| Version 1.0 Oct. 2018 | Initial Version |

Preface

This document describes the interaction with Bundesdruckerei's ID Issuer instance for Germany. It introduces the basic interaction concepts, the interfaces offered and major data type exchanged during interaction with the ID Issuer instance for Germany.

1. System Purpose and Basis

The interface described here offers the functionality of an ID Issuer as set out in DIRECTIVE 2014/40/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3 April 2014 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, hereinafter also referred to as "TPD" [1], and COMMISSION IMPLEMENTING REGULATION (EU) 2018/574 of 15 December 2017 on technical standards for the establishment and operation of a traceability system for tobacco products, hereinafter also referred to as "TPD-Impl-Act" [2] and it's amendment "TPD-Impl-Act-Amendment" [9].

The basic purpose of the ID Issuer is to issue unique identifier for economic operators and their facilities as well as the production machines used. The identifiers are maintained in a local registry and shared with the Secondary Repository.

Additionally the ID Issuer is responsible for issuing unique codes for tobacco unit level packs (upUI) and aggregations of unit level packs (aUI). Producers and importers may choose whether upUIs are to be delivered electronically or printed on German tax stamps.

According to TPD-Impl-Act all requests regarding registry items, upUIs and aUIs can be submitted electronically. The ID Issuer supports all operations mentioned in TPD-Impl-Act [2] - Annex II incl. the changes introduced by Amended TPD [9], which are applicable to the ID Issuer role.

2. Interaction with the ID Issuer – Basic Concepts

2.1 Methods of interaction

The ID Issuer offers two methods of interaction:

- using a graphical user interface (GUI), and
- an application programmable interface (API)

All of the GUIs offered rely on browser based html/javascript technics and support current browsers from major browser suppliers. The API is offered with an http based RestAPI with JSON-style [3] parameter notation. Details of the interfaces offered and supported use cases can be found in chapter 4.

2.2 Secured communication

Communication between the ID Issuer and interacting participants of the tobacco industry is secured by TSL v1.3 or v1.2 encryption. Cypher suites that are less secure are not supported. If the TLS version or cypher used proves to be corroded or vulnerable, BDr reserves the right to replace the affected item with a state-of-the-art item after prior announcement.

2.3 Two factor authentication

Interaction with the ID Issuer requires a two factor authentication, referred to as 2FA in this document.

Mutual authentication during communication setup is one of the two factors. Every economic operator directly interacting with the ID Issuer is equipped with a TLS client X509 certificate issued by D-Trust, an accredited trust service provider. The ID Issuer applies for this certificate on behalf of the economic operator during the initial registration procedure. Nothing else is required of the economic operator. The certificate has a validity period of two year. The ID Issuer monitors the lifetime of issued certificate. Prior to the lifetime expires, the ID Issuer applies for certificate renewal at D-Trust autonomously and issues a new certificate to the economic operator.

For every interaction with the API or Self-Management Portal (s. chapter 4) the ID Issuer will request its communication peer to present this certificate.

The second factor depends on the interaction method, API or GUI. In the case of GUI, the economic operator is required to authenticate himself using the credentials obtained as a result of the initial registration. In the case of API interaction, the invoking service is required to request for a token. This token can be obtained at a token endpoint

POST <https://iam.de.id-issuer.eu/auth/realms/idissuer/protocol/openid-connect/token>

presenting OpenID Connect [7] credentials. The following information must be included in a token request:

| Property | Value |
|----------------|-------------------------------------|
| clientId | Fixed value 'self-management-gui' |
| clientUsername | Obtained via Self-Management-Portal |
| clientPassword | Obtained via Self-Management-Portal |
| clientSecret | Obtained via Self-Management-Portal |
| scope | Fixed value 'openid' |
| grantType | Fixed value 'password' |

A successful request to the token endpoint returns an access token that must be included as bearer token in subsequent requests.

2.4 *GS1 product identifier*

The TPD does not foresee support of any existing commercial coding schemes. However, as a courtesy to our partners, Bundesdruckerei's ID Issuer supports the GTIN as product description in upUI orders, though, use of GTIN is not mandatory. GTIN is supported in the formats 8, 12, 13 and 14.

3. Process Descriptions

This chapter details the business processes backed by the ID Issuer powered by Bundesdruckerei. The enclosed graphical process descriptions follow BPMN notation.

Process definitions are not necessarily backed by interfaces one by one, but sometimes one process is realized by multiple interfaces.

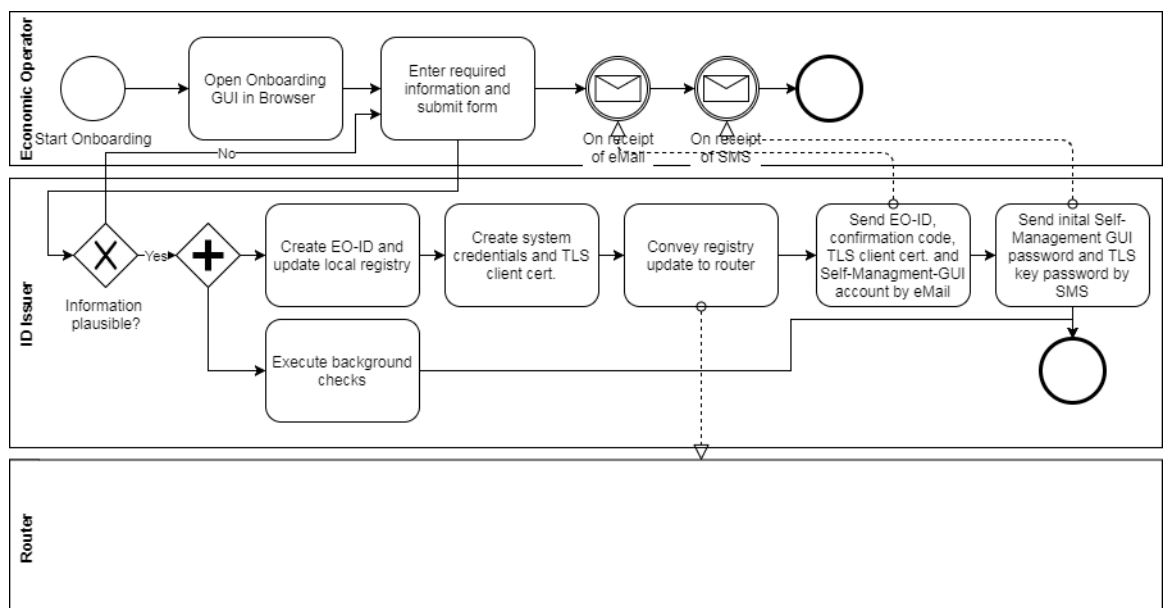
3.1 Onboarding of economic operators

The onboarding process implements the initial registration of an economic operator as defined by TPD-Impl-Act – Annex II – message-type 1-1.

The EO starts the process by browsing the ID Issuer Onboarding GUI (c.f. 4.1), entering the required information into the form and then submitting it.

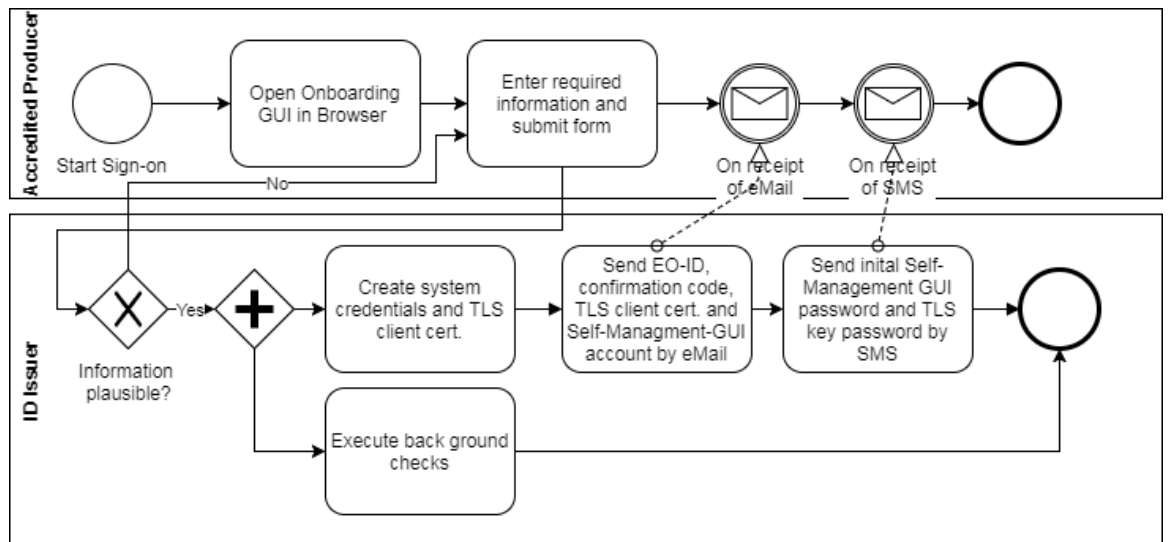
The ID Issuer checks the plausibility of the request data submitted and, if this check is successful, some additional validations are executed in the background.

Parallel to the background checks, the ID Issuer creates the EO-ID and the corresponding confirmation code and transmits it via the router to the Secondary Repository. A X509 TLS client certificate is additionally requested on behalf of the EO and the credentials are created in order to enable interaction with the Self-Management Portal. The EO-ID, confirmation code, TLS certificate, and the Self-Management Portal user account are sent to the EO in an e-mail. The initial Self-Management Portal user password and certificate PIN are sent separately via SMS.



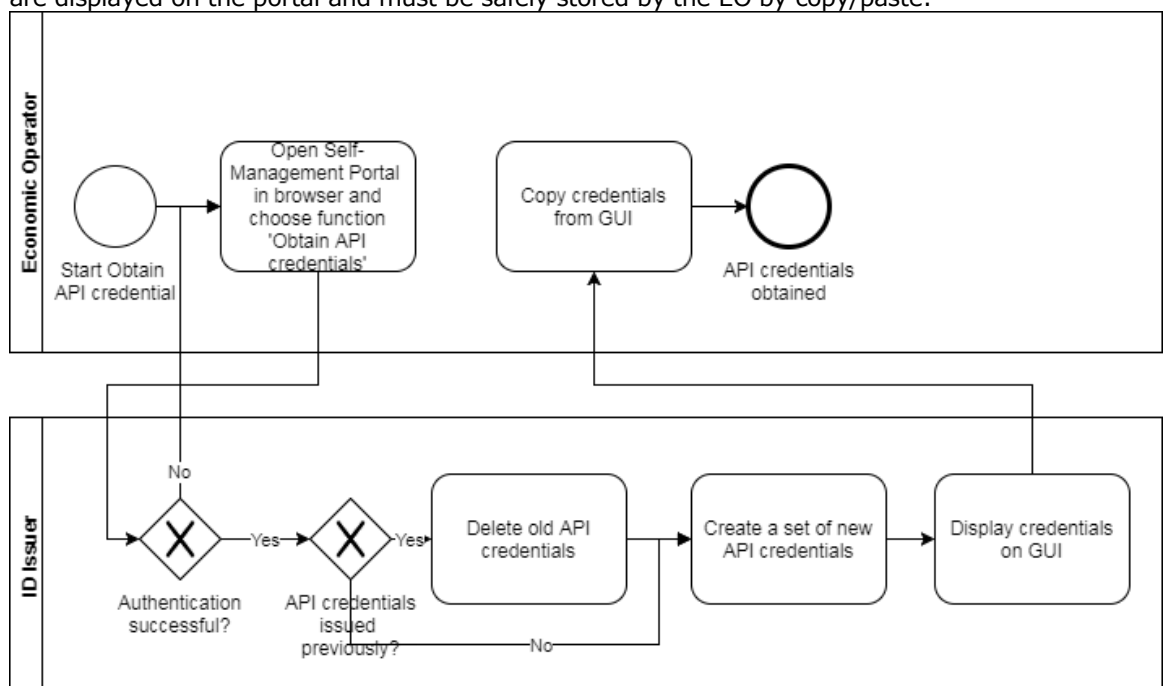
3.2 Sign-on of Accredited Producers/Importers

EOs of type producer/importer that have been already registered by an ID Issuer of another Member State must not be assigned a new EO-ID when requesting for upUIs/aUI at an ID Issuer, different to the ID Issuer the EO is registered. In the following these EOs are referred to as *Accredited EOs*. Even though Accredited EOs are not assigned a new EO-ID they have to sign-on with the German ID Issuer in order to enter company information used for invoicing and to obtain system credentials, allowing them to interact with the German ID Issuer. All this is similar to the onboarding of a normal EO, except that no new EO-ID is issued. After a successful sign-on, an accredited EO is equipped with the Self-Management-Portal credentials and a TLS X509 client certificate.



3.3 Obtain API Credentials

In order to use the ID Issuer API a set of OpenID Connect credentials (user-id, user secret) must be obtained via the Self-Management Portal. The portal offers the possibility to obtain new credentials but not the possibility to review or change the credentials. Credentials can be obtained unlimited. Every time new credentials are created for an EO, the set of previously issued credentials are automatically deactivated and replaced by the new set of credentials. Credentials are displayed on the portal and must be safely stored by the EO by copy/paste.

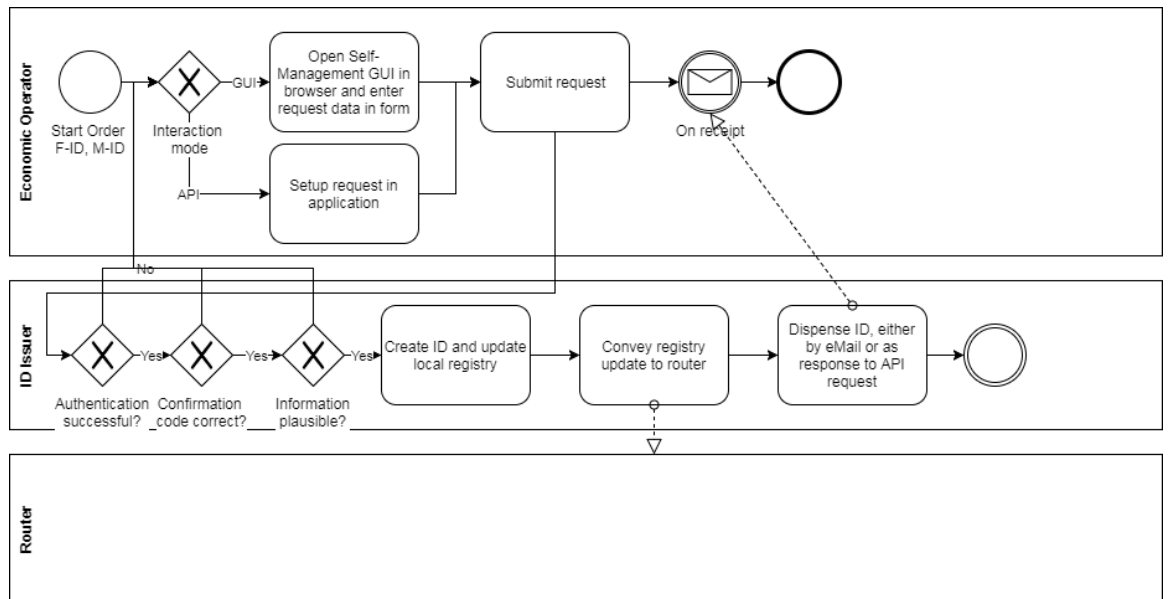


3.4 Registration of facilities or machines

This process is used to register facilities and machines as defined by TPD-Impl-Act – Annex II – message-types 1-4 and 1-7.

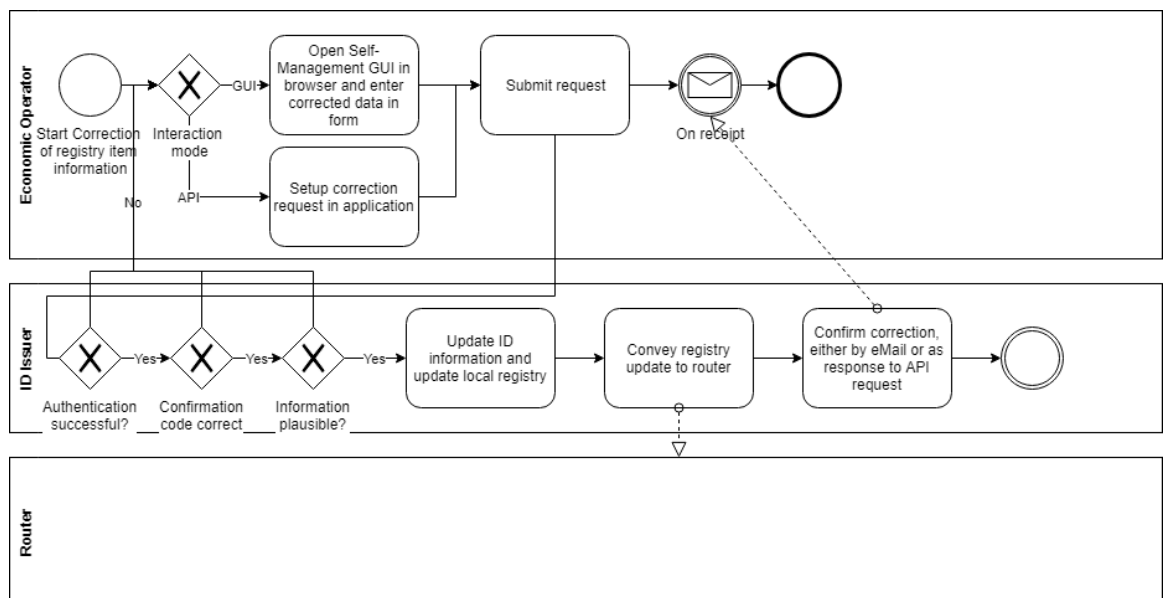
Facilities and machines can be registered via the Self-Management Portal or API. When a request is submitted, the ID Issuer first verifies authentication by means the confirmation code. Furthermore ID Issuer validates the plausibility of the information. If this check is successful, the

ID is created, published to the Secondary Repository and issued to the requester either as an e-mail (GUI) or in the body part of the response (API), depending on the interaction mode.



3.5 Correction of registry item information

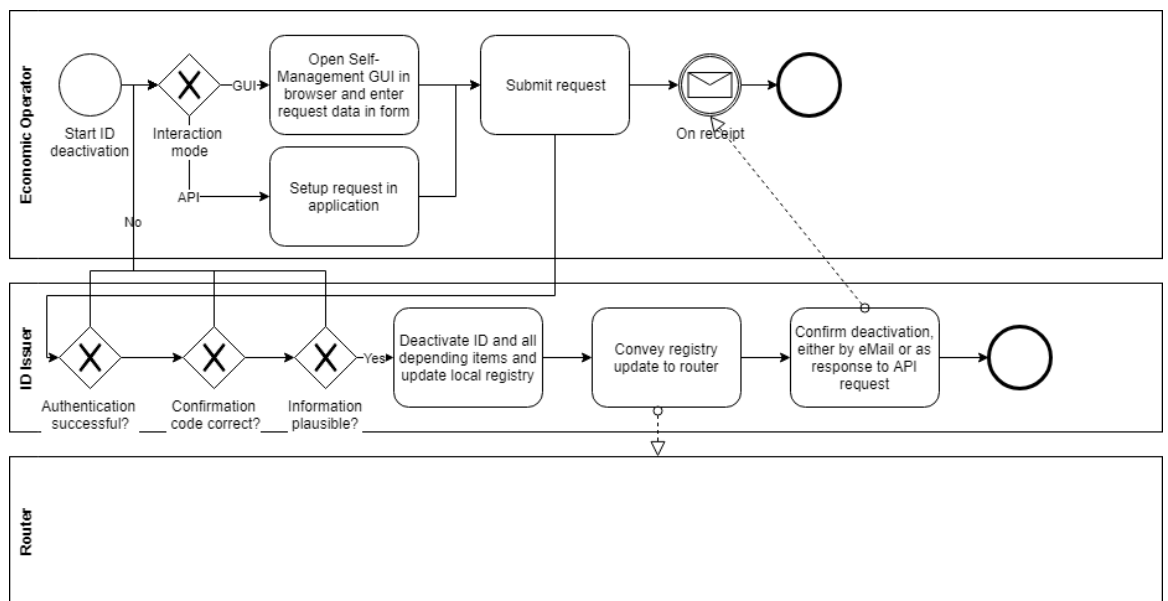
This process is used to correct information related to registered economic operators, facilities, and machines as defined by TPD-Impl-Act – Annex II – message-types 1-2, 1-5, and 1-8. Information can be corrected via the Self-Management Portal or API. When a request is submitted, the ID Issuer validates the EO's specific confirmation code and the plausibility of the information submitted. If this check is successful, the corresponding registry item is updated, the update is published to the Secondary Repository and the correction is confirmed to the originator either as an eMail (GUI) or in the body part of the response (API), depending on the interaction mode.



3.6 Deactivation of a registration

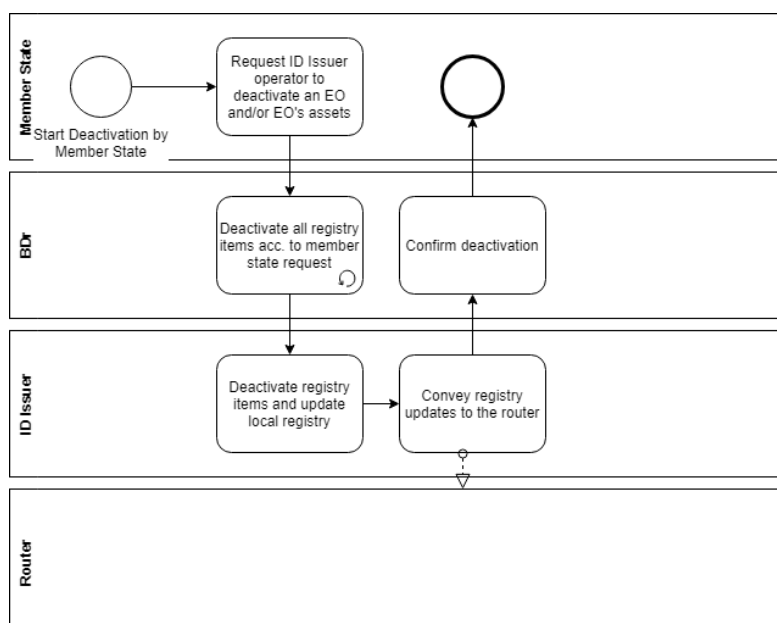
This process is used to deactivate registered economic operators, facilities, and machines as defined by TPD-Impl-Act – Annex II – message-types 1-3, 1-6, and 1-9.

Information can be deactivated via the Self-Management Portal or API. When a request is submitted, the ID Issuer validates the EO's specific confirmation code and the plausibility of the information submitted. If the check is successful, the corresponding registry item is updated, the update is published to the Secondary Repository and the correction is confirmed to the originator either as an e-mail (GUI) or in the body part of the response (API), depending on the interaction mode.



3.7 Deactivation of a registration by a Member State

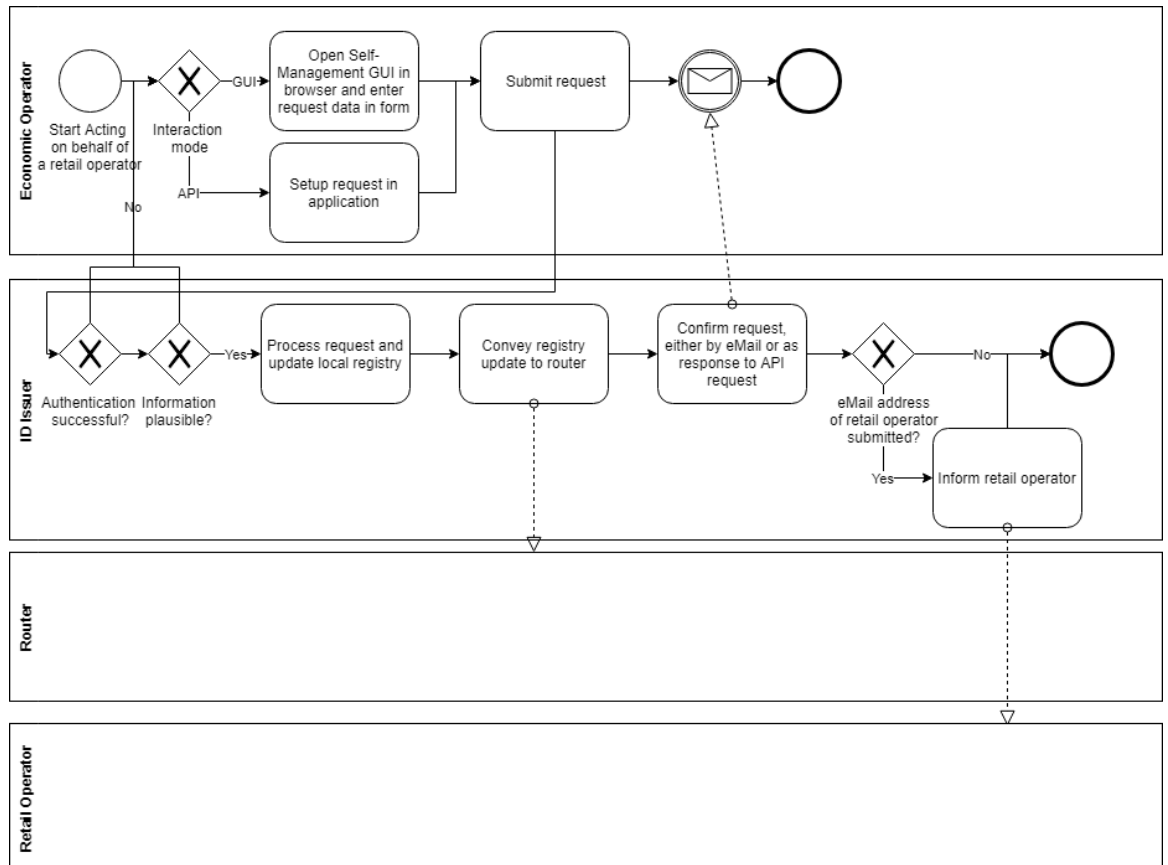
In duly justified cases, a Member State may request deactivation of registered EOs and/or their registered assets.



3.8 Acting on behalf of a retail operator

TPD-Impl-Act allows retail operators to delegate the obligation to register and maintain registry information to any other registered EO.

An EO acting on behalf of a retail operator can interact with the ID Issuer via the Self-Management Portal or API. The EO may register a retail operator or facilities run by the retail operator, correct the registry information or deactivate the registration. All ID Issuer responses are sent by default to the EO acting on behalf of the retail operator. If a retail operator's e-mail address was submitted during registration, the retail operator is supplied with a copy of all the ID Issuer's responses.



3.9 Ordering and recall of unit pack level IDs (upUI)

This process is used by producers or importers to order upUIs as defined by TPD-Impl-Act – Annex II – message-types 2-1 and 5.

For Germany producers/importers have two delivery options for upUIs:

- Electronic delivery as a file for download
- Physical delivery printed on German tax stamps

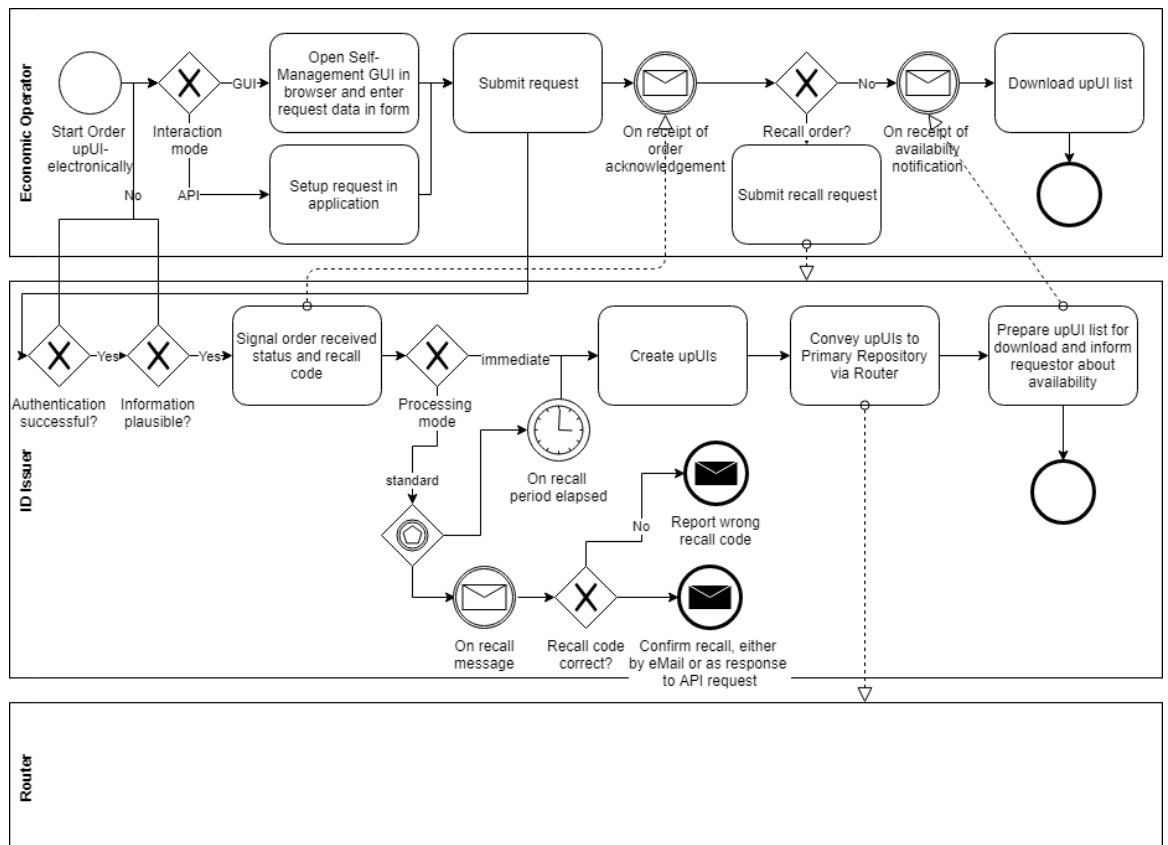
This section covers both modes of delivery and provides process description for each one.

Deviating from the EU recommendation, the ID Issuer powered by Bundesdruckerei offers producers/importers two order processing modes:

- Standard mode acc. to TPD-Impl-Act. This is the default mode if not indicated otherwise. In this mode, order processing is postponed until the recall period of one working day has elapsed.
- Immediate mode. This mode must be deliberately checked. In this mode, the requestor waives the order recall right in favour of immediate order processing.

Electronical delivery

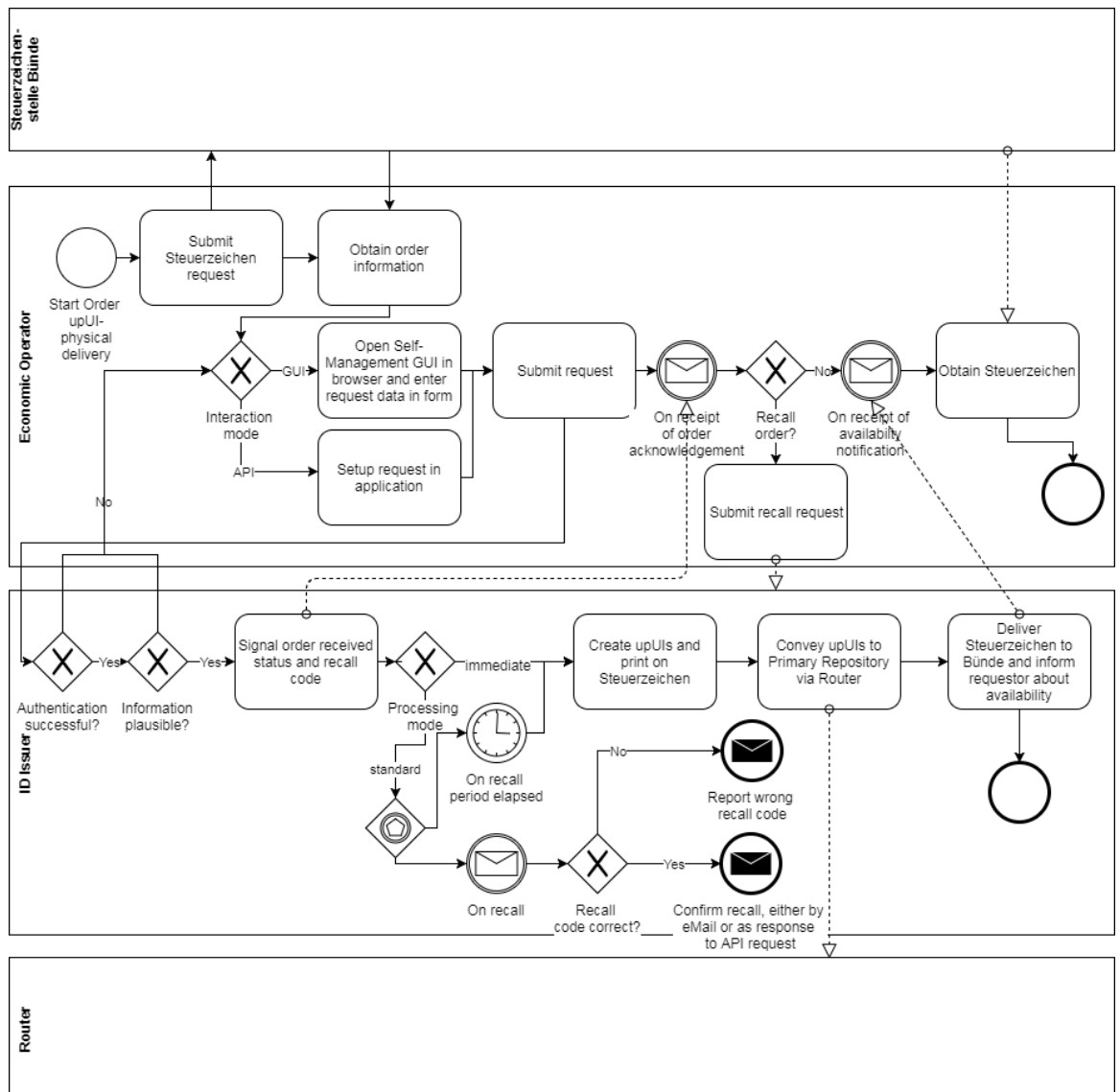
A producer/importer submits his upUI order via the Self-Management Portal or API. If the plausibility check is successful, the ID Issuer flags an order acknowledgement and the order recall-code to the requester. Depending on the order processing mode, the order is postponed or executed immediately. Once the upUIs have been created, they are sent to the Primary Repository via the router and the requester is informed that the order is ready for delivery.



Physical delivery

Prior to placing the order with the ID Issuer, the producer/importer must first file a tax stamp order at *Hauptzollamt Bielefeld Tabaksteuer und Steuerzeichenstelle Bünde*. In response to the tax stamp order, the requestor is issued a Bünde order-id.

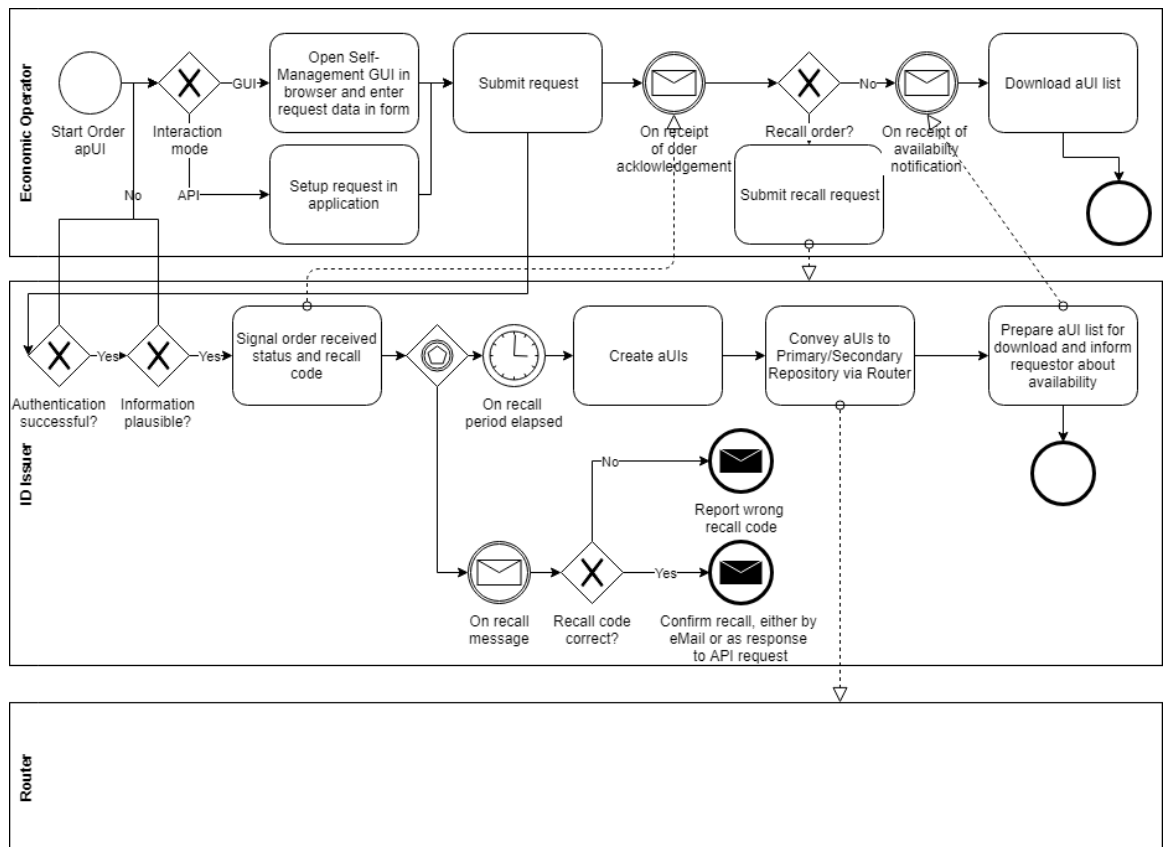
Equipped with the Bünde order id and order position, the producer/importer submits his upUI order via the Self-Management Portal or API. In the case of physical delivery the Bünde order id and order position must be entered in the order form/API request. If the plausibility check is successful, the ID Issuer flags an order acknowledgement and the order recall-code to the requestor. Depending on the order processing mode the order is postpone or executed immediately. The upUIs are created by the ID Issuer and transmitted to the tax stamp printing facility to be applied to the tax stamps. Before tax stamps are handed over to *Hauptzollamt Bielefeld Tabaksteuer und Steuerzeichenstelle Bünde* the upUIs are conveyed to the competent Primary Repository via the router and the requestor is informed that the order is ready for delivery.



3.10 Ordering and recall of aggregated pack level IDs (aUI)

This process is used by an EO to order aUIs as defined by TPD-ImplAct – Annex II – message-types 2-2 and 5.

An EO submits his aUI order via the Self-Management Portal or API. If the plausibility check is successful, the ID Issuer flags an order acknowledgement and the order recall-code to the requestor. Depending on the order processing mode, the order is postponed or executed immediately. Once the aUIs have been created they are sent to the Primary or Secondary Repository via the router and the requestor is informed that the order is ready for delivery.



4. Interfaces

Bundesdruckerei's ID Issuer by offers browser based graphical user interfaces as well as an API. Even though most of the functionality can be triggered via the GUI as well as via the API, this is not valid for the entire feature set. The following table lists the use case support by the interface.

| Operation | Onboarding GUI | Self-Mgt. GUI | API |
|--|----------------|---------------|-----|
| EO-Onboarding | ✓ | ✗ | ✗ |
| F-ID, M-ID Registration | ✗ | ✓ | ✓ |
| 3rd party EO-ID, F-ID Registration | ✗ | ✓ | ✓ |
| upUI, aUI Ordering / Storno | ✗ | ✓ | ✓ |
| Modification of EO-ID, F-ID, M-ID incl. 3 rd party | ✗ | ✓ | ✓ |
| De-activation of EO-ID, F-ID, M-ID incl. 3 rd party | ✗ | ✓ | ✓ |
| Obtain API token | ✗ | ✓ | ✗ |

Please refer to chapter 4.4 and 6 for a detailed description of the data type used in the GUIs and the API.

4.1 Onboarding GUI

The sole purpose of the onboarding GUI is to enable economic operators to register with the ID Issuer in order to obtain an economic operator ID (EO-ID), see process *Onboarding of economic operators*, chapter 3.1. Access to this GUI is not restricted.

The onboarding procedure initially requests the EO's business type. The business type can be:

- Producer/Importer
- Other (Wholesale/Logistics/Retail operator)
- Accredited external operator, an EO that have been registered and assigned an EO-ID by an ID Issuer of another Member State already

The screenshot shows a web interface for the ID Issuer onboarding process. At the top, there is a progress indicator with five circles, the first of which is filled with blue. Below this, the text reads: "Welcome to the ID Issuer onboarding process! Please select your profile." In the center, there is an icon of three stylized human figures in blue. Below the icon are three blue buttons with white text, each representing a different profile type. The first button is labeled "Producer/Importer" and describes producers or importers based in Germany. The second button is labeled "Trading companies, logistics, laboratories" and describes other economic operators of the tobacco market based in Germany. The third button is labeled "Accredited external operator" and describes producers or importers with European headquarters outside Germany.

Welcome to the ID Issuer onboarding process!
Please select your profile.

Producer/Importer
Producers or importers **based in Germany**

Trading companies, logistics, laboratories
All other economic operators of the tobacco market (e.g. sales or laboratories) **based in Germany**

Accredited external operator
Producers or importers with European headquarters **outside Germany**

The steps listed below differ depending on the business type selected.

Producer/Importer/Accredited EO

Economic operators of type producers/importers or accredited are required to complete the following fields:

- Company name and alternative/abridged name, if applicable,
- Company legal form
- Company address and country of registration
- eMail address used for notifications and interaction with the EO,
- Mobile phone number to which the initial Self-Management Portal password is to be sent,
- VAT-ID, TIN or German Steuernummer (TIN only in case that VAT/Steuernummer is not available),
- SEED Excise Number, if available,
- A list of EO-IDs assigned by another ID Issuer, if available,
- Invoicing method (electronically, paper) and invoicing address (eMail, or postal address),

Wholesale/Logistics or Retail operator

Wholesale/Logistics economic operators are required to complete the following fields:

- Company name and alternative/abridged name, if applicable,
- Company address and country of registration
- eMail address used for notifications and interaction with the EO,
- Mobile phone number to which the initial Self-Management Portal password is to be sent,
- VAT-ID, TIN or German Steuernummer (TIN only in case that VAT/Steuernummer is not available),
- SEED Excise Number, if available,
- A list of EO-IDs assigned by another ID Issuer, if available,

After the economic operator has successfully completed the form, he will receive an e-mail with the assigned EO-ID, confirmation-code, the user-name for the Self-Management Portal and the TLS client certificate needed for further interaction with the ID Issuer. The initial passphrase for the Self-Management Portal is conveyed via a separate SMS to the mobile telephone number entered during registration.

4.2 Self-Management Portal

With the exception of the onboarding process, the Self-Management Portal provides support for all other use cases served by the ID Issuer. Interaction with the Self-Management Portal requires a two factor authentication with a TLS client certificate and user credentials. The password initially provided by SMS must be changed on first login to the Self-Management-GUI. In addition to the processes referred to in chapters 3.2 - 3.10 the Self-Management Portal can be used to obtain the token required to interact with the API. Additionally an operator may change the Self-Management Portal user's password. Finally all orders and requests will be shown along with their processing status.

Form fields shown in the processes registration, correction of information and deregistration are defined in TPD-Impl-Act – Annex II and the TPD amendment. The following information is required by the ID Issuer on top of TPD:

| Field | Use cases | Remark |
|--|--|---|
| Invoicing information | Correction of EO information, applicable to producers/importers only | |
| Bünde tax stamp order-ID/order-position (optional) | upUI requests with delivery method printed-on-tax-stamps | The Bünde order must be qualified in order to allow BDr to match the corresponding tax stamp request originated by Bünde. |
| GTIN (optional) | upUI requests | Will be included in the upUI to describe the product. |
| Order-Processing-Priority (optional) | upUI/aUI requests | Denotes how an order for upUIs or aUIs will be processed by the ID Issuer. Possible values are: <ul style="list-style-type: none"> • TpdStandardProcessing, meaning that order processing is postponed until the recall period has elapsed (default) |

| | | |
|--|--|---|
| | | setting), <ul style="list-style-type: none">• ImmediateProcessingNoRecallPossible, meaning that the order will be processed immediately by the ID Issuer. However the requestor is unable to recall an order with this processing priority. |
|--|--|---|

The execution of orders for upUIs and aUIs is determined by the Order-Processing-Priority parameter. If omitted, default processing applies acc. to the EU recommendation, which means, that order processing is postponed until the recall period has been elapsed. In any case, orders for upUIs and aUIs are an asynchronous operation. The ID Issuer will respond to a successful UI order with an e-mail containing the order-id which can be used to track the status of the order. Once the UI order has been processed the requestor is informed by e-mail. If the UI delivery method is electronic, notification will contain a link to the UI list.

4.3 Programmable Interface – API

Invocation of the API requires a two factor authentication with a TLS client certificate and API token. The API serves all processes referred to in chapters 3.2 - 3.10.

In most cases the EO-ID, although marked as mandatory in TPD-Impl-Act – Annex II, is not part of the parameter set. This approach was deliberately selected, because the identity of the invoking party is clearly determined by the two factor authentication which can be used to derive the EO-ID. Stating the EO-ID within the API parameters therefore simply duplicates the identity information. The retailer's EO-ID must be stated in those cases where an already registered EO acts on behalf of the retailer.

For similar reasons the message-type field has not been modeled within the API, although this is marked mandatory within TPD-Impl-Act – Annex II. The information contained in the message-type field is represented by the combination of the API endpoint and method, e.g. POST operation on the endpoint /operator stands for the message with message-type 1-1, Request for an economic operator identifier code.

The ID Issuer will maintain forward and backward compatibility on the API. Different API versions will be separated by the version-identifier in the URL, e.g. <https://api.de.id-issuer.eu/v2/order>. In general we recommend to follow Martin Fowler's Tolerant Readers pattern [10] when implementing the API client. Essentially, the Tolerant Reader pattern recommends ignoring any information sent by the server that the client is not interested in.

The following endpoints are offered:

| Servers | |
|--|--|
| <input type="text" value="https://api.de.id-issuer.eu/v2 - The productive environment"/> | |
| api-information ^ | |
| GET | /api Provides OpenAPI Specification on this API in YAML format |
| orders ^ | |
| GET | /order List all orders created by the invoking EO |
| GET | /order/{orderId} Provides information on an ID order in an arbitrary processing state |
| DELETE | /order/{orderId} Delete an order |
| unique identifiers ^ | |
| POST | /upui Submit a new order for unit packet level unique identifiers. Only one order per operation is allowed. |
| POST | /aui Submit a new order for aggregated level unique identifiers. Only one order per operation is allowed. |
| GET | /downloads/{orderId}/download This endpoint is used to download uPIs/aUIs order before. |
| economic operator IDs ^ | |
| POST | /operator Submit an order for a 3rd party economic operator registration. Multiple EOs may be registered within one order. |
| GET | /operator/{identifier} Query the status of one EO-ID. A boolean value is returned, where 'true' means EO-ID is confirmed to be registered with status active. 'false' is returned in ANY other case, e.g. EO-ID is unknown or EO-ID is deactivated. This query can be applied to IDs issued by German ID Issuer only. |
| PUT | /operator/{identifier} Submit an order to correct information regarding the EO's identifier. This correction can concern information about the company itself or about a retailer on whose behalf the EO acts. |
| DELETE | /operator/{identifier} Submit an order to deactivate an EO-ID. The deactivation can concern the company itself or a retailer on whose behalf the EO acts. All assets will be deactivated, too, linked with the affected EO. |
| facility IDs ^ | |
| POST | /facility Submit an order for a facility id. This operation serves both cases, registration of own assets and 3rd party registration. Multiple facilities can be processed by one order. |
| GET | /facility/{identifier} Query the status of one F-ID. A boolean value is returned, where 'true' means F-ID is confirmed to be registered with status active. 'false' is returned in ANY other case, e.g. F-ID is unknown or F-ID is deactivated. This query can be applied to IDs issued by German ID Issuer only. |
| DELETE | /facility/{identifier} Submit an order to deactivate a facility-ID. The deactivation can concern a facility of the company itself or a retailer's facility on whose behalf the EO acts. If applicable, all machines will be deactivated, too, linked with the affected facility. |
| machine IDs ^ | |
| POST | /machine Submit an order for a machine id. Multiple machines can be processed by one order. |
| PUT | /machine/{identifier} Submit an order to correct properties of a machine. |
| DELETE | /machine/{identifier} Submit an order to deactivate a machine-ID. |

The ID Issuer API is specified utilizing Open API Specification [4] syntax. The complete API specification can be found at:
https://www.bundesdruckerei.de/files/yaml/IdIssuer_External_api.openapi.yaml .

The specification file can be viewed best with swagger editor [5].

4.4 Environments

Bundesdruckerei operates two separate ID Issuer environments permanently in parallel, namely a productive system and a quality assurance system.

Due to security policy only the Onboarding Portal is accessible for the public. Self-Management Portal, API and Identity Management System are accessible with a valid TLS client certificate only, issued after a successful onboarding.

4.4.1 Productive environment

The productive environment provides the competent ID Issuer for Germany as set out by the TPD. All identifiers issued by the productive system are preceded by a prefix QCBDR in capital letters. The productive ID Issuer is available at the following URLs:

| System | URL |
|----------------------------|---|
| Onboarding portal | https://onboarding.de.id-issuer.eu |
| Self-Management Portal | https://self-management.de.id-issuer.eu |
| API | https://api.de.id-issuer.eu |
| Identity Management System | https://iam.de.id-issuer.eu |

4.4.2 QA environment

The QA environment can be used to test usage and integration. The ID Issuer QA environment is connected to Dentsu's QA Router to allow for end-to-end tests. All identifiers issued by the QA system are preceded by a prefix qcbdr in small letters. By its nature the QA ID Issuer does not conform to any uptime or availability agreements. Submitted data may disappear without prior notification. The QA ID Issuer is available at the following URLs:

| System | URL |
|----------------------------|---|
| Onboarding portal | https://onboarding.test.de.id-issuer.eu |
| Self-Management Portal | https://self-management.test.de.id-issuer.eu |
| API | https://api.test.de.id-issuer.eu |
| Identity Management System | https://iam.test.de.id-issuer.eu |

5. Major Data Types

5.1 Basic concepts

5.1.1 Fixed Information Item Positions

All codes commonly share the principle of fixed positions for data elements. This provides for a rapid code analysis. Once the code has been read, one can directly focus on the elements of interest rather than scanning through the code searching for identifiers denoting an element first.

5.1.2 Enhanced 64 Symbol Alphabet

For the code content representation an enhanced alphabet was selected to express a wider range of symbols compared to simple alphabet or numeric values. The enhanced 64 symbols alphabet which forms a subset of the ISO646:1991 immutable character set is used with every identifier issued by the ID Issuer. It consists of the following symbols:

- Small letters a-z, without letters l (ASCII 0x6C) and o (ASCII 0x6F) to avoid misinterpretation with digits 0 and 1,
- Capital letters A-Z, without letters I (ASCII 0x49) and O (ASCII 0x4F) to avoid misinterpretation with digits 0 and 1,
- Digits 0-9
- Characters: '&' (ASCII 0x26), '*' (ASCII 0x2A), '+' (ASCII 0x2B), '<' (ASCII 0x3C), '>' (ASCII 0x3E), '?' (ASCII 0x3F).

5.1.3 ID Issuer Identifier

According to TPD-Impl-Act, every code issued must be prefixed by the ID issuer's identifier. The ID Issuer identifier denotes the ID Issuer itself and is issued by an Issuing Agency acc. to ISO 15459 [6], part 2. The BDR's identifier is 'QCBDR'.

5.1.4 Country Code and Code Type Indicator (CCCTI)

Economic operator IDs, facility IDs, machine IDs, upUIs and aUIs all are equipped with an indicator that reveals the identifier type. For upUIs and aUIs this indicator also indicated the country in which the UIs have been issued.

The CCCTI is included in all codes and directly follows the ID Issuers Identifier that must precede every code.

The CCCTI indicated the type of code and the originating country. While the first applies to all codes, the latter is valid for upUIs and aUI only.

Examples:

CCCTI value 'a' -> upUI created by ID Issuer appointed for Germany

CCCTI value 'G' -> aUI created by ID Issuer appointed for Germany

CCCTI value '+' -> EO-ID

CCCTI value '<' -> F-ID

CCCTI value '>' -> M-ID

The following table provides a schematic explanation for all possible CCCTI values.

| Symbol | Decimal Value | Code Type | Country | Symbol | Decimal Value | Code Type | Country |
|--------|---------------|-----------|----------|--------|---------------|-----------|----------|
| a | 0 | upUI | Germany | s | 16 | upUI | reserved |
| b | 1 | | reserved | t | 17 | | reserved |
| c | 2 | | reserved | u | 18 | | reserved |
| d | 3 | | reserved | v | 19 | | reserved |
| e | 4 | | reserved | w | 20 | | reserved |
| f | 5 | | reserved | x | 21 | | reserved |
| g | 6 | | reserved | y | 22 | | reserved |
| h | 7 | | reserved | z | 23 | | reserved |
| i | 8 | | reserved | Ä | 24 | | reserved |
| j | 9 | | reserved | B | 25 | | reserved |
| k | 10 | | reserved | C | 26 | | reserved |
| m | 11 | | reserved | D | 27 | | reserved |
| n | 12 | | reserved | E | 28 | | reserved |
| p | 13 | | reserved | F | 29 | | reserved |
| q | 14 | | reserved | G | 30 | | aUI |
| r | 15 | reserved | H | 31 | reserved | | |

| Symbol | Decimal Value | Code Type | Country | Symbol | Decimal Value | Code Type | Country | |
|--------|---------------|-----------|----------|--------|---------------|-----------|----------|-----|
| J | 32 | aUI | reserved | 0 | 48 | aUI | reserved | |
| K | 33 | | reserved | 1 | 49 | | reserved | |
| L | 34 | | reserved | 2 | 50 | | reserved | |
| M | 35 | | reserved | 3 | 51 | | reserved | |
| N | 36 | | reserved | 4 | 52 | | reserved | |
| P | 37 | | reserved | 5 | 53 | | reserved | |
| Q | 38 | | reserved | 6 | 54 | | reserved | |
| R | 39 | | reserved | 7 | 55 | | reserved | |
| S | 40 | | reserved | 8 | 56 | | reserved | |
| T | 41 | | reserved | 9 | 57 | | reserved | |
| U | 42 | | reserved | & | 58 | | reserved | |
| V | 43 | | reserved | * | 59 | | reserved | |
| W | 44 | | reserved | + | 60 | | EO-ID | n/a |
| X | 45 | | reserved | < | 61 | | F-ID | n/a |
| Y | 46 | | reserved | > | 62 | | M-ID | n/a |
| Z | 47 | reserved | ? | 63 | reserved | reserved | | |

5.1.5 Code Version

Every code is equipped with a code version. Together with the CCCTI the code version clearly identifies the structure of the presented code. In case the code structure needs to be updated, e.g. on demand by EU, the structure update can be introduced in a compatible manner by incrementing the code version.

5.1.6 Short codes and Lookup Tables

upUIs and aUIs rely heavily on the use of lookup tables. By applying this technique, the information required in the UIs can be condensed and compacted. In order to decode this compact information, lookup-tables are kept by the ID Issuer and shared with the Secondary Repository.

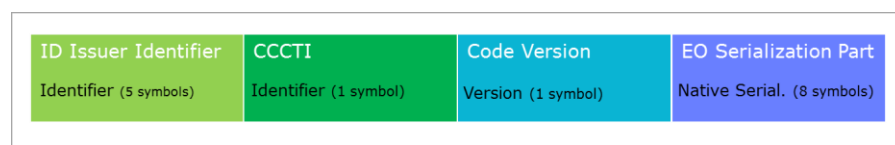
5.2 Economic Operator ID (EO-ID)

Every economic operator MUST apply for an EO-ID at the relevant ID Issuer. EO-IDs are used in requests for other identifiers (e.g. facility IDs, upUIs ...) and in the events about product creation and trade, sent by economic operators to the repository system.

5.2.1 Code Version 1

The EO-ID has a length of 15 symbols and consists of four information items, which are:

| Information Item | Type | Length | Remark |
|-----------------------|--------|--------|--|
| ID Issuer identifier | String | 5 | s. chapter 5.1.2 |
| CCCTI | String | 1 | s. chapter 5.1.4 |
| Code version | String | 1 | s. chapter 5.1.5 |
| EO serialization part | String | 8 | ISO 3166-1 ALPHA-2 country identifier followed by a numeric sequence number in the range of 0 – 999.999 Regex format: <code>^[A-Z]{2}\d{6}\$</code> |



Example:

EO-ID, code version 1, German operator

QCBDR + 1 DE020054

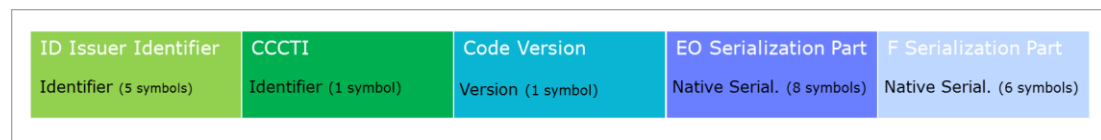
5.3 Facility ID (F-ID)

Every economic operator MUST apply for facility IDs at the relevant ID Issuer for every facility involved in production or trade of tobacco products. F-IDs are used in requests for other identifiers (machine identifier, upUIs or aUIs) and in the events about product creation and trade, sent by economic operators to the repository system.

5.3.1 Code Version 1

The F-ID has a length of 21 symbols and consists of five information items, which are:

| Information Item | Type | Length | Remark |
|-----------------------|--------|--------|--|
| ID Issuer identifier | String | 5 | s. chapter 5.1.2 |
| CCCTI | String | 1 | s. chapter 5.1.4 |
| Code version | String | 1 | s. chapter 5.1.5 |
| EO serialization part | String | 8 | ISO 3166-1 ALPHA-2 country identifier followed by a numeric sequence number in the range of 0 – 999.999 Regex format: <code>^[A-Z]{2}\d{6}\$</code> |
| F serialization part | String | 6 | A numeric sequence number in the range of 0 – 999.999 Regex format: <code>^\d{6}\$</code> |



Example:

F-ID, code version 1,

QCBDR < 1 DE020054 000048

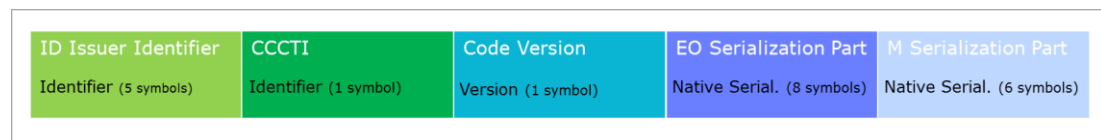
5.4 Machine ID (M-ID)

Every producer/importer MUST apply for machine IDs at the relevant ID Issuer for every machine/production line involved in production of tobacco products. M-IDs are used in requests for upUIs and in the events about product creation/import, sent by economic operators to the repository system.

5.4.1 Code Version 1

The M-ID has a length of 21 symbols and consists of five information items, which are:

| Information Item | Type | Length | Remark |
|-----------------------|--------|--------|--|
| ID Issuer identifier | String | 5 | s. chapter 5.1.2 |
| CCCTI | String | 1 | s. chapter 5.1.4 |
| Code version | String | 1 | s. chapter 5.1.5 |
| EO serialization part | String | 8 | ISO 3166-1 ALPHA-2 country identifier followed by a numeric sequence number in the range of 0 – 999.999 Regex format: <code>^[A-Z]{2}\d{6}\$</code> |
| M serialization part | String | 6 | A numeric sequence number in the range of 0 – 999.999 Regex format: <code>^\d{6}\$</code> |



Example:

M-ID, code version 1,

QCBDR > 1 DE020054 000012

5.5 Unit pack level Unique Identifier (upUI)

TPD-Impl [2] sets out the content of an upUI and a length maximum length of 50 characters. However, the structure of an upUI is at the discretion of the ID Issuer.

The following information items must be included in the upUI:

- The ID Issuer Identifier,
- A serial number
- A code (*product code*) allowing for the determination of the following:
 - Place of manufacturing
 - Manufacturing facility
 - Machine used for the manufacturing
 - Product description
 - Intended market of retail sale
 - Intended shipment route
 - Where applicable, the importer into the Union
- 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 manufacture.

Apart from the latter, the ID Issuer is responsible for issuing a code acc. to the above requirement. The time stamp is added by the producer/importer.

The **ID Issuer Identifier** is an identifier of 5 character's length. This immutable identifier the ID Issuer is assigned by an issuing authority EurodataCouncil acc. to ISO 15459, cf. chapter 5.1.2.

The **serial number** is a sequence of 10 characters. The construction of the serial number is defined as follows.

- 1 symbol CCCTI (s. chapter 5.1.4)
- 1 symbol code version (s. chapter 5.1.5)
- unique id (s. relevant version chapter below)

The information set referred to as **product code** is coded in the so called *Primary Information* block.

The basic idea for the Primary Information block is to use lookup tables and short codes so that less space is needed to include the required information in the UIs. An exemplary look up table for the "Machine" information element would look like this:

| Machine Identification Code | Short Code |
|-----------------------------|------------|
| QCBDR>1DE020054000012 | A1B |
| QCBDR>1DE0000A3000001 | A1C |

More space can be saved by identifying and removing redundancies. The EU, for instance, requires information on the place of manufacture, the facility and the machine used to be included in the UI. Assuming a fixed relationship between the place of manufacture, the facility and the immovable production machine, it is sufficient to indicate only the machine within the UI with a short code allowing the facility and the place of manufacture to be derived from the machine.

By applying the lookup-table method, redundancy removal and an enhanced alphabet (see chapter 5.1.2), the primary information block of a UI code is defined as follows.

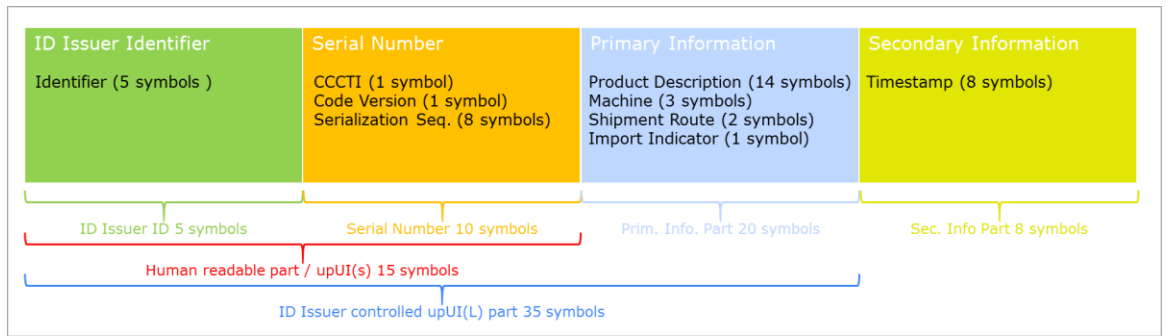
| Information element | UI element name | Code example |
|--|---------------------|----------------|
| Place of manufacturing | Machine | A1B |
| Manufacturing facility | | |
| Machine used to manufacture the tobacco products | | |
| Product description | Product description | 00225630001542 |
| Intended market of retail sale | Shipment route | 2M |
| Intended shipment route | | |
| Where applicable, the importer into the EU | Importer | 1 |

The **Secondary Information** consists of a UTC time stamp in the format YYMMDDhh. The Secondary Information is not created by the ID Issuer but added by the producer.

5.5.1 Code Version 1

The upUI has a length of 43 symbols and consists of nine information items grouped by four blocks, which are.

| Information Item | Type | Length | Block Name | Remark |
|------------------------|--------|--------|-----------------------|---|
| ID Issuer identifier | String | 5 | ID Issuer ID | s. chapter 5.1.2 |
| CCCTI | String | 1 | Serial Number | s. chapter 5.1.4 |
| Code version | String | 1 | Serial Number | s. chapter 5.1.5 |
| Serialization sequence | String | 8 | Serial Number | Described in detail below |
| Product description | String | 14 | Primary Information | The product description may hold either a GTIN or short code denoting a TPPN or brand based on a lookup-table. If the product description starts with character '!' it holds a short code. If it starts with a digit or character '\$' it holds a GTIN. |
| Machine | String | 3 | Primary Information | Machine short code |
| Shipment/market | String | 2 | Primary Information | Shipment route and market identifier |
| Import indicator | String | 1 | Primary Information | Indicate imported products |
| Timestamp | String | 8 | Secondary Information | Product timestamp. The timestamp is not created by the ID Issuer |



upUI(L) Examples

upUI(L) for Germany, code version 1, Italian Market via Austria, no import with product description compliant to TPD Annex II -message type 2-1

QCBDR a10wBnq5V3 !d5JP30x3KeZ71dTQE00 18121607

upUI(L) for Germany, code version 2, Portuguese Market via France, no import with GTIN-14 product description

QCBDR a20wBnq5V3 00003172440841dTQM90 18121607

upUI(L) for Germany, code version 2, Portuguese Market via France, no import with GTIN-12 product description

QCBDR a20wBnq5V3 \$\$003172440841dTQM90 18121607

5.6 Aggregated Packaging Level Unique Identifiers (aUI)

Acc. to TPD-Impl [2] an aUI must contain the following information:

- The ID Issuer Identifier,
- A serial number,
- The facility identifier in which the aggregation process took place,
- 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.

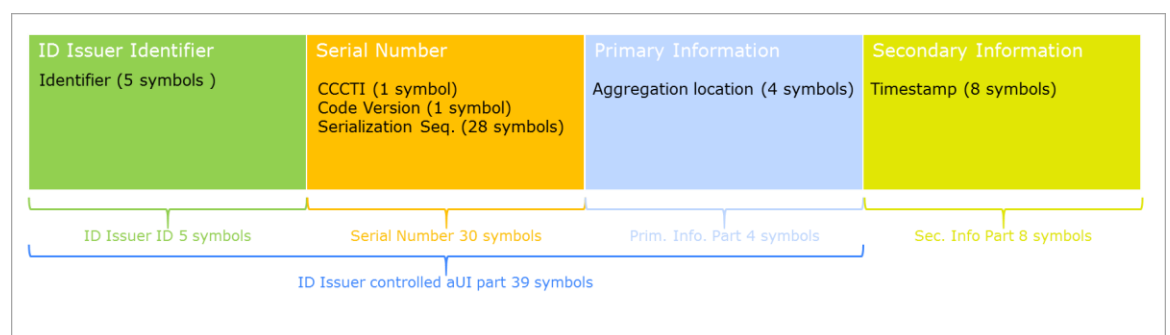
In order to keep the aUI concise, the facility identifier is represented by a short code that can be dereferenced using a lookup-table.

Similar to the upUI the ID Issuer is not responsible of the time stamp.

5.6.1 Code Version 1

The aUI has a length of 47 symbols and consists of six information items grouped by four blocks, which are.

| Information Item | Type | Length | Block Name | Remark |
|------------------------|--------|--------|-----------------------|---|
| ID Issuer identifier | String | 5 | ID Issuer ID | s. chapter 5.1.2 |
| CCCTI | String | 1 | Serial Number | s. chapter 5.1.4 |
| Code version | String | 1 | Serial Number | s. chapter 5.1.5 |
| Serialization sequence | String | 28 | Serial Number | A unique sequence |
| Aggregation location | String | 4 | Primary Information | A short code denoting the location where the aggregation took place |
| Timestamp | String | 8 | Secondary Information | Product timestamp. The timestamp is not created by the ID Issuer |



aUI Example

aUI for Germany with code version 1

QCBDR G1jEwk74JR0wBnq5xqK7w303kPV38a H0S+ 20180416

5.7 UI Lists for electronic delivery of UIs

upUIs and aUIs are delivered as a file via GUI or as response to a download operation via API. Either way, the list structure is the same. An object of type `UiList` is returned, which conveys an instance of `AUiList` or `UpUiList`, depending on the ordered UI type. The attributes have the following meaning:

- `orderId`: the id issued by the ID Issuer to track the order
- `idType`: the type of delivered UIs. Can be one of `upUI` or `aUI`
- `amount`: number of delivered UIs
- `recallCodeList`: contains one or more identifier, issued by the Router upon receipt of the UIs
- `uiList`: the list of created UI in the format `upUI(i)` as defined in [9] or `aUI` as defined in [2].
- `uiShortList` (only for `idType upUI` orders): list of created UI in the format `upUI(s)` as defined in [9]

A detailed description of the used data type can be found at [11].

Example:

```
{
  "orderId": "20327898375",
  "idType": "upUI",
  "amount": 2,
  "recallCodeList": [
    "873345b2-882f-4064-91f0-90669b46c30a"
  ],
  "uiList": [
    "QCBDRa20wBnq5V300003172440841dTQM90",
    "QCBDRa2fT3wp08200003172440841dTQM90"
  ],
  "uiShortList": [
    "QCBDRa20wBnq5V3",
    "QCBDRa2fT3wp082"
  ]
}
```

5.8 Order ID

The ID Issuer handles requests for `upUI` and `aUIs` in orders. An order ID is returned in response to a successful request. The format of the order ID is:

OrderId:

```
type: string
minLength: 11
maxLength: 11
description: An order ID
format: '^\\d{11}$'
example: "18000093616"
```


6. Other Data Types

6.1 Mapping of TPD-Impl-Act – Annex II – types to internal type

| TPD field name | Internal type-name | Internal type | Length |
|------------------|---------------------|---------------|--------|
| EO_City | City | String | 40 |
| EO_Code | ConfirmationCode | String | 6 |
| EO_CountryReg | IsoCountry | String | 2 |
| EO_Email | Email | String | 80 |
| EO_ExciseNumber1 | ChoiceSelector | Boolean | 1 |
| EO_ExciseNumber2 | SEED | String | 13 |
| EO_HouseNumber | HouseNumber | String | 20 |
| EO_ID | EOID | String | 15 |
| EO_Name1 | EoName | String | 100 |
| EO_Name2 | EoName | String | 100 |
| EO_Street | Street | String | 40 |
| EO_ZipCode | ZipCode | String | 10 |
| F_City | City | String | 40 |
| F_CountryReg | IsoCountry | String | 2 |
| F_ExciseNumber1 | ChoiceSelector | Boolean | 1 |
| F_ExciseNumber2 | SEED | String | 13 |
| F_HouseNumber | HouseNumber | String | 20 |
| F_ID | FID | String | 21 |
| F_Status | ChoiceSelector | Boolean | 1 |
| F_Street | Street | String | 40 |
| F_Type | FacilityTypes | Integer | int32 |
| F_Type_Other | DescriptionType | String | 50 |
| F_ZipCode | ZipCode | String | 10 |
| Import | ChoiceSelector | Boolean | 1 |
| Intended_Market | IsoCountry | String | 2 |
| Intended_Route1 | ChoiceSelector | Boolean | 1 |
| Intended_Route2 | IsoCountry | String | 2 |
| M_Capacity | MachineCapacity | Integer | int32 |
| M_ID | MID | String | 21 |
| M_Model | DescriptionType | String | 20 |
| M_Number | DescriptionType | String | 20 |
| M_Producer | DescriptionType | String | 20 |
| OtherEOID_N | ArrayOf<type> | Array | <type> |
| OtherEOID_R | ChoiceSelector | Boolean | 1 |
| OtherFID_N | ArrayOf<type> | Array | <type> |
| OtherFID_R | ChoiceSelector | Boolean | 1 |
| P_Brand | TobaccoProductBrand | String | 50 |
| P_CN | CnCode | String | 10 |
| P_OtherType | DescriptionType | String | 50 |
| P_Type | TobaccoProductTypes | Integer | int32 |
| P_weight | PackageWeight | Number | float |
| Process_Type | ChoiceSelector | Boolean | 1 |
| Recall_Code | RecallCode | String | 6 |
| Recall_Reason1 | RecallReasonTypes | Integer | int32 |
| Recall_Reason2 | DescriptionType | String | 50 |
| Recall_Reason3 | DescriptionType | String | 50 |

| | | | |
|--------------|----------------|---------|-------|
| Reg_3RD | ChoiceSelector | Boolean | 1 |
| Req_Quantity | Quantity | Integer | int32 |
| TAX_N | TIN | String | 16 |
| TP_ID | TPIId | String | 14 |
| TP_PN | TPPN | String | 20 |
| VAT_N | VatID | String | 14 |
| VAT_R | ChoiceSelector | Boolean | 1 |

6.2 Additional types

| Field name | Internal type-name | Internal type | Length |
|----------------------------|------------------------|---------------|--------|
| Buende_Order_ID | BuendeOrderId | String | 35 |
| Buende_Order_Position | BuendeOrderPostion | Integer | int32 |
| Delivery_Method | DeliveryMethod | String | enum |
| EO_InvoiceAddr_City | City | String | 40 |
| EO_InvoiceAddr_CountryReg | IsoCountry | String | 2 |
| EO_InvoiceAddr_HouseNumber | HouseNumber | String | 20 |
| EO_InvoiceAddr_Street | Street | String | 40 |
| EO_InvoiceAddr_ZipCode | ZipCode | String | 10 |
| EO_InvoiceEmail | Email | String | 80 |
| EO_MobileTelefonNumber | MobilePhoneNumber | String | 20 |
| GTIN | GTIN | String | 14 |
| OrderProcessingPriority | OrderProcessingOptions | String | enum |
| OrderProcessingPriority | OrderProcessingOptions | String | enum |

7. Constrains and Boundaries

upUI orders:

Range for the amount parameter: 1 – 1.000.000

aUI orders:

Range for the amount parameter: 1 – 1.000.000

EO-ID, F-ID, M-ID order:

Max. of 1000 parallel ID orders in one API request

8. Data Carrier Rules

This chapter describes how data carriers shall be constructed to convey upUI and aUI information. The depicted rules are in line with Eurodata Council, the issuing agency acc. to ISO 15459, competent for bdr ID Issuer identification code, pursuant to Article 3(4) [2] and follow clarifications on the structure of unit level identifiers issued by DG SANTE dating of 2019/04.

The data coding rules below apply to every UI issued by the German ID Issuer, though, not to UIs issued by ID Issuer of other Member States or aggregated level unique identifiers (aUIs) created by the EOs themselves acc. to Article 10(4) [2].

8.1 General Encoding Rules

Data carrier must comply with the rules as set out by Article 21 [2]. The data carrier content must be preceded by a mandatory ISO data identifier 5R, defined by [8].

8.1.1 Unit pack level Unique Identifiers (upIU)

upUI's shall be encoded in the data carrier as follows:

Position 1: DI 5R

Position 2: fixed value QCBDRU:

Position 3: the upUI as set out in 5.5, without preceding ID Issuer identifier QCBDR

Position 4: the time stamp in the format YYMMDDhh, which is optional acc. to derogation set out in Article 21(4) [2]

Practical advice: replace upUI preceding ID Issuer identifier QCBDR by 5RQCBDRU: and add the timestamp, if desired.

Example of the information to encode into the data carrier for an upUI

QCBDRa10wBnq5V3!!!!!!x3KeZ71dTQE00 with a production date of May 20th 2019, 4:00pm included in the data carrier:

=> Data carrier content:

```
5RQCBDRU:a10wBnq5V3!!!!!!x3KeZ71dTQE0019052016
```

8.1.2 Aggregated level Unique Identifiers (aIU)

aUI's shall be encoded in the data carrier as follows:

Position 1: DI 5R

Position 2: fixed value QCBDR:

Position 3: the aUI as set out in 5.6, without preceding ID Issuer identifier QCBDR

Position 4: the time stamp in the format YYMMDDhh

Position 5: optional additional Information as set out by Article 11(4) [2]

Practical advice: replace aUI preceding ID Issuer identifier QCBDR by 5RQCBDR: and add additional information, if desired.

Example of the information to encode into the data carrier for an aUI

QCBDRG1jEwk74JR0wBnq5xqK7w303kPV38aH0S+ with an aggregation date of May 20th 2019, 5:00pm included in the data carrier and additional information 'lot213':

=> Data carrier content:

```
5RQCBDR:G1jEwk74JR0wBnq5xqK7w303kPV38aH0S+19052017lot213
```

8.2 General Decoding Rules

The repository system expects the information without DIs contained in the data carrier. Any party processing information intended for transmission to the repository system contained in a data carrier, must strip the preceding control information beforehand.

8.2.1 Unit pack level Unique Identifiers (upIU)

Decoding example for data carrier content:

```
5RQCBDRU:a10wBnq5V3!!!!!!x3KeZ71dTQE0019052016
```

=> Information for transmission to repository system:

```
QCBDRa10wBnq5V3!!!!!!x3KeZ71dTQE0019052016
```

8.2.2 Aggregated level Unique Identifiers (aIU)

Decoding example for data carrier content:

```
5RQCBDRAG1jEwk74JR0wBnq5xqK7w303kPV38aH0S+19052017lot213
```

=> Information for transmission to repository system:

```
QCBDRG1jEwk74JR0wBnq5xqK7w303kPV38aH0S+19052017
```

Please note that the trailing additional information 'lot213' has also been stripped from the information intended for transmission.

9. Disclaimer

The present document reflects the information available regarding Directive 2014/40/EU including TPD [2] and amended TPD [9].

However, the content of this API specification may change over the course of time. Some of the reasons for adaptations might be:

- Changes due to decisions of DG SANTE “subgroup on traceability and security features”
- If the router API requires adaptations

Bundesdruckerei may not be held responsible for impacts that result from API modifications.

10. References

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- [4] Open API Specification
<https://github.com/OAI/OpenAPI-Specification>
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- [9] COMMISSION IMPLEMENTING REGULATION (EU) 2023/448 of 1 March 2023 amending Implementing Regulation (EU) 2018/574 on technical standards for the establishment and operation of a traceability system for tobacco products
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